GEORGIA
LIFE SCIENCES

# Pathways & Partnerships:

## A ROADMAP FOR GEORGIA'S LIFE SCIENCES SECTOR

### Positioning Georgia as the Scale-Up Manufacturing Hub of the Southeast

# Contents

# A Message From The Leaders

**It is with a great sense of purpose and optimism that we present this Roadmap for Georgia's life sciences sector to guide the growth of Georgia's biosciences and medtech economy and position our state as a leading global hub for innovation, investment, and impact.**

This plan is grounded in a clear recognition: Georgia's existing strengths in biotechnology, pharmaceuticals, medical devices, digital health, and agricultural and industrial biotechnology give us a unique opportunity to lead in the next generation of life sciences breakthroughs. Like other successful life sciences clusters across the country, Georgia can accelerate its growth by following a defined strategy and aligning the efforts of committed stakeholders—private industry, government, academic and research institutions, healthcare systems, investors, and economic and workforce development partners. This Roadmap sets out the key priorities and actions necessary to harness those strengths and translate them into jobs, investment, and improved quality of life for communities across our state.

We invite you to engage deeply with this Roadmap. Identify where your organization can contribute, collaborate, and lead in advancing Georgia's life sciences ecosystem. Whether you are a startup founder, researcher, executive, investor, policymaker, educator, or advocate, your participation is essential to moving this agenda forward. In the months ahead, we will continue to convene stakeholders, refine our initiatives, and report on progress as we translate this strategy into tangible programs, investments, and outcomes for Georgia.

We also extend our sincere appreciation to the many stakeholders from across the state who generously contributed their time, insights, and expertise to shape this Roadmap. Special thanks are due to the Georgia Life Sciences (GLS) Board of Directors, whose dedication and counsel were instrumental in guiding this effort from concept to completion.

Georgia's success in building a more dynamic and impactful life sciences sector will depend on our collective vision, collaboration, and execution. The opportunity before us is significant—for our companies, our talent, and our citizens. The future is ours to create. We invite you to join us.

Sincerely,

**Maria Thacker Goethe**
*President & CEO, Georgia Life Sciences*

**Steven Damon**
*CEO, Micron Biomedical*

**Dave Penake**
*Chair, Georgia Life Sciences*
*CEO, Saol Therapeutics*

**Scott Rizzo**
*Vice Chair, Georgia Life Sciences*
*Board of Directors, Bend Bioscience*

# Pathways & Partnerships:

## A ROADMAP FOR GEORGIA'S LIFE SCIENCES SECTOR

### EXECUTIVE SUMMARY

Georgia stands at an inflection point in the growth of its life sciences sector, spanning biopharma, medical devices and diagnostics, agricultural and industrial biotechnology, and related digital and research services. While the state has strong research institutions, early-stage incubators, and large-scale view manufacturing assets, it lacks the specialized "scale-up" infrastructure, capital, and coordinated leadership that allow companies across these segments to move from startup to mid-size without leaving the state.

This roadmap outlines a ten-year strategy (2025–2035) to position Georgia as the Scale-up Manufacturing Hub of the Southeast for the full life sciences continuum, from therapeutics and vaccines to smart devices, diagnostics, and ag/industrial biotechnology. Here, "scale-up" refers to the growth phase when companies move from successful lab or pilot work into regulated, commercial-ready manufacturing—building the facilities, talent, and quality systems needed to produce at meaningful volume. North Carolina today anchors the Southeast's most mature biomanufacturing cluster; Georgia's goal is to complement that strength and, over time, rival it by becoming the region's preferred location for multi-node, multi-segment scale-up and advanced manufacturing at lower cost. It is grounded in:

- Comparative analysis of leading life sciences and bioscience roadmaps (Arizona, Indiana, Massachusetts, Colorado, New York, others).
- Biotechnology Innovation Organization (BIO)/ Council of State Bioscience Associations (CSBA) best-practice guidance on incentives, workforce, and public–private collaboration.
- Stakeholder inputs from surveys, executive interviews, and community partners across Georgia's ecosystem, including human health, medtech, and food and agbio stakeholders.
- Recommendations and sector guidance based on national best practices and stakeholder input; they are intended as a menu of options for Georgia to adapt, phase, or scale rather than a fixed implementation mandate.
- Relevant national and federal reports, including the National Security Commission on Emerging Biotechnology (NSCEB) recommendations on biomanufacturing, AI, and cyber bio capabilities.

> This roadmap provides a clear, shared framework to help align efforts, scale innovation, and drive long-term economic impact across the state.

The strategy is organized around five pillars:

1. Scale-Up Manufacturing Infrastructure
2. Workforce and Talent Pipeline
3. Capital and Investment
4. Policy, Incentives, and Regulatory Environment
5. Ecosystem Coordination and Collaboration

Over a 10-year horizon, the roadmap aims to:

- Establish Georgia as the Southeast's preferred location for scaling biopharma, medtech, diagnostics, agricultural, and industrial biotech companies.
- Generate thousands of high-wage jobs and retain more companies through later growth stages across all major life sciences subsectors.
- Build a self-sustaining ecosystem that relies less over time on ad-hoc or one-off incentives, as private capital and market-driven investment strengthen.

## HOW TO USE THIS ROADMAP

This roadmap is a vision and strategic framework for Georgia's life sciences sector—not a binding commitment or prescriptive budget document.

**What It Is.** This roadmap is a curated menu of tools and priorities proven in peer states such as Massachusetts, North Carolina, Indiana, Arizona, and others. Rather than speculating about what might work in Georgia, each recommendation reflects real-world execution and measurable outcomes from leading ecosystems. The roadmap is evidence-based and grounded in stakeholder input and data—developed through executive interviews with ~20 senior leaders across Georgia's life sciences ecosystem, a statewide professional survey, and quantitative analysis of labor market, tax, and company formation trends. And it is open-source: state leaders, Georgia Life Sciences, universities, corporations, investors, and regional partners can each adopt pieces that align with your priorities and advance them independently. This is not an all-or-nothing prescription; it is a toolkit.

**What It Isn't.** This roadmap is not a strategic plan for Georgia Life Sciences as an organization. It is not a binding commitment or procurement document; it does not commit the state to specific dollar amounts or timelines. It is not prescriptive down to the dollar; financial estimates and timelines are indicative targets based on peer-state models, not line-item budgets. It is not a substitute for detailed business cases or due diligence; each major initiative outlined here will require robust analysis and feasibility studies before execution. And it is not a replacement for existing programs; this roadmap is designed to complement and strengthen Georgia's existing economic development, education, and research initiatives.

**How to Use It.** State leaders, universities, corporations, investors, and regional partners can each take pieces that align with your priorities and advance them. GLS is not solely responsible for execution; it is the orchestrator and co-lead on select pillars (especially capital, policy, and coordination), working alongside state and regional partners.

Bottom line: This is a living document. Stakeholders are invited to shape how Georgia executes this vision. As market conditions shift, as federal funding opportunities emerge, and as early initiatives yield results, this document can and should be refined to reflect new evidence and stakeholder input.

## CONTEXT AND OPPORTUNITY

### The Strategic Opportunity for Georgia

The national bioscience expansion creates a clear opening for Georgia to claim a differentiated role in the U.S. life sciences landscape. Rather than competing head-to-head with Boston or the Bay Area, Georgia can position itself as the scale-up and advanced manufacturing hub of the Southeast, serving growth-stage companies that are moving from proof-of-concept to commercial production. North Carolina today anchors the Southeast's most mature biomanufacturing cluster; Georgia's ambition is not to imitate or displace that model, but to complement and, over time, rival it by offering multi-node, multi-segment scale-up capacity at lower cost—spanning biopharma, medtech, diagnostics, and ag/industrial biotech and leveraging Atlanta's logistics platform and regional hubs such as Athens and Augusta. States that organize around targeted incentives, workforce development, and public–private collaboration—such as North Carolina, Indiana, Texas, and others—are capturing a disproportionate share of this growth, underscoring the urgency for Georgia to act deliberately rather than incrementally.

Several structural advantages support this positioning. Georgia's central Southeast location and two-day truck access to roughly 80 percent of the U.S. population, combined with Hartsfield–Jackson Atlanta International Airport's global reach, create a logistics platform well-suited to time-sensitive pharmaceutical and medtech supply chains. At the same time, manufacturing operating costs that are an estimated 30–40 percent lower than major coastal hubs offer a compelling value proposition for capital-intensive biomanufacturing investments.

These cost and logistics advantages are reinforced by the state's research and corporate base. Institutions such as Georgia Tech, Emory, UGA, Morehouse School of Medicine, and Augusta University provide a deep reservoir of scientific and engineering talent, while companies like Takeda, Johnson & Johnson, Boehringer

### NATIONAL MARKET DYNAMICS

The bioscience industry is a powerful engine for state economies. The BIO/CSBA 2025 report highlights that:

- The global bioscience product market is projected to grow from approximately **$1.7 trillion in 2025** to more than **$5 trillion by 2034,** an annual growth rate of around 12–14%.
- In the U.S., the bioscience industry employed **~2.3 million workers in 2023–2024** across nearly 150,000 business establishments.
- Average annual wages in bioscience exceed **$132,000**, roughly **83% higher** than the national private-sector average.
- The industry contributed over **$3.2 trillion** in economic output in 2023, accounting for nearly **6.8%** of U.S. private-sector GDP.

Even during economic downturns, the bioscience sector has demonstrated resilience and continued to generate high-wage employment and innovation. States that organize around targeted incentives, workforce development, and public–private collaboration are capturing a disproportionate share of this growth.

Ingelheim, and Boston Scientific demonstrate that Georgia can support both research and development (R&D) and large-scale production. The core question is not whether Georgia has the ingredients, but whether it will move quickly enough to organize these assets into a coherent strategy before peer states solidify their lead.

Georgia's universities have also benefited from the Georgia Research Alliance (GRA), which for decades has provided a distinctive platform for recruiting eminent scholars, funding research infrastructure, and helping spin out university-based companies.

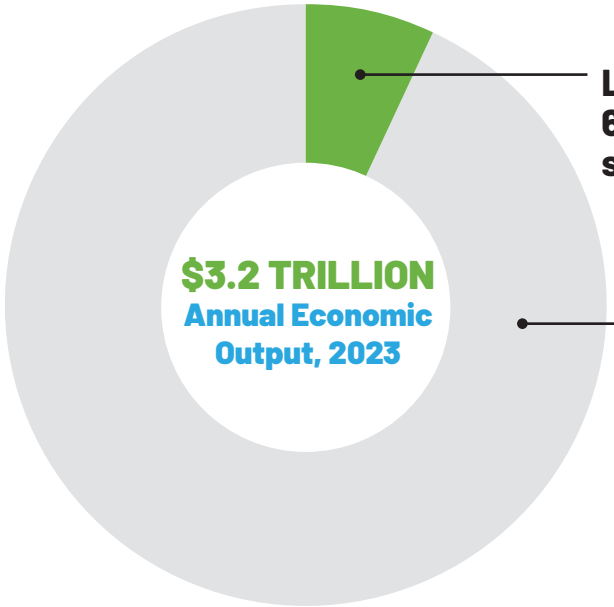
Despite these strengths, Georgia's public investment in life sciences has lagged behind that of several peer and even smaller southeastern states. While Georgia offers broad-based business incentives, it has not yet made the kind of visible, sector-specific commitments—such as Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) matching programs, dedicated life sciences funds, and large-scale grant mechanisms—that Tennessee, Alabama, and others are using to attract and retain companies. Industry leaders consistently report that Georgia's economic development approach does not yet reflect the nuance of capital-intensive, highly regulated life sciences growth, and that this is beginning to shift projects, talent, and investment to neighboring states.

Georgia's geography presents both a coordination challenge and a strategic opportunity for life sciences. Unlike compact hub districts such as Cambridge/Boston or North Carolina's Research Triangle Park, Georgia's activity is distributed across a large metro area and multiple regions—Atlanta, Athens, Augusta, and emerging suburban and rural nodes—without a single, dense life sciences district that anchors the entire ecosystem. Science Square and similar projects provide critical urban capacity, but many founders, workers, and manufacturing sites are located well outside the city and prefer to scale in suburban or regional locations. This roadmap therefore adopts a "one ecosystem, many nodes" approach: building a stronger central hub for coordination and intelligence through GLS, while deliberately supporting a network of connected sites across the state so that companies can grow where it makes the most sense for their talent, costs, and markets.

> Regional competitiveness in the life sciences is built on alignment—when industry, research institutions, and policymakers work together to create an environment where innovation can thrive. Georgia's strength lies in our ability to move as a unified ecosystem."

# The $3.2 Trillion U.S. Life Sciences Engine

**The choice is stark:** either organize now around a coherent life sciences strategy, or accept that the next decade of company formation, biomanufacturing, and high-wage jobs will flow toward better aligned states."




Life sciences represent a meaningful share of the national economy, not a niche.

## JOBS

**2.3 MILLION**

Direct U.S. life science jobs (2023–2024)

*High-skill roles in all 50 states.*

## BUSINESSES

**150,000**

Life science business establishments

*From startups to global manufacturers.*

## WAGES

**$132,000+**

Average annual wage in life sciences

*83% higher than U.S. private-sector average.*

**Georgia's opportunity:** capture a larger share of this $3.2T engine by becoming the Southeast hub for scale up and advanced biomanufacturing.

## Georgia's Starting Point

Georgia already possesses many of the foundational assets required for global competitiveness in life sciences, from research and talent to logistics and cost structure.

### Geographic and Logistics Advantage

Central Southeast location with two-day truck access to 80% of the U.S. population.

- Hartsfield–Jackson Atlanta International Airport, the world's busiest airport, as a premier global passenger and cargo hub.
- Existing logistics infrastructure, including UPS and other major carriers, supporting pharmaceutical, medtech, and cold-chain supply chains.
- Proximity to the Port of Savannah, one of North America's fastest-growing container ports, expands global market access for life science products.

However, stakeholders note that Georgia has not yet translated these generic logistics strengths into a focused, life-sciences-specific value proposition with the concrete benchmarks and use cases that site selectors and companies now expect, highlighting an important area for collaboration with state and regional economic development partners.

### Cost Advantage

- Operating costs estimated at 30–40% lower than major coastal hubs such as Boston or the Bay Area, and competitive with or below many Southeastern peers on operating costs.
- Competitive tax and regulatory environment, including right-to-work status and pro-business incentives, further lowers the effective cost of doing business for life science manufacturers and R&D operations.

### Academic and Research Strengths

- Georgia Tech, Emory University, Georgia State University, the University of Georgia, Morehouse School of Medicine, Augusta University, and others anchor a diversified research base across engineering, biomedicine, public health, agriculture, and data science.
- Strong basic and translational research in biomedicine, engineering, agriculture, and data sciences, supported by major federal grants and clinical partnerships (e.g., Centers for Disease Control and Prevention (CDC), U.S. Department of Veterans Affairs (VA), and major health systems in metro Atlanta and Augusta).
- The Georgia BioScience Training Center, a state-of-the-art Quick Start facility built to support biomanufacturing employers, provides a platform for customized, Good Manufacturing Practice (GMP) aligned training that many emerging markets would envy, with simulated biomanufacturing processes (centrifugation, chromatography, nanofiltration, aseptic filling) and advanced manufacturing training capability. At present, access is largely limited to employer-sponsored training engagements; this roadmap proposes using the Center more deliberately as the anchor for a broader, statewide biomanufacturing talent strategy.
- Emerging shared wet-lab and innovation spaces—including university-affiliated facilities and private providers such as BioSpark Labs, the Incubator at Science Square, and other campus-linked incubators—are beginning to address early-stage company needs. However, by stakeholder report, overall non-university wet-lab capacity and transparent, affordable access remain limited relative to peer hubs, and Georgia lacks a consolidated view of available space and pricing.

### Corporate Presence and Emerging Clusters

- Major manufacturing and R&D investments from companies such as Takeda, Johnson & Johnson, Boehringer Ingelheim, Alcon, Pfizer, Sanofi, UCB, Boston Scientific, and others, spanning human and animal health, medical devices, and biopharmaceuticals.

## Critical Gaps to Address

Georgia's current strengths are meaningful but they sit alongside several structural gaps that must be addressed for the state to reach true Tier-1 cluster status. Stakeholders continue to cite that early-stage companies face limited access to local, sector-savvy risk capital, with few dedicated life sciences investors based in Georgia and a reliance on out-of-state funders. Lab and scale-up infrastructure also remain constrained: outside of emerging anchors like Science Square and select incubators, non-university wet-lab space is scarce and difficult to access for founders not embedded in major institutions, creating friction in spinning research out into companies.

Talent is another pressure point; while Georgia has a deep overall labor pool, shortages persist in experienced biomanufacturing technicians and in senior executives with prior scale-up and commercialization experience, and the region must still work hard to recruit c-suite and board-level leaders from more mature hubs.

Finally, competing states are moving aggressively with targeted incentives, lab-space buildouts, and SBIR/STTR match programs, raising the bar for Georgia to convert its current asset base into sustained global leadership rather than incremental growth.

- Takeda alone has invested more than $2 billion in its Georgia biomanufacturing campus, employing more than 1,100 people and leveraging the Georgia BioScience Training Center for workforce development.
- Regional nodes such as Atlanta (R&D, headquarters, medtech), Athens (ag/industrial biotech and biomanufacturing), and Augusta (clinical and defense-health interfaces), along with emerging suburban and rural hubs, are forming a distributed innovation corridor that connects research universities, health systems, and industrial biomanufacturing sites.
- In total, nearly 4,000 life science-related organizations in Georgia employ roughly 78,000 workers directly, with additional spillover employment in technology, logistics, and professional services—evidence that the state already has meaningful critical mass.

Taken together, these assets give Georgia a strong platform to build from, but they are not yet sufficient to secure true Tier-1 life sciences cluster status.

## The Strategic Gap—"The Missing Middle"

Georgia has many of the right ingredients for a globally competitive life sciences ecosystem, but they do not yet connect into a seamless growth path for companies. Georgia's current strengths are meaningful but they sit alongside several structural gaps that stakeholders continued to highlight. Stakeholders describe a 'missing middle' in the continuum from early discovery to commercial manufacturing: firms can start in Georgia and they can manufacture at very large scale in Georgia, but there is no clear way to scale from one to the other without leaving the state.

Early-stage incubation is reasonably well supported. BioSpark Labs at Science Square (Georgia Tech), CollabTech (Georgia State), Lab2Launch (Emory), the Augusta University Life Sciences Business Development Center, and other wet-lab and preclinical facilities provide startups with a place to begin. Large-scale manufacturing capacity also exists, as demonstrated by Takeda's Covington facility, the Georgia Bioscience Training Center, and other major plants, but these assets are typically not accessible or right-sized for scaling companies moving from bench-scale to mid-scale production.

What is missing is scale-up infrastructure: 100–2,000L GMP-capable manufacturing suites, shared QC labs, clean-room space, regulatory and quality support, and flexible, affordable facilities for companies progressing from startup to mid-size. This "missing middle" prevents Georgia-grown firms from maturing in-state and limits the state's ability to capture higher-value, manufacturing-intensive growth.

In addition, executive interviews and surveys highlight ecosystem gaps that compound this infrastructure problem:

1. Fragmentation across institutions, companies, and state agencies, with no single coordinating entity or "head coach."
2. Limited, specialized capital focused on manufacturing-intensive growth and scale-up facilities.
3. Workforce gaps, especially at the technician and mid-career levels, even though Georgia has specialized employer-focused training assets such as Georgia Quick Start and the Georgia BioScience Training Center that are used as incentives once companies hire. These programs provide valuable, GMP-aligned training capacity but do not yet function as broad, open-access workforce pipelines or generators of new entrants into the field.
4. Utility, permitting, and site-readiness challenges that hinder biomanufacturing attraction relative to states like North Carolina, Indiana, and Massachusetts, which are investing aggressively in biomanufacturing capacity and workforce.

These are precisely the gaps this roadmap is designed to address, through targeted investments in scale-up infrastructure, better coordination and governance, deeper pools of specialized capital, and accelerated talent and site-readiness initiatives.

# Georgia's Life Sciences "Missing Middle"

**DISCOVERY & INCUBATION**

- University- linked incubators
- Wet labs & preclinical facilities

**Examples:** BioSpark Labs, Collab Tech, Lab2Lanch, Augusta LSBDC

**THE MISSING MIDDLE**

**SCALE-UP & PROCESS DEVELOPMENT**

100–2,000L GMP suites
Shared QC labs
Cleanroom space
Regulatory support

Critical infrastructure gap prevents in-state scaling

**COMMERCIAL MANUFACTURING**

- Large-scale facilities
- Major manufacturing plants

**Examples:** Takeda Covington, Georgia Bioscience Training Center

## FOUR CROSS-CUTTING ECOSYSTEM GAPS

**GOVERNANCE**

Fragmentation across institutions, companies, and state agencies with no single coordination "head coach"

**CAPITAL**

Limited specialized capital focused on manufacturing-intensive growth and scale-up facilities

**WORKFORCE**

Gaps at the technician and mid-career levels despite strong training infrastructure

**INFRASTRUCTURE**

Site-readiness, utility, and permitting challenges versus leading peer states

## STRATEGIC VISION AND GUIDING PRINCIPLES

### Vision

By 2035, Georgia will be recognized as the Southeast's premier destination for life sciences innovation and scale-up manufacturing, where companies transition from breakthrough science to market impact with world-class infrastructure, talent, capital, and policy support.

Global advances in biomanufacturing, automation, and AI are compressing 'idea-to-market' timelines from years to months in some domains, as highlighted in the recent National Security Commission on Emerging Biotechnology (NSCEB) report, increasing the premium on regions that can provide integrated R&D, scale-up, and regulatory support in one place. Georgia's goal is to be that hub for the Southeast.

Georgia will be known not for replicating Boston or San Diego, but for occupying a "Goldilocks zone":

- Enough scale and sophistication to support complex biomanufacturing, advanced research, and smart medical devices and diagnostics.
- Lower costs and more flexible capacity than major coastal hubs.
- A collaborative ecosystem that enables companies to stay and grow in Georgia rather than relocate at key inflection points.

### Guiding Principles

The roadmap is guided by the following principles:

1. Scale-Up Focus—Prioritize the "growth and expansion" phase where companies move from proof-of-concept to manufacturing and commercial readiness.
2. Evidence-Based Design—Align with nationally recognized best practices (BIO/CSBA, state roadmaps from Arizona, Indiana, Massachusetts, and others) and Georgia-specific data.
3. Public–Private Partnership (PPP)—Leverage public resources to crowd in private capital and expertise, rather than substitute for it.
4. Shared Responsibility with Industry—Georgia cannot achieve a competitive life sciences position through public action alone; companies must play a more collaborative role—co-investing in shared infrastructure, shaping workforce programs, and engaging in unified advocacy rather than competing in silos.
5. Equity and Inclusion—Extend opportunities beyond metro Atlanta, including rural and Opportunity Zone communities, and across diverse talent pools.
6. One Ecosystem, Many Nodes—Build regional centers of excellence connected through a unified, statewide coordination framework led by Georgia Life Sciences (GLS).
7. Competitive Commitment—Recognize that peer states are making deliberate, long-term public investments in life sciences; Georgia must match this level of intentionality to avoid losing Georgia-grown companies and projects to better-funded neighbors.

## FRAMEWORK: COMPANY LIFE-CYCLE AND STRATEGIC PILLARS

### Company Lifecycle Lens

The BIO/CSBA 2025 report organizes state strategies around four phases of company development. At the same time, recent NCSEB work highlights how AI, automation, and new biomanufacturing technologies are compressing movement through these phases, shifting some 'ideatomarket' timelines from years to months

**Phase 1: Discovery/Seed Stage**

- Origin in university labs or small spin-outs.
- Focus: proof-of-concept research, IP, early grants.

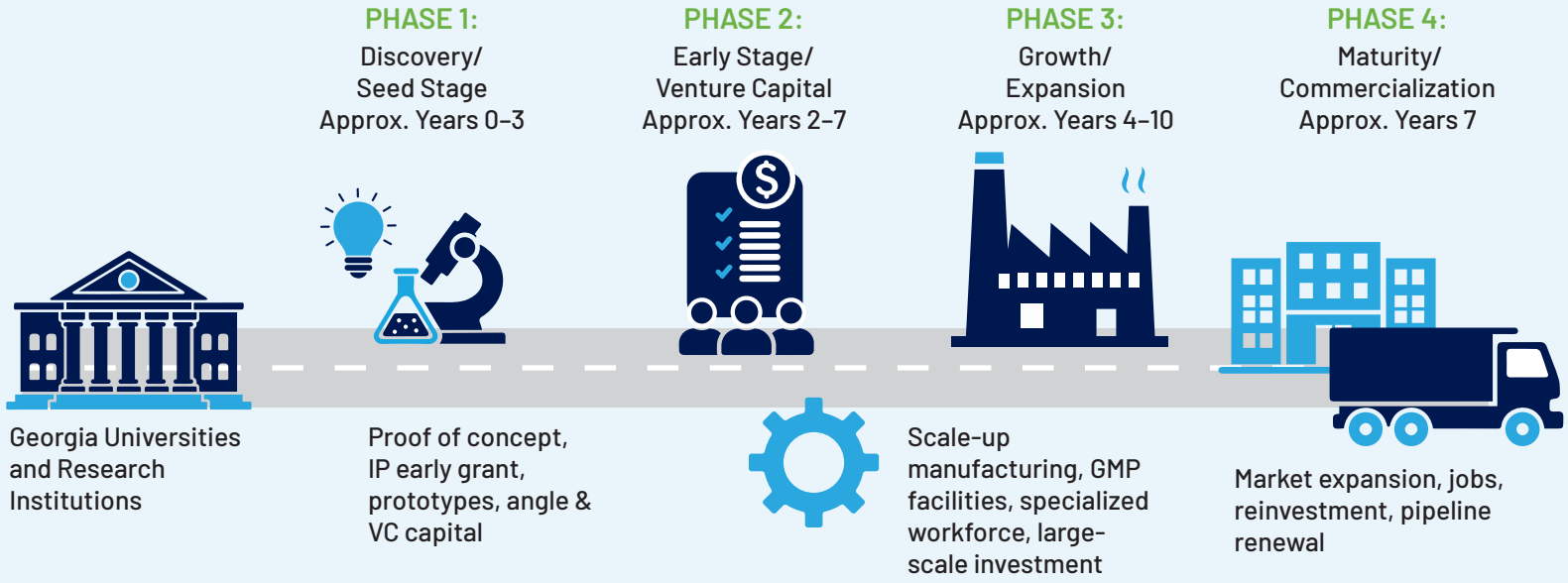
**Phase 2: Early Stage/Venture Capital**

- Preclinical studies, prototypes, early regulatory paths.
- Focus: attracting angel and VC capital, building core team.

**Phase 3: Growth/Expansion**

- Late-stage clinical trials, scaling manufacturing, and preparing for commercialization.

## Georgia Focus: Scale-up Manufacturing Hub of the Southeast



- Focus: large-scale investment, specialized facilities, supply chain, and workforce expansion.

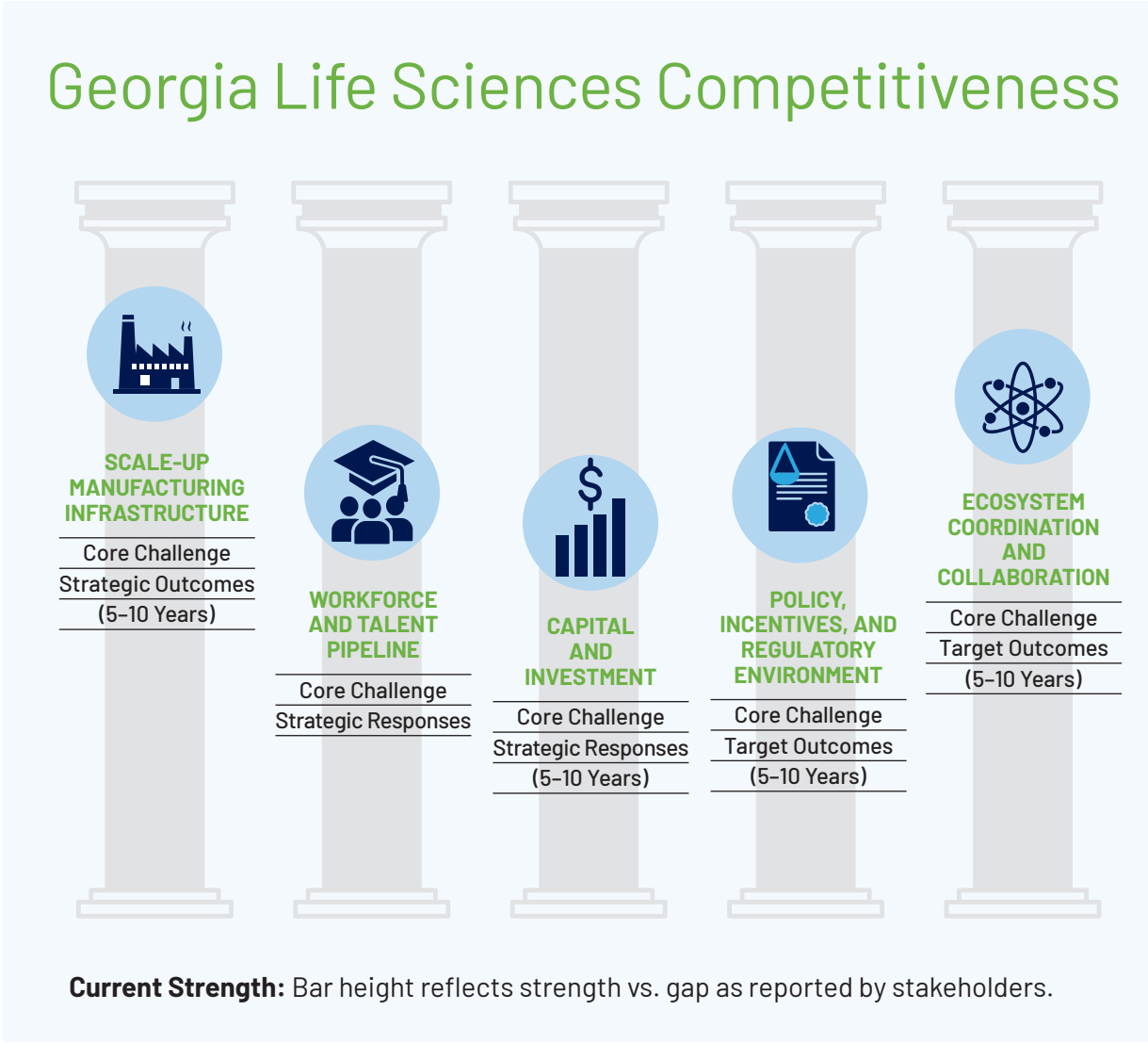
**Phase 4: Maturity/Commercialization**

- Market expansion, M&A, and pipeline renewal.

Georgia's highest-leverage opportunity lies in Phase 2–3, especially Phase 3 (growth/expansion), where scale-up manufacturing and capital intensity peak. The roadmap therefore targets the specific needs of companies in this phase, while also ensuring a healthy pipeline from Phase 1 and 2.

For Georgia's universities and research institutions, this focus on the growth and expansion phase is also a retention strategy. Many spinouts from Georgia Tech, Emory, UGA, and other institutions report that they can launch in Georgia but must relocate to other states to secure GMP-capable scale-up facilities, specialized talent, and manufacturing-focused capital. By positioning Georgia as the Scale-Up Manufacturing Hub of the Southeast, this roadmap is designed to keep more of those companies—and the associated jobs, IP, and investment—in-state as they move from breakthrough science to commercial production.

## Five Strategic Pillars




**Current Strength:** Bar height reflects strength vs. gap as reported by stakeholders.

## PILLAR 1 – SCALE-UP MANUFACTURING INFRASTRUCTURE

### Core Challenge

Georgia has strong bookends in its life sciences infrastructure—early-stage wet labs and incubators on one side, and large-scale manufacturing plants on the other—but the critical "missing middle" remains unresolved. Growth-stage companies that need GMP-ready, rightsized space for 100–2,000L production, ISO-aligned clean-rooms for device and diagnostics assembly, and integrated QC and regulatory support often find no suitable, affordable options instate and are forced to look elsewhere when they scale. This gap not only constrains local company growth; it also weakens Georgia's ability to retain university spinouts and attract outside firms seeking a scalable, lower-cost manufacturing base in the Southeast.

**Note:** *While GLS cannot and should not act as the developer or operator of major manufacturing facilities, it is well-positioned to convene state agencies, GRA, real estate partners, utilities, and industry anchors to structure the public–private partnerships, incentives, and demand commitments required to deliver this infrastructure.*

### Strategic Responses

#### Multi-Tenant GMP Manufacturing Complex

Anchor the scale-up strategy with a shared, rightsized GMP manufacturing complex that lowers capital barriers for growing companies and demonstrates Georgia's commitment to life science manufacturing. Develop an initial ~100,000 square foot GMP manufacturing complex, designed as a multi-tenant facility with:

- Modular suites at 100L, 500L, 1,000L, and 2,000L scales.
- Downstream processing and formulation equipment.
- Fill-finish capabilities for injectable and oral solid dosage forms.
- Temperature-controlled storage and distribution facilities.
- Expandable design allowing companies to grow "in place."

#### Quality Control and Testing Hub (~25,000 sq ft)

Complement the manufacturing complex with a shared Quality Control (QC) and Testing Hub so companies can access U.S. Food and Drug Administration (FDA) compliant analytical capabilities without building full labs in-house.

- FDA-compliant analytical, microbiology, and stability testing capabilities.
- Method development and validation support services.
- Shared equipment model to reduce individual company capital expenditure by up to 70%.

#### Regulatory and Compliance Center (~15,000 sq ft)

Establish a shared Regulatory and Compliance Center to give scaling companies affordable access to specialized quality and regulatory expertise that is often out of reach for startups and mid-size firms. Core functions would include support for FDA submissions, quality systems, and validation; supply chain management and vendor qualification support; and training programs aligned with evolving FDA Quality Management System Regulation (QMSR) and International Organization for Standardization (ISO) 13485 standards.

#### Flexible Capacity Model

Design modular bioprocessing suites that are configurable across pilot and intermediate scale volumes (for example, roughly 100–2,000L where appropriate), with flexibility to accommodate different process types and modalities. Specific configurations and technologies would be determined through detailed industry consultation to ensure alignment with the mix of modalities Georgia is

best positioned to support. The model should allow companies to begin at pilot scale, expand capacity in place as demand grows, and ultimately transition into dedicated suites or standalone facilities within Georgia, with clear pathways for technology transfer to larger greenfield sites as they mature.

### Real Estate and Site Strategy

Coordinate state, regional, and local economic development partners to ensure Georgia has a visible pipeline of 'manufacturing-ready' life sciences sites, not just generic industrial land. Key actions include:

- Identifying and preparing 100–200acre manufacturing-ready sites with appropriate zoning, utilities, and transportation access, working closely with local development authorities and Georgia's BioReady-type community designations.
- Expanding wet-lab and clean-room capacity (for example, additional sites beyond Science Square at Georgia Tech) to serve both startups and scaling firms.
- Establishing a multi-node infrastructure strategy (e.g: Atlanta for R&D and headquarters; Athens and Augusta as biomanufacturing and specialized centers) plus rural nodes where feasible, including device and diagnostics assembly and sterilization capacity near major health systems and logistics hubs.

### Public–Private Partnership Model

Structure the complex as a demand-driven public–private partnership rather than a purely state-owned facility, using public tools to derisk private investment while avoiding a 'white elephant' project. The model should: combine state infrastructure financing (e.g: bonds or tax-increment financing) with private development and operations; secure anchor tenants to provide stability and signal confidence; and phase build-out alongside demonstrated demand to manage risk and capital requirements.

### Target Outcomes (5–10 Years)

- 25–30 companies using shared GMP/QC/ regulatory facilities by Year 5.
- 5–7 companies graduating from shared facilities into dedicated Georgia-based manufacturing plants by Year 10.
- Georgia recognized as a competitive alternative to North Carolina and other leading biomanufacturing hubs for growth-stage companies.

## PILLAR 2 – WORKFORCE AND TALENT PIPELINE

Talent was the constraint most frequently cited by Georgia life sciences companies, including biopharma, medtech, diagnostics, and ag/industrial biotech, even though the state's overall education and labor-force strengths suggest a significant, still-underleveraged advantage in building a specialized life sciences workforce.

The 2025 National Security Commission on Emerging Biotechnology's report highlights how AI, automation, and cyber-bio capabilities, areas where Georgia has emerging strengths at institutions like Georgia Tech and the Georgia Cyber Center, are reshaping skill needs across R&D, manufacturing, and quality.

Georgia has made forward-looking investments in program such as the Georgia BioScience Training Center and Georgia Quick Start— specialized training platforms that, in interviews and peer-state comparisons, stakeholders described as assets many emerging markets would envy, yet which remain underutilized and relatively unknown.

As states like Indiana and Virginia build highly visible biomanufacturing and device-relevant training centers and position themselves as national hubs for GMP and quality-ready talent, Georgia must move quickly and strategically to claim its place as a center of excellence for life sciences workforce and training, turning scattered programs into a coordinated, end-to-end talent system with multiple entry points and upskilling paths that is a core part of the state's value proposition to companies.

## Core Challenge

Stakeholders consistently identify workforce as the top constraint, especially for:

- Skilled technicians and operators.
- Mid-level professionals in quality, regulatory, and manufacturing (including devices, diagnostics, and combination products.)
- Experienced leaders able to manage complex, regulated operations.

Georgia must build a cradle-to-career talent pipeline that meets industry needs and offers clear, accessible career pathways into quality jobs across the state.

In addition to shortages and misaligned training, many life sciences employers are only lightly engaged with the education and workforce system, leading to low awareness of existing pathways and limited employer input into program design.

## Strategic Responses

### K–12 Awareness and Preparation

- Expand life sciences exposure in middle and high school curricula statewide, building on the Georgia Biotech Teacher Training Initiative and related STEM career-exploration programs.
- Provide hands-on, real-world experiences through classroom projects, industry-aligned demonstrations, career days, and educator externships with life sciences employers.
- Create job shadowing and internship programs for high school students, explicitly linked to life sciences employers across biopharma, medtech, diagnostics, and ag/industrial biotech.

### Technical College System of Georgia (TCSG) Expansion

Too often, 2-year and certificate programs fail to translate into jobs when they are designed without clear employer commitments, leaving graduates underemployed and eroding confidence in the system. Georgia must close this gap by making TCSG life sciences pathways explicitly demand-driven.

- Partner with Lanier Technical College, Athens Technical College, and other TCSG institutions to co-design certificates and applied programs only where there is validated hiring demand and clear placement pathways, in roles such as bioprocessing and biomanufacturing operations, quality control and assurance, regulatory and compliance support, and medical device assembly, validation, and sterilization.
- Establish apprenticeship and internship programs that blend classroom instruction with paid, on-the-job training at Georgia life sciences companies, giving students work experience and a direct route into employment while they complete their credentials.
- Design short-course "fast-track" programs for career changers, veterans, and under-employed workers that prepare them for specific entry- and mid-level roles in manufacturing, maintenance, quality, and operations across biopharma, medtech, diagnostics, and ag/industrial biotech, with outcomes tracked in terms of job placement and wage gains.

### University Alignment

Work closely with University System of Georgia institutions, and other universities to embed work-relevant learning outcomes into life sciences, engineering, data/AI, and business programs—so graduates are prepared for specific roles in R&D, biomanufacturing, medtech, diagnostics, quality, and regulatory functions. Many four-year programs have historically emphasized academic depth over job-ready skills; GLS can help bridge this gap by organizing structured employer input on curricula, defining priority job profiles and competencies, and expanding internships, co-ops, and applied projects tied to real industry use cases.

Georgia can draw on concrete models from other leading states: North Carolina's BTEC at NC State, BRITE at North Carolina Central University, and the NC BioNetwork and NCBioImpact collaborations that align community colleges and universities around biopharma manufacturing skills; Massachusetts Life Sciences Center programs such as Pathmaker and BioBoost that fund university and training-provider offerings only when they are co-designed with industry around direct hiring needs; and Indiana's emerging biomanufacturing workforce partnership anchored at Purdue with NIBRT-aligned curricula to prepare students and workers for specific biopharmaceutical manufacturing roles. GLS will support Georgia's universities in adapting similar approaches so that degrees and certificates translate into clearly understood, in-demand career opportunities across the state's life sciences sectors.

### Professional Development and Retention

Create modular, industry-aligned continuing education programs in regulatory affairs, quality, manufacturing leadership, and AI/automation in life sciences, delivered through TCSG, universities, and online platforms, so that incumbent workers and supervisors can upskill without leaving the workforce. These offerings should be co-designed with employers to ensure they solve concrete capability gaps (for example, validation, GMP documentation, data integrity, and device quality systems) and are scheduled and priced to be practical for companies to use at scale.

Expand structured apprenticeship and early-career development pathways that pair on-the-job learning with formal instruction, giving new entrants access to coaching while creating a more reliable pipeline of talent for employers. Stakeholders should also encourage participation from talent pools that are currently under-represented in Georgia's life sciences workforce—such as veterans, career-changers from adjacent industries, and students from rural and historically under-served communities—where data show clear opportunity to grow the sector's talent base.

Explore fractional executive models to give startups access to seasoned leadership while building a pipeline of executive talent instate, with GLS serving as a neutral convener and liaison between experienced leaders and growing companies.

### Workforce Data and Planning

- Invest in carefully designed, regularly updated labor-market insight for Georgia's life sciences sector, focusing on a small set of high-value indicators (e.g., job postings, occupational mix, wage trends) rather than broad, static forecasts that can be misleading.
- Use this data to help chambers of commerce, economic development agencies, and education partners prioritize which pathways and credentials to scale, and to target employer outreach and talent recruitment for both existing companies and strategic prospects the state is trying to attract.
- Because Georgia is both serving existing employers and competing for future biomanufacturing and medtech investments, workforce data efforts should explicitly support both: validating near-term hiring demand and signaling the state's capacity to prospective investors.

### Target Outcomes (5–10 Years)

- By Year 5, aim for on the order of 200 learners per year completing clearly defined, life sciences-aligned career pathways (e.g., technician, Quality Assurance/Quality Control (QA/QC), bioprocess, regulatory, and data/AI roles) across K–12, TCSG, and university programs).
- Target high placement rates (approximately 80–85%) into Georgia-based life sciences roles for graduates of relevant technical and university programs, measured using a consistent, sector-appropriate methodology agreed upon by GLS, education partners, and industry.
- Work toward strong three-year retention in key technical and professional roles in Georgia's life sciences companies, with specific retention benchmarks and reporting approaches to be developed in partnership with employers and state agencies during implementation.


Talent development is not a straight line. People join the workforce at different entry points and transition across roles over time. Our responsibility is to design an interconnected system of pathways and on-ramps, not a rigid, one-direction pipeline."

## PILLAR 3 – CAPITAL AND INVESTMENT

### Core Challenge

Georgia's capital landscape for life sciences is still relatively thin, particularly for manufacturing-intensive, growth-stage companies. Many promising companies face a "valley of death" when transitioning from R&D to scale-up. This challenge is compounded by Georgia's being the only Southeastern state without an SBIR/STTR matching program and by its lack of a large, visible life sciences capital platform, leaving local companies at a disadvantage relative to peers in Tennessee, Alabama, and North Carolina. At the same time, Georgia's historically important Georgia Research Alliance (GRA) funding—one of the state's most distinctive innovation assets—has declined in relative scale over time, weakening a tool that once helped de-risk university-based innovation and early-stage company formation.

### Strategic Responses

#### Georgia Life Sciences Investment Credit (GLSIC)

- Establish a refundable or carry-forward income tax credit for qualified equity or debt investments in Georgia life sciences companies, with clear eligibility tied to job creation, R&D, and instate manufacturing or headquarters presence. Provide higher credit rates and/or caps for (a) biomanufacturing and scale-up investments, and (b) companies locating in rural or Opportunity Zone communities to reinforce Georgia's cost and logistics advantages beyond metro Atlanta. Structure GLSIC using best-in-class models from states such as Massachusetts and New Jersey—e.g., tradeable or refundable credits, tiered rates up to 40–60 percent of the investment amount, and streamlined certification—so that it is immediately recognizable and competitive to investors evaluating multiple states.

#### Life Sciences Facilities Fund (Relaunch & Modernization)

- Georgia already has a statutory Life Sciences Facilities Fund housed at the Georgia Department of Community Affairs, providing a ready-made vehicle to support specialized lab and manufacturing space. However, stakeholders note that the fund has not been reviewed, modernized, or resourced at a level comparable to peer-state facilities programs for many years, limiting its impact on current project pipelines. As part of this roadmap, state leaders should evaluate the fund's design, update its eligibility and deployment criteria for today's life sciences needs (GMP, clean-rooms, multi-tenant labs), and consider recapitalizing it alongside new tools such as the Scale-Up Manufacturing Fund, so Georgia can actively de-risk critical infrastructure projects rather than watching them land in better-funded states.

#### Scale-Up Manufacturing Fund (~$75 million target)

- Establish a state-backed, professionally managed Scale-Up Manufacturing Fund with a long-term target size of approximately $75 million to co-invest in companies establishing or expanding manufacturing operations in Georgia, finance shared infrastructure (GMP facilities, QC labs, clean-rooms), and provide equipment leasing and working-capital support for companies scaling production. The fund's capitalization can be built over time through a combination of state appropriations, bond or program-related financing, and private or federal matching resources, allowing for a phased ramp-up aligned with demonstrated demand and fiscal capacity.

### SBIR/STTR Matching Program (Economic Development Tool, Complementary to GRA)

- Offer a state match for federal SBIR/STTR awards, contingent on companies committing to maintain significant operations and/or manufacturing in Georgia, so that the program functions clearly as an economic development incentive rather than a research grant. Use this match to attract additional private capital and retain companies during critical growth phases, especially as they move from R&D toward scale-up and commercialization. To avoid unintended consequences for the Georgia Research Alliance (GRA), the program should be designed and communicated explicitly as complementary to GRA—not a reallocation of GRA's existing resources and not a competing mechanism for early-stage university research support.
- In phase 1, Georgia could prioritize matches for SBIR/STTR recipients that do not already receive GRA funding or are beyond GRA's traditional scope (for example, later-stage or non-university-affiliated companies), allowing the state to test demand and impact while maintaining GRA's role and stability. GRA could serve as a strategic advisor in the selection process—helping to review opportunities, flag highpotential companies, and ensure alignment with the state's broader research and commercialization portfolio—without being responsible for administering the program or diverting its own funds.

### Georgia Life Sciences SPV Platform (~$100 million)

- Establish a Georgia Life Sciences SPV (special purpose vehicle) platform that aggregates capital from multiple accredited and institutional investors into deal-specific or portfolio vehicles focused on Georgia-based life sciences companies. The platform would lower minimum check sizes (for example, from the typical $50K+ for direct angel or fund investments down to ~$5K–$25K), simplify tax reporting, and centralize professional management so that a broader set of Georgia family offices, high-net-worth individuals, health systems, and corporate partners can participate in the sector without building their own venture infrastructure.
- The SPV platform should be managed by experienced fund managers, with performance-based compensation, and closely coordinated with GLSIC, the Scale-Up Manufacturing Fund, and SBIR/STTR match so that investors can stack state incentives and de-risk participation in Georgia deals.
- Over time, the goal is to build a platform with the capacity to channel on the order of $100 million into Georgia life sciences opportunities, increasing the availability of follow-on capital for growth-stage companies while keeping more ownership, wealth creation, and decision-making in the state.
- Leverage GLSIC, and other state incentives, to attract both instate and out-of-state capital into the SPV platform and make Georgia deals more competitive on a risk-adjusted basis.

### Georgia Investor Day

- Organize an annual "Georgia Life Sciences Investor Day," led by GLS in collaboration with the Metro Atlanta Chamber, Rowen Foundation, major universities, regional chambers, and industry partners, modeled on the ecosystem-wide coordination seen in platforms like *Venture Atlanta*.
- The event should serve as a unified showcase for Georgia life sciences opportunities—presenting companies across stages, with a particular emphasis on scale-up and manufacturing-focused firms—so that investors experience one coordinated pipeline rather than fragmented pitches from individual institutions.

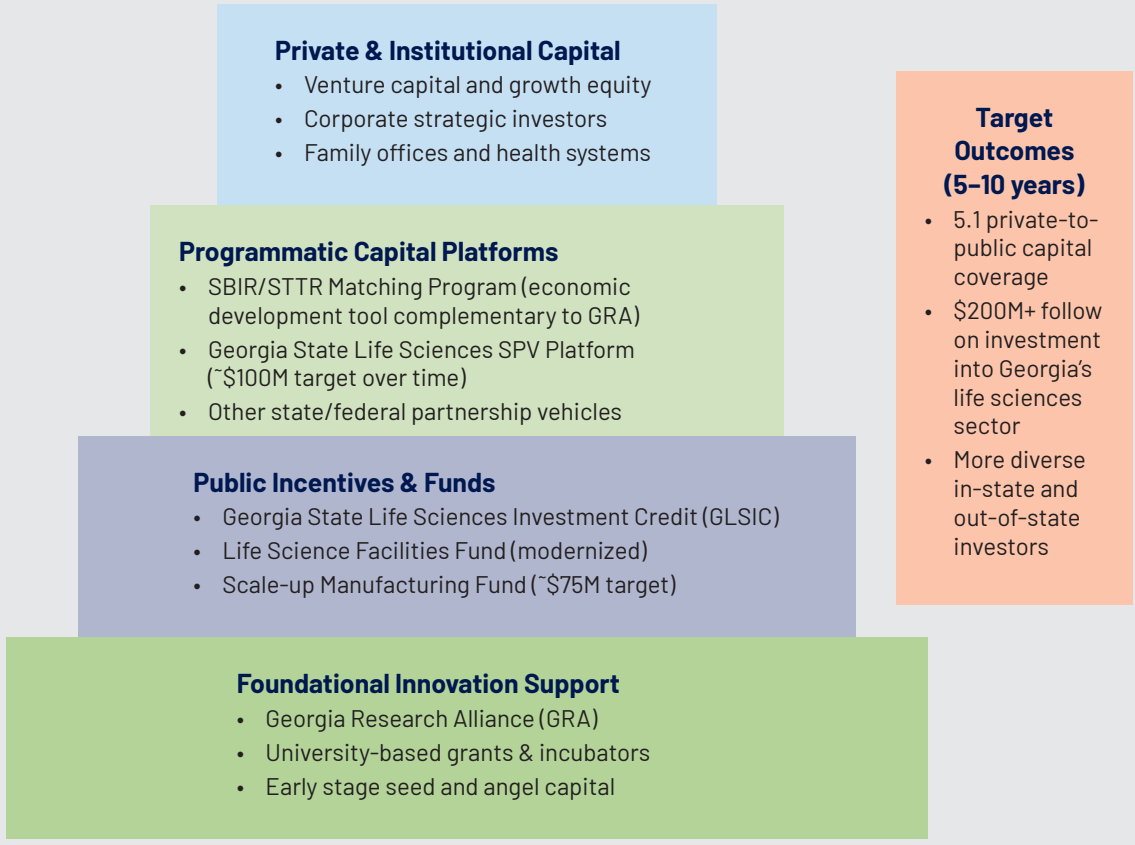
- GLS may act as the neutral, central convener and coordinator, curating the agenda and aggregating deal flow from universities, research institutes, incubators, and regional hubs, while those partners nominate companies and participate in programming.
- This shared platform reduces duplicative outreach, strengthens Georgia's brand as an organized, investor-ready ecosystem, and complements tools such as GLSIC, the Scale-Up Manufacturing Fund, and the SPV platform by giving investors a clear window into the state's most promising opportunities.

### Target Outcomes (5–10 Years)

- Achieve a 5:1 private-to-public capital leverage ratio on state-supported investments by Year 5.
- Attract $200 million+ in follow-on investment into Georgia life sciences companies through GLSIC, the Scale-Up Manufacturing Fund, the Life Sciences Facilities Fund, and SPV structures.
- Increase both the number and diversity of active investors (in-state and out-of-state) participating in Georgia life sciences deals, including family offices, health systems, corporates, and regional funds.

## Georgia Life Sciences Capital Stack: Bridging Valley of Death

**LAYERED APPROACH FROM FOUNDATIONAL INNOVATION TO PRIVATE CAPITAL**




**Company Journey:** R&D ➔ Scale-up ➔ Commercialization Progression

## **PILLAR 4** – POLICY, INCENTIVES, AND REGULATORY ENVIRONMENT

### Core Challenge

Georgia already offers many incentive tools, like manufacturing investment tax credits and job creation credits, but they were designed for broad use, not specifically for the life sciences sector. While Georgia has long promoted itself as a business and regulation-friendly state, stakeholders report that for life sciences projects the policy and permitting experience can feel slower and less tailored than in peer hubs, underscoring the need to clarify and modernize the state's regulatory value proposition for this sector. As a result, companies face uncertainty in navigating programs, slow permitting timelines, and uneven site readiness and infrastructure. To remain competitive, Georgia must build a faster, clearer, and industry-focused policy environment that signals its long-term commitment to life sciences growth.

### Strategic Responses

#### Georgia Life Sciences Policy Playbook

Create a simple, comprehensive, public-facing policy and incentive guide that shows companies *exactly* how to do business and grow in Georgia. The Playbook would:

- List every available state and local incentive relevant to life sciences.
- Explain eligibility, timelines, and how to apply—in plain language.
- Align information and responses across agencies so companies get clear, consistent answers.
- Serve as a primary recruiting tool to promote Georgia's "open for life sciences" message.
- Support expansion of Georgia's BioReady® Community program to more municipalities, tying higher-tier designations to streamlined permitting, biotech-friendly zoning, and pre-permitted GMP sites, so companies can quickly identify "shovel-ready" life sciences locations statewide.

#### Bioscience-Specific Incentives and Streamlined Permitting

Tailor existing programs to life science needs and cut red tape:

- Work with Georgia Quick Start, and related training partners, to adapt elements of their employer-specific training model to life sciences needs, for example, GMP-aligned technical skills, quality systems, and documentation practices, recognizing that for biopharma and medtech the primary timing bottlenecks are often regulatory and validation requirements rather than initial employee training alone. Note: Quick Start today functions primarily as an employer

> North Carolina's "Life Sciences Incentive Navigator" helps companies choose sites faster—Georgia can offer a similar resource with stronger emphasis on biomanufacturing advantages.

incentive once companies have hired; any expanded role in life sciences would require explicit rescoping and collaboration with industry to ensure it addresses genuine bottlenecks rather than duplicating existing corporate training.

- Launch a fast-track permitting lane for facilities that meet Good Manufacturing Practice (GMP) standards. While core regulatory timelines for products are set at the federal and international levels, Georgia can still reduce friction by streamlining state and local permitting, clarifying expectations for facility approvals, and coordinating with federal regulators so that companies experience fewer avoidable delays at the interface between plant, process, and product approvals.
- Provide special tax abatements and utility rate breaks for shared GMP facilities and multi-tenant biomanufacturing campuses.
- Over time, aim for a critical mass of Gold-level BioReady communities across major metros and key regional hubs, signaling predictable permitting and infrastructure to national site selectors.

### Rebalancing and Augmenting Existing Incentives

- Modernize Georgia's incentive mix to focus on industries that build longterm value with; evaluate redirecting or complementing successful tools (like film tax credits) with new Life Sciences Growth Credits aimed at manufacturing, research facilities, and tech platforms, with lessons learned from past sector incentives applied to ensure durability of projects and assets.
- Prioritize support for projects that create durable capital assets and high-wage, skilled jobs.

### Utility and Infrastructure Readiness

Reliable and affordable infrastructure is critical to biotech operations:

- Work with Georgia Power, local water authorities, and broadband providers to pre-certify power, water, and data capacity at key sites.
- Offer long-term, affordable energy contracts to startups and fast-growing manufacturing firms, leveraging Georgia's stable baseload generation, including newly online nuclear capacity, to provide predictable, low-carbon power for life sciences facilities.
- Publish annual "biomanufacturing site readiness" reports to signal Georgia's preparedness to national and international investors.

## WHAT SUCCESS LOOKS LIKE (5–10 YEARS)

- A company can quickly see "why Georgia" in one simple policy and incentives playbook tailored to life sciences.
- New biomanufacturing and R&D projects move from interest to ground-breaking faster because permitting and utilities are predictable and pre-planned.
- Georgia is recognized alongside leading states as a top place to start, grow, and manufacture life sciences products, from medicines to medical devices and ag biotech.
- Incentives clearly reward long-term investments in plants, equipment, and skilled workers—not just short-term activity.

### State-Level Advocacy and Alignment

Sustained political and policy alignment will be essential for growth:

- Establish a recurring Life Sciences Policy Forum with the Governor's Office, Department of Economic Development, and legislative leaders.
- Use the Forum to track progress, align priorities, and maintain stable funding for biosciences infrastructure, talent, and R&D programs.
- Ensure life sciences remain a named pillar in Georgia's economic development strategy and budget.

### Target Outcomes (5–10 Years)

- A Competitive Policy Framework: Georgia is recognized nationally as having a clear, cohesive incentive structure tailored to life sciences.
- Reliable and Predictable Business Climate: Permitting and site selection processes are timely, transparent, and coordinated.
- Long-Term Growth Commitment: Life sciences are firmly positioned as a strategic pillar of Georgia's economy, alongside logistics, film, and advanced manufacturing.

> When Georgia's policies and incentives are clear, fast, and reliable, life sciences companies can spend more time innovating and less time navigating red tape. This helps the state win more projects that bring long-term facilities, high-wage jobs, and new technologies to local communities.

## PILLAR 5 – ECOSYSTEM COORDINATION AND COLLABORATION

### Core Challenge

Over the past several decades, Georgia Life Sciences has often been the primary convening body for the state's life sciences community, even as new organizations, initiatives, and regional efforts have emerged. Today, however, the ecosystem's growth has outpaced the original model, with responsibilities spread across many actors. There is no entity clearly mandated and resourced is clearly mandated and resourced to provide statewide coordination, strategic intelligence, and unified advocacy on behalf of the entire sector. As a result, Georgia's efforts can appear fragmented to companies and external investors, and opportunities sometimes move faster than the system can respond.

## Strategic Responses

### GLS as the Ecosystem Orchestrator

GLS may consider explicitly adopt four interconnected roles, mirroring effective models from other states while remaining focused on its strengths and capacity as Georgia's only neutral, statewide, cross-subsector intermediary spanning human health, ag/industrial biotech, and medtech. GLS's emphasis is on orchestration—strategy, alignment, and coalition-building—rather than owning infrastructure or operating large programs directly.

### Strategic Intelligence Hub

Provide market analysis, sector research, and custom insights to companies, investors, and policymakers, including data on infrastructure needs, workforce trends, and capital gaps. GLS may publish a Georgia Life Sciences annual Georgia Life Sciences "State of the Sector" report focused on capital, workforce, and infrastructure trends, with regional breakouts for Atlanta, Athens, Augusta, and other emerging nodes.

### Capital Convener and Catalyst

Rather than operating large grant or loan programs itself, GLS could convene and align capital providers—such as the Georgia Research Alliance, public funds, private investors, and philanthropy—around shared priorities for early-stage and scale-up financing. GLS's role is to surface gaps, shape program design, and help partners stand up vehicles like GLSIC, SBIR/STTR matching, and the Scale-Up Fund, not to become a mega-grantmaker. GLS could establish a standing Capital Council that meets at least twice per year to align pipelines, share deal flow, and identify co-investment opportunities, and will maintain a shared "capital map" of public, philanthropic, and private programs to provide companies with a clear view of the full financing stack.

### Workforce Pipeline Developer

Coordinate an end-to-end talent strategy by aligning K–12, postsecondary, and workforce development programs with industry needs in biomanufacturing, medtech, diagnostics, and ag/industrial biotech, with a particular focus on AI, automation, engineering, and quality-related roles. GLS could act as a grant and partnership convener for workforce initiatives—helping design programs, braid public and philanthropic funding, and position Georgia as a center of excellence for life sciences and biomanufacturing training, even when funds flow through partners such as the Georgia BioScience Training Center, Technical College System of Georgia (TCSG) institutions, the Georgia Area Health Education Centers (AHEC) Network, and/or universities. GLS could also lead or co-lead multi-partner funding proposals (for example, federal and philanthropic bids) for large-scale talent initiatives in partnership with these delivery organizations.

### Industry Association Advocate

Serve as the primary voice for Georgia life sciences at the state and federal levels, aggregating concerns and opportunities, informing policy design, and ensuring that Georgia's incentives, permitting, and infrastructure keep pace with peer states. GLS continues to develop and maintain an annual state and federal policy agenda, informed by structured member input (including policy roundtables and surveys), and participates in joint advocacy days at the Georgia state Capitol and in Washington, D.C. with local and national partners across the ecosystem.

### Governance and Board Engagement

GLS leads a "Ecosytem Council" focused on:

- Workforce and education partnerships, including oversight of the cradle-to-career talent strategy.

- Development, maintenance, and oversight of the statewide life sciences playbook and strategic metrics.
- Strengthening member engagement and value, including structured feedback mechanisms.
- Prioritization of cross-sector convenings, regional strategies, and GLS's role in major coalitions and "big bet" initiatives.

Where appropriate, GLS will also leverage and empower existing GLS Councils, working groups, and Board committees to codesign, cohost, and steward key initiatives—such as cross-sector convenings and statewide marketing campaigns—rather than standing up duplicative new structures.

The Ecosystem Council will also regularly review national best practices—such as Colorado's "Hub for Health Impact" consortium model—to inform GLS's approach to coalition governance, statewide campaigns, and cross-sector initiatives.

### Cross-Sector Convenings

Hold regular (e.g., quarterly or semi-annual) summits bringing together:

- Industry (biotech, pharma, medtech, ag/industrial biotech)
- Academic and research institutions
- Investors and capital providers
- State and local government leaders
- Utilities and infrastructure partners

Each summit will be designed to produce a short "Action Memo" capturing 3–5 shared priorities, assigned leads, and agreed metrics, with GLS tracking and reporting progress at subsequent convenings. Over time, GLS may establish one or more flagship, named events (e.g., a Georgia Life Sciences Leadership Summit and a Biomanufacturing Talent Roundtable) that anchor the state's reputation and provide predictable touchpoints for collaboration.

### Regional Centers of Excellence

Develop regional strategies for key nodes such as:

- **Atlanta—**R&D headquarters, medtech and smart devices, digital health, and platform companies, including corporate HQ councils and a digital health testbed function.
- **Athens—**Ag biotech, industrial biotech, and biomanufacturing, including demonstration projects, contract biomanufacturing pilots, and expansion of animal and plant health capabilities.
- **Augusta—**Clinical, military, and cyberbio interfaces, including defense-health innovation partnerships and clinical trial networks.

GLS will charter regional advisory councils for each node and convene them at least twice per year to update regional action plans, align with statewide priorities, and identify joint projects. Beyond these hubs, GLS will engage emerging and rural nodes—leveraging AHEC regions, TCSG sites, and local economic development organizations—so that benefits and opportunities extend statewide. The intended outcome is to ensure tight coordination and shared strategic metrics among GLS leadership and the Ecosystem Council.

## TARGET OUTCOMES (5–10 YEARS)

GLS recognized as the trusted neutral, central orchestrator for Georgia's life sciences sector.

- By Year 5, at least 75 percent of surveyed ecosystem leaders identify GLS as the primary coordinating entity for statewide life sciences strategy.

All significant new and expanding life sciences companies are connected with GLS early in their life cycle.

- At least 90 percent of projects qualifying for life sciences incentives or state/local support have documented GLS engagement prior to final location or expansion decisions.

The ecosystem operates with a clear, unified voice on policy, workforce, and infrastructure priorities.

- An annual shared policy agenda is adopted by GLS and at least a core set of partner organizations, and GLS coordinates at least one joint advocacy day per year at the state and federal levels.
- GLS leads or co-leads a minimum number of major, multi-partner funding proposals (e.g., federal or large philanthropic opportunities) over each three-year period that advance statewide workforce, infrastructure, or innovation priorities.

GLS's orchestration role is visible through transparent products and processes.

- Publication of an annual 'State of the Sector' report, quarterly market briefs, and post-summit action memos, alongside regular reporting on progress against agreed ecosystem metrics.

## IMPLEMENTATION PHASES AND TIMELINE

Georgia should implement this roadmap in three overlapping phases that move from foundation-building to scale-up and, ultimately, to a self-sustaining hub status for life sciences.

### Phase 1 (Years 1–2): Foundation and Ecosystem Building

**Focus:** Stand up the core structures that enable everything else.

**Key actions:**

- Launch the Georgia Life Sciences Investment Consortium (GLSIC) framework and design SBIR/STTR and translational research matching programs.
- Strengthen GLS's advocacy presence at the State Capitol and in Washington, D.C., and formalize its orchestrator role across industry, universities, and state agencies.
- Empower the GLS Board Committee on Workforce and Talent, with responsibility for the Workforce Playbook and annual updates.
- Initiate expanded workforce development partnerships across K–12, TCSG, and universities, including common life sciences curricula, dual-enrollment and apprenticeship pathways, and employer-aligned credentialing. Initiate expanded workforce development partnerships across K–12, TCSG, universities, and non-educational partners such as employers, workforce boards, community organizations, and philanthropy, including common life sciences curricula, dual-enrollment and apprenticeship pathways, and employer-aligned credentialing.
- Identify and secure sites for initial GMP and incubator infrastructure (e.g., a multi-tenant biomanufacturing complex and innovation center) and structure public–private partnership (PPP) arrangements to finance build-out and equipment.
- Develop, adopt, and publish a Georgia Life Sciences Policy Playbook, including priority incentives, regulatory reforms, and regional differentiation strategies.

### Phase 2 (Years 3–5): Scale-Up and Company Formation

Focus: Move from planning and pilots to visible physical assets, company creation, and talent throughput at scale.

**Key actions:**

- Open the initial multi-tenant GMP complex, quality-control lab, and regulatory support center, with services accessible to startups, university spinouts, and SMBs.
- Reach occupancy by 25–30 companies in shared facilities (GMP, incubators, and associated lab space), with a mix of human health, ag/industrial biotech, medtech, and diagnostic firms.
- Support the creation of at least 20 new Georgia-based life sciences startups annually through GLSIC, accelerators, and university commercialization programs.
- Graduate at least 200 students per year through clearly defined life sciences career pathways (technician, QA/QC, bioprocess, regulatory, data/AI in life sciences), with strong placement into Georgia employers.
- Launch the Georgia Life Sciences Special Purpose Vehicle (SPV) platform and host the first Georgia Life Sciences Investor Day to attract regional and national venture, corporate, and strategic capital.
- Establish regional centers of excellence in Athens, Augusta, and Atlanta, each with a differentiated focus (e.g., biomanufacturing, medical devices/digital health, oncology/immunology, ag/industrial biotech) and strong industry–academic ties.

## Phase 3 (Years 5–10): Hub Status and Self-Sustaining Ecosystem

Focus: Consolidate Georgia's position as the Southeast's leading life sciences hub and shift from state-led to market-driven growth.

**Key actions:**

- Achieve recognized status as the Southeast's leading life sciences destination for scale-up, as evidenced by project pipeline, external rankings, and relocation/expansion decisions.
- Reach at least 4,000 direct life sciences jobs associated with roadmap initiatives, with strong representation across biomanufacturing, R&D, medtech, and ag/industrial biotech.
- Demonstrate at least 5:1 private-to-public capital leverage across GLSIC, SPVs, state funds, and local incentives, with increasing participation from national and global investors.
- Support multiple successful company exits and IPOs from Georgia-based firms, recycling talent, capital, and know-how back into the ecosystem.
- Transition to a more self-sustaining ecosystem with reduced reliance on new state incentives, shifting the state's role toward targeted gap-filling, infrastructure refresh, and inclusive growth initiatives.

> When we evaluate where to invest and expand, alignment matters. The engagement of Georgia's senior life sciences leaders in shaping and advancing this Roadmap signals a coordinated, long-term commitment to building a competitive environment for companies like ours."

# Implementation

| PHASE & TIMING | PRIMARY FOCUS | HEADLINE METRICS |
|---|---|---|
| **Phase 1 (Years 1–2)** | Build the foundation: governance, advocacy, pipeline, initial sites | • GLSIC framework launched and SBIR/STTR matching program live (Year 1–2)<br>• GLS Workforce & Talent Committee established and Policy Playbook published (by end of Year 2)<br>• At least 2 priority sites secured for GMP/incubator infrastructure with executed PPP terms<br>• At least three K–12/TCSG/university pathway pilots launched, with first small cohort completions by end of Year 2 |
| **Phase 2 (Years 3–5)** | Scale physical assets, startups, and talent throughput | • Multi-tenant GMP complex, QC lab, and regulatory support center operational (by Year 3–4)<br>• 25–30 companies occupying shared facilities (by Year 5)<br>• >20 new Georgia life sciences startups created annually (Years 3–5)<br>• >200 students completing life sciences pathways annually by Year 5<br>• Georgia Life Sciences SPV platform launched and first Investor Day held (by Year 4–5)<br>• Three regional centers of excellence fully designated (Athens, Augusta, Atlanta) by Year 5 |
| **Phase 3 (Years 5–10)** | Cement hub status and shift to self-sustaining growth | • Recognized as Southeast's leading life sciences scale-up destination in at least one external ranking or national benchmarking study by Year 8–10<br>• >4,000 direct life sciences jobs attributable to roadmap initiatives by Year 10<br>• >5:1 private to-public capital leverage across GLSIC, SPVs, and funds by Year 10<br>• At least 3–5 significant exits/IPO events from Georgia-based firms<br>• New state incentive authorizations tapering as a share of total capital deployed, with incentives focused on targeted gaps and inclusive growth (Years 8–10) |

## KEY PERFORMANCE INDICATORS

To track progress and maintain accountability, GLS and its partners should monitor performance across five domains:

### Company Formation and Growth

- Number of new life sciences startups formed annually.
- Number of companies expanding from startup to mid-size (50–500 employees).
- Company retention rates across growth phases, especially post-Series B/C.
- Number of companies relocating into Georgia.
- Number of active life sciences firms by sub-sector (e.g., therapeutics, medtech, agbio, industrial biotech).

### Capital and Investment

- Total capital deployed via GLSIC, Scale-Up Fund, SPV platform, and other mechanisms (with clear inclusion rules for all Georgia life sciences deals).
- Private-to-public capital leverage ratio (target: 5:1 by Year 5).
- Number of out-of-state investors participating in Georgia life sciences deals.
- Median and total deal size by stage (seed, Series A, Series B+).

### Workforce Development

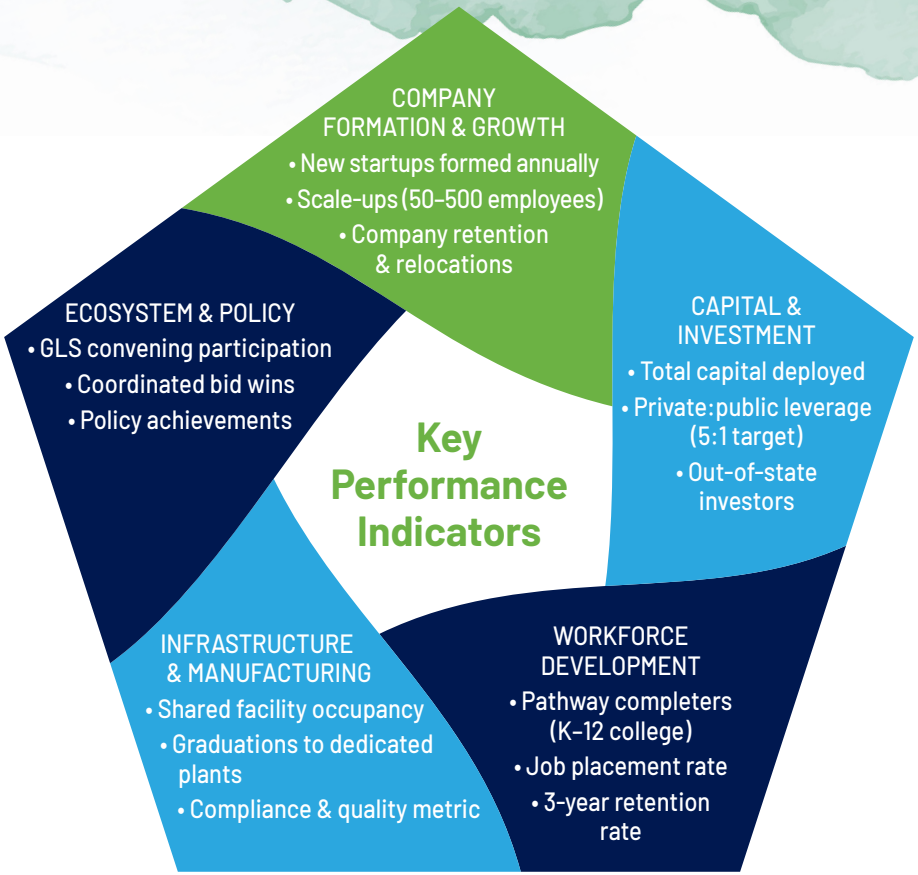
- Number of students completing life sciences pathways, segmented by K–12 programs, technical/community college credentials, and university degrees.
- Job placement rate into Georgia life sciences roles within 12 months of completion.
- Retention rates for key skilled positions after three years in-state.
- Number of participants completing short-cycle reskilling/upskilling programs (e.g., GMP technician bootcamps, QC, regulatory, data and digital skills).

### Infrastructure and Manufacturing

- Occupancy rates for shared GMP, QC, and regulatory facilities, with target ranges to maintain healthy utilization.
- Number of companies graduating from shared facilities to dedicated plants.
- Compliance and quality metrics aligned with FDA and ISO 13485 standards (e.g., successful inspections, audit findings per facility, time to close CAPAs, on-time batch release).
- Square footage of GMP, lab, and biomanufacturing space delivered and in the development pipeline.

### Ecosystem Coordination and Policy

- Participation rates in GLS-led convenings and initiatives, segmented by stakeholder type (startups, scale-ups, large companies, investors, academia, government).
- Number of coordinated responses to major investment and site opportunities, and associated outcomes (wins, shortlistings, capital committed, jobs).
- Policy wins and incentive enhancements achieved in collaboration with state government, with estimated investment and job impact where feasible.




| DOMAIN | KEY METRICS | WHY IT MATTERS |
|---|---|---|
| Company Formation & Growth | New startups/year, scale-ups (50–500 employees), retention post-Series B/C | Tracks pipeline health and ability to grow companies in-state |
| Capital & Investment | Total capital deployed, private:public leverage (5:1 target), out-of-state investors | Measures investment depth and external validation |
| Workforce Development | Pathway completers (K–12, college, upskilling), placement rate, 3-year retention | Ensures talent availability for company growth |
| Infrastructure & Manufacturing | Shared facility occupancy, graduations to dedicated plants, compliance metrics | Monitors infrastructure readiness and quality |
| Ecosystem & Policy | GLS convening participation, coordinated bid wins, policy achievements | Gauges coordination effectiveness and policy support |

## COMMUNITY & BOARD ENGAGEMENT: NEXT STEPS

Delivering on this roadmap will require coordinated action from GLS, its board of directors, and a broad coalition of community partners across industry, academia, philanthropy, and government. The role of GLS is not to execute every initiative alone, but to organize, sequence, and convene the actors who can move each pillar forward—aligning local and statewide efforts around a shared set of priorities, milestones, and metrics.

To translate this roadmap into action, GLS will need visible leadership and sustained support from its board and partners. In parallel with public-sector commitments, industry partners will need to step up as co-architects of the ecosystem—serving on implementation committees, co-funding shared assets, and aligning corporate strategies with the roadmap's longterm goals.

### 1. Board Endorsement of the Five-Pillar Strategy

- Secure a formal GLS Board resolution endorsing the roadmap and clarifying GLS's role as orchestrator and convening authority for Georgia's life sciences ecosystem.
- Confirm board-level champions for each pillar who will serve as visible sponsors with external stakeholders.

### 2. Formation of Implementation Committees

- Establish board and staff-led committees for Infrastructure, Workforce, Capital, Policy, and Ecosystem Coordination, with clear charters, decision rights, and success metrics.
- Recruit cross sector members (industry, universities, health systems, ag/industrial biotech, investors, community organizations) and ensure representation from both metro Atlanta and key regions across Georgia.

### 3. Stakeholder Validation and Refinement

- Present the draft roadmap through a structured listening tour with key partners (universities, major companies, chambers, utilities, state agencies, community and patient organizations) to gather feedback and secure alignment.
- Incorporate feedback into a "Version 1.0" roadmap and publish a high-level engagement calendar so partners know when and how to plug in.

### 4. State-Level Alignment

- Engage the Commissioner of Economic Development, University System of Georgia leadership, and legislative champions to socialize the vision and identify near-term policy and funding opportunities.
- Map this roadmap against existing state initiatives and incentives to identify quick wins and co-investment opportunities (e.g., infrastructure, workforce, R&D, incentives).

### 5. Detailed Action Planning By Pillar

- For each pillar, develop a 12–24 month action plan with named owners, milestones, resource requirements, and a simple reporting cadence back to the GLS board of directors.
- Define a small set of crosscutting metrics (e.g., jobs, capital attracted, new facilities, community engagement touchpoints) to track and communicate early progress.
- GLS and its partners will also establish structured community engagement mechanisms, such as regular listening sessions, to ensure that residents, patients, and local organizations help shape and benefit from the state's life sciences growth.

## BEST PRACTICES: STATE-BY-STATE COMPARISON

Georgia's life sciences roadmap must be grounded in how other states are competing—and in the reality that Georgia is at risk of falling behind without a step-change in public commitment. Across the country, states such as Washington, North Carolina, Texas, Arizona, Virginia, Ohio, Indiana, Tennessee, and South Carolina have made deliberate, long-term bets on biotechnology, pharmaceuticals, medical devices, and ag/industrial biotech and are now seeing those investments translate into jobs, capital, and federal funding. The state-to-state comparison section highlights how these peers have structured their clusters, what policy and funding tools they have put in place, and which lessons are most relevant for Georgia's next decade of growth.

Georgia's life sciences sector is growing, but it is not keeping pace with states that are making bolder public investments—and that gap is widening in the Southeast. Georgia now trails leading national hubs and is being pressured regionally. Tennessee builds a more comprehensive life sciences strategy and South Carolina declares life sciences a top statewide economic priority, pairing that with a well-funded industry platform and explicit state support for recruitment, biomanufacturing, and R&D. Without comparable public funding and policy commitment, Georgia risks losing companies, talent, and federal dollars to neighbors that are moving faster to match grants, de-risk early-stage ventures, build lab and biomanufacturing space, and secure anchor projects in what is now one of the fastest-growing, highestwage sectors in the U.S. economy.

States that are outpacing Georgia are not just investing in physical assets, they are also directly resourcing their statewide life sciences trade associations to serve as organizing backbones for implementation. In South Carolina, Virginia, and Tennessee, public dollars flow through or alongside associations such as SCbio, Virginia Bio, and Life Science Tennessee to underwrite industry analyses, strategic plans, workforce consortia, and coordinated business recruitment—effectively turning these associations into quasi-public partners for execution. Georgia Life Sciences plays a similar convening and advocacy role

Georgia has a rare window to claim a distinctive, highly competitive niche in the global life sciences economy as the Scale-Up Manufacturing Hub of the Southeast. By organizing around this roadmap and executing with discipline, the state can convert strong research, logistics, and cost advantages into a coherent, end-to-end ecosystem that keeps companies and jobs in Georgia. The prize is significant: a self-sustaining engine of innovation, high-wage employment, and biomanufacturing capacity, and smart medical devices and diagnostics that deliver health and economic benefits to communities across Georgia for decades to come.

but operates with far less direct state backing than many peer associations, limiting Georgia's ability to compete for projects, talent, and federal resources at the pace the market now demands.

The comparative scorecards that follow are designed to be practical playbooks, not academic case studies. For each peer state, a cluster profile presents a common set of benchmark metrics—scale, specialization, innovation capacity, talent, and infrastructure—alongside a concise summary of "what the state has put forward to grow the sector," including dedicated funds, incentives, and institutional arrangements. Each profile ends with clear "Implications for Georgia," distilling which elements could be adapted or scaled to Georgia's context and what is at risk if the state continues to under-invest. Together, these comparisons make a direct, evidence-based case: without sustained public funding and a stronger partnership with Georgia Life Sciences, Georgia will miss the window to secure a leading position in one of the most economically transformative industries of this century.

Georgia has a rare opportunity to occupy a distinctive and highly competitive niche in the global life sciences landscape as the scale-up manufacturing hub of the Southeast. With deliberate, coordinated action anchored in this roadmap, the state can build a world-class ecosystem that fuels innovation, creates high-wage jobs, and delivers health and economic benefits for decades to come.

Georgia also has a powerful but underused workforce asset in the Georgia BioScience Training Center, a state-of-the-art Quick Start facility created to support biomanufacturing employers and technically skilled talent. For more than a decade, this center has offered customized training capacity that many emerging markets would envy, yet it has not been fully leveraged as the anchor of a statewide biomanufacturing talent strategy.

Meanwhile, other states are treating biomanufacturing workforce as a frontline economic development priority—and investing accordingly. Indiana's Heartland BioWorks Tech Hub is building a coordinated regional platform to scale biomanufacturing talent and innovation through integrated training, demonstration facilities, and flexible, stackable credentials. Virginia has catalyzed a $ 120 million, industry-backed Virginia Center for Advanced Pharmaceutical Manufacturing that is projected to train 2,000 to 2,500 learners each year through stackable credentials and degrees tied directly to GMP environments. Ohio, through JobsOhio and Ohio Life Sciences, has launched a biomanufacturing workforce initiative that will invest up to 30 million dollars in a new state-of-the-art training center and a huband-spoke network of community colleges and technical schools serving employers statewide.

Taken together, these examples underscore a simple but critical point for Georgia: having a biotech training center is not enough; states that win in biomanufacturing are wrapping that asset in sustained public funding, regional partnerships, and industry-governed programming to create a visible, scalable pipeline. Unless Georgia moves quickly to fully activate and expand its BioScience Training Center as the centerpiece of a broader statewide talent strategy, it will continue to lose projects, workers, and federal opportunities to states that treat workforce as the decisive factor in life sciences competitiveness.

## PEER STATE COMPARISON

### Texas Life Sciences Cluster Scorecard

#### Scale & Economic Weight

- More than 7,400 life sciences and biotech firms operate statewide, employing over 116,000 professionals.
- The biopharmaceutical industry alone generates roughly 95 billion dollars in economic output, and broader life sciences and biotech activity contributes tens of billions more with wages around 100,000 dollars on average.

#### Specialization & Cluster Composition

- Texas has significant activity across biopharma, medical devices, research/testing labs, bioscience-related distribution, and ag/industrial biosciences, with especially fast growth in research/testing and distribution.
- The state ranks near the top nationally for number of biotech-related establishments, with three major regional clusters (Houston, Dallas–Fort Worth, Austin) giving it a diversified, multi-node profile.

#### Innovation & Capital Formation

- University research and development expenditures in Texas exceed 4 billion dollars annually, with life sciences a major component, and the state has hosted more than 17,000 clinical trials since 2004.
- Dallas–Fort Worth alone attracted about 1.6 billion dollars in life sciences venture capital between 2018 and 2022, and Texas hosts one of the three national ARPAH hubs, signaling strong federal and private confidence in its innovation capacity.

#### Talent, Pipeline & Infrastructure

- From 2021–2024, Texas life sciences employers posted more than 155,000 unique job openings across subsectors, indicating strong and sustained demand.
- Multiple metros (Houston, Dallas–Fort Worth, Austin, San Antonio) combine large health systems, research universities, specialized lab and biomanufacturing space, and a growing set of incubators and accelerators, positioning Texas as a leading but still maturing national hub.

### Implications for Georgia

- Demonstrates how a large, diversified state built multiple regional hubs, leveraged university R&D and federal platforms (e.g., ARPAH), and used sustained workforce demand to justify investments in facilities and training—offering a realistic model for Georgia to scale beyond a single core metro.

## North Carolina Life Sciences Cluster Scorecard

### Scale & Economic Weight

- North Carolina's life sciences industry supports more than 70,000 jobs directly and over 100,000 when including related activities, anchored by the Research Triangle region.
- The state has attracted over 10 billion dollars in announced life sciences investments over the past decade, with at least 25 new or expanded life sciences projects announced in 2024 alone.

### Specialization & Cluster Composition

- North Carolina has deep strength in biopharmaceutical manufacturing, vaccines, and biologics, with major facilities from companies such as Pfizer, Merck, Novo Nordisk, and Grifols.
- The Research Triangle (Raleigh–Durham–Chapel Hill) serves as a dense hub for biotech R&D, contract research organizations, and clinical development, while Charlotte and Eastern NC add medical device, ag-biotech, and biomanufacturing assets.

### Innovation & Capital Formation

- Anchored by Duke, UNC, and NC State, the state's universities generate billions in annual R&D, with life sciences as a leading category and significant National Institutes of Health (NIH) funding flowing into the Triangle.
- The Research Triangle has become one of the top U.S. and global life sciences hubs, attracting sustained venture capital and corporate investment into early-stage biotech and advanced manufacturing projects.

### Talent, Pipeline & Infrastructure

- North Carolina has one of the nation's most mature life sciences workforce pipelines, with the NC Community College System's specialized biomanufacturing and biotech training programs serving as a differentiator.
- The state offers extensive GMP manufacturing capacity, multiple research parks (Research Triangle Park, NC Biotech Center–linked campuses), and a coordinated state-level economic development apparatus that aligns talent, incentives, and infrastructure.

### Implications for Georgia

- North Carolina demonstrates how a Southeastern state can leverage a flagship research triangle, a purpose-built community college pipeline, and targeted incentives to create a globally recognized life sciences manufacturing and R&D hub—offering Georgia a concrete template for linking Atlanta, Augusta, Athens, and other metros into a more integrated innovation and production corridor.

## Virginia Life Sciences Cluster Scorecard

### Scale & Economic Weight

- Virginia's life sciences sector includes more than 3,400 establishments across biopharma, medical devices, diagnostics, research, and related activities.
- Over the past several years, life sciences projects in Virginia have generated billions in capital investment and thousands of jobs, with multiple large-scale manufacturing commitments concentrated in central and southwestern regions.

### Specialization & Cluster Composition

- The state is emerging as a biopharmaceutical manufacturing hub, with major projects from companies such as Merck, Eli Lilly, and others in areas like Greater Richmond and Petersburg focused on vaccines and injectable therapies.
- Northern Virginia and the Hampton Roads area add strengths in health IT, federal health agencies, and defense-related biosciences, while university-linked hubs in Roanoke–Blacksburg and Charlottesville contribute translational research and medtech.

### Innovation & Capital Formation

- Virginia's universities and health systems (e.g., UVA, VCU, Virginia Tech/Carilion) are expanding biomedical research portfolios, while state and regional initiatives (GO Virginia, NSF Engine awards, federal Build Back Better grants) aim to scale commercialization and cluster infrastructure.
- Policymakers and industry advocates argue that with targeted support—such as robust site development, incentives, and workforce programs—Virginia can capture a disproportionate share of next-generation biomanufacturing investment.

### Talent, Pipeline & Infrastructure

- Virginia promotes a high-education workforce, with strong engineering and bioscience talent pipelines from its universities and community colleges and proximity to federal health and regulatory institutions in the Washington, D.C.region.
- The state offers multi-modal logistics advantages through the Port of Virginia, I95/I81 corridors, and air cargo capacity, positioning it well for export-oriented biomanufacturing and distribution.

### Implications for Georgia

- Virginia illustrates how a state just north of Georgia is using targeted biomanufacturing recruitment, port and logistics advantages, and coordinated regional initiatives to build a high-value production base—underscoring Georgia's need to match or exceed competing incentive packages, develop ready sites, and connect ports, airports, and interstates to life sciences manufacturing strategies.

## Ohio Life Sciences Cluster Scorecard

### Scale & Economic Weight

- Ohio's life sciences industry includes more than 1,100 business locations and roughly 17,000 direct life sciences jobs, with recent analyses showing job growth of about 25 percent between 2019 and 2024.
- The sector generates billions in economic impact across pharmaceuticals, medical devices, research and testing, and bioscience distribution, with strong contributions from multiple metro regions rather than a single dominant hub.

### Specialization & Cluster Composition

- Ohio has significant depth in biopharmaceutical and medical device manufacturing, clinical and contract research, and health IT, with notable strengths in cell and gene therapy, cardiovascular devices, and diagnostics.
- Three major metros—Cleveland–Akron, Columbus, and Cincinnati—each host sizeable clusters tied to major health systems and research institutions, making Ohio a model of a multi-node life sciences state.

### Innovation & Capital Formation

- Ohio has invested state resources in biomanufacturing and talent development, including a planned biomanufacturing workforce training center backed by tens of millions of dollars to support companies' production needs.
- Columbus and Cincinnati have been identified as top "emerging" U.S. life sciences markets, with increased private equity, venture financing, and grant activity flowing into R&D districts such as the Columbus Innovation District focused on cell and gene therapy.

### Talent, Pipeline & Infrastructure

- Ohio leverages extensive university and health system assets—Ohio State, Cleveland Clinic, University of Cincinnati, and others—along with community colleges and technical centers that are increasingly aligning programs to biomanufacturing and lab technician roles.
- The state's central U.S. location, manufacturing heritage, and logistics networks (highways, air, and distribution centers) support both domestic and export supply chains for pharmaceuticals, devices, and research supplies.

### Implications for Georgia

- Ohio offers a compelling precedent for Georgia in building multiple regional life sciences hubs around major health systems and universities and in using state-backed workforce and biomanufacturing initiatives to support growth in noncoastal markets—reinforcing the opportunity for Georgia to expand beyond metro Atlanta and strengthen Augusta, Savannah, Columbus, and Athens as specialized nodes.

## Pennsylvania Life Sciences Cluster Scorecard

### Scale & Economic Weight

- Pennsylvania's life sciences industry provided more than 100,000 direct jobs in 2020, with an additional roughly 230,000 jobs supported through supply chain and household spending linkages.
- The sector generated about 105.6 billion dollars in total state economic output in that period, including approximately 61.9 billion dollars in direct impact and 43.7 billion dollars in indirect and induced impact.

### Specialization & Cluster Composition

- Pennsylvania is a national leader in cell and gene therapy, oncology, vaccines, and complex biologics, with dense clusters in Greater Philadelphia and growing activity in Pittsburgh and central Pennsylvania.
- The state hosts thousands of life sciences establishments, most of them small firms with ten or fewer employees, indicating a robust startup and early-stage ecosystem around large pharma anchors like Merck, GSK, and others.

### Innovation & Capital Formation

- Pennsylvania's universities and health systems—Penn, Penn State, Pitt, and others—are major NIH funding recipients and drive a strong pipeline of translational research, spinouts, and clinical trials, especially in gene and cell therapies.
- State leadership has recently proposed a 50 million dollar investment package for life sciences and innovation, including a one-time 30 million dollars targeted to life sciences and 20 million dollars annually for innovation sectors, alongside continued funding for the state's Life Sciences Greenhouses.

### Talent, Pipeline & Infrastructure

- The state's Life Sciences Greenhouses in Pittsburgh, Harrisburg, and Philadelphia provide early-stage capital and sector-specific support, helping to commercialize university discoveries and grow companies statewide.
- Pennsylvania benefits from a large, experienced biopharma and medical device workforce, integrated with major contract manufacturers, logistics networks, and academic medical centers that support end-to-end R&D, clinical development, and manufacturing.

### Implications for Georgia

- Pennsylvania shows how a state can leverage dense academic medical centers, targeted public investment (e.g., innovation funds, specialized "greenhouses"), and a strong startup base around big pharma anchors to become a leader in advanced modalities like cell and gene therapy—highlighting options for Georgia to pair Emory, Georgia Tech, Augusta University, and others with state-backed seed funds, incubators, and translational infrastructure.

# BEST PRACTICE: STATE-BY-STATE COMPARISON

| DIMENSION | GEORGIA | NORTH CAROLINA | VIRGINIA | OHIO | PENNSYLVANIA |
|---|---|---|---|---|---|
| **Cluster maturity & position** | Emerging, high-potential hub centered on Atlanta; recognized as an "emerging market" with strong growth but still subscale versus leading peers. | Fully mature global hub; one of the top U.S. life sciences markets with deep biomanufacturing and R&D base. | Fast-rising regional player; rapidly scaling biomanufacturing and leveraging DC-adjacent federal/ funding presence. | Established, diversified Midwestern cluster; strong in production and multi-metro activity but less "brand" than NC/PA. | National leader; especially strong in advanced therapies (cell/gene), oncology, and large-scale pharma. |
| **Scale: firms, jobs, economic weight** | ~2,000+ life sciences/ global health organizations; life sciences employment and output have grown more than twice as fast as Georgia's overall private-sector since 2015. | 75,000+ life sciences workers; billions in recent biomanufacturing and R&D investments across the state. | 3,400+ life sciences-related businesses; billions in announced projects and several thousand new jobs in recent years. | 1,100+ locations and ~17,000 direct jobs; roughly 25% job growth over recent years and sizable economic impact. | 100,000+ direct jobs and ~230,000 total supported; more than 100B dollars in total economic output from the sector. |
| **Specialization profile** | Global health (CDC, Task Force for Global Health, CARE), medtech and smart devices, CDMOs, logistics-intensive life sciences, and growing ag/industrial biotech base. | Biologics and vaccine manufacturing, CROs, agbiotech, and medtech centered on the Research Triangle with spillovers statewide. | Large-scale biopharma manufacturing (vaccines, injectables), health IT, defense/federal health, and university-linked biotech/ medtech. | Biopharma and device manufacturing, cell/gene therapy, diagnostics, and health IT distributed across several metros. | Cell and gene therapy, oncology, vaccines, complex biologics, with a dense mix of big pharma anchors and startups. |

| DIMENSION | GEORGIA | NORTH CAROLINA | VIRGINIA | OHIO | PENNSYLVANIA |
|---|---|---|---|---|---|
| **Innovation & capital formation** | Strong research engines (Emory, Georgia Tech, UGA) and NIH funding; Atlanta flagged as a fast-growing life sciences labor pool, but dedicated sector VC and later-stage capital remain comparatively shallow. | Toptier hub for corporate and VC flows into both R&D and manufacturing; repeated mega projects from global companies. | Growing R&D and commercialization capacity via UVA, VCU, Virginia Tech and regional initiatives; capital ecosystem still maturing but gaining momentum. | Rising "emerging market" status; targeted state investments in biomanufacturing talent and infrastructure catalyze private capital in Columbus and other metros. | Strong NIH and translational funding; new state proposals for 50M dollar-plus in life sciences and innovation funds add to existing Life Sciences Greenhouses. |
| **Talent pipeline & workforce systems** | Rapid job growth and strong university output, but relatively early-stage dedicated biomanufacturing/ technician training compared with benchmark states. | National benchmark in community-college-based biomanufacturing pipelines (e.g., BioWork); deep, experienced R&D and manufacturing workforce. | Highly educated workforce with strong engineering and IT talent; building more specialized life sciences training aligned with recent plant announcements. | Large industrial and technical workforce; new statewide biomanufacturing training center and aligned programs bolster pipeline. | Large, mature life sciences workforce supported by academic medical centers and sector-specific commercialization infrastructure. |
| **Infrastructure, sites & logistics** | Worldclass air hub (HartsfieldJackson), Savannah port, and logistics networks; emerging urban lab clusters and growing industrial bio-economy presence, but still building volume of ready-to-go GMP sites. | Multiple research parks and significant GMP capacity; a broad inventory of turnkey and near-ready biomanufacturing sites statewide. | Port of Virginia and interstate corridors support export-oriented biomanufacturing; expanding inventory of certified life sciences sites. | Central U.S. logistics advantage with highways, rail, and distribution hubs; strong base of adaptable industrial facilities. | Dense lab and manufacturing footprint in the Philadelphia and Pittsburgh regions, with integrated logistics and supply chain assets. |

## APPENDIX

### Methodology: An Evidence-Based, Consensus-Informed Approach

This roadmap was developed through a rigorous, multi-method process designed to ground strategic recommendations in real stakeholder experience, quantitative evidence, and proven best practices from leading life sciences ecosystems.

#### 1. Executive Interviews

One-on-one conversations with approximately 20 senior leaders across Georgia's life sciences ecosystem provided in-depth qualitative insights. Participants represented:

- **Industry—**Biotech, pharma, medtech, and ag-biotech companies
- **Academia—**Research universities and teaching institutions
- **Government—**Economic development agencies and policy leaders
- **Support Organizations—**Incubators, accelerators, and industry associations

Interview topics included sector strengths and challenges, growth opportunities, workforce needs, infrastructure gaps, capital access, and collaboration priorities.

All executive interviews were conducted under non-attribution.

#### 2. Statewide Stakeholder Survey

A public survey open to professionals across Georgia's life sciences ecosystem gathered broad-based input on:

Thank you to GLS board member Scott Rizzo, who led the executive interview process and synthesis of stakeholder input, supported by research interns Maya Sultan, a Biomedical Engineering student at the Georgia Institute of Technology, and Anshu Rao, a Mechanical Engineering student at Kennesaw State University. Together, they helped ensure that the strategy reflects real world perspectives from across Georgia's life sciences ecosystem, rather than the views of any single organization.

- Primary barriers to company growth and ecosystem development
- Strategic priorities for state investment
- Drivers of location and expansion decisions
- Effectiveness of current policies and programs

Survey responses were aggregated and anonymized to ensure candid feedback and protect confidentiality.

### 3. Ecosystem and Economic Data Analysis

Quantitative analysis of Georgia's life sciences sector drew on:

- **Public datasets—**NAICS codes, state tax records, labor market intelligence, university commercialization metrics
- **Sector benchmarking—**Current size, distribution, and growth trends of Georgia's biotechnology, pharmaceutical, medical device, and ag-biotech industries
- **Peer comparison—**Investment patterns, workforce availability, infrastructure capacity, and policy frameworks in North Carolina, Massachusetts, California, Michigan, Arizona, Indiana, and other leading states

### 4. National Best-Practice Review

The roadmap incorporated guidance and frameworks from:

- **Biotechnology Innovation Organization/ Council of State Bioscience Associations** state life sciences competitiveness reports and toolkits
- **Peer-state roadmaps—**Arizona, Indiana, Massachusetts, Colorado, New York, Denmark, and others
- **Federal initiatives—**U.S. Economic Development Administration (EDA) Tech Hubs, Advanced Research Projects Agency for Health (ARPA-H) models, NIH/NSF commercialization programs

### Outcome

The result is a roadmap grounded in real stakeholder voices, validated by quantitative data, and informed by what is demonstrably working in peer ecosystems. Strategic priorities reflect consensus across industry, academia, and government, and recommendations are designed to be actionable, evidence-based, and aligned with Georgia's unique competitive position.

# SOURCES: AN EVIDENCE-BASED, CONSENSUS-INFORMED APPROACH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# SOURCES: STATE-BY-STATE SOURCE LIST (MASTER SOURCES)

| STATE | SOURCE/TITLE | ORGANIZATION | SOURCE TYPE | LINK |
|---|---|---|---|---|
| Georgia | Industry Impact – Georgia Life Sciences | Georgia Life Sciences | Industry association/ impact data | https://www.galifesciences.org/industry-impactgalifesciences |
| Georgia | Growth, Investment, and Future Potential | Georgia Life Sciences | Industry association/ narrative + data | https://www.galifesciences.org/georgia-life-sciences-growth-investment-and-future-potentialgalifesciences |
| Georgia | U.S. "Industrial Bioeconomy" Adds $210.4B... Georgia in Top 10 | Georgia Life Sciences | Industry association/ industrial bioeconomy | https://www.galifesciences.org/u-s-industrial-bioeconomy-adds-210-4b-and-643-992-jobs-says-report-georgia-in-top-10galifesciences |
| Georgia | Life Sciences Industry in Georgia | Georgia Dept. of Economic Development (SelectGeorgia) | State EDO/sector overview | https://www.selectgeorgia.com/discover-georgia/industries/Life-Sciences-in-georgia/selectgeorgia |
| Georgia | Georgia: An Emerging Market for Life Sciences | Cushman & Wakefield | Market/real estate analysis | [PDF] GEORGIA: An Emerging Market For Life Sciencescushmanwakefield |
| Georgia | Atlanta Ranks Among Nation's Fastest-Growing Life Science Labor Pools | CBRE | Market/labor analysis | https://www.cbre.com/press-releases/atlanta-ranks-among-nations-fastest-growing-life-science-labor-poolscbre |
| North Carolina | Life Sciences Industry in North Carolina | EDPNC | State EDO/sector overview | https://edpnc.com/industries/life-sciences/edpnc |
| North Carolina | Annual Report – Key Features (Project & Investment Highlights) | EDPNC | State EDO/project & investment data | https://edpnc.com/annual-report/features/edpnc |
| North Carolina | Research Triangle Park: North Carolina's Growing Biotech Hub | Labiotech.eu | Ecosystem/narrative | https://www.labiotech.eu/in-depth/research-triangle-park-north-carolina-biotech-hub/labiotech |
| North Carolina | The Research Triangle: Up-and-Coming Life Sciences Manufacturing Hub | Meet Life Sciences | Market/cluster narrative | https://www.meetlifesciences.com/media-hub/blog/the-research-triangle—why-raleigh-is-an-up-and-coming-life-sciences-manufacturi...meetlifesciences |
| Virginia | Life Sciences | Virginia Economic Development Partnership (VEDP) | State EDO/sector overview | https://www.vedp.org/industry/life-sciencesvedp |

| STATE | SOURCE/TITLE | ORGANIZATION | SOURCE TYPE | LINK |
|---|---|---|---|---|
| Virginia | GO Virginia Region 2 to Help Make Virginia a Biotechnology Hub | GO Virginia/RBTC | Regional strategy/cluster initiative | https://www.rbtc.tech/regional-news/go-virginia-region-2-to-help-make-virginia-a-biotechnology-hub/rbtc |
| Virginia | Virginia Can Lead Biotech Manufacturing Renaissance | Virginia Bio | Policy/strategy commentary | https://www.vabio.org/virginia-can-lead-biotech-manufacturing-renaissance-if-policymakers-help/vabio |
| Virginia | Emerging Life Sciences Markets: Richmond, VA | CBRE | Market/emerging hub analysis | https://www.cbre.com/insights/briefs/emerging-life-sciences-markets-richmond-vacbre |
| Ohio | Ohio Life Sciences Industry Assessment & Economic Impact | Ohio Life Sciences/ TEConomy | Industry impact/core data | https://ohiolifesciences.org/wp-content/uploads/2025/02/TEConomy-OLS_Industry_Assesssment_and_Economic_Impact-Report_vFinal2.pdfohiolifesciences |
| Ohio | Ohio Claims the Top Two Emerging Hubs for Biotech Research | Site Selection | Market/hub ranking | https://siteselection.com/ohio-claims-the-top-two-emerging-hubs-for-biotech-research-may-2024/siteselection |
| Ohio | Emerging Life Sciences Markets: Columbus, OH | CBRE | Market/emerging hub analysis | https://www.cbre.com/insights/briefs/emerging-life-sciences-markets-columbus-ohcbre |
| Ohio | Ohio Bets on Workforce Training to Capture Boom in Biomanufacturing | Fierce Biotech | Workforce/policy initiative | https://www.fiercebiotech.com/sponsored/ohio-bets-workforce-training-capture-boom-biomanufacturing-digital-healthfiercebiotech |
| Pennsylvania | Economic Impact | Life Sciences PA | Industry association/ impact data | https://lifesciencespa.org/economic-impact/lifesciencespa |
| Pennsylvania | 2024 Annual Report | Life Sciences PA | Industry association/sector overview | https://lifesciencespa.org/2024-annual-report/lifesciencespa |
| Pennsylvania | Policy Priorities | Life Sciences PA | Policy/funding priorities | https://lifesciencespa.org/policy-priorities/lifesciencespa |
| Pennsylvania | City of Philadelphia: A National Life Sciences Leader – Impact Study | Econsult Solutions | City-level impact study | https://econsultsolutions.com/wp-content/uploads/2025/04/City-of-Philadelphia-Life-Sciences-Impact-Study.pdfeconsultsolutions |
| Pennsylvania | Life Sciences—Pennsylvania Gets It Done | Commonwealth of Pennsylvania | State marketing/sector positioning | https://pagetsitdone.com/key_industries/life_sciencespagetsitdone |

| STATE | SOURCE/TITLE | ORGANIZATION | SOURCE TYPE | LINK |
|---|---|---|---|---|
| Texas | Building the Innovations of Tomorrow (Texas sections) | InnovateBIO | National/state benchmarking report | https://www.innovatebio.org/sites/default/files/publications/Building%20the%20Innovations%20of%20Tomorrow_2024.pdfreddit |
| Texas | Biotech & Life Sciences – Sector Profiles and Reports | Office of the Governor/ Business in Texas | State EDO/sector overview & data | https://gov.texas.gov/business/page/biotechnology-life-sciencesmylifeelsewhere |
| Texas | Texas Life Science Workforce Report (TEConomy) | THBI | Industry association/ workforce data | https://www.thbi.com/Texas%20Stats_TEConomy-LSWC%20Life%20Science%20Workforce%20Report%202025.pdfrbtc |
| Texas | 2023 U.S. Life Sciences Outlook/Emerging Markets (Dallas, Houston) | CBRE | Market/emerging hub analysis | https://www.cbre.com/insights/books/2023-us-life-sciences-outlook/emerging-marketslifesciencewa |

# GEORGIA LIFE SCIENCES

Georgia Life Sciences, founded in 1989, is a non-profit, membership-based organization that promotes the interests and growth of the life sciences industry. It is the state's largest and most influential life sciences advocacy and business leadership organization working to improve access to innovative discoveries that have lifesaving impact. The association connects business, academia, government, and other allied entities involved in the application of life sciences products to fuel growth and collaboration through policy development, community programs, national industry initiatives, and a portfolio of educational and networking events.

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