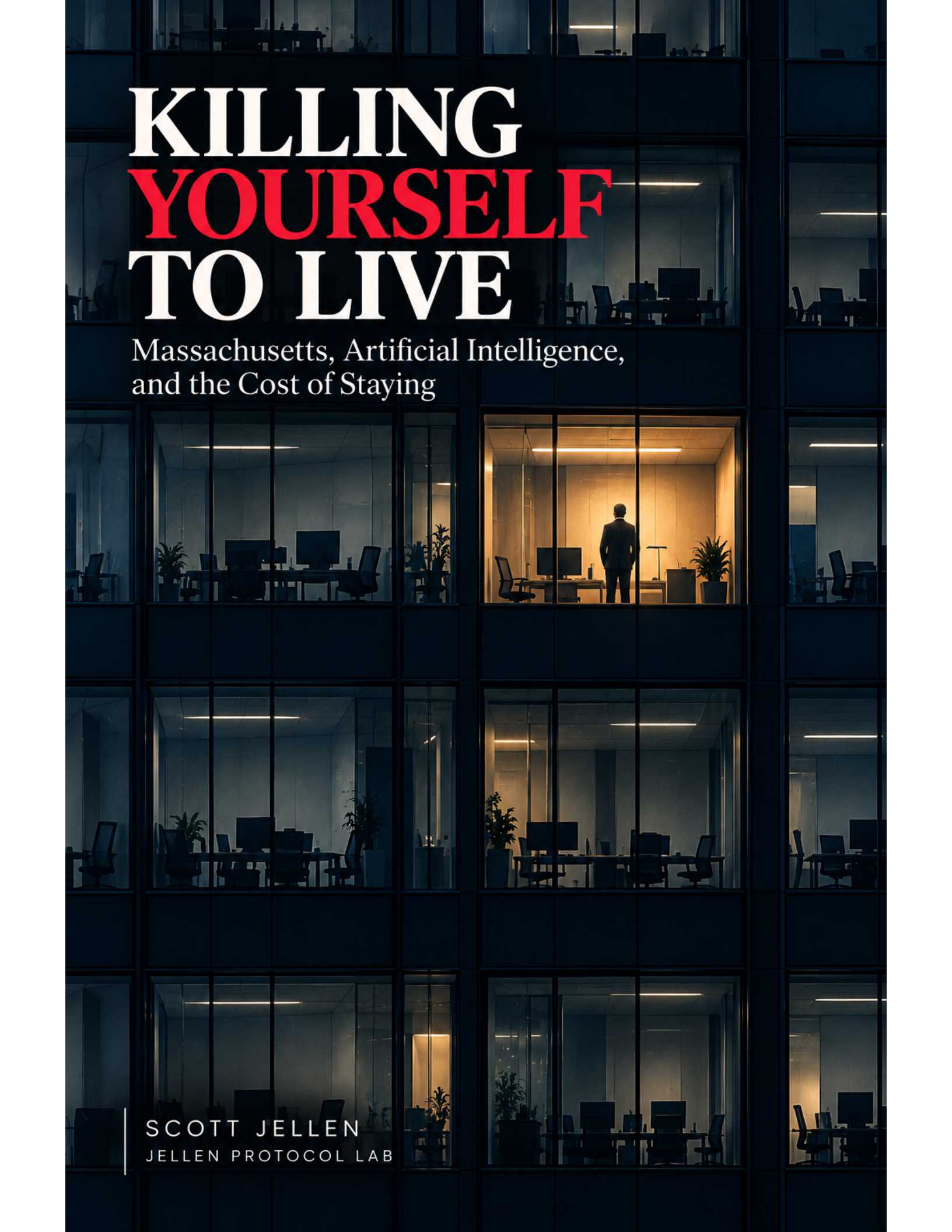




KILLING YOURSELF TO LIVE

Massachusetts, Artificial Intelligence,
and the Cost of Staying

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Killing Yourself to Live

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Abstract

Massachusetts has built an unusually prosperous economy around high household costs, concentrated knowledge-intensive employment, and institutions sustained by substantial recurring economic activity. This paper examines a structural vulnerability in that arrangement: the earning power that justifies the Commonwealth's cost premium may become less reliable even as household commitments, public obligations, and physical infrastructure remain slow to adjust.

Artificial intelligence is examined not as a prediction of mass unemployment, but as a potential change in the amount of human labor required to produce knowledge-intensive output. The analysis distinguishes employment, economic value, carrying wage capacity, and household income headroom. Using public economic data, illustrative wage-compression scenarios, demographic trends, fiscal conditions, and the historical transformation of the Route 128 technology corridor, it identifies a conditional feedback mechanism through which declining household margin and rigid institutional obligations could reinforce one another without an immediate collapse in employment, population, or economic output.

The paper does not establish that such deterioration is already underway. Instead, it argues that Massachusetts' long-term resilience depends on how technological productivity translates into durable household and fiscal capacity. Its proposed direction combines greater physical anchoring of knowledge-intensive economic activity with reductions in the recurring costs of sustaining ordinary households.

The central question is not whether Massachusetts can continue creating extraordinary wealth, but whether that prosperity can continue supporting the population and institutions built around it.

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Killing Yourself to Live

1. The Massachusetts Bargain

Massachusetts is prosperous by almost every conventional measure. It has high household incomes, valuable property, world-class universities and hospitals, dense concentrations of advanced industries, and one of the most highly educated workforces in the United States.

For decades, those advantages have supported an implicit bargain: Massachusetts is unusually expensive, but the opportunity available within it can be unusually valuable.

That bargain has allowed costs that would be extraordinary elsewhere to become ordinary here.

The median Massachusetts household earned \$104,828 in 2024 (U.S. Census Bureau, 2025). Yet income alone gives an incomplete picture of what it takes to establish and maintain a household in the Commonwealth. In 2026, the MIT Living Wage Calculator estimated that two working adults raising two children in Massachusetts require approximately \$164,800 in combined pre-tax income to meet a modeled set of basic needs (MIT Living Wage Institute, 2026b).

That figure does not describe affluence. It represents a modeled basic-needs budget covering housing, food, childcare, transportation, healthcare, taxes, and other necessary household expenses.

Nor does it mean every Massachusetts household requires \$164,800. Household size, age, geography, homeownership, childcare needs, and other circumstances matter. A single adult and a family with two young children are fundamentally different economic units.

The point is that entirely ordinary forms of household formation can now require incomes that would conventionally be regarded as high.

A six-figure income in Massachusetts can therefore describe both prosperity and constraint.

The distinction becomes sharper when income is compared with wealth. The Federal Reserve Bank of Boston's Massachusetts Economic Conditions and Household Opportunity Survey estimated median family net wealth at approximately \$374,000. But the 25th percentile was only \$10,000. Families with a respondent or spouse under age 45 had median net wealth of approximately \$97,000. And 35.4 percent of Massachusetts families reported that they could not cover an unexpected \$400 expense with cash or its equivalent (Mattingly et al., 2026).

These figures describe different dimensions of economic security.

A household may own an appreciated home, hold retirement assets accumulated over years, and appear successful on a balance sheet while maintaining relatively little immediately accessible cash. Home equity does not easily make next month's childcare payment. A retirement account is not designed to absorb a sudden loss of wages.

Net worth measures what has accumulated.

It does not necessarily measure how long a household can maintain its current life when income changes.

Massachusetts can therefore be wealthy without Massachusetts households being equally resilient.

That matters because much of the Commonwealth's cost structure assumes continuity. A mortgage does not automatically decline after a pay cut. Property taxes do not immediately adjust to household income. Childcare, insurance, transportation, utilities, and debt payments do not fall proportionally when earnings fall.

Families make long-duration commitments based on the income available when those commitments are made.

A household earning \$200,000 may reasonably build a \$200,000 life.

If that household later earns \$160,000, it has not become poor. Its income remains high by almost any conventional measure. But its obligations were not constructed at \$160,000.

The relevant economic change is not simply a decline in income.

It is the disappearance of the space between income and commitments.

That space is **income headroom**.

Income headroom is the margin between what a household earns and what it requires to remain economically self-sufficient within its existing environment. Two households earning the same amount can possess radically different headroom depending on children, housing, debt, location, savings, and other fixed commitments.

A household can therefore move from secure to fragile without crossing a poverty line, losing every asset, or becoming unemployed.

The relevant question is not merely how much a Massachusetts household earns.

It is how much room remains after Massachusetts has been paid for.

For much of the modern era, that room did not have to be especially large because the Commonwealth offered something capable of justifying the premium: extraordinary economic opportunity.

Its universities supplied talent. Its research institutions generated knowledge. Its hospitals and laboratories created global centers of medicine and science. Its technology, finance, professional-services, and innovation industries paid salaries capable of supporting expensive households.

Massachusetts did not need to be cheap.

It needed to be worth it.

A high-cost state remains stable while the opportunity premium it offers is large enough to justify the cost premium it charges.

The bargain changes when those two premiums stop moving together.

If costs remain while opportunity weakens, households do not need to become destitute for the system to come under pressure. They only need to lose enough headroom that the premium for remaining in Massachusetts becomes progressively harder to justify.

That is the vulnerability at the center of this paper.

Massachusetts has built an extraordinarily successful economy around households capable of earning extraordinary incomes.

The question is what happens when the economic system responsible for producing those incomes begins to change faster than the costs built around them can adjust.

2. The Population Carrying the Commonwealth

The Massachusetts bargain depends on more than prosperity in the aggregate.

It depends on maintaining a sufficiently large population of households capable of functioning inside the Commonwealth's unusually expensive environment while generating enough recurring economic capacity to support the systems around them.

This population cannot be identified through a single income threshold.

A retired household with a paid-off home may possess substantial resilience on comparatively modest annual income. A family earning \$175,000 while paying for housing and two children may possess considerably less. Two households adjacent in an income distribution can occupy very different economic positions once housing, assets, liquidity, family structure, and location are considered.

What matters is function.

This paper refers to the **carrying population** as households with sufficient income, assets, liquidity, and economic stability to sustain themselves within the Massachusetts cost structure while also contributing recurring capacity to the larger system through taxes, consumption, property, savings, and participation in the labor market.

The term does not assign greater social value to one household than another. It describes an economic function.

Every society contains people at different stages of life and with different levels of dependence on shared institutions. Children, retirees, disabled residents, lower-income workers, and households receiving public support remain integral parts of the Commonwealth.

But the system still requires enough productive capacity to support all of them.

Massachusetts requires an unusually large amount of that capacity because Massachusetts itself is unusually expensive.

The carrying population is an analytical concept rather than a separately measured demographic category.

Identifying its size would require examining household income, assets, liquidity, family composition, recurring costs, and geographic differences together. Determining whether that population is expanding or contracting would also require comparable observations over time.

This paper does not calculate the number of Massachusetts households meeting those conditions or establish that the carrying population has already declined.

The household-income distribution nevertheless provides a useful starting point for understanding the economic structure from which that capacity is drawn (U.S. Census Bureau, 2025).

In 2024, Massachusetts contained approximately 2.83 million households. Roughly 52 percent earned at least \$100,000. About 34 percent—approximately 971,000 households—earned \$150,000 or more.

Neither income threshold identifies the carrying population, nor does either establish a boundary around it.

The roughly 1.48 million households with annual incomes of at least \$100,000 represent a substantial portion of the Commonwealth's household-income distribution. Some possess considerable economic resilience. Others, particularly families with children or high housing costs, may already have little income headroom.

Approximately 971,000 of those households had annual incomes of at least \$150,000. Even at that level, income alone does not guarantee resilience.

Conversely, households earning less than \$100,000 may possess substantial economic margin through lower housing costs, accumulated assets, limited fixed obligations, or other circumstances.

Household structure, recurring commitments, assets, and liquidity all matter.

The most important territory may therefore sit between conventional descriptions of the middle and upper-middle class.

Approximately 844,000 Massachusetts households—nearly three in ten—had annual household incomes between \$100,000 and \$200,000 in 2024.

Their incomes are high enough to appear prosperous in national statistics.

Yet for many family configurations, they remain close enough to the Massachusetts cost structure that a meaningful reduction in earnings can quickly remove their margin.

Income alone therefore cannot identify the population carrying the Commonwealth.

An independent measure of household affordability establishes the scale of the existing constraint.

United For ALICE estimated that approximately 1.19 million Massachusetts households, or 42 percent of the state's total, had incomes below the locally adjusted cost of basic necessities in 2024 (United For ALICE, 2026).

The remaining 1.64 million households were above that threshold.

These figures do not establish an accelerating affordability crisis.

Massachusetts' below-threshold share was approximately 43 percent in 2023 (United For ALICE, 2025), and its 2024 rate was close to the national average.

They establish a different starting condition.

A substantial portion of Massachusetts households already operates below a basic-needs benchmark, while the economic resilience of households above that benchmark remains largely unmeasured.

This paper is concerned particularly with the latter population.

The relevant question is how much wage compression those households can absorb before they cross from economic self-sufficiency into financial pressure.

The other half of the equation is where those incomes come from.

Greater Boston is unusually concentrated in highly compensated professional work.

Using May 2025 occupational employment and wage estimates from the U.S. Bureau of Labor Statistics, this paper calculates that six occupational groups—management; business and financial operations; computer and mathematical; architecture and engineering; life, physical, and social science; and legal—represented approximately 29 percent of employment in the Boston-Cambridge-Newton, MA–NH metropolitan area (U.S. Bureau of Labor Statistics, 2026; author calculations).

Their employment-weighted average annual wage was approximately \$143,000, compared with roughly \$89,600 across all metropolitan occupations. Together, these six groups accounted for an estimated 46 percent of the metropolitan area’s total occupational wage bill.

The concentration is substantially greater than the national occupational structure.

Using the same six occupational groups, approximately 20.8 percent of employment nationwide accounted for an estimated 35.5 percent of the national occupational wage bill. In Greater Boston, the corresponding shares were approximately 29.1 percent and 46.4 percent.

These comparisons are author calculations based on BLS occupational employment shares and mean wages. They estimate a wage-bill proxy rather than directly observed payroll totals (U.S. Bureau of Labor Statistics, 2026; author calculations).

BLS generally converts hourly wages to annual wages using a 2,080-hour work year. Differences in actual hours worked and part-time employment across occupational groups can therefore affect how closely these estimated shares correspond to actual annual payroll.

Less than one-third of Greater Boston employment therefore accounts for nearly one-half of its estimated occupational wages, a considerably greater concentration than exists nationally.

This concentration does not establish the number of households carrying the Commonwealth. The calculation measures the occupational wage structure of the Boston-Cambridge-Newton, MA–NH metropolitan area, not the income distribution or fiscal contribution of Massachusetts residents alone.

It establishes where a substantial portion of regional earning power is concentrated, rather than how many households possess sufficient economic margin.

That concentration helps explain how Massachusetts sustains such an expensive economic structure.

The Commonwealth does not merely contain many jobs.

It contains an unusually large block of jobs capable of generating the incomes required to support expensive housing, substantial household consumption, valuable property, and a large public sector.

This is why job counts alone are insufficient.

Ten thousand jobs paying \$160,000 do not perform the same economic function as ten thousand jobs paying \$80,000, even though both appear identically in an employment total.

A labor market can replace jobs without replacing the same amount of labor earnings.

This paper uses **carrying wage capacity** to describe the aggregate flow of employment earnings available to sustain Massachusetts households within the Commonwealth's cost structure.

It is distinct from employment counts and does not establish a fixed salary threshold for individual workers.

Whether those earnings translate into economically resilient households depends on how income is distributed, the number of earners within each household, nonwage resources, recurring costs, assets, and liquidity.

Carrying wage capacity is therefore an analytical concept, not a separately calculated statewide statistic in this paper.

An economy can maintain low unemployment even as carrying wage capacity grows more slowly or declines outright.

Slower career progression can restrain wage growth. Replacing higher-paying employment with lower-paying work, or producing the same output with less aggregate payroll, can reduce the total earnings flowing to workers.

Neither outcome necessarily establishes a reduction in the Commonwealth's broader carrying capacity. That depends on whether new employment, business activity, investment income, productivity gains, and public revenue sufficiently offset the changes in labor earnings.

Massachusetts' fiscal structure makes that distinction particularly consequential.

Employment earnings supply a substantial share of Commonwealth tax revenue through wage withholding (Massachusetts Department of Revenue, 2026).

The connection extends beyond income taxes.

High-wage employment supports consumption, housing values, restaurants, contractors, childcare providers, professional services, and the commercial and residential property bases on which municipalities depend.

A high-wage worker therefore participates in the Massachusetts balance sheet through several channels at once.

This does not mean every dollar disappears when a worker earns less or leaves.

Jobs can be refilled.

Workers can be replaced.

Economic activity can move between industries.

Productivity can increase.

One person's departure does not automatically become a permanent fiscal loss.

But replacement is precisely the issue.

For the Massachusetts model to remain intact, the Commonwealth does not merely need to replace people or jobs.

It needs to replace enough of the economic capacity they supplied.

A departing \$180,000 worker replaced by a \$90,000 worker can represent successful replacement in a population count and even in an employment count.

It does not represent full replacement of wage capacity.

Likewise, a company can increase output while reducing payroll and become more productive while directly supporting fewer households.

This distinction matters more in a high-cost state.

Massachusetts does not require every resident to earn an extraordinary income.

It does require a sufficiently large economic base capable of generating the resources that allow households, businesses, municipalities, and the Commonwealth itself to function.

The system therefore depends on a relationship between two things:

the population Massachusetts contains,

and the economic capacity within that population capable of carrying an unusually large share of its cost structure.

As long as that capacity remains large, productive, and continually replenished, Massachusetts can absorb remarkable expense.

High housing prices can coexist with growth.

Public obligations can remain manageable.

Universities and hospitals can expand.

Municipalities can maintain expensive services.

The vulnerability begins when population, employment, and carrying capacity stop moving together.

Massachusetts can add jobs while losing carrying wage capacity.

It can maintain population while losing working-age fiscal capacity.

It can become more productive while directly supporting fewer households.

It can remain rich while the population capable of sustaining that richness becomes narrower.

The relevant question is therefore not simply how many jobs Massachusetts has, or even how wealthy Massachusetts is.

It is:

How large is the population capable of carrying the Commonwealth, and what happens if the work supporting that population begins to require fewer people?

3. When Knowledge Stops Being Scarce

Massachusetts built much of its modern economic advantage around the scarcity of human knowledge.

Its universities produced highly trained workers. Its hospitals, laboratories, financial institutions, technology companies, law firms, research organizations, and professional-services businesses converted specialized knowledge into unusually valuable economic output.

Workers capable of producing, interpreting, organizing, and applying information commanded high wages because those capabilities were difficult to reproduce at scale.

That scarcity supported the Massachusetts bargain.

Artificial intelligence changes the economics of that scarcity.

It does not need to replace scientists, engineers, analysts, programmers, attorneys, accountants, managers, or researchers completely.

It only needs to reduce the amount of human labor required to perform a meaningful portion of their work.

That distinction is central.

Much of the public discussion around artificial intelligence asks how many jobs will disappear.

For Massachusetts, the more consequential question may be how much **human payroll will be required to produce a given amount of knowledge-intensive output**.

A company that once required ten analysts may eventually require eight.

A department that routinely hired twenty junior employees may hire twelve.

A professional worker may remain employed while software absorbs enough of the workload that the next person is hired later, at a lower wage, or not at all.

A firm may become more productive while its payroll grows more slowly.

None of these outcomes requires mass unemployment.

Each can weaken the growth of carrying wage capacity, and some can reduce it outright.

The net effect depends on whether new employment, increased compensation, and other economic activity sufficiently offset the changes.

That possibility matters unusually much in Greater Boston because the region's wage base is concentrated in analytical and cognitive work.

The six occupational groups identified in Section 2—management; business and financial operations; computer and mathematical; architecture and engineering; life, physical, and social science; and legal occupations—accounted for approximately 29 percent of employment and an estimated 46 percent of the occupational wage bill in the Boston-Cambridge-Newton, MA–NH metropolitan area in May 2025.

This does not mean 46 percent of Greater Boston wages are vulnerable to artificial intelligence.

It establishes the scale of the economic block through which a knowledge-work shock could travel.

Contemporary estimates illustrate the potential exposure.

In 2026, Tufts University’s Digital Planet project ranked Massachusetts among the states most vulnerable to AI-driven employment disruption. Under its central AI adoption scenario, the American AI Jobs Risk Index identified approximately 260,000 Massachusetts positions associated with \$25.6 billion in annual wages as potentially vulnerable to displacement over a two-to-five-year period (Chakravorti et al., 2026). These figures represent modeled displacement risk rather than observed job losses or a forecast of net employment change. The estimates do not account for potential offsetting employment creation, productivity gains, or other economic benefits associated with artificial intelligence adoption.

Artificial intelligence could also create new occupations, increase demand for existing workers, raise productivity, increase wages, or allow Massachusetts firms to expand into markets that would otherwise remain unreachable. The ultimate effect on Massachusetts will depend on how those gains compare with displacement and wage compression.

The important conclusion is narrower.

Massachusetts is unusually exposed because an unusually large share of its economic capacity sits in well-paid cognitive work.

That structure matters even if any particular forecast proves wrong.

Consider the professional wage block already described.

If occupations responsible for approximately 46 percent of Greater Boston wages experienced an aggregate 5 percent reduction in wage capacity, the effect would equal roughly 2.3 percent of the entire metropolitan wage bill.

At 10 percent, the effect would be roughly 4.6 percent.

At 20 percent, roughly 9.2 percent.

These are illustrative sensitivity calculations, not predictions. They measure hypothetical gross changes in the occupational wage bill of the Boston-Cambridge-Newton, MA–NH metropolitan area, not net changes in statewide earnings, economic output, or tax collections.

They show why Massachusetts does not require catastrophic unemployment for artificial intelligence to become economically consequential.

A moderate change applied to an unusually large high-wage portion of the economy can produce a substantial aggregate effect.

The same point can be expressed through a simple set of stress scenarios.

The following scenarios are illustrative sensitivity tests, not extensions of the Tufts risk index.

Each uses a \$150,000 annual earnings benchmark for an affected position and applies a hypothetical reduction to the aggregate wages associated with those positions.

The \$150,000 benchmark represents an illustrative earnings level for relatively well-paid professional work. It is broadly comparable to the approximately \$143,000 employment-weighted mean annual wage of the six Greater Boston occupational groups identified in Section 2.

The Tufts risk index examines a different statewide occupational mix and estimates potential income losses using occupational median wages, rather than the employment-weighted mean wages used in this paper's occupational analysis.

The two approaches should not be interpreted as directly comparable estimates.

The numbers of affected positions and the percentages of wage compression are modeling assumptions, not predicted employment losses or estimated probabilities.

The resulting dollar amounts represent annual reductions in aggregate payroll once each hypothetical transition is fully realized. They are not cumulative losses over the transition period, and the scenarios do not specify how quickly the assumed changes occur.

Under a **Scenario A**, 50,000 positions are affected over several years and aggregate wage capacity associated with them declines by 25 percent.

The resulting annual wage-capacity reduction would be approximately \$1.9 billion once fully realized.

Under a **Scenario B**, 100,000 positions are affected and aggregate wage capacity declines by 50 percent.

The annual reduction would be approximately \$7.5 billion.

Under a **Scenario C**, 250,000 positions are affected at the same 50 percent average reduction.

The annual difference would approach \$18.8 billion.

An affected position is not necessarily an eliminated position.

A 50 percent aggregate compression does not mean every worker earning \$150,000 suddenly earns \$75,000.

Some jobs may disappear.

Others may remain unchanged.

Some may be replaced at lower wages.

Entry-level hiring may slow.

Raises may weaken.

Teams may become smaller.

Contractors may replace salaried workers.

New jobs may appear elsewhere.

These scenarios calculate hypothetical gross reductions in payroll associated with the affected positions, not the net change in Massachusetts employment earnings after new jobs, productivity gains, wage growth elsewhere, or other offsets.

They do not establish the resulting change in state tax revenue.

That distinction matters because conventional employment statistics may not immediately reveal the transition.

Unemployment can remain low while wage capacity weakens.

Employment can remain stable while high-paying jobs are replaced by lower-paying ones.

Output can increase while payroll declines.

Productivity can rise while fewer households receive the wages previously required to produce that output.

A state can therefore become more economically efficient while directly supporting fewer economically self-sufficient households.

That possibility complicates the assumption that productivity growth automatically strengthens the Massachusetts model.

Artificial intelligence may produce enormous gains, and Massachusetts may benefit substantially from them.

Its universities, life-sciences sector, hospitals, engineering base, and concentration of highly educated workers could make it exceptionally capable of adopting new tools and building new industries around them.

The strongest alternative outcome is that these advantages allow Massachusetts to capture more economic value from artificial intelligence than it loses through displaced work.

Higher productivity could support new industries, expand investment, increase demand for complementary occupations, and reduce the cost of goods and services.

Under those conditions, artificial intelligence could strengthen household purchasing power, public revenue, and the Commonwealth's long-term competitiveness even as particular occupations contract.

The distinction is timing and distribution.

New economic value does not necessarily emerge in the same places, occupations, or households where existing earning capacity disappears.

Business profits, investment income, and tax collections may strengthen the aggregate economy without immediately replacing lost professional wages.

Lower consumer costs may improve household resilience, but their effect depends on whether the savings offset changes in earnings and recurring obligations.

The adverse transition examined here becomes consequential if existing carrying capacity deteriorates faster than new employment, higher earnings, lower living costs, and additional public resources can compensate.

If those gains emerge quickly enough and reach enough households, Massachusetts may become more resilient rather than less.

The question is how the resulting productivity is distributed.

If a professional-services company uses artificial intelligence to increase output by 30 percent while maintaining employment and raising wages, carrying capacity may increase.

If the same company increases output by 30 percent while reducing its workforce by 20 percent, the company may become more valuable while the number of households directly supported by its payroll declines.

Both outcomes represent productivity growth.

They are not equivalent for Massachusetts.

This is the distinction between economic value and carrying capacity.

The Commonwealth's existing cost structure does not depend only on companies producing valuable goods and services.

It depends on enough of that value flowing through wages, households, property, consumption, and recurring taxable activity to sustain the system surrounding those companies.

Artificial intelligence therefore creates a peculiar challenge for a state whose economic success has been built around expensive human cognition.

The technology may make Massachusetts companies more productive precisely by making portions of Massachusetts labor less scarce.

The Commonwealth can benefit enormously from that change.

But higher output does not automatically preserve the household base on which the current system was built.

For a worker, the relevant question is not whether Massachusetts GDP increased after the worker's salary fell.

It is whether the household can still support the life constructed around its previous income.

For the Commonwealth, the question is similar:

How much of the economic value created by artificial intelligence will continue to flow through a sufficiently large population of working households?

Massachusetts has historically answered economic disruption by producing, attracting, and replacing highly skilled workers.

If artificial intelligence reduces the number of workers required within the state's most valuable occupations, the next question is whether that replacement machine can continue performing the function on which the Massachusetts bargain depends.

4. The Replacement Machine

Massachusetts has never depended entirely on the people born within its borders.

Its modern economy has been built around movement.

Students arrive for universities. Researchers arrive for laboratories. Physicians arrive for hospitals. Engineers, scientists, financial workers, entrepreneurs, and skilled immigrants arrive because Massachusetts offers unusually dense concentrations of institutions and opportunity.

Others leave.

For decades, the system has worked because enough economic capacity continually entered behind them.

This is the Massachusetts replacement machine.

Its importance becomes visible in the state's migration data.

Massachusetts has experienced persistent net domestic outmigration, particularly among younger adults.

In 2022, the Commonwealth lost approximately 24,000 prime-working-age residents through domestic migration, including roughly 13,700 people between ages 25 and 34 (Massachusetts Executive Office of Housing and Livable Communities, 2025c).

That year may have represented an unusually disruptive period. The state's housing assessment acknowledges that the pandemic and widespread adoption of remote work may have temporarily increased departures.

More recent conditions have been less uniformly negative. Massachusetts' population increased by approximately 70,000 between 2023 and 2024, supported partly by international immigration and moderating domestic outmigration.

Nevertheless, net domestic outmigration remained approximately 27,400 residents of all ages in 2024, close to its longer-term average (Massachusetts Executive Office of Housing and Livable Communities, 2025b, 2025c).

Population growth can therefore coexist with domestic outmigration. Neither total population growth nor domestic outmigration alone establishes whether the Commonwealth is successfully replenishing its working-age earning capacity.

Those losses matter because many departing residents are at the stage of life when careers, households, homeownership, and long-term attachments are being formed. More than one-third of the individuals who moved out of Massachusetts in the state's 2022 analysis held graduate degrees. This describes the educational attainment of departing residents, not the net change in the state's graduate-degree population.

The immediate population loss is therefore only part of the story.

A 30-year-old professional leaving Massachusetts removes one resident today.

If that person would otherwise have remained for decades, purchased a home, raised children, advanced into higher-paying employment, paid taxes, and accumulated wealth inside the Commonwealth, the longer-run economic difference can be much larger.

None of that future activity is guaranteed.

Nor is it necessarily lost when someone leaves.

A replacement worker can arrive.

A job can be refilled.

Another household can purchase the home.

Massachusetts has historically relied upon exactly that process.

The distinction that matters is between **population replacement** and **economic replacement**.

If one resident leaves and another arrives, population has been replaced.

But the Commonwealth may still need to replace:

the worker,

the wage,

the household,

the tax capacity,

and the future economic trajectory attached to that resident.

A \$175,000 mid-career worker replaced by a student, retiree, child, lower-paid worker, or recent arrival who has not yet reached the same economic position may leave the population count unchanged while reducing immediate carrying capacity.

Likewise, a departing worker whose job remains in Massachusetts and is filled by another worker may impose little lasting economic loss.

A departing worker whose job moves with them, disappears, or is automated produces a different outcome.

Replacement is therefore not a headcount problem alone.

International migration has helped Massachusetts maintain population and replenish its working-age population despite persistent domestic outmigration and demographic aging.

That contribution is economically significant, but population replacement does not automatically imply equivalent replacement of employment, earnings, or fiscal capacity.

Nor can immigration be assumed to function as an inexhaustible balancing mechanism.

People do not migrate simply because Massachusetts needs workers.

They migrate because the Commonwealth offers enough opportunity to justify establishing a life there.

International migration, like domestic migration, responds to economic incentives, institutional networks, family connections, federal policy, and expectations about the future.

Massachusetts can benefit enormously from immigration without assuming that immigration will automatically replace whatever economic capacity the Commonwealth loses.

The underlying demographic structure makes that distinction increasingly important.

Under the Commonwealth's baseline demographic projection—described as the low or no-growth scenario—Massachusetts' population is projected to decline by approximately 0.4 percent, or roughly 28,000 residents, between 2025 and 2035 (Massachusetts Executive Office of Housing and Livable Communities, 2025b).

Its age composition changes more substantially.

Every age group under 40 declines by approximately 3 to 9 percent, while the population age 70 and older increases by roughly 25 percent.

The resident labor force falls by approximately 50,000 workers (Massachusetts Executive Office of Housing and Livable Communities, 2025b).

Massachusetts can therefore maintain nearly the same number of people while possessing fewer workers.

Population stability does not guarantee economic stability.

The state's own planning shows how sensitive the outlook is to retention.

Reducing annual domestic outmigration from roughly 27,000 people toward approximately 17,000 would be enough, under state estimates, to stabilize the resident labor force over the coming decade (Massachusetts Executive Office of Housing and Livable Communities, 2025a).

The difference is only about 10,000 departures per year.

In a state of more than seven million people, that number appears small.

Over time, it changes the trajectory.

Higher education has historically provided another form of replacement.

Massachusetts possesses an unusual ability to import young adults before they have established permanent households elsewhere.

Students arrive from across the country and the world, spend formative years inside the Commonwealth, form professional networks, encounter Massachusetts employers, and sometimes remain after graduation.

Universities therefore serve not only as employers and knowledge-producing institutions.

They are also **population-importing infrastructure**.

That function matters because it brings young adults into Massachusetts at precisely the age when future geographic attachments remain unusually fluid.

But this mechanism is becoming less automatic.

Massachusetts has experienced contraction among smaller private colleges, with numerous institutions closing, merging, or beginning wind-downs over the past decade (Massachusetts Department of Higher Education, n.d.).

These institutional changes have occurred amid broader demographic and financial pressures affecting the higher-education sector.

At the same time, the story is not one of universal educational decline.

Public undergraduate enrollment has recovered, particularly at community colleges, aided by expanded state support and free-community-college policy (Massachusetts Executive Office of Education, 2025).

That contrast illustrates the larger point.

The underlying function can survive while the institution performing it changes.

A college loses enrollment.

Its buildings, administration, debt, and other fixed commitments cannot shrink at the same rate.

The institution loses margin.

It closes, merges, contracts, or receives support.

The Commonwealth then has an interest in preserving the function—education, workforce preparation, and access—even if the original institution can no longer provide it economically.

The replacement machine still works.

But more of it must be maintained deliberately rather than assumed to continue through demographic momentum alone.

Artificial intelligence did not create this challenge.

Massachusetts was aging, losing prime-working-age residents domestically, and experiencing stress among smaller colleges before the current AI transition accelerated.

That chronology matters.

AI arrives on top of an existing replacement problem.

The risk is therefore not that artificial intelligence suddenly causes everyone to leave Massachusetts or destroys the university system.

It is that a state already dependent on continuous economic replacement encounters a technology that may reduce the number of high-wage workers its dominant industries require.

Massachusetts may continue attracting young people.

It may continue educating them.

It may continue producing extraordinarily skilled workers.

But if high-paying entry points into the knowledge economy grow more slowly than the population seeking them, the replacement pipeline can remain physically intact while becoming economically less effective.

The same is true of migration.

New residents can increase population without immediately replacing the wage capacity lost through retirement, outmigration, or technological change.

This does not diminish their contribution.

It shows why headcount is an incomplete measure of replacement.

The Commonwealth's relevant question is not simply:

Did another person arrive?

It is:

Did Massachusetts replenish the economic capacity necessary to support another durable household inside Massachusetts?

That question becomes more difficult as the state's opportunity premium changes.

For decades, Massachusetts could tolerate substantial domestic outmigration because enough people still wanted access to its universities, institutions, industries, and professional networks.

The economic magnet remained powerful enough to replenish much of what the state lost.

But a high-cost region cannot assume that advantage indefinitely.

If the value of locating in Massachusetts declines while the cost of locating in Massachusetts remains high, replacement becomes progressively harder.

A young worker deciding between Boston and another metropolitan area does not evaluate only the salary attached to the first job.

The worker evaluates the career that might follow it.

How many employers exist nearby?

What happens if the first company fails?

Can another job be found without relocating?

Can the worker eventually afford a home?

Can a family be established?

Is the premium required to live in Massachusetts justified by a sufficiently large set of future opportunities?

This is the **opportunity premium**.

Massachusetts can sustain a high cost premium while its opportunity premium remains greater.

The danger begins when that relationship narrows.

The Commonwealth therefore faces two related problems.

It must retain enough of the carrying population it already possesses.

And it must continually create the next one.

Aging places pressure on the first.

Outmigration places pressure on both.

Artificial intelligence may place pressure on the second by changing how many people the knowledge economy requires.

None of these forces alone is necessarily destabilizing.

Together, they make replacement less automatic.

Massachusetts is not simply at risk of losing a middle class.

It is at risk of becoming less effective at replenishing one.

5. Losing Household Margin

The household at the center of the Massachusetts economy does not need to become poor before it becomes fragile.

That distinction matters because conventional measures often identify distress only after a household crosses a recognizable threshold: unemployment, poverty, missed payments, foreclosure, dependence on public assistance, or some other visible failure.

By then, much of the household's economic margin may already be gone.

A more useful question is how far a household can fall before it is forced to change the life it has already built.

Consider two working adults raising two children in Massachusetts.

In 2026, the MIT Living Wage Calculator estimated that such a household requires approximately \$164,800 in annual pre-tax income to meet a modeled set of basic needs (MIT Living Wage Institute, 2026b).

That figure is not a definition of the middle class. It does not describe every family's spending. It is a standardized estimate of necessities including housing, childcare, food, healthcare, transportation, taxes, and other basic expenses.

But it provides a useful reference point.

The MIT estimate serves a different purpose from the United For ALICE findings introduced in Section 2.

ALICE measures the share of Massachusetts households whose incomes fell below household-specific basic-needs thresholds in 2024. MIT's estimate represents the modeled pre-tax income required by one particular household configuration in 2026.

The two measures differ in methodology, reference year, and population covered. They illustrate related dimensions of household affordability, but they cannot be treated as interchangeable or used together to calculate how many Massachusetts households would become financially vulnerable after an earnings shock.

A household earning \$175,000 sits approximately \$10,000 above MIT's modeled pre-tax basic-needs requirement.

At \$200,000, the difference is approximately \$35,000.

At \$230,000, it is approximately \$65,000.

These differences represent modeled income cushions, not measured disposable income, household savings, or financial runway. Actual resilience depends on existing commitments, taxes, assets, liquidity, and other household circumstances.

All three would ordinarily be described as high-income households.

Yet their capacity to absorb a reduction in earnings can be very different.

A 20 percent reduction in earnings takes the \$175,000 household to \$140,000.

The family remains far above conventional poverty measures, but now sits roughly \$25,000 below the modeled basic-needs threshold.

The same reduction takes the \$200,000 household to \$160,000.

It remains a six-figure household, but its previous modeled headroom has disappeared.

The point is not that these exact income levels determine whether a family succeeds or fails.

It is that **the distance between apparent affluence and economic pressure can be much smaller than the headline income suggests.**

This illustrates how quickly modeled basic-needs headroom can disappear when earnings decline.

But income headroom is also geographic.

Massachusetts does not possess one uniform cost structure. Housing, childcare, transportation, and other necessities vary considerably across the Commonwealth.

In 2026, MIT estimated that two working adults raising two children required approximately \$173,466 in annual pre-tax income to meet basic needs in Greater Boston, compared with approximately \$148,870 in the Worcester metropolitan area (MIT Living Wage Institute, 2026a, 2026c).

The same \$200,000 household therefore begins with approximately \$26,500 of modeled headroom in Greater Boston and \$51,100 in Worcester.

After a 20 percent earnings reduction, its income falls to \$160,000 in either location.

In Greater Boston, the household falls approximately \$13,500 below the modeled basic-needs requirement.

In Worcester, it remains approximately \$11,100 above it.

The household experiences the same income shock.

Its economic position depends partly on where it lives.

This distinction introduces an adjustment mechanism within Massachusetts itself.

A household losing earning power in Greater Boston may be able to restore some margin by relocating to a less expensive part of the Commonwealth rather than leaving the state entirely.

Such a move could preserve much of the household's contribution to Massachusetts' economy while redistributing its spending, housing demand, and municipal tax capacity.

But the difference between regional cost benchmarks is not necessarily the amount a particular family would save by moving. Actual housing arrangements, commuting costs, childcare needs, taxes, and other commitments determine the realized adjustment.

Nor does a less expensive location automatically provide equivalent professional opportunity.

A household can reduce its cost of living without replacing the earning power it has lost.

Geographic mobility therefore provides another possible adjustment, but not a universal solution.

Massachusetts must sustain both the economic opportunities that provide households with sufficient earning power and enough places where those earnings can support durable lives.

The problem becomes more serious because household costs do not adjust symmetrically with income.

For the same two-adult, two-child Massachusetts household, MIT estimates annual basic expenses of approximately \$30,200 for housing, \$41,700 for childcare, \$12,000 for medical costs, and \$13,700 for transportation (MIT Living Wage Institute, 2026b).

Those four categories alone approach \$98,000 per year.

Add food and basic household expenses, and the total exceeds \$120,000 before taxes and other components of the modeled pre-tax requirement are included.

Many of these expenses exhibit **fixed-cost lock-in**.

A mortgage signed at a \$200,000 household income does not become smaller after a pay cut.

Rent does not adjust because an employer reorganized a department.

Property taxes do not decline because the market value of an occupation changes.

Childcare does not become 20 percent cheaper because one parent earns 20 percent less.

Insurance premiums, car payments, student loans, utilities, and transportation requirements can remain largely unchanged.

The household therefore experiences an asymmetric adjustment:

Income can move quickly; obligations usually cannot.

That is why the same nominal income can produce different outcomes depending on how the household arrived there.

A family beginning its life at \$160,000 can make decisions appropriate to \$160,000.

It can choose a different home, commute, childcare arrangement, savings rate, or level of debt.

A family that built its life at \$200,000 and then falls to \$160,000 must unwind decisions already made.

That process takes time.

And time requires liquidity.

This introduces a second household measure: **financial runway**.

Income headroom describes the distance between recurring income and recurring obligations.

Financial runway describes how long a household can cover a recurring cash-flow deficit using accessible financial reserves before it must restore income, reduce expenses, borrow, or liquidate other assets.

The distinction matters because wealth can be misleading.

As Section 1 established, accumulated wealth does not necessarily provide accessible cash during an earnings shock.

For households with little accumulated wealth, the position can be even tighter.

The Boston Fed survey estimated median family net wealth among Massachusetts renters at approximately \$1,500 (Mattingly et al., 2026).

Financial runway therefore depends on accessible reserves, not headline wealth figures.

Home equity cannot easily make next month's mortgage payment.

Retirement assets were accumulated for the future, not next week's childcare bill.

Vehicles and other assets can be sold, but liquidation can itself represent a deterioration in the household's long-term position.

The relevant question after an income shock is therefore not simply how much the household owns.

It is:

How long can the household continue operating before it must alter its structure?

Return to the \$175,000 household.

A 20 percent reduction brings annual earnings to \$140,000, roughly \$25,000 below the modeled statewide basic-needs income requirement.

That difference establishes the household's position relative to the benchmark. It does not, by itself, establish the amount of money the household must withdraw from savings each month.

Actual financial runway depends on after-tax income, existing commitments, accessible reserves, and the household's ability to reduce expenses.

Consider a household that, after accounting for those factors, faces an actual recurring cash deficit of \$2,000 per month.

A \$10,000 accessible reserve would cover approximately five months of that deficit.

A \$25,000 reserve would cover approximately one year.

These are illustrative cash-flow calculations, not estimates derived directly from the MIT pre-tax income requirement.

Actual taxes, benefits, spending reductions, unemployment compensation, severance, partner earnings, debt access, and household choices would change the result.

What matters is the relationship.

A family that still earns \$140,000 can move from apparent prosperity to consuming accumulated savings within months if its recurring obligations exceed its available income.

It need not lose both jobs.

It need not suffer a medical catastrophe.

It need not become poor.

Its recurring income only needs to fall below the cost structure it previously built.

The household then begins adjusting.

Discretionary spending is reduced first.

Retirement contributions are paused.

Vacations disappear.

Home repairs are postponed.

Cars are kept longer.

Savings are consumed.

Credit is used.

None of these changes necessarily appears immediately in unemployment or poverty statistics.

But each represents a reduction in resilience.

A household that stops saving for retirement to preserve its mortgage solves today's cash-flow problem partly by creating a future one.

A household that consumes its emergency fund can maintain its standard of living temporarily while becoming more vulnerable to the next shock.

A family that delays a home purchase, postpones having another child, or abandons plans to establish itself permanently in Massachusetts may remain economically functional while changing the Commonwealth's future demographic structure.

Eventually the available adjustments become larger.

Childcare arrangements change.

A second job is taken.

A house is sold.

A commute becomes longer.

The household moves to a less expensive part of Massachusetts.

One parent leaves the labor market.

Public assistance becomes relevant.

Or the household leaves the Commonwealth entirely.

Each response can be rational for the family.

Collectively, they matter to Massachusetts.

Reduced consumption affects local businesses.

Reduced retirement saving weakens future household security.

Delayed household formation changes future housing and demographic demand.

Intrastate relocation can shift household spending, property demand, and municipal revenue without necessarily removing economic capacity from Massachusetts.

Outmigration can remove wages, spending, and tax capacity from the Commonwealth.

A household-level income shock therefore does not remain confined to the household.

This is particularly important because eligibility for public support does not begin only at poverty.

Massachusetts and federal programs operate at different income levels, use different definitions of household income, and apply different categorical requirements.

A household experiencing a large earnings reduction can move from being primarily a contributor to public systems toward qualifying for forms of assistance while still earning an income conventionally described as middle class.

The same economic event can therefore move the household in two directions on the public balance sheet:

Tax capacity declines

while

potential demand for public support increases.

This is not unusual or improper.

Social insurance and public assistance exist because economic circumstances change.

The systems question is what happens when the same transition occurs across a sufficiently large number of households at once.

This is why carrying capacity is more useful than a simple distinction between rich and poor.

A carrying household is not defined by never using public services. Every household participates in shared institutions, and households move between economic positions throughout their lives.

The relevant question is whether enough households possess sufficient margin, for enough of their working lives, to sustain themselves while generating the recurring economic capacity required by the larger system.

Massachusetts has historically been able to assume that a large professional economy would continue producing such households.

Artificial intelligence places pressure on that assumption not because every professional worker will lose a job, but because even moderate and persistent reductions in earning power can push households across boundaries conventional labor statistics do not capture.

A \$200,000 household becoming a \$160,000 household still appears prosperous.

A \$175,000 household becoming a \$140,000 household still appears employed.

But the household balance sheet tells a different story.

The first thing lost is not necessarily the job.

It is the margin.

And once enough households begin losing margin at the same time, the problem no longer belongs only to them.

6. Losing Commonwealth Margin

The household is not the only balance sheet in Massachusetts built around the expectation of continued income.

The Commonwealth is too.

Massachusetts enters this transition with a substantial revenue-generating economy.

Preliminary fiscal year 2026 tax collections totaled approximately \$45.5 billion, more than 4 percent above the state's annual benchmark. Personal income taxes generated approximately \$28.8 billion. Withholding alone produced more than \$20.2 billion (Massachusetts Department of Revenue, 2026).

The additional income-tax surtax generated an estimated \$3.38 billion.

These figures demonstrate the scale of Massachusetts' existing tax base.

They do not, by themselves, establish the Commonwealth's fiscal headroom.

That depends on the relationship between recurring revenue, spending commitments, long-term liabilities, reserves, and the government's ability to adjust when economic conditions change.

Massachusetts begins with a large, productive, highly taxable economy supporting an expensive public structure.

The question is how much financial flexibility that structure retains if the economic capacity supporting it begins to weaken.

The distinction is similar to the one facing a household.

A family earning \$200,000 can be entirely solvent while its income remains \$200,000. The vulnerability appears when income changes faster than the commitments constructed around it.

The Commonwealth has its own long-duration commitments.

Public employees earn pension benefits that must eventually be funded.

Retired workers receive healthcare and other post-employment benefits.

Debt incurred to build infrastructure must be serviced.

Schools, transportation systems, courts, public safety agencies, healthcare programs, municipal governments, and physical infrastructure cannot be resized every time economic conditions change.

The state's fiscal structure therefore contains substantial **obligation rigidity**.

Revenue responds to economic activity.

Many obligations do not.

Massachusetts' pension schedule illustrates the difference in speed.

The Commonwealth's fiscal year 2027 pension transfer is approximately \$5.13 billion, as established in the enacted state budget (Commonwealth of Massachusetts, 2026b).

Under the triennial funding schedule filed in January 2026, annual appropriations are planned to increase by 4 percent through fiscal year 2038, with final amortization of the unfunded actuarial liability scheduled for fiscal year 2039 (Massachusetts Executive Office for Administration and Finance, 2026).

Retiree healthcare creates another long-duration commitment. In 2026, the Commonwealth reported approximately \$15.5 billion in total other post-employment benefit liability, against roughly \$2.8 billion in fiduciary assets, leaving a net liability of approximately \$12.7 billion (Massachusetts Public Employee Retirement Administration Commission, 2026).

Municipal governments carry additional obligations of their own.

These commitments were accumulated over decades.

They do not disappear because the labor market changes over five years.

That difference in timing is fundamental.

Artificial intelligence can change the staffing requirements of an occupation quickly.

A worker can leave Massachusetts within months.

A company can reduce hiring within a year.

A commercial lease can expire.

A tax receipt can weaken during the next fiscal cycle.

A pension obligation can remain for decades.

Governments possess tools households do not.

They can alter spending, raise or reduce taxes and fees, use reserves, borrow, restructure programs, delay capital spending, receive federal funds, or change how costs are distributed.

Massachusetts also begins with substantial institutional capacity to make those adjustments.

But none of those choices makes a loss of economic capacity disappear.

It determines **where the adjustment goes**.

That pressure is already visible at the municipal level.

Boston and Cambridge provide useful examples because both cities have historically benefited from unusually valuable commercial property bases tied closely to the knowledge economy.

From fiscal year 2025 to fiscal year 2026, commercial assessed value declined by approximately \$2.4 billion in Boston and \$2.2 billion in Cambridge (Guilfoyle & Rassias, 2026).

These declines do not translate directly into equivalent losses of property-tax revenue. Under Massachusetts' municipal tax system, changes in assessed value can be partly absorbed through adjustments in tax rates and shifts between property classes. The immediate concern is therefore not necessarily declining collections, but the increasing pressure required to sustain municipal revenue when an important component of the property base weakens.

The two cities did not respond identically.

Cambridge maintained a structure in which commercial and industrial property accounted for 66.2 percent of the fiscal year 2026 property-tax levy.

As commercial assessed values weakened, the city's commercial tax rate increased by 22 percent, compared with 5 percent for residential property.

These changes describe tax rates rather than equivalent increases in individual property-tax bills (City of Cambridge, 2025; Guilfoyle & Rassias, 2026).

Cambridge's own fiscal year 2026 tax-rate summary also identified hybrid work and artificial intelligence as factors prompting companies to reconsider their office and laboratory space requirements (City of Cambridge, 2025).

The observation does not establish how much, if any, of the decline in assessed commercial property values can be attributed to artificial intelligence.

It does demonstrate that the technology has entered the municipality's assessment of changing commercial-space demand.

Boston faced a different distribution. Under fiscal year 2026 rules, the average single-family homeowner receiving the residential exemption was expected to see an annual property-tax increase of roughly 13 percent as the commercial side of the tax base weakened (City of Boston, 2026).

Neither example establishes a universal rule that commercial decline automatically becomes residential taxation.

It establishes something more important.

When one source of carrying capacity weakens while the underlying obligation remains, **the adjustment has to be absorbed somewhere.**

Commercial taxpayers can pay more.

Residential taxpayers can pay more.

Spending can be reduced.

Services can change.

Reserves can be used.

New revenue can be sought.

Usually the adjustment is distributed across several channels.

But the underlying loss cannot be removed through accounting.

This is the public-sector version of fixed-cost lock-in.

The household can cancel a vacation before it can cancel a mortgage.

The city can postpone some spending before it can eliminate the cost of schools, roads, public safety, sanitation, pensions, and other basic systems.

The Commonwealth can adjust discretionary programs more readily than it can erase obligations accumulated over decades.

The result is a **shrinking-denominator problem**.

Consider a fixed obligation supported by one hundred equal units of economic capacity.

If the available capacity falls to ninety-five units while the obligation remains unchanged, the burden per remaining unit rises by approximately 5.3 percent.

If capacity falls to ninety units, the burden rises by approximately 11.1 percent.

At eighty units, it rises by 25 percent.

The arithmetic is simple.

Real public finance is not.

These units are illustrative rather than a proposed measurement of Massachusetts' economic capacity. They demonstrate how a fixed obligation becomes more burdensome relative to the resources available to support it.

The reduction could result from population loss, declining earnings, weaker taxable economic activity, or some combination of these changes.

Massachusetts does not literally divide its obligations across equal units of economic capacity. Revenue comes from taxes, businesses, investment activity, federal transfers, fees, property, consumption, and other sources. Spending can change. New industries can emerge. Productivity can increase the tax base even with fewer workers.

The calculation is not a forecast of future tax bills.

It illustrates the direction of pressure.

The obligations are the numerator. The economic capacity available to support them is the denominator.

If the numerator remains comparatively rigid while the denominator contracts, the system must adjust.

That matters most when the same household experiences pressure on both sides.

A professional worker loses 20 percent of earnings.

The household has less income headroom.

At the same time, weakening commercial property values place pressure on the municipality.

The city still needs revenue.

Taxes rise, services decline, spending changes, or some other source of capacity must compensate.

The household therefore encounters a situation in which:

Earning capacity falls while the cost of maintaining the surrounding system does not.

That is the point at which household fragility and Commonwealth fragility begin reinforcing one another.

The household-level mechanism described in Section 5 has a fiscal counterpart.

Declining earnings may reduce tax capacity while increasing eligibility for public assistance.

When this occurs across a sufficiently large number of households, the resulting pressures converge on the same public balance sheet.

Massachusetts can support substantial redistribution while its carrying population remains large and productive.

Pressure increases when the population requiring additional support grows while the population generating extraordinary fiscal capacity contracts.

This is why current revenue strength does not contradict the argument.

It demonstrates the size of the carrying economy Massachusetts currently possesses.

Strong collections give the Commonwealth room to adapt.

They do not guarantee that today's economic composition is permanent.

A large share of Greater Boston's wage capacity is concentrated in a relatively small professional block.

A significant portion of state revenue depends directly on personal income and withholding.

Municipalities in the knowledge-economy core depend heavily on property whose value reflects expectations about workers, offices, laboratories, and future development.

The wage-capacity scenarios presented earlier in this paper are not estimates of lost state tax revenue.

The fiscal effect would depend on which workers and households experience income changes, their taxable income, applicable tax rates, and whether lost wages are replaced by new employment, business income, or other economic activity.

Higher corporate profits, investment income, or productivity-driven growth could offset some losses. Weaker household spending or commercial property demand could create additional pressure elsewhere.

Municipal effects would also depend on changes in property values, tax rates, and spending obligations.

The scenarios establish the potential scale of changes in employment earnings.

They do not establish the resulting net fiscal effect.

These systems reinforce one another during expansion.

High-wage employment grows.

Household income rises.

Property becomes more valuable.

Tax collections increase.

Commercial development expands.

Municipal revenue strengthens.

Public systems become easier to finance.

The relationships can also operate in reverse.

The central question is how much capacity remains between recurring revenue and the commitments the Commonwealth must maintain.

That is **fiscal headroom**.

Fiscal headroom is the public counterpart to household income headroom.

It is the margin that allows Massachusetts to absorb recessions, demographic shifts, infrastructure projects, public-health emergencies, policy experiments, and other shocks without forcing immediate adjustment onto residents.

The danger is not merely a budget deficit.

It is the gradual consumption of that margin.

A state can remain solvent while becoming less flexible.

A municipality can balance its budget while relying on a narrower tax base.

A household can pay every bill while exhausting its savings.

All can appear stable while losing the capacity to absorb the next shock.

This is where the title acquires its second meaning.

The household works harder, spends savings, delays consumption, or takes on additional obligations to preserve the life it has already built.

The Commonwealth responds by finding additional revenue, protecting institutions, maintaining services, expanding infrastructure, assisting households, and subsidizing future growth.

Each response may be rational.

But preservation consumes capacity.

If maintaining the existing system requires progressively more from a shrinking carrying population, Massachusetts begins using tomorrow's resilience to finance today's continuity.

The resident is no longer the only one killing themselves to live.

The Commonwealth is doing it too.

7. Fast Technology, Slow Commonwealth

The imbalance facing Massachusetts is not only between income and obligations.

It is also between speeds.

Artificial intelligence can alter the economics of an occupation within a product cycle. A company can deploy new software in months. Hiring plans can change immediately. A team can reorganize within a year. Capital can move. A worker can relocate.

The physical Commonwealth moves differently.

A house takes time to permit and build.

A transmission line can require years of planning, siting, financing, and construction.

A university campus cannot contract in proportion to one year's enrollment decline.

A thirty-year mortgage remains a thirty-year mortgage after the occupation supporting it changes.

Roads, hospitals, schools, substations, water systems, public debt, and retirement obligations all operate on timelines much longer than the technologies increasingly shaping the economy around them.

Massachusetts therefore faces a **speed mismatch**.

The economic system can change faster than the physical and institutional system built around it.

Electricity provides the clearest example.

Massachusetts is already undertaking a major transformation of its electric system. Electrification of transportation and buildings requires the Commonwealth to reduce unnecessary energy consumption while expanding the infrastructure capable of delivering electricity.

National Grid's 2024 Future Grid Plan projects that peak electricity demand on its Massachusetts distribution network will increase from approximately 4.9 gigawatts to 10.7 gigawatts by 2050, more than doubling as transportation and building electrification expand (National Grid, 2024). The forecast also anticipates a transition from summer to winter peak demand as electric heating becomes more widespread.

These are planning projections, not guaranteed outcomes. The precise scale and timing depend on adoption, efficiency, distributed energy resources, and other assumptions.

The direction is nevertheless clear: Massachusetts must modernize an electric system built around an earlier pattern of demand while accommodating electric vehicles, heat pumps, storage, additional housing, and new businesses.

That transformation was already underway before artificial intelligence became a major economic-development question.

Households have been enlisted in it.

Mass Save and related programs encourage residents and businesses to weatherize buildings, install efficient equipment, manage demand, replace fossil-fuel heating, and reduce unnecessary consumption.

In 2025 alone, Mass Save reported 209 megawatts of summer demand savings (Sponsors of Mass Save, 2026).

Those savings have real value.

The figure measures reductions in summer peak electricity demand, rather than the total amount of electricity conserved over a year.

Reducing peak demand can help avoid or defer investments in generation, transmission, and distribution infrastructure, depending on when and where the reductions occur.

Artificial intelligence introduces a new class of demand at a very different scale.

Large data centers can require tens or hundreds of megawatts.

In September 2026, Massachusetts issued Executive Order 658, establishing additional permitting conditions for new or expanded data-center projects exceeding 25 megawatts of peak electricity demand (Commonwealth of Massachusetts, 2026a). The order requires qualifying projects to demonstrate compliance with the Commonwealth's responsible-development framework and submit community benefits agreements before receiving relevant state permits.

It also directs state agencies to develop additional protections addressing electricity infrastructure costs, incremental clean-energy procurement, water resources, and related community impacts.

A facility drawing 25 megawatts continuously would consume approximately 219 gigawatt-hours of electricity annually. At 100 megawatts, consumption would reach 876 gigawatt-hours.

These calculations assume continuous operation at the stated power level.

Actual electricity consumption depends on average demand, which may differ from a facility's peak demand. The 25-megawatt threshold established by Executive Order 658 refers to peak demand, not annual electricity consumption.

Massachusetts also operates within the integrated New England electric system. These figures are measures of scale rather than estimates for any specific facility.

The point is that individual projects can represent very large blocks of new demand.

The resulting question is not whether artificial intelligence should consume electricity.

Every productive activity consumes scarce resources.

The question is what Massachusetts receives in return.

Conventional economic-development measures do not fully answer it.

A large computing facility may represent enormous capital investment while employing comparatively few permanent workers.

It may generate substantial property-tax revenue.

It may provide strategically valuable computing infrastructure.

Low-latency capacity may support biotechnology, medicine, finance, research, defense, and other sectors in which Massachusetts possesses genuine advantages.

Those benefits matter.

So does opportunity cost.

A megawatt committed to one activity cannot simultaneously serve another without additional capacity being built.

The same is true of substations, transmission corridors, interconnection capacity, construction labor, land, and public planning attention.

If those resources are genuinely scarce, Massachusetts needs a way to ask whether their use strengthens the population capable of carrying the Commonwealth.

One useful way to frame this evaluation is **carrying capacity per megawatt**.

The phrase describes an analytical principle rather than a formally calculated economic metric.

It does not propose allocating electricity according to employment counts or assigning every project a universal carrying-capacity score.

A facility's economic contribution may extend far beyond its direct employment through taxable activity, supporting industries, infrastructure, productivity gains, and other effects.

Those benefits must also be considered alongside the facility's demand for electricity, land, infrastructure, and other scarce resources.

The purpose is not to reduce these relationships to a single number.

It is to ask a broader question:

For each increment of scarce physical capacity, how much durable Massachusetts carrying capacity results?

How much permanent payroll?

How many career paths?

How much taxable value?

How much secondary economic activity?

How physically anchored is that activity to Massachusetts?

How much additional infrastructure does it require?

And how much carrying wage capacity might the technology it supports reduce elsewhere?

These questions matter because Massachusetts is not approaching the AI transition with abundant unused infrastructure.

It is already trying to build enough capacity to complete another major economic transformation.

That creates an important asymmetry.

Residents can be asked to weatherize homes, manage demand, purchase efficient equipment, install heat pumps, and help reduce pressure on the grid.

Those efforts can be economically and environmentally justified.

But if households are asked to conserve because capacity is valuable, the Commonwealth should be equally demanding about the economic return produced by the largest new consumers of that capacity.

This is not an argument against large electrical loads.

It is an argument that **scarcity should be priced intellectually as well as financially**.

The principle extends beyond electricity.

Massachusetts has limited housing capacity.

Limited developable land.

Congested transportation infrastructure.

Finite public capital.

Scarce construction capacity.

Institutional systems that take years to change.

A high-value economy can consume each of these resources without necessarily creating a proportionate number of households capable of supporting the system around it.

That is why investment is not the same as carrying capacity.

A billion dollars of capital can produce extraordinary economic value while supporting relatively little permanent payroll.

A highly automated company can achieve enormous market capitalization without creating a broad employment base.

A new technology can increase productivity while reducing office demand or labor intensity.

Massachusetts may benefit from all of those outcomes.

But company valuation alone cannot finance the surrounding public system.

Economic value must eventually become anchored in some combination of wages, households, property, consumption, businesses, and recurring public revenue.

The speed mismatch makes that requirement more consequential.

If Massachusetts builds expensive physical systems around one assumption about the future economy, those systems cannot be unwound as quickly as the assumption can change.

Factories outlive the technologies that justified them.

Campuses remain after enrollment contracts.

Office towers remain after companies reduce their footprints.

Transportation infrastructure remains after commuting patterns change.

Homes remain after demographic assumptions shift.

The physical world carries memory.

Technology does not have to.

This is the larger challenge facing Massachusetts.

Its comparative advantage was built around activities capable of changing quickly: research, finance, software, science, professional services, and technology.

Its costs are embedded in systems that change slowly.

Artificial intelligence may improve productivity faster than Massachusetts can build housing for the workers who benefit.

It may reduce office demand faster than municipalities can replace commercial tax capacity.

It may create electrical demand faster than transmission and generation can expand.

It may alter the value of credentials faster than colleges can resize themselves.

It may change wage structures faster than households can unwind mortgages and other long-duration commitments.

The danger is therefore not technological disruption alone.

It is technological disruption interacting with **institutional inertia**.

Massachusetts can adapt.

It has repeatedly done so.

But adaptation requires time, capital, political capacity, and margin.

Households require income margin.

Government requires fiscal margin.

The electric system requires capacity margin.

Universities require enrollment margin.

Housing markets require affordability margin.

When several of those margins become thin simultaneously, individually rational transitions begin competing for the same scarce capacity.

Massachusetts wants to electrify transportation and buildings.

Build more housing.

Modernize the grid.

Preserve affordability.

Maintain climate commitments.

Attract the next generation of technology companies.

And ensure that the residents financing and participating in the transition can still afford to remain.

Each goal can be defensible on its own.

The difficulty is pursuing all of them through systems that cannot expand at the speed of the technologies changing demand.

This is the central mismatch of the next Massachusetts economy:

fast technology, slow Commonwealth.

And it leads to the paper's most uncomfortable question.

What happens when every part of the system responds rationally to that mismatch, but the combined effort to preserve the system begins consuming the margin required to sustain it?

8. Killing Yourself to Live

No single actor in this system needs to behave irrationally for the system itself to become more fragile.

Households attempt to preserve their standard of living.

Employers protect competitiveness. Universities defend enrollment and financial stability. Municipalities maintain services and revenue. Utilities preserve reliability.

The Commonwealth seeks to retain its economic position.

Each responds using the tools available to it.

Households reduce spending, consume savings, work more, or move. Employers automate, reorganize, and restrain hiring.

Universities consolidate programs. Municipalities adjust taxation, spending, or reserves. Utilities expand infrastructure.

The Commonwealth subsidizes growth, protects institutions, and searches for new economic capacity.

Many of these responses are necessary.

The problem begins when preserving one part of the system places additional pressure on another part already operating with limited margin.

Consider one possible sequence.

A widespread reduction in household earnings weakens consumption.

Businesses experience pressure on revenue.

Some employers respond by reducing hiring, restraining payroll, or expanding automation.

Payroll growth weakens further.

Office demand may soften.

Commercial property values may come under additional pressure.

Municipal obligations remain.

If the resulting losses are not offset elsewhere, the pressure must be absorbed through some combination of additional revenue, reduced spending, altered services, or reserves.

Household margin may narrow further.

Some residents leave.

Others decide not to arrive.

The economic capacity available to support the next adjustment becomes smaller.

Each response can be rational in isolation.

The aggregate result can nevertheless become self-reinforcing.

The cycle becomes destabilizing when losses of household and fiscal capacity repeatedly exceed the gains from new economic activity and the relief provided by adjustments to existing costs and obligations.

This is the system described by the title of this paper.

Killing Yourself to Live begins with preservation.

A household can keep itself economically intact for years by consuming savings, postponing retirement contributions, taking on additional work, delaying purchases, or reducing future choices.

It remains functional.

But some of the resources preserving the household today are the same resources that would otherwise strengthen it tomorrow.

The Commonwealth can face the same problem.

Massachusetts can protect services, subsidize strategic industries, expand infrastructure, support distressed institutions, and seek additional revenue.

Each action can preserve something valuable.

But each also consumes fiscal, physical, or political capacity.

The state and the resident therefore occupy opposite sides of the same system.

The resident needs Massachusetts to remain valuable enough to justify its costs.

Massachusetts needs enough residents to remain economically productive enough to finance the structure surrounding them.

The critical transition occurs when Massachusetts stops merely absorbing pressure and begins amplifying it through its own adjustment mechanisms.

This is the **shrinking denominator**.

The Commonwealth does not need to lose most of its population.

It does not need mass unemployment.

It does not need a fiscal crisis.

It only needs the population capable of carrying its existing structure to contract faster than the structure itself can adjust.

That population can shrink economically even when headcount remains stable.

A professional worker earning less still appears employed.

A new resident can replace a departing resident without replacing the same wage capacity.

A productive company can expand output while reducing payroll.

A retiree can preserve population and property value without replacing the labor-market role of a departing working-age household.

The denominator is therefore not simply population.

It is **carrying capacity**: the economic resources and resilience available to sustain Massachusetts households and the institutions surrounding them.

That capacity depends not only on how many households remain, but on their earning power, recurring obligations, financial margin, and ability to absorb economic shocks.

That capacity can deteriorate quietly.

Accumulated wealth can hide the change.

A household can consume savings before becoming visibly distressed.

A municipality can use reserves or alter taxation while continuing to balance its budget.

A state can redirect spending, borrow, or use institutional capacity without approaching insolvency.

Wealth delays the visible consequences of declining margin.

It does not eliminate them.

Economic growth is therefore an incomplete measure of resilience.

Companies can become more valuable without supporting substantially more households. Productivity can rise while payroll contracts.

Investment can expand while infrastructure demands increase.

These outcomes may strengthen Massachusetts economically without proportionately increasing its ability to sustain the households and institutions built around its existing cost structure.

The relevant distinction is between value creation and capacity creation.

The Commonwealth needs both.

It should want valuable companies.

It should want productivity.

It should want investment and innovation.

But long-run resilience also depends on whether enough of that value becomes anchored in households, wages, property, businesses, and recurring public revenue.

The deeper economic-development question is therefore:

How much durable carrying capacity remains after the growth occurs?

Artificial intelligence makes that question especially important.

Massachusetts cannot realistically choose whether AI transforms its economy.

Companies will adopt it because competitors will.

Workers will use it because it improves productivity.

Universities, hospitals, laboratories, financial institutions, manufacturers, and public agencies will incorporate it because the benefits can be substantial.

The Commonwealth also has legitimate reasons to want part of the industry itself.

The danger is not participation.

It is confusing participation with capture.

Massachusetts can use artificial intelligence extensively without capturing a proportionate share of the companies, capital, employment, or intellectual property created around it.

It can even spend scarce public and physical capacity supporting the transition while the same technology reduces labor demand elsewhere in its existing economy.

That possibility does not make AI investment irrational.

It makes the return more complicated.

The question becomes whether Massachusetts is purchasing the next source of carrying capacity or merely attempting to preserve its status as a technology center.

That distinction matters because the Commonwealth's most constrained resources are increasingly physical.

Electric capacity is finite.

Housing is scarce.

Infrastructure takes years to construct.

Developable land is limited.

Public capital has alternative uses.

Household margin is not unlimited.

A strategy that consumes large amounts of these resources while producing little durable carrying capacity can make Massachusetts more technologically advanced while leaving it less resilient.

This is where the symmetry between resident and Commonwealth becomes complete.

The resident can earn a high income and still possess little margin.

The Commonwealth can create extraordinary economic value and still possess less carrying capacity.

Both can appear successful while becoming more dependent on continuous performance.

Both can respond to pressure by demanding still more performance.

And both can eventually reach a point where preserving the existing structure consumes the resources required to build the next one.

That is **killing yourself to live**.

The phrase is not an accusation.

It describes a condition.

A successful system encounters changing conditions and initially responds by trying harder to preserve what success created.

That response is natural.

It can also become a trap.

The alternative is not decline.

It is adaptation.

Massachusetts does not need to dismantle the economy that made it prosperous.

It needs to distinguish between the capabilities worth preserving and the arrangements that cannot reasonably be preserved unchanged.

The universities matter.

The scientific base matters.

The hospitals matter.

The skilled workforce matters.

The culture of research and technical sophistication matters.

But the scarcity model underlying much of their economic value is changing.

Massachusetts therefore faces a deeper choice than whether to subsidize one industry, build one transmission line, or change one tax.

It must decide whether the objective is to preserve the existing form of the knowledge economy or to preserve the ability of Massachusetts households and institutions to prosper after that form changes.

Those are not necessarily the same thing.

The distinction becomes clearest by looking backward.

Massachusetts has already experienced a technological regime change in which an industry central to its identity did not disappear from the world.

It simply stopped needing Massachusetts in the same way.

9. The Rust Belt of the Knowledge Economy

Massachusetts has already lived through a version of this transition.

In the 1970s and 1980s, the Route 128 corridor became one of the most important technology centers in the world.

Digital Equipment Corporation, Data General, Wang Laboratories, Prime Computer, and related companies helped define the state's economic resurgence after the decline of older manufacturing industries (Dorfman, 1983).

The decline of the minicomputer industry formed part of a broader contraction in Massachusetts technology employment during the late 1980s and early 1990s.

During the first five months of 1991, Massachusetts' high-tech sector averaged approximately 290,300 jobs, more than 42,000 fewer than in 1988, according to contemporary state employment figures (Yenkin, 1991).

Much of that contraction occurred among major computer manufacturers, but the employment figures describe the broader statewide high-tech sector. The transition reflected changes in computing architectures, competition, and the geographic organization of the industry (Saxenian, 1994).

The Massachusetts Miracle was not only a story of growth.

It was a story of technological centrality.

For a period, Massachusetts stood near the frontier of a computing regime that appeared capable of supporting decades of continued expansion.

Then the architecture changed.

The personal computer did not eliminate computing.

It made computing more important than ever.

What changed was where value accumulated, which companies captured it, which technologies became dominant, and how much of the next era belonged to Massachusetts.

The state's minicomputer companies struggled to adapt.

Digital Equipment was acquired (Computer History Museum, n.d.-b).

Data General was acquired (Computer History Museum, n.d.-a).

Wang entered bankruptcy and subsequently emerged with a business strategy centered on software and services (Florida-UCLA-LoPucki Bankruptcy Research Database, n.d.; Los Angeles Times, 1993).

Prime Computer announced the closure of its computer hardware division in July 1992 as it reorganized under the Computervision name (Los Angeles Times, 1992).

The transition was not exclusively technological.

AnnaLee Saxenian's comparison of Silicon Valley and Route 128 identified important differences in how the two regional economies were organized.

Silicon Valley developed networks of specialized firms, mobile workers, suppliers, and institutions capable of exchanging knowledge and adapting collectively.

Route 128 remained more dependent on vertically integrated corporations that concentrated knowledge, production, and decision-making within individual firms (Saxenian, 1994).

Those differences influenced how each region responded when the economics of computing changed.

The lesson extends beyond the failure of particular companies.

Regional economic resilience depends partly on whether the institutions surrounding an industry can adapt when the sources of competitive advantage shift.

Massachusetts survived.

More than survived.

The Commonwealth rebuilt around biotechnology, medicine, software, finance, professional services, research, and other knowledge-intensive industries.

Kendall Square became one of the world's most important life-sciences clusters. Universities and research hospitals remained major sources of innovation. New industries expanded even as the old Route 128 giants disappeared.

The lesson is not that Massachusetts inevitably loses technological transitions.

It is that **being central to one technological era does not guarantee ownership of the next one.**

That is the relevant warning for artificial intelligence.

The possibility that established knowledge-economy centers could become disproportionately vulnerable to artificial intelligence is not unique to this analysis.

Tufts University's Digital Planet project has described a similar geographic risk through its comparison of emerging AI-exposed regions with the historical Rust Belt (Chakravorti et al., 2026).

The concern examined here is more specific: whether Massachusetts' household costs, concentrated wage base, and long-duration institutional obligations could amplify such a transition.

For years, another American industrial geography has carried the more familiar analogy.

Silicon Valley has periodically been described as a future Detroit: a dominant regional economy eventually vulnerable to technological change, rising costs, competition, or institutional complacency.

Artificial intelligence complicates that analogy.

The Bay Area is not merely home to a mature industry threatened by its successor.

It is heavily concentrated in many of the companies, capital networks, researchers, platforms, and infrastructure shaping the successor itself.

At the same time, artificial intelligence can become an input into nearly every other industry.

Software uses it.

Finance uses it.

Medicine uses it.

Biotechnology uses it.

Defense uses it.

Media uses it.

Robotics uses it.

Manufacturing uses it.

If the firms controlling the most valuable layers of that technology remain concentrated elsewhere, Massachusetts can participate deeply in the AI economy without capturing a proportionate share of its highest-value companies, capital, or employment.

The analogy therefore shifts.

The future Rust Belt may not emerge where today's dominant AI companies are located.

It may emerge in places whose prosperity depended heavily on forms of human knowledge work that artificial intelligence makes less scarce.

Boston is unusually exposed to that possibility.

This is not a prediction that Boston becomes Detroit.

The two places differ profoundly in economic structure, geography, institutions, accumulated wealth, industrial diversity, and physical form.

Boston possesses universities, hospitals, biotechnology companies, cultural institutions, valuable real estate, tourism, scarce land, and enormous concentrations of human and financial capital.

Those assets do not disappear because one category of work changes.

A knowledge-economy decline would therefore look different from twentieth-century industrial decline.

It could remain visually prosperous for a long time.

Harvard would still be Harvard.

MIT would still be MIT.

Massachusetts General Hospital would still be a major medical institution.

Beacon Hill would still be valuable.

Fenway Park would still fill.

The skyline would remain.

The wealth accumulated during the previous era would remain visible.

What could weaken is the mechanism underneath it.

Fewer young workers might decide that Boston's cost premium is justified.

Entry-level professional ladders could narrow.

Companies could employ smaller teams.

Office demand could remain structurally weaker.

Smaller colleges could continue closing or consolidating.

School enrollment could decline as fewer young families remain.

The population could age.

Housing could remain expensive even as career optionality weakens.

The city would still look rich.

It would simply become less effective at creating the next generation of households capable of participating in that wealth.

This is what a **Rust Belt of the knowledge economy** could look like.

Not abandoned factories.

Empty desks.

Not smokestacks shutting down.

Smaller professional cohorts.

Not entire neighborhoods immediately collapsing.

Expensive neighborhoods becoming increasingly detached from the earning power of younger workers.

Not industrial ruins.

Shrinking colleges, underused offices, aging institutions, and a growing mismatch between inherited infrastructure and the population economically capable of sustaining it.

Accumulated wealth can conceal that transition.

Industrial decline became visible because factories were enormous physical objects.

When they closed, their absence was obvious.

Knowledge-economy contraction can be quieter.

A company that once employed 2,000 people might employ 1,300 while producing more output.

An office tower can remain standing while occupying fewer floors.

A university can remain open while reducing programs and staff.

A neighborhood can retain million-dollar homes while containing fewer young families.

A state can continue collecting substantial revenue while depending on a narrower economic base.

The artifacts remain after the underlying density of economic activity begins to change.

Massachusetts already experiences some of these pressures for reasons that have little or nothing to do with artificial intelligence.

Remote and hybrid work weakened office demand.

Commercial property values in Boston and Cambridge softened.

Smaller private colleges have closed or merged as enrollment and revenue declined (Massachusetts Department of Higher Education, n.d.).

These developments do not establish that Massachusetts is becoming a Rust Belt.

They establish that even prestigious knowledge-economy institutions remain subject to the same rule as every other system in this paper:

fixed structures become vulnerable when the economic population supporting them contracts.

Artificial intelligence matters because it could extend that pressure into the employment base itself.

The original Rust Belt was not created because Americans stopped wanting manufactured goods.

Industrial output continued.

Productivity improved.

Automobiles remained important.

But production methods changed, competition intensified, employment requirements changed, and economic activity moved.

The places built around the previous configuration suffered even as the underlying products remained valuable.

The same distinction can apply to knowledge.

Research will not disappear.

Software will not disappear.

Finance, law, analysis, medicine, engineering, and science will not disappear.

They may become more productive.

The question is how many people will be required to produce the next unit of output, where the companies controlling the new tools will reside, and where the resulting economic value will be captured.

This is why Route 128 matters.

The personal computer did not destroy computing.

It changed the scarcity structure of computing.

Companies built around the previous structure struggled.

Massachusetts ultimately found another economic model.

The comparison with artificial intelligence is structural rather than technological.

Personal computing undermined the competitive position of established minicomputer manufacturers.

Artificial intelligence could instead change the amount of human labor required across many knowledge-intensive industries, including companies that remain successful and become more productive.

The outcomes need not be identical.

What connects the two transitions is the possibility that technological progress increases overall economic value while weakening the regional employment structures built around an earlier source of scarcity.

The Commonwealth survived the decline of its first great computer industry by becoming increasingly dependent on the knowledge economy.

What happens when the knowledge economy faces its own personal-computer moment?

The answer does not have to be decline.

Massachusetts possesses extraordinary assets for adaptation.

Its life-sciences cluster remains globally significant.

Its hospitals and research institutions operate at the frontier of medicine.

Its defense, robotics, engineering, advanced-manufacturing, energy, and scientific capabilities extend far beyond purely digital work.

The same institutions that made Massachusetts successful in a knowledge-scarce economy can help it adapt to a world in which machine intelligence becomes more abundant.

But adaptation requires recognizing what has changed.

The Commonwealth cannot assume that preserving its position means reproducing the same employment structure indefinitely.

Nor should it measure success solely by whether Massachusetts remains associated with innovation.

Route 128 remained historically important after the center of computing moved elsewhere.

Historical importance is not the same as economic centrality.

Prestige is not the same as opportunity.

Accumulated wealth is not the same as reproductive capacity.

A place can remain famous for what it built while becoming less important to what comes next.

That is the real warning contained in the Rust Belt analogy.

Massachusetts should not fear becoming poor.

It should fear becoming a legacy center of the previous economic era.

The alternative is not to reject artificial intelligence or retreat from knowledge-intensive industries.

It is to ask what becomes scarce after intelligence itself becomes cheaper.

That question points away from preserving the old economy and toward building the next one.

10. Beyond the Computer

If artificial intelligence makes portions of human knowledge less scarce, Massachusetts does not need to become less intelligent.

It needs to become more physical.

The Commonwealth's modern prosperity was built by accumulating unusually dense concentrations of knowledge: universities, laboratories, hospitals, engineers, scientists, physicians, programmers, financial workers, researchers, and professional institutions.

That remains an extraordinary advantage.

The mistake would be assuming that the value of those capabilities must continue to terminate primarily in information.

The next Massachusetts economy should push them deeper into the physical world.

Medicine must still interact with bodies.

Biology still requires laboratories, equipment, manufacturing, clinical testing, and regulated production.

Robots must still be designed, fabricated, tested, deployed, repaired, and operated.

Energy must still be generated, transmitted, stored, and delivered.

Buildings still have to be constructed.

Materials still have to be produced.

Aircraft, defense systems, medical devices, power equipment, manufacturing tools, and infrastructure still have to exist somewhere.

Artificial intelligence can transform all of these activities.

It cannot make their physical constraints disappear.

That is the opportunity.

Massachusetts should not organize its economic strategy around preserving the scarcity of human cognition.

It should use increasingly abundant machine intelligence to multiply the value of things that remain scarce.

The old knowledge economy often moved toward abstraction.

Research produced information.

Software produced information.

Finance processed information.

Professional services interpreted information.

The next model can retain that knowledge layer while extending it further into production.

The knowledge economy should not disappear.

It should become more physical.

Massachusetts already possesses important pieces of such an economy.

Life sciences provide the clearest example.

The Commonwealth's advantage in biotechnology was built from universities, research institutions, hospitals, scientists, capital, and specialized labor.

But biotechnology is not ultimately valuable because Massachusetts produces papers, patents, or discoveries.

Its highest economic value appears when knowledge becomes a drug, diagnostic, device, manufacturing process, treatment, or clinical system.

The more of that value chain Massachusetts physically anchors inside the Commonwealth, the more durable the economic activity becomes.

Research can move.

A manufacturing facility is harder to move.

A scientist may work remotely.

A regulated production system, specialized laboratory, clinical network, and supply chain have stronger geographic ties.

The same principle applies to robotics, defense, advanced manufacturing, energy, medical technology, and other sectors in which digital intelligence becomes embodied in physical systems.

Artificial intelligence inside software can reduce the demand for some forms of cognitive labor.

Artificial intelligence inside machines can likewise reduce labor demand through automation, even as it creates new opportunities in engineering, fabrication, testing, maintenance, integration, and operation.

The difference for Massachusetts is not that physical industries are immune to labor displacement.

It is that physical production can create additional, place-dependent channels through which technological productivity supports local economic activity.

A highly successful software company can generate enormous value with a relatively small workforce and a limited physical footprint.

A physically intensive industry may still require software engineers, but it can also create demand for technicians, machinists, mechanical engineers, facilities, suppliers, contractors, and production workers.

The intelligence becomes embodied.

The economic activity becomes harder to detach from place.

This is **physical anchoring**.

It is not nostalgia for twentieth-century manufacturing.

A physically anchored economy can be highly automated.

Factories automate.

Laboratories automate.

Warehouses automate.

Robots build robots.

Artificial intelligence will increase productivity throughout the physical economy as well.

The distinction is that physical production retains constraints software does not.

Land matters.

Energy matters.

Materials matter.

Permitting matters.

Transportation matters.

Supply chains matter.

Facilities matter.

Skilled hands still matter.

Those constraints create forms of economic attachment that are more difficult to reproduce instantly somewhere else.

Physical anchoring can strengthen the relationship between economic activity and place, but it does not guarantee durable local employment or household prosperity.

A highly automated facility may remain in Massachusetts while supporting relatively few workers. Its ownership, profits, and supply chains may extend well beyond the Commonwealth.

The relevant question is therefore not simply whether an industry remains physically located in Massachusetts, but how much durable employment, household earning capacity, locally retained economic value, and fiscal capacity its presence actually supports relative to the infrastructure and public resources it requires.

Despite these limitations, physically anchored industries can create opportunities to distribute economic capacity more broadly across Massachusetts.

The Commonwealth's highest-value economy remains heavily concentrated in Boston, Cambridge, and the Route 128 corridor.

That concentration has produced extraordinary benefits.

It also creates concentration risk.

A more physically anchored economy does not require reproducing Kendall Square in every region.

It requires more than one geography capable of producing durable, high-value careers.

Central and Western Massachusetts possess different combinations of land, infrastructure, manufacturing, healthcare, research, and logistics.

The South Coast possesses ports and maritime infrastructure.

Other regions contain defense, industrial, agricultural, materials, medical, and engineering capabilities that do not need to be compressed into the Boston core.

The objective is not regional redistribution for its own sake.

It is economic redundancy.

A resilient Commonwealth should possess multiple regions where available careers and household costs allow people to build economically durable lives.

Massachusetts is already pursuing elements of this strategy.

In September 2026, the Massachusetts Life Sciences Center announced nearly \$40 million in tax incentives for 38 companies, associated with commitments to create 1,644 jobs (Massachusetts Life Sciences Center, 2026).

Thirty-one of those companies planned expansions outside Boston and Cambridge, accounting for approximately 71 percent of the expected jobs (Massachusetts Life Sciences Center, 2026).

These incentives support research, development, commercialization, and manufacturing. They demonstrate that the Commonwealth already recognizes the value of retaining and distributing knowledge-intensive economic activity.

But announced jobs are not necessarily realized jobs, and public investment does not automatically produce lasting economic capacity.

The additional standard proposed here is whether those investments ultimately create durable employment, household earning power, geographically anchored production, and sufficient economic returns to justify their public and infrastructure costs.

Recent developments in Massachusetts biotechnology illustrate why the distinction matters.

MassBio's 2026 Industry Snapshot reported that Commonwealth biopharma employment declined by 3.1 percent in 2025, even as aggregate industry wages increased by 2.2 percent (MassBio, 2026).

Research and development employment contracted, while biomanufacturing added a modest number of jobs (MassBio, 2026).

The contrast also illustrates the limitation of physical anchoring as an economic strategy. Expanding biomanufacturing does not automatically replace employment lost elsewhere in the industry.

The value of a more physically anchored economy depends on whether that expansion generates sufficient durable employment, household earning capacity, and locally retained economic activity to strengthen the Commonwealth's underlying economic base.

That is why economic development cannot be evaluated through investment, employment, payroll, or industry valuation alone.

The larger question is whether the resulting economic activity creates durable careers, geographically anchored production, and enough household margin to sustain the population participating in it.

These distinctions change how economic development should be measured.

Jobs matter.

Investment matters.

Company formation matters.

Venture capital matters.

Economic output matters.

But none fully answers the question raised by this paper.

A company can create tremendous value while supporting relatively few households.

A major investment can consume substantial land and electricity while producing little permanent payroll.

A highly automated facility can expand output without creating a broad employment base.

An industry can generate extraordinary valuations while concentrating much of its upside elsewhere.

The additional question should therefore be:

How much carrying capacity does this activity create?

How much durable Massachusetts payroll accompanies the investment?

How many careers, rather than temporary jobs, result?

How much physical value remains attached to Massachusetts?

How much taxable capacity is created?

How much of the surrounding supply chain can exist here?

How much geographic diversification results?

How much scarce infrastructure is consumed in the process?

This does not require government to calculate a universal carrying-capacity score and centrally allocate the economy.

It requires recognition that not all growth has the same relationship to the systems that must ultimately support it.

A high-cost state needs more than valuable companies.

It needs an economy capable of reproducing the households that make the state viable.

That is why artificial intelligence should be treated as an input rather than an identity.

Massachusetts does not need to become the Bay Area.

It does not need to win every layer of the foundation-model economy.

It should participate where doing so strengthens advantages it already possesses.

Use artificial intelligence in medicine.

In biotechnology.

In robotics.

In defense.

In energy.

In advanced manufacturing.

In construction.

In infrastructure.

The objective is not to resist abundant intelligence.

It is to decide what abundant intelligence should be used to make more valuable.

For Massachusetts, the answer should increasingly be the things that remain difficult to virtualize.

This is the transition from a knowledge Commonwealth toward a more **tactile Commonwealth**.

Not a rejection of research.

An extension of it.

Not a retreat from technology.

A deeper embodiment of it.

Not an attempt to recreate the industrial economy of the twentieth century.

An attempt to build a physical economy appropriate to the twenty-first.

Such an economy would still require extraordinary scientists, engineers, researchers, physicians, programmers, and entrepreneurs.

But their work would terminate more often in things that must be produced, installed, maintained, tested, delivered, or operated.

That creates a different relationship between intelligence and place.

It can also create a different relationship between prosperity and margin.

The current Massachusetts model frequently requires extraordinary income to support extraordinary costs.

A more resilient model would create enough productive capacity across enough industries and enough geography that an ordinary successful household does not need to occupy the top of the national income distribution merely to remain economically secure.

That should be the standard.

But creating more durable economic opportunities addresses only one side of the Massachusetts bargain.

The other is the cost of remaining.

A household's economic resilience depends not only on what it earns, but on what it must spend to maintain an ordinary life.

Massachusetts can attract new industries, expand manufacturing, increase productivity, and generate substantial economic value while continuing to place extraordinary financial demands on the households participating in that economy.

If housing, childcare, energy, transportation, insurance, and other recurring obligations continue rising alongside earnings, much of the additional economic capacity can be absorbed before it becomes household margin.

The Commonwealth therefore faces two related tasks.

It must create more durable earning capacity.

And it must reduce the income required to sustain an economically secure household.

These are not competing strategies.

They address opposite sides of the same economic relationship.

One strengthens the earning power available to households. The other reduces the recurring costs those earnings must support.

Both can increase household income headroom and strengthen the Commonwealth's broader carrying capacity.

A worker earning \$150,000 in a region where ordinary household formation requires \$140,000 possesses a different level of resilience than a worker earning the same amount where comparable needs require \$110,000.

The distinction is not simply affordability.

It is the amount of economic capacity remaining after the basic structure of life has been financed.

Reducing that requirement increases household headroom without requiring every household to obtain an extraordinary salary.

More housing supply, reliable and affordable energy, workable transportation, accessible childcare, and more efficient infrastructure can therefore strengthen Massachusetts' carrying population even when they do not directly increase wages.

These changes are not automatic. Physical supply constraints, existing commitments, public obligations, and institutional rules can prevent technological productivity from translating into lower household costs.

That is why the next Massachusetts economy cannot be evaluated solely by what it produces.

It must also be evaluated by what ordinary participation in that economy costs.

A physically anchored industry is not sufficient if its workers cannot afford to live near it.

A prosperous region is not sustainable if its next generation cannot establish households within it.

The objective is to widen the distance between ordinary earning power and the cost of ordinary life.

That distance is margin.

And margin, rather than extraordinary income alone, is what allows prosperity to reproduce itself.

The test of the next Massachusetts economy is not whether it can create extraordinary wealth.

The old economy already proved that it can.

The test is whether it can create enough **ordinary prosperity** for a broad population to remain.

That is how Massachusetts avoids becoming a legacy center of the knowledge era.

Not by preserving every job or institution built during the previous one.

Not by competing for every new technological fashion.

Not by asking households to carry an ever-larger structure with ever-less margin.

But by converting the capabilities it already possesses into forms of economic activity that are harder to dislodge, more widely distributed, and more capable of reproducing the population required to sustain the Commonwealth.

Artificial intelligence may make knowledge cheaper.

Massachusetts should make that knowledge physical.

Conclusion

Massachusetts does not need to become poor to become fragile.

It does not need mass unemployment, collapsing home prices, empty cities, or a fiscal emergency.

The vulnerability examined in this paper would emerge if the economic capacity sustaining Massachusetts households and public institutions weakened relative to the costs and obligations surrounding them.

That can happen even while population remains stable, economic output increases, and the Commonwealth continues generating extraordinary wealth.

That possibility begins with margin.

A household earning \$200,000 can appear prosperous while possessing less economic resilience than the income suggests. Its mortgage, childcare, insurance, transportation, taxes, energy, and other commitments were built around an expectation of continued earnings.

If income falls, the household does not immediately become poor.

It loses room.

The Commonwealth faces the same problem.

Massachusetts possesses extraordinary assets: universities, hospitals, research institutions, valuable property, global industries, and one of the most skilled workforces in the country.

It also possesses long-duration commitments that cannot resize at the speed of technological change.

Pensions remain.

Healthcare remains.

Infrastructure remains.

Schools remain.

Municipal systems remain.

The grid must expand.

Housing must still be built.

The central vulnerability is therefore not simply whether Massachusetts continues producing wealth.

It is whether enough of that wealth continues to flow through households capable of sustaining themselves and the system around them.

Artificial intelligence matters because it changes the scarcity on which much of the modern Massachusetts economy was built.

It does not need to eliminate knowledge work.

It only needs to reduce the amount of human labor required to produce a given amount of knowledge-intensive output.

That can raise productivity while weakening carrying wage capacity.

Jobs can be replaced without replacing wages.

Population can be replaced without replacing fiscal capacity.

Economic output can rise while fewer households receive the income required to maintain durable lives inside Massachusetts.

That is the stress this paper describes.

The danger becomes greater when the Commonwealth responds to that pressure by consuming the same margin required to adapt.

Households spend savings to preserve existing lives.

Municipalities shift burdens to preserve existing services.

The Commonwealth commits revenue and infrastructure to preserve economic position.

Each response may be rational.

Together, they can produce a system increasingly dependent on continuous high performance merely to remain where it already is.

That is **Killing Yourself to Live**.

The phrase does not describe collapse.

It describes preservation becoming expensive enough to weaken resilience.

Massachusetts has faced structural change before.

The Route 128 computer industry declined.

The Commonwealth did not.

It rebuilt around another economic model.

Artificial intelligence may require another transition of that kind.

The answer is not to retreat from knowledge, research, science, or technology.

It is to use them differently.

If intelligence becomes increasingly abundant, Massachusetts should use that intelligence to increase the value of things that remain scarce and physically anchored: biology, medicine, energy, advanced manufacturing, robotics, defense, infrastructure, materials, and other systems that must exist somewhere.

The knowledge economy should not disappear.

It should become more physical.

But creating more durable economic opportunity addresses only one side of the Massachusetts bargain.

The Commonwealth must also reduce the recurring costs of ordinary household life, so that more of the prosperity it creates becomes household margin rather than being absorbed by existing obligations.

The objective is not simply to create more economic value.

It is to create more durable carrying capacity.

More households with income headroom.

More career paths capable of supporting ordinary life.

More economic activity that creates lasting value within Massachusetts.

More geographic redundancy.

Lower recurring costs for ordinary households.

More fiscal and infrastructure margin.

A high-cost state does not need to be cheap.

It needs to remain worth it.

That means preserving the opportunity premium that once justified the cost premium, while making the Commonwealth less dependent on a narrow set of extraordinarily compensated occupations to sustain ordinary household formation.

Massachusetts has already proved that it can create extraordinary wealth.

The next challenge is whether it can create enough ordinary prosperity for a broad working population to remain part of that wealth.

That is the difference between a prosperous place and a sustainable one.

The Commonwealth does not need to preserve every feature of the economy that made it successful.

It needs to preserve the capacity of people to build lives inside it.

The challenge is not whether Massachusetts can remain rich.

It is whether enough people will still be able to afford to belong to the prosperity it creates.

Methods and Limitations

This paper is a structural risk analysis of the Massachusetts economy. It examines how changes in knowledge-intensive employment, household earning power, demographic replacement, public finances, and physical infrastructure could interact under conditions of technological disruption.

The analysis combines published economic and institutional data with author calculations, illustrative sensitivity scenarios, and historical comparison. It does not attempt to forecast Massachusetts employment, population, economic output, or public revenue.

Evidence Base

Household-income estimates are drawn from the U.S. Census Bureau's American Community Survey. Household affordability is examined using the MIT Living Wage Calculator and United For ALICE. Family wealth and financial-liquidity indicators are drawn from the Federal Reserve Bank of Boston's Massachusetts Economic Conditions and Household Opportunity Survey.

Occupational employment and wage estimates come from the U.S. Bureau of Labor Statistics. Demographic projections, fiscal collections, pension obligations, municipal property assessments, electricity planning, and industry developments are examined using published government, institutional, and industry sources.

These sources measure different populations, geographic areas, and reference periods. They are used to establish relevant economic conditions and relationships, not as components of a single integrated statistical model.

Author Calculations

The occupational wage-concentration estimates use May 2025 Bureau of Labor Statistics employment and mean annual wage figures for the Boston-Cambridge-Newton, MA–NH metropolitan area.

Estimated occupational wage capacity is calculated by multiplying employment by mean annual wages. The six selected occupational groups account for approximately 29 percent of metropolitan employment and an estimated 46 percent of the occupational wage bill.

These figures describe the distribution of metropolitan employment earnings. They do not directly measure the income, economic resilience, or tax contributions of Massachusetts households.

The household-income examples compare specified earnings levels with MIT’s modeled pre-tax basic-needs requirements for particular household configurations. The differences illustrate potential income cushions relative to standardized necessities, not measured household disposable income or actual financial reserves.

The financial-runway examples separately assume specified monthly cash deficits and accessible reserves.

AI Sensitivity Scenarios

The paper presents illustrative scenarios in which 50,000, 100,000, or 250,000 positions are affected by changes in employment earnings.

Each scenario applies an assumed percentage reduction to aggregate payroll associated with those positions, using a \$150,000 annual earnings benchmark.

The resulting calculations illustrate the potential scale of gross payroll changes. They are not derived from the Tufts American AI Jobs Risk Index, do not represent estimated probabilities, and should not be interpreted as forecasts of job losses.

The scenarios do not calculate offsetting employment creation, productivity-driven wage growth, changes in business income, or the distribution of AI-related economic gains.

They therefore do not establish net employment losses, net changes in Massachusetts household income, or resulting state and municipal revenue losses.

Analytical Limitations

The paper introduces four related analytical concepts: carrying population, carrying wage capacity, income headroom, and fiscal headroom.

Carrying population refers to households possessing sufficient economic capacity to sustain themselves within Massachusetts' cost structure.

Carrying wage capacity describes the aggregate employment earnings available to support such households.

Income headroom describes the margin between household earnings and the resources required to maintain economic self-sufficiency, while fiscal headroom describes the financial flexibility available to public institutions after accounting for recurring commitments and other obligations.

These concepts describe different dimensions of economic resilience. They are not interchangeable measurements, and changes in one do not necessarily produce equivalent changes in another.

This paper does not calculate the number of Massachusetts households belonging to a measurable carrying population or establish that this population has already contracted.

The United For ALICE estimates and MIT Living Wage Calculator use different methodologies and reference periods. Their results cannot be combined directly to estimate how many Massachusetts households would cross a basic-needs threshold after an earnings shock.

A longitudinal assessment of household resilience would require comparable historical affordability estimates matched to household-level income, composition, geographic, and financial information.

The analysis also does not establish that artificial intelligence has caused the economic pressures already visible in Massachusetts housing, higher education, commercial property, or demographic trends.

Those pressures have multiple causes, many of which predate the current AI transition.

Evaluating whether the proposed mechanism is developing would require comparable observations over time.

Relevant indicators would include sustained weakening in inflation-adjusted carrying wage capacity within knowledge-intensive occupations, declining income headroom among comparable household types, reduced economic replacement of departing working-age residents, and increasing pressure on municipal and Commonwealth fiscal margins.

These developments would be consistent with the mechanism described in this paper, but they would not independently establish artificial intelligence as their cause. Business cycles, demographic changes, housing supply, migration, and other economic forces would also need to be examined.

The opposite outcome is possible.

Artificial intelligence could generate new employment, increase wages, reduce household costs, attract investment, and expand taxable economic activity quickly enough to preserve or increase household and fiscal capacity despite displacement within existing occupations.

The decisive relationship is therefore not simply how much employment artificial intelligence changes, but whether new economic capacity emerges quickly enough, and reaches enough households, to offset losses before existing costs and obligations become difficult to sustain.

Massachusetts faces a structural vulnerability if the economic capacity supporting its households and institutions deteriorates faster than new capacity emerges or existing costs and obligations can adjust.

The purpose of this paper is to identify that mechanism and the conditions under which it matters, rather than to establish that a particular outcome is inevitable.

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About the Author

Scott Jellen is an independent researcher and protocol designer focused on system design, institutional structure, public infrastructure, economic systems, and long-range structural change. His work examines how incentives, governance, technology, rights, and infrastructure shape complex systems and the people and institutions required to sustain them.

About Jellen Protocol Lab

Jellen Protocol Lab is an independent research practice focused on protocol design, institutional systems, rights and access infrastructure, public-facing technical artifacts, and long-range structural research. The Lab develops frameworks, specifications, registries, simulations, and reference models intended to make complex systems more legible, inspectable, and actionable.

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Examines the structural vulnerability created when changes in knowledge-intensive employment and household earning capacity interact with Massachusetts' high cost of living and long-duration institutional obligations.

Introduces carrying population, carrying wage capacity, income headroom, fiscal headroom, and the shrinking-denominator mechanism as analytical concepts for examining economic resilience.

Includes illustrative wage-capacity scenarios, demographic and fiscal analysis, historical comparison with the Route 128 technology transition, and a proposed economic direction emphasizing physically anchored production and lower recurring household costs.

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