

STRUCTURAL INTELLIGENCE BRIEF

Educational Services

NAICS 61 | Critical Infrastructure (Educational Facilities)



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Four Frequencies Framework

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Executive Summary

American education operates inside a structural paradox: the sector responsible for producing the nation's human capital cannot retain its own workforce. One in eight teaching positions is either vacant or filled by someone without full certification. Sixty-four percent of public schools report they cannot find qualified candidates. The production pipeline that should replenish this workforce — higher education — has shifted 68% of its faculty to contingent appointments and faces a demographic enrollment cliff that will eliminate 15% of its incoming students by 2029. This brief applies the Four Frequencies diagnostic framework to U.S. Educational Services (NAICS 61) using 16 federal data metrics from NCES, BLS, NAEP, DOE, and GAO.

Two frequencies score **VULNERABLE**. Two score **STRAINED**. No frequency scores **STABLE**. The structural conditions described in this brief are not projections. They are measurements of conditions that already exist in the sector's workforce, infrastructure, governance, and institutional knowledge systems.

*Thinness measures the structural depth of critical capacity. Permission measures the distribution of decision authority. Management measures leadership effectiveness and operational coordination. Absence measures what happens when these capacities fail. Two frequencies score **VULNERABLE**.*



Sector Structural Profile

The Educational Services sector (NAICS 61) encompasses K-12 schools, higher education institutions, technical and trade schools, and other educational training services. The Department of Education designates Educational Facilities as a subsector of the critical infrastructure Government Facilities Sector. K-12 alone operates through 13,303 independent school districts managing 128,966 schools. Total K-12 enrollment is 54.1 million students with annual expenditure of approximately \$982 billion. Higher education serves 19.4 million postsecondary students with federal support through a \$268.4 billion DOE budget.

Workforce Thinning

The most immediately measurable structural condition in education is workforce contraction. 411,549 teaching positions are either unfilled or filled by staff without full certification. Sixty-four percent of public schools report they cannot find qualified candidates. Special education faces the deepest shortage: 74% of schools report difficulty filling special education positions. Math and science face state-level shortages in 40 and 41 states respectively.

Early childhood education carries the lowest structural compensation: median wage is \$13.07 per hour, producing 65% elevated turnover compared to sector baseline. Teacher turnover overall is 27% above 1990s baseline. Higher education has structurally shifted contingency: 68% of faculty are now in non-tenure-track positions, up from 47% in 1987. This transformation means that the institutions responsible for training the next generation of teachers operate with two-thirds of their workforce in disposable employment arrangements.

Institutional Contraction

Higher education is contracting at demographic scale. Undergraduate enrollment has declined 8.4% from 2010 peak. The enrollment cliff projects a further 15% decline between 2025 and 2029 as smaller cohorts move through the pipeline. Institutional closures accelerated: 28 institutions closed in 2024 compared to 15 in 2023. Community college enrollment has dropped 20-26% at major systems including CUNY.

Endowment concentration amplifies risk. The top 10% of doctoral institutions hold 56% of sector assets. This means institutions without major endowments must sustain operations from tuition revenue that is declining in real terms as student populations shrink. The structural consequence: small and mid-size institutions that serve regional populations and depend on tuition cannot absorb the enrollment cliff. The geographic access point for higher education disappears from entire regions.

Four Frequency Assessment

The Four Frequencies framework measures structural resilience across four dimensions of organizational and sector health. Each frequency captures a distinct pattern of structural vulnerability. In education, these vulnerabilities are interconnected and compounding.

THINNESS

Thinness measures the structural depth of critical capacity. In education, it surfaces as understaffing across the entire pipeline, infrastructure deterioration, and the erosion of institutional knowledge from rapid departure.

The evidence for VULNERABLE is layered across multiple dimensions. 411,549 positions unfilled or uncertified represents a baseline of one-in-eight compromised. School psychologists operate at 1,071:1 student ratio against a recommended 500:1. School counselors are at 372:1 against recommended 250:1. The structural effect: critical support functions that students depend on are simply absent. Support that does exist concentrates on students in crisis, leaving universal prevention and early intervention infrastructure unprovided.

Infrastructure carries a \$90 billion deferred maintenance gap. The average American school building is 50 years old. Six thousand rural schools have closed since 1998, eliminating the institutional access point for students in those communities. Higher education carries \$750 billion to \$950 billion in capital needs over

VULNERABLE

the next decade while enrollment contracts and tuition revenue declines.

Thinness in education is not a staffing problem to be solved with recruitment campaigns. It is a structural condition operating simultaneously at every level of the pipeline: early childhood (\$13.07/hour), K-12 (1 in 8 positions compromised), and higher education (68% contingent faculty). When structural depth is compromised across all three levels, the system cannot replenish itself.

PERMISSION

STRAINED

Permission measures how structural conditions distribute or concentrate decision authority. In education, it surfaces through the fragmentation of 13,303 independent school districts, conflicting federal mandates, state-level curriculum restrictions, and the structural dependency created by federal funding that carries compliance burden without proportional authority.

The structural architecture reveals permission strain at multiple levels. Federal funding provides 7.8% of K-12 expenditure but carries 41% of compliance burden. Title IX rules were vacated nationwide in January 2025, creating legal uncertainty for institutional planning. Twenty-one states have implemented curriculum restrictions. Eight hundred twenty-one censorship attempts were documented in 2024, more than nine times the 2001-2020 average. DEI programs have been eliminated via executive order.

One point three million students are enrolled in school choice programs with 25% annual growth. At least ten states are pushing to weaken or eliminate tenure protections. Title IV federal funding creates \$114.1 billion in institutional dependency while regulations around that funding shift. The permission structure is STRAINED because authority is fragmented horizontally (13,303 districts), constrained vertically (federal mandates without authority), and actively being redistributed (curriculum restrictions, voucher expansion, tenure erosion).

MANAGEMENT

STRAINED

Management frequency measures how structural conditions shape leadership effectiveness, operational coordination, and capacity to execute strategy. In education, it surfaces as leadership instability, benefits spending that exceeds instructional spending growth, and the structural gap between immediate needs and funding timelines.

Superintendent turnover in the 500 largest school districts stands at 23%, up from 14-16% pre-pandemic. This velocity means leadership focus shifts from sustained strategy execution to reactive crisis management. University president tenure has collapsed from 8.5 years in 2006 to 5.9 years in 2023. Higher education benefits spending increased 81% between 2002 and 2023 while salary growth increased 8%, compressing the margin available for instructional investment.

Per-pupil spending varies 4.3 times (New York \$36,976 vs Idaho \$8,508), creating structural inequity that management cannot locally overcome. Twenty-five percent of K-12 students lack broadband access; only

27% of states report being prepared for digital infrastructure sustainability. Student loan default involves \$180 billion and 7.7 million borrowers, creating management pressure on higher education institutions that depend on students' capacity to borrow. The management structure is STRAINED because it must simultaneously address workforce shortages, infrastructure collapse, funding inequity, and the structural reallocation of the sector away from educational mission.

ABSENCE **VULNERABLE**

Absence measures what happens when structural conditions create gaps in critical functions, and what fills those gaps. In education, it surfaces as achievement decline, absenteeism, demographic collapse, and the compounding stress that accelerates departure from remaining staff.

NAEP data shows reading scores down 5 points and math scores down 8 points at 8th grade (2019-2024). Chronic absenteeism stands at 23.5%, 57% above pre-pandemic baseline. Thirteen million Americans live in education deserts without nearby college access. Male enrollment is down 17% since 2010. New international enrollments dropped 17% fall 2025. Forty-one percent of education graduates did not find jobs in their field.

Seven point seven percent annual teacher departure represents an absolute ceiling beyond which organizational capacity cannot sustain. Seventy percent of early-career teachers leave or consider leaving within five years. The compounding effect is structural: Thinness (workforce gaps) intensifies Absence (remaining teachers absorb more load, burn out faster, then leave). Permission constraints (administrative burden, curriculum restrictions) accelerate departure. Management instability (23% superintendent turnover) prevents the sustained intervention required to interrupt these patterns.

When the sector responsible for producing the nation's workforce cannot retain its own workforce, the structural deficit propagates to every sector that depends on educated labor. Which is all of them.

Federal Data Evidence Base

This assessment draws on 16 metrics from federal agencies and authoritative industry sources. Each metric maps to one or more Four Frequencies dimensions. The data is publicly available; the structural interpretation through the Four Frequencies lens is proprietary.

Source	Metric	Key Finding
NCES/IES	Teaching position status	411,549 unfilled or uncertified
NCES	School hiring difficulty	64% report lack of qualified candidates
NCES	Special education vacancies	74% report difficulty filling positions
AAUP	Faculty contingency rate	68% non-tenure-track (fall 2023)

Source	Metric	Key Finding
ASCE/GAO	K-12 deferred maintenance	\$90 billion gap
NASP	School psychologist ratio	1,071:1 (recommended 500:1)
NCES	School district count	13,303 independent districts
NAEP/NAGB	Student achievement	Reading -5pts, math -8pts (2019-2024)
AEI	Chronic absenteeism	23.5% (57% above pre-pandemic)
ACE	University president tenure	5.9 years (down from 8.5 in 2006)
ILO Group	Superintendent turnover	23% in 500 largest districts
Moody's	Higher ed capital needs	\$750B-\$950B over next decade
FSA	Student loan default	\$180B in default, 7.7M borrowers
EdChoice	School choice participation	1.3M students, 25% annual growth
Third Way	Education deserts	13M without nearby college access
NCES	Enrollment decline	19.28M undergraduate (down 8.4% from 2010)

Sources: National Center for Education Statistics (NCES), Bureau of Labor Statistics (BLS), National Assessment of Educational Progress (NAEP), National Assessment Governing Board (NAGB), Department of Education (DOE), Government Accountability Office (GAO), American Association of University Professors (AAUP), American Society of Civil Engineers (ASCE), National Association of School Psychologists (NASP), American Enterprise Institute (AEI), Association of Governing Boards of Universities and Colleges (ACE), ILO Group, Moody's Investors Service, Federal Student Aid (FSA), EdChoice, Third Way.

Structural Risk Scenarios

Structural conditions do not predict specific events. They define the envelope of probable outcomes. The following scenarios are structurally plausible given current conditions. They are not forecasts. They are the shapes that failure takes in a sector with this structural profile.

Cascade Scenario: Regional Teacher Collapse

A high-need district loses 30% of its teaching staff in a single year due to compounding burnout, pay gaps, and safety concerns. Substitute teachers cannot be sourced; 20% of substitute requests already go unfilled. Class sizes spike. Remaining teachers absorb additional load, injuries increase, burnout accelerates, departure accelerates further. The structural conditions that enable this scenario: workforce already at one-in-eight compromise, substitute system operating at 80% capacity, special education at 74% difficulty, superintendent turnover preventing sustained intervention response.

Compounding Scenario: Enrollment Cliff Institutional Failure

The demographic cliff eliminates 15% of incoming higher education students by 2029. Small and mid-size institutions that depend on tuition revenue and lack endowment buffers cannot sustain operations. Institutional closures accelerate from 28 per year to 80 or more. Each closure displaces students,

eliminates regional employment opportunities for faculty, and removes the higher education access point that communities depend on. Education deserts expand from current 213 counties to 400 or more. The structural conditions: enrollment concentration at elite institutions, endowment concentration at top 10%, regional institutions structurally dependent on tuition.

Structural Freeze Scenario: Governance Paralysis

A state simultaneously implements curriculum restrictions, voucher expansion, and Title IX compliance reversals. District superintendents (already turning over at 23% annually) face contradictory mandates from federal, state, and local governance layers. The 13,303-district governance structure cannot coordinate coherent response. Schools appear governed. Structurally, they are 13,000 organizations receiving conflicting authority signals with no mechanism to resolve them. Instructional focus shifts to defensive compliance. Student outcomes continue declining. Teacher departures accelerate.

Each scenario describes a pattern, not an event. The structural conditions that enable these patterns are measurable today. Whether a specific organization experiences them depends on its internal structural profile, which is what the diagnostic measures.

The Diagnostic Gap

This brief assesses structural conditions visible from federal data and public sources. The Four Frequencies framework measures 20 dimensions. Sixteen are assessable from public data for this sector. Four require diagnostic access to an organization's internal structural patterns through behavioral intelligence from raters inside the organization.

What Public Data Reveals (16 Dimensions)

The 16 public dimensions capture sector-level structural conditions: teaching workforce supply and vacancy patterns, institutional infrastructure condition, higher education enrollment and institutional viability, faculty employment arrangements, governance fragmentation, funding asymmetries, student achievement patterns, student access and completion patterns, leadership turnover velocity, and institutional knowledge loss. These are the dimensions scored in this brief. They describe the structural environment that every organization in this sector inhabits.

What Requires Diagnostic Access (4 Dimensions)

Institutional Knowledge Mapping

Where critical teaching expertise actually lives. Sector data shows 7.7% annual teacher departure. It cannot tell you which knowledge domains departed your specific school or district or which individuals currently absorb compensatory load for those departures.

Decision Authority Distribution

Who can make which decisions, and how far authority sits from the classroom. Sector data shows 13,303 districts revealing fragmentation at market level. It cannot map the internal decision architecture that determines how quickly your district responds when a critical teacher departure creates a gap.

Cultural Load Distribution

Which informal norms carry weight that formal systems have failed to carry. No federal dataset measures what unwritten expectations hold your organization together or what happens when those informal networks break.

Adaptive Capacity Under Stress

How the organization's structural profile changes under pressure. The scenarios preceding describe sector-level patterns. How a specific district or institution responds depends on dimensions only visible through diagnostic engagement, including the informal workarounds and adaptive networks that carry operational load.

The gap between what is publicly visible and what is structurally real is where organizational risk lives. The brief tells you the weather. The diagnostic tells you whether your building can hold.

Methodology

The Four Frequencies framework measures structural resilience across four dimensions: Thinness (depth of critical capacity), Permission (distribution of decision authority), Management (leadership and operational effectiveness), and Absence (gaps in critical functions and their consequences). Each frequency is assessed across five dimensions, for a total of twenty structural measurements.

Sector-level assessments draw on federal data mapped to the publicly-measurable dimensions. Organization-level diagnostics add behavioral intelligence from internal raters to score all twenty dimensions. The combination produces the Structural Resilience Index (SRI), a composite score calibrated to a six-band severity scale.

Severity terminology: RESILIENT (structural depth across all frequencies), STABLE (adequate structural capacity with minor gaps), STRAINED (measurable structural pressure in one or more frequencies), VULNERABLE (significant structural gaps with compounding risk), FRAGILE (structural conditions that amplify disruption), CRITICAL (structural failure in progress or imminent).

What This Means for Your Organization

This brief describes the structural environment your organization operates inside. Whether these sector-level conditions are amplified or mitigated within your specific organization depends on your internal structural profile.

The Four Frequencies diagnostic measures all 20 dimensions for a single organization, producing a 40-page structural analysis with the Structural Resilience Index.

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About S.J. Bridger

S.J. Bridger is a structural resilience diagnostics practice. We analyze the structural conditions that determine whether organizations hold together when key people leave, when systems fail, and when the relationships that carried institutional knowledge disappear. The Four Frequencies framework was developed through forensic analysis of organizational failures across multiple sectors and refined through diagnostic engagements that measure what traditional assessments miss.

Structural Intelligence Briefs are published assessments of sector-level conditions. They are updated quarterly as federal data sources release new information. The Educational Services brief is part of a series covering critical infrastructure and high-structural-risk sectors across the U.S. economy.

DISCLAIMER: This Structural Intelligence Brief is a sector-level structural assessment based on publicly available federal data and the Four Frequencies analytical framework. It does not constitute advice to any specific organization. It does not establish a consulting engagement, advisory relationship, or professional obligation between S.J. Bridger and any reader or recipient.

Sector-level structural conditions described in this brief may or may not apply to any individual organization within the Educational Services sector. Organizational structural profiles vary based on internal conditions that are measurable only through diagnostic engagement. Decisions regarding organizational strategy, workforce planning, risk management, or any other operational matter should not be based solely on the sector-level findings in this document.

The severity scores, structural risk scenarios, and analytical observations in this brief reflect conditions as of the publication date. Federal data sources update at varying intervals. This brief will be updated quarterly. Prior versions should not be relied upon after a subsequent version has been published.

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