BUILDING CAPACITY

Tim Callahan, MPH

People, Pipes, and Population Series—Part 1: Workforce Capacity as the Hard Constraint

Editor's Note: A need exists within environmental health agencies to increase their capacity to perform in an environment of diminishing resources. With limited resources and increasing demands, we need to seek new approaches to the practice of environmental health. Acutely aware of these challenges, the *Journal* publishes the Building Capacity column to educate, reinforce, and build on successes within the profession using technology to improve efficiency and extend the impact of environmental health agencies.

Column contributors are guest authors. The conclusions of this column are those of the author(s) and do not necessarily represent the views or policies of NEHA.

Tim Callahan is a NEHA technical advisor for the Data & Technology section. Over the next year, we will publish a 4-part series authored by Callahan that explores environmental health modernization and the foundational support modernization requires.

Environmental health is in the middle of a sweeping modernization wave. New information systems, portals, dashboards, and mobile tools are being rolled out across the country. These efforts are essential and long overdue. Yet experience has shown me that the true constraint is not the software itself. The true constraint is the people doing the work.

No matter how well designed, no system will succeed if the workforce responsible for using it is stretched too thin, too inexperienced, or too burned out to carry the change forward. That is the lesson I have taken from working on a statewide system replacement project. Technology mattered, but the limiting factor was always human capacity.

Lessons From the Field

Large-scale projects arrive with their own rhythm. Timelines are negotiated, features are prioritized, and budgets are set. But people do not operate like servers that can simply be scaled up on demand. In my state, modernization meant hours of testing, new workflows, training on redesigned processes, and rewriting standard operating procedures. Those tasks landed on the same group of environmental health specialists already responsible for inspections, investigations, and responding to the public.

When experienced staff were reassigned or retired, the knowledge gap became visible almost overnight. Along with staff walking out the door, so did institutional memory, how to handle unusual cases, which workarounds kept programs afloat, and what shortcuts to avoid.

This type of knowledge is what organizational theorists call **tacit knowledge**: the unwritten, experience-based know-how that makes daily operations possible. In environmental health, it lives in judgment calls about borderline violations, in the sequencing of site visits that minimizes travel, and in how a seasoned specialist explains a correction to an operator so that it sticks. Tacit knowledge cannot be exported, queried, or mined. It has to be captured person-to-person by staff who possess the knowledge and remain employed, and it is captured through observation, dialogue, and documentation.

What the National Data Say

The story is not unique to one jurisdiction. National surveys confirm that workforce fragility is the rule, not the exception. The Public Health Workforce Interests and Needs Survey (PH WINS) found the following (Table 1):

- More than two thirds of respondents reported at least one symptom of burnout (de Beaumont, 2026)
- More than one half of respondents had 5 years or less at their current agency (de Beaumont, 2026)
- Training needs of respondents were greatest in budgeting, financial management, policy engagement, and systems thinking. These skills quietly determine whether modernization projects succeed (de Beaumont & Association of State and Territorial Health Officials, 2026)

The National Association of County and City Health Officials reported similar findings

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TABLE **1**

Select Public Health Workforce Interests and Needs Survey (PH WINS) Indicators, 2024

Indicator Category	Example Indicator	Reported Value (%)	Notes or Context
Burnout	Respondents reporting ≥1 burnout symptom	71	Structural issue across all agency types [a]
Tenure	Employees with ≤5 years at current agency	54	Indicates limited institutional knowledge [a]
Age distribution	Employees ≤35 years	25	Younger workforce entering supervisory roles [a]
Training need: Area 1	Budget and financial management	51	Top identified gap [b]
Training need: Area 2	Policy engagement and advocacy	40	Common need across state and local staff [b]
Training need: Area 3	Systems thinking and process improvement	34	Supports modernization adoption [b]
Intent to stay	Plan to remain in public health ≥1 year	75	Shows a slight rebound since 2021 PH WINS [a]

[a] de Beaumont, 2026.

[b] de Beaumont & Association of State and Territorial Health Officials, 2026.

People Planning

Be Aware

- Burnout and short tenure are widespread. These problems are structural and not isolated (de Beaumont, 2026).
- Skill gaps in budgeting, policy, and systems thinking can derail technology projects (de Beaumont & Association of State and Territorial Health Officials, 2026).
- Workforce volatility at local health departments is ongoing, even after pandemic recovery (Patel et al., 2025).

Prepare

- Assume capacity limits when setting modernization timelines.
- Recognize that tacit knowledge leaves with retiring staff—plan its capture early.
- Treat workforce indicators as critical project metrics, not background noise.

in its Forces of Change Survey: staffing volatility, job losses in some local health departments, and uneven recovery of workforce capacity since the COVID-19 pandemic (Patel et al., 2025). Even as temporary COVID-19 funding allowed short-term hiring, many of those positions are disappearing, leaving agencies with similar or fewer staff to manage bigger responsibilities.

Why It Matters for Modernization

Modernization is not just about cutting over from one system to another. It is about redesigning workflows, retraining staff, and reshaping what good practice looks like day-to-day. A short-tenured workforce limits the pace at which these changes can be absorbed.

When project schedules overlap with seasonal peaks of pool inspections, heat emergencies, onsite sewage, and vector control, the same staff are asked to do more with less. Invisible labor piles up in the background: user acceptance testing, data cleanup, and preparing training materials. The capacity problem is not that staff are unwilling; it is that the throughput of change is capped by human bandwidth.

Another dimension is tacit knowledge. Many of the most effective inspectors and managers hold years of undocumented practice wisdom, the patterns that never make it into policy manuals. Without structured efforts to capture and transfer that knowledge, modernization can unintentionally erase it.

Capturing Tacit Knowledge Before Modernization

The most effective strategy for protecting tacit knowledge is not digital. We must use policy. Before modernization begins, leadership should establish a formal knowledge-transfer requirement as part of project readiness and include this requirement in each work plan. Three actions make this possible without new funding or technology:

1. **Structured mentoring:** Pair senior staff nearing retirement or reassignment with mid-career employees for a defined 6-month overlap period. Require a documented summary of what works for key inspection types or operational routines.
2. **After-action debriefs:** Following complex investigations or enforcement actions, conduct short, written reflections led by the field supervisor. These documents become living case references for new hires.
3. **Narrative standard operating procedures:** Supplement standard procedures with narrative "how it really happens" notes. Record the field-tested details about equipment quirks, local partner expectations, or seasonality.

Embedding these expectations in policy ensures that capturing tacit knowledge is not treated as optional or dependent on spare time. It becomes a precondition of modernization, just like data migration or user acceptance testing.

A Balanced Way of Thinking

Projects often emphasize technology, but balanced modernization requires equal weight on five interconnected disciplines: people, process, practice, policy, and procurement. This framework is simply a reminder that workforce capacity and institutional knowledge are not extras—they are the foundation of system success.

Agencies that treat capacity and tacit knowledge as central are better prepared for the hidden demands of system change. Those agencies that ignore these concepts might find their new systems technically sound but practically underutilized.

Looking Ahead

This column is the first in a series on what really underpins environmental health mod-

ernization. While technology matters, it sits on top of three interconnected foundations: 1) people, 2) pipes, and 3) population. The workforce (the people) is the most immediate constraint. Next, we will look at infrastructure fragility, and how every digital plan depends on power and water systems.

AI Disclaimer: The author used Chat GPT for review prior to final drafting of this column with the following prompt: "Act as an expert editor for an academic journal. Review the attached article for coherence, grammar, and engagement with environmental health professionals. Do not change any text and only make recommendations for edits. Before generating anything, ask questions to help produce the best result."

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Did You Know?

Our Pillars of Governmental Environmental Public Health provides evidence-based recommendations for building and sustaining effective environmental public health programs at the local level. The guide identifies 11 core programs essential for protecting community health—from food safety and water quality to lead prevention and emergency preparedness. Learn more at www.neha.org/pillars-of-governmental-envivonmental-public-health.