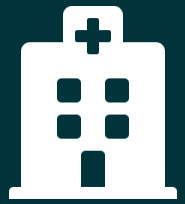


Rural Hospital Replacement

25 Years of Evidence

Brian Haapala, CEO & Jolene Robichaud, Director

The Starting Question

Snap Poll

Have you ever presented a capital project to your board without a lot of (or any) comparable evidence?

Most rural hospital leaders are making the biggest investment decision of their career with anecdotal evidence, outdated studies, and incomplete data.

Today's Session

0:00 - 0:05	**The 25-Year Story**	Replacement growth over time
0:05 - 0:20	**What the Data Reveals**	Pre/post performance trends
0:20 - 0:30	**Case Study Deep Dive**	How Rio Grande Hospital leveraged investments over time
0:30 - 0:45	**The Directory (Live)**	Interactive peer-matching demonstration
0:45 - 0:50	**Implications & Action**	Capital readiness in today's environment

The 25-Year Story

Trends in Replacement Activity Over Time

Replacement Study Cohort Profile

264 Critical Access Hospitals **41** States

Top States

BY COUNT

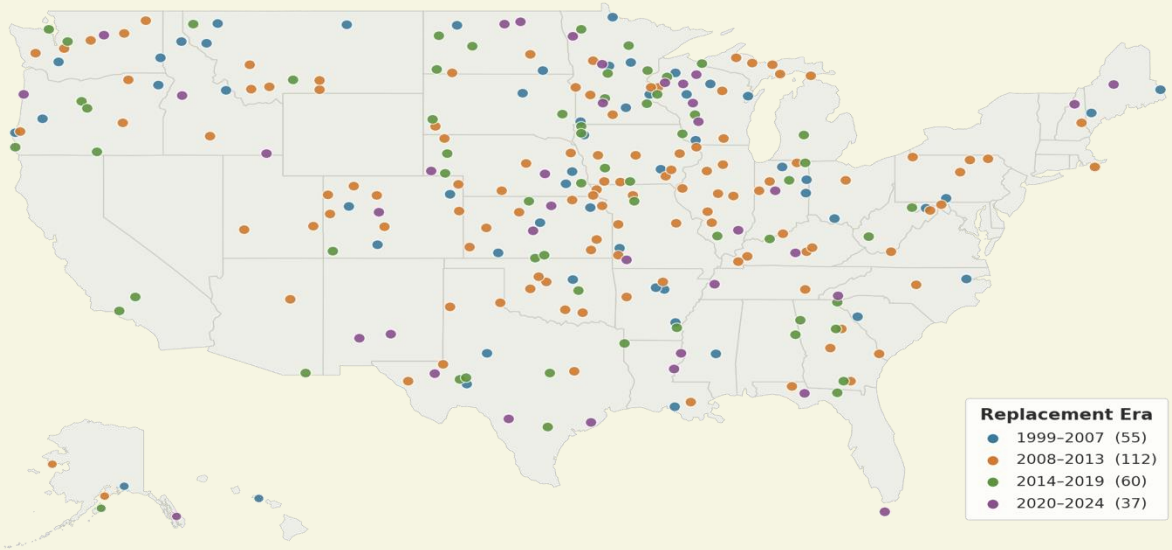
Wisconsin	**19**
Minnesota	**18**
Kansas	**15**
Texas	**14**
Iowa	**13**

BY RATE *(≥10 CAHs)*

Oregon	**44.0%**
Alaska	**38.5%**
Colorado	**37.5%**
Indiana	**33.3%**
Wisconsin	**32.8%**
Pennsylvania	**31.2%**

Zero Replacements

NY · VT · NV · WY



Replacement Rate by Census Region *(replacements ÷ total CAHs)*

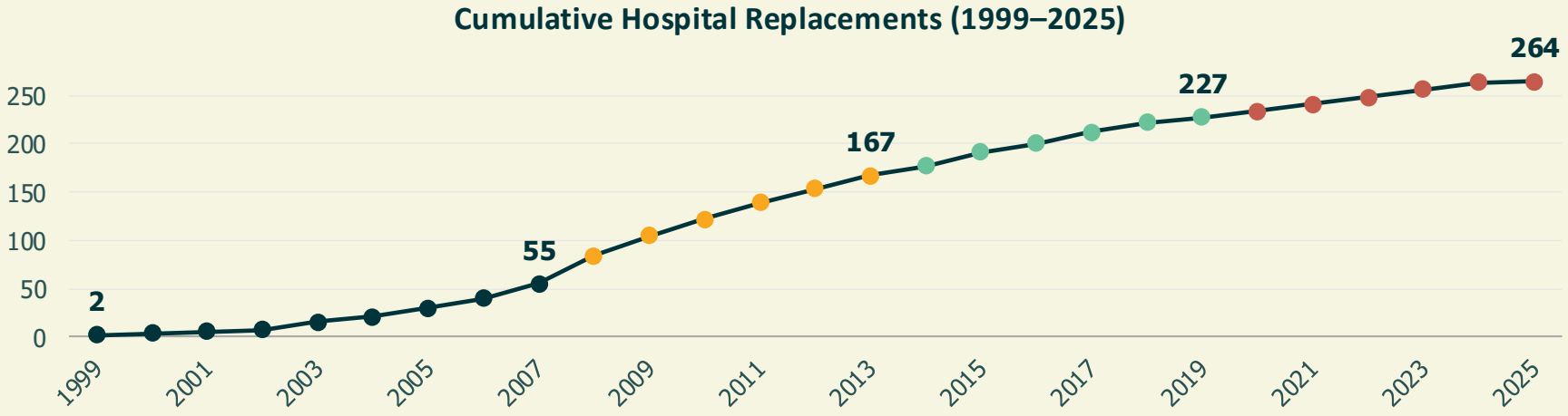
MIDWEST	WEST	SOUTH	NORTHEAST	NATIONAL
20.3%	**20.3%**	**17.4%**	**13.9%**	**19.1%**
128/632	62/305	63/363	11/79	264/1,379

Source: CMS-2552 Cost Reports, FY 2000–2025 | Stroudwater Capital Partners and Stroudwater Associates

STUDY OVERVIEW

Replacement Activity Across Four Phases

264 critical access hospital replacements completed between 1999 and 2025, grouped into four operating-environment phases.



PHASE 1: FOUNDATION & EMERGENCE

1999–2007

55

hospitals · *~6 / year*

PHASE 2: EXPANSION & PEAK ACTIVITY

2008–2013

112

hospitals · *~19 / year*

PHASE 3: REALIGNMENT & RETRENCHMENT

2014–2019

60

hospitals · *10 / year*

PHASE 4: RESILIENCE & RENEWAL

2020–2025

37

hospitals · *~6 / year*

Source: CMS-2552 Cost Reports, FY 2000–2025 | Stroudwater Capital Partners and Stroudwater Associates

The Pattern

When federal credit policy remains consistent and aligned, rural communities see remarkable results. When fragmented or uncertain, momentum stalls.

Throughout each cycle, rural leaders found creative financing, maintained partnerships, and refused to let geography or policy shape their futures.

What the Data Reveals

Pre/Post Performance Trends

What Prior Studies Found

Key metrics from the 2022 study (n=243). Volume and efficiency shown as compound annual growth rate over each 3-year period; EBITDA shown as median margin.

VOLUME

annual total volume growth

+1.3pp

+1.6% → **+2.9%**

Volume growth nearly doubled

EFFICIENCY

FTEs per unit of service

–1.9pp

+0.8% → **–1.1%**

Less labor per unit of service

PROFITABILITY

median EBITDA margin

+4.1pp

9.1% → **13.2%**

Margin expanded by ~45%

Source: CMS-2552 Cost Reports, FY 2000–2025 | Stroudwater Capital Partners and Stroudwater Associates

2022 → 2026: What Changed

+21 new CAH replacements identified, bringing the total to **264, or 19% of all CAHs**

NEW IN 2026 · DISTRIBUTION

See the full distribution.

Percentile bands on every measure reveal peer performance above and below the median, not just the midpoint.

MEDIAN ONLY → FULL DISTRIBUTION

NEW IN 2026 · DATA QUALITY

Screen every metric, automatically.

Standardized flags exclude outliers and bad records from medians; each measure displays its cleaned record count.

MANUAL SPOT-CHECK → AUTOMATED FLAGS

NEW MEASURE : EBITDA less debt service captures profitability after capital investment, not EBITDA margin alone

Source: CMS-2552 Cost Reports, FY 2000–2025 | Stroudwater Capital Partners and Stroudwater Associates

How to Read the Data

Timeline

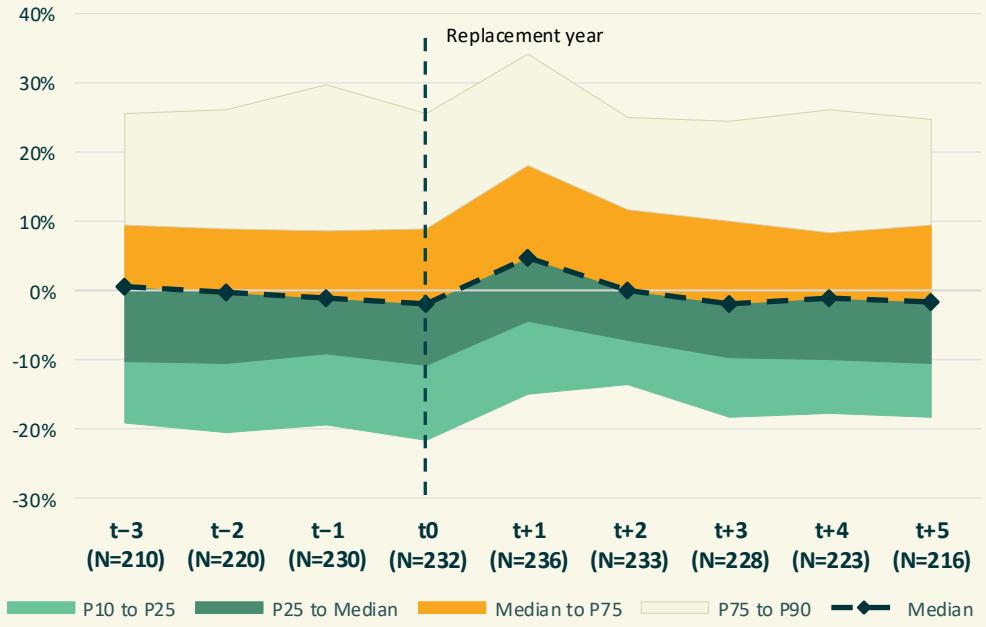
Annual % change, t−3 through t+5

-- Median

Distribution bands

- P75 – P90
- Median – P75
- P25 – Median
- P10 – P25

N = hospitals reporting in each period

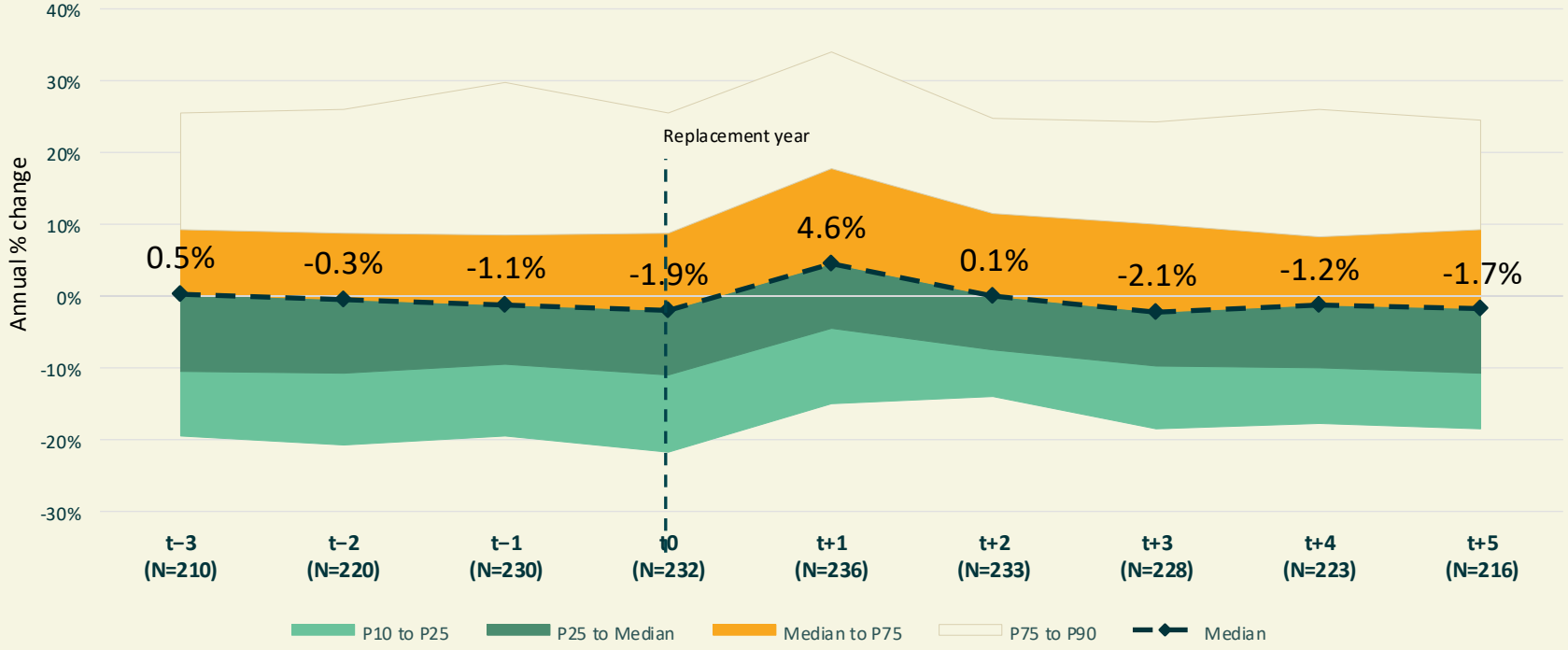


Source: CMS-2552 Cost Reports, FY 2000–2025 | Stroudwater Capital Partners and Stroudwater Associates

Inpatient Days

PERCENT CHANGE BY YEAR

Inpatient days ranged from +0.5% to −1.9% before replacement, with each year's change compounding on the prior year's base. Volumes rose 4.6% in the first year after replacement (t+1), held roughly flat at t+2, then declined 1.2% to 2.1% through t+5.

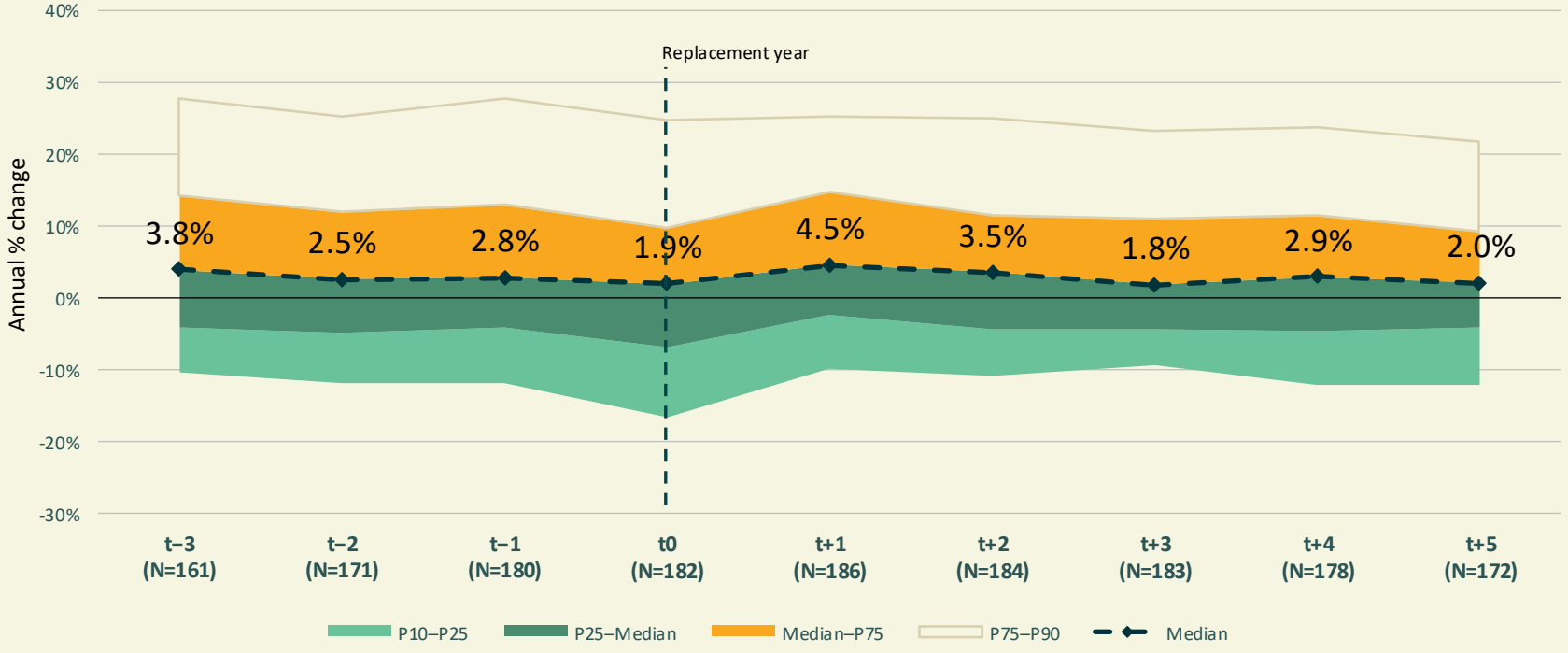


Source: CMS-2552 Cost Reports, FY 2000–2025 | Stroudwater Capital Partners and Stroudwater Associates

Adjusted Patient Days

PERCENT CHANGE BY YEAR

Adjusted patient days stayed positive throughout, with each year's growth building on the prior year's base. The pre-replacement median ran 2.5% to 3.8%, dipping to 1.9% at t0. The first year after replacement peaked at 4.5%, then settled in the 1.8% to 3.5% range through t+5.

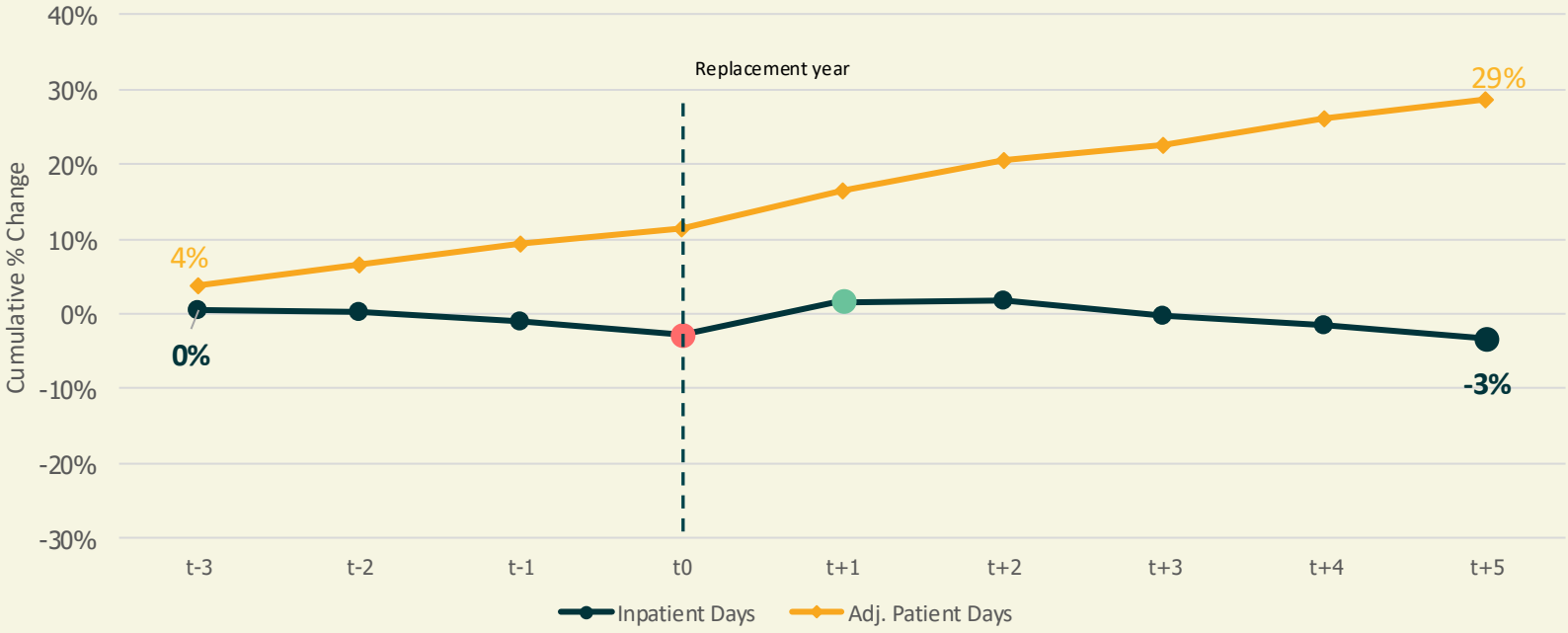


Source: CMS-2552 Cost Reports, FY 2000–2025 | Stroudwater Capital Partners and Stroudwater Associates

Volume Changes Over Time

CUMULATIVE EFFECT OF ANNUAL CHANGES

Inpatient days stay flat or decline in every period except t+1, producing a cumulative ~3% decline across the window. Adjusted patient days grow ~29% cumulatively by t+5, reflecting volume growth from outpatient and ancillary services rather than inpatient.



Source: CMS-2552 Cost Reports, FY 2000–2025 | Stroudwater Capital Partners and Stroudwater Associates

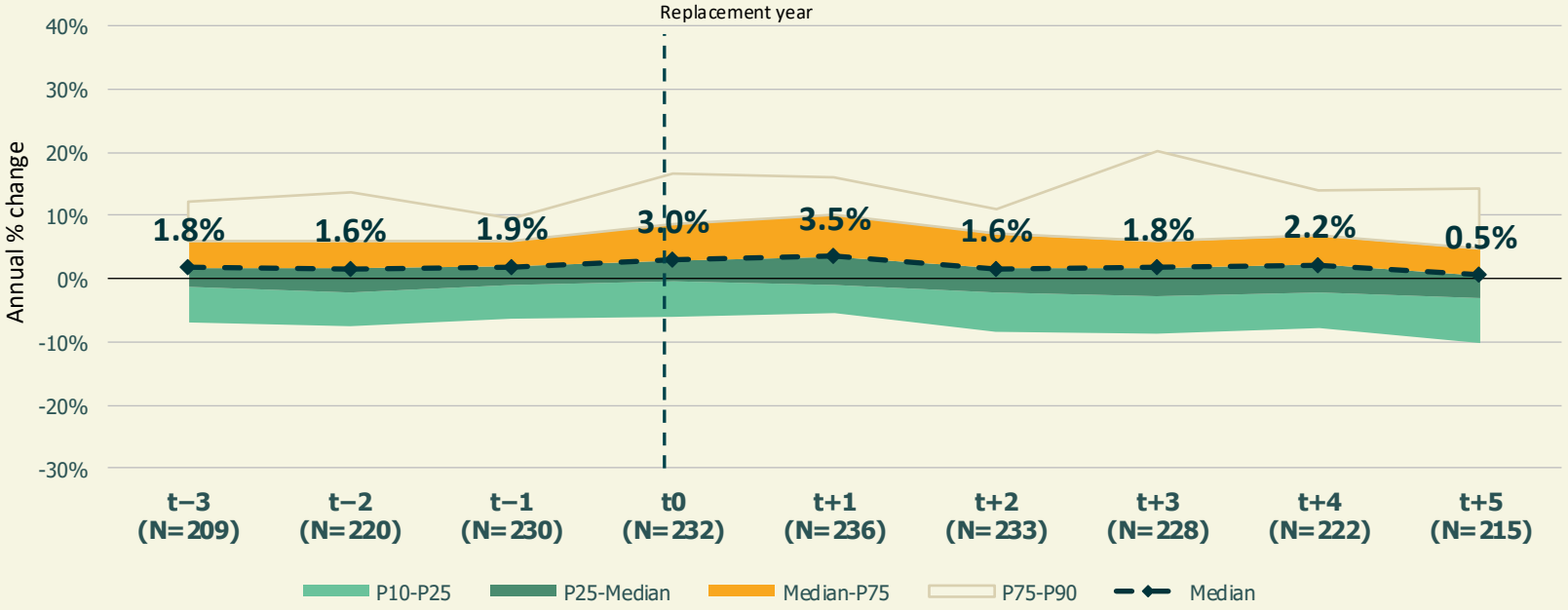
Poll Question

What services would have the most opportunity for growth with a replacement, renovation, or expansion at your facility?

Total FTEs

PERCENT CHANGE BY YEAR

Total FTEs grew every year, with each year's growth building on the prior year's base. Growth accelerated into replacement, from 1.6% to 1.9% before replacement, peaked at 3.0% at t0 and 3.5% at t+1, then slowed to 1.6% to 2.2% in t+2 through t+4 and to 0.5% by t+5.

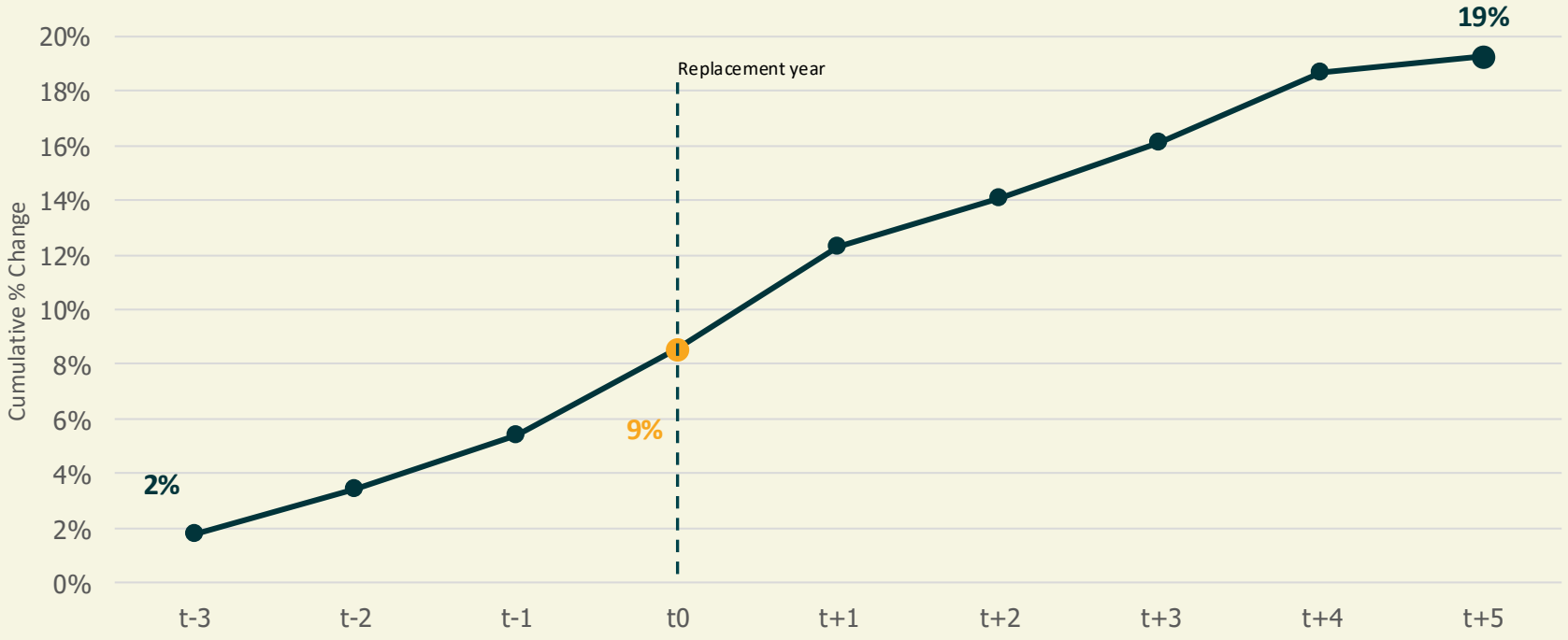


Source: CMS-2552 Cost Reports, FY 2000–2025 | Stroudwater Capital Partners and Stroudwater Associates

Total FTEs Over Time

CUMULATIVE EFFECT OF ANNUAL CHANGES

Compounding the median annual FTE growth rates yields a 19% cumulative increase in total FTEs from t−3 to t+5. The steepest gains occur through t+1, with the curve flattening noticeably in t+2 through t+5 as annual growth slows to 2.2% or less.

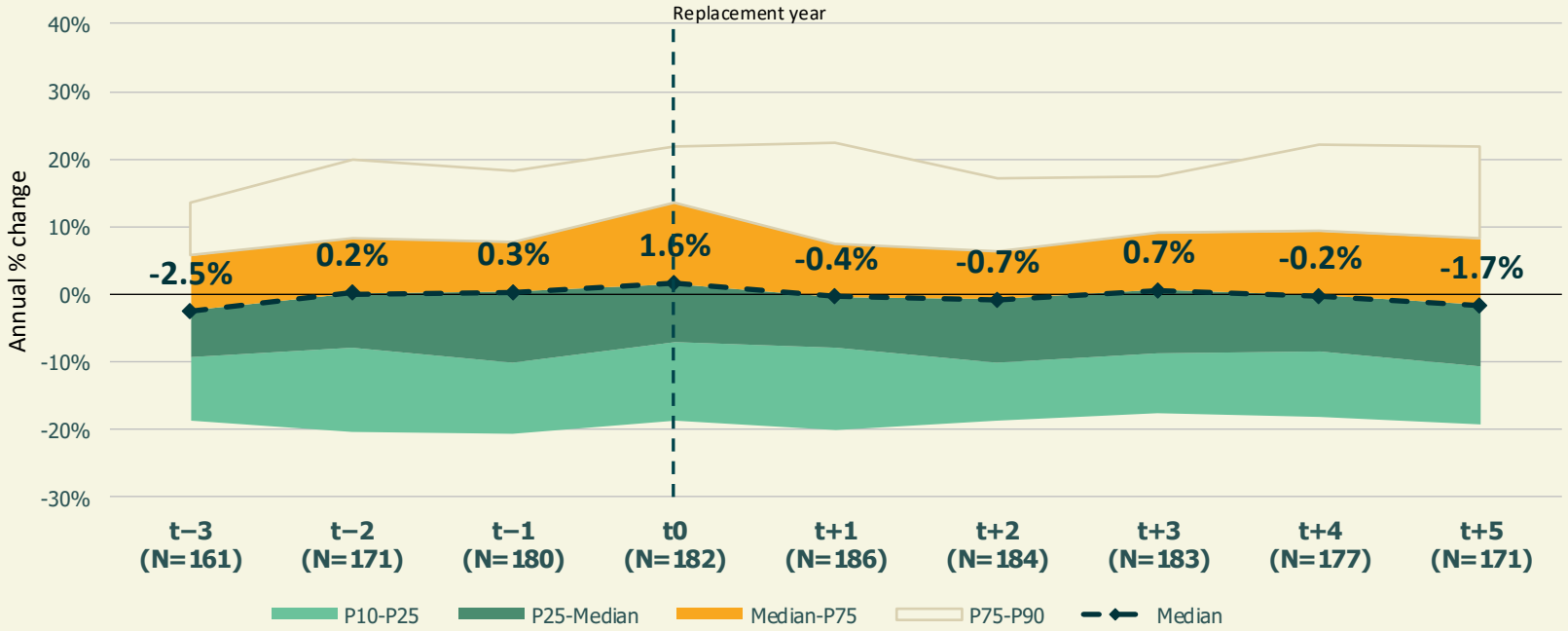


Source: CMS-2552 Cost Reports, FY 2000–2025 | Stroudwater Capital Partners and Stroudwater Associates

FTEs per Adjusted Patient Day

PERCENT CHANGE BY YEAR

FTEs per adjusted patient day rose 0.2% to 1.6% from t−2 through t0 as staffing outpaced volume, with each year's change compounding on the prior year's base. After replacement, the ratio fell 0.4% at t+1 and 0.7% at t+2, with efficiency gains continuing intermittently through t+5 (−1.7%).



Source: CMS-2552 Cost Reports, FY 2000–2025 | Stroudwater Capital Partners and Stroudwater Associates

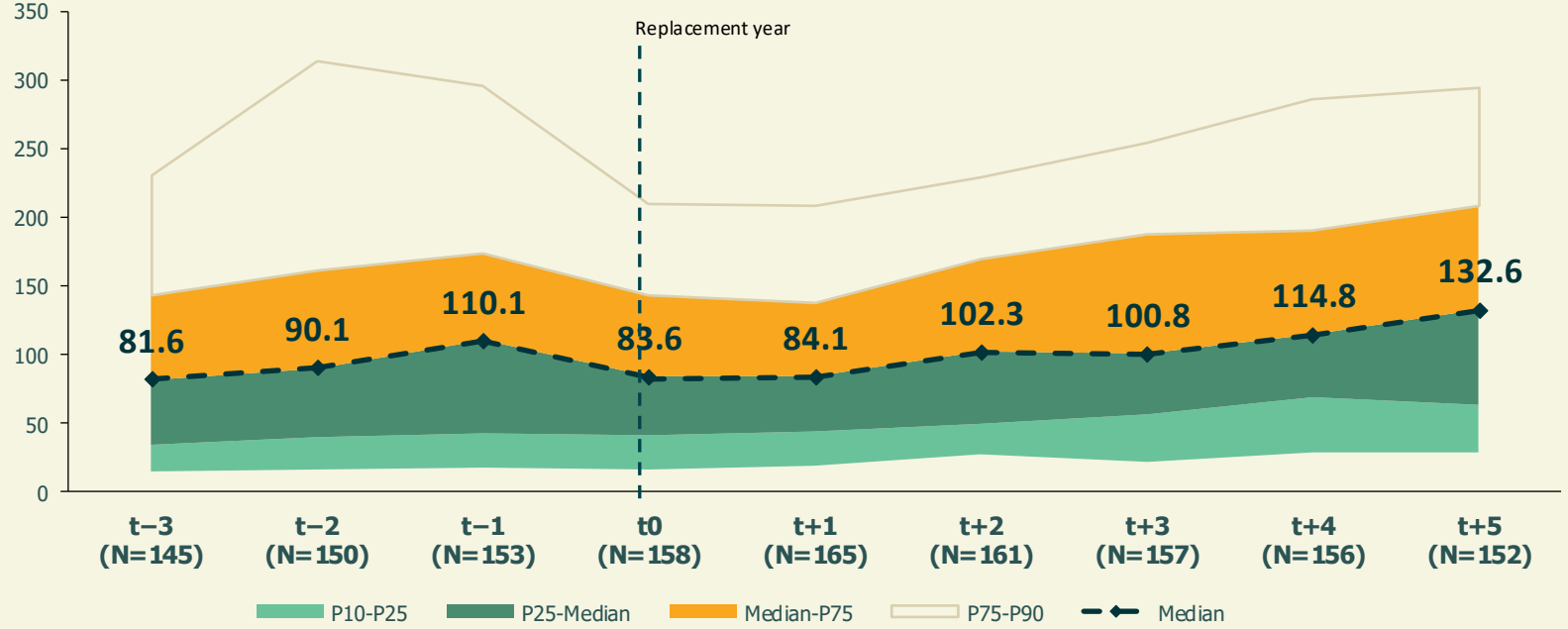
Poll Question

What value does a facility replacement, renovation, or expansion create for employee recruitment and retention?

Days Cash on Hand

CASH ON HAND VALUES BY YEAR

Median days cash on hand climb from about 82 days before replacement to a peak of 110 days at t−1, dip to a trough of 84 days at t+1 as hospitals deploy cash for the project, then rebuild to 101 days by t+3 and 133 days by t+5. Liquidity fully recovers and exceeds pre-replacement levels.



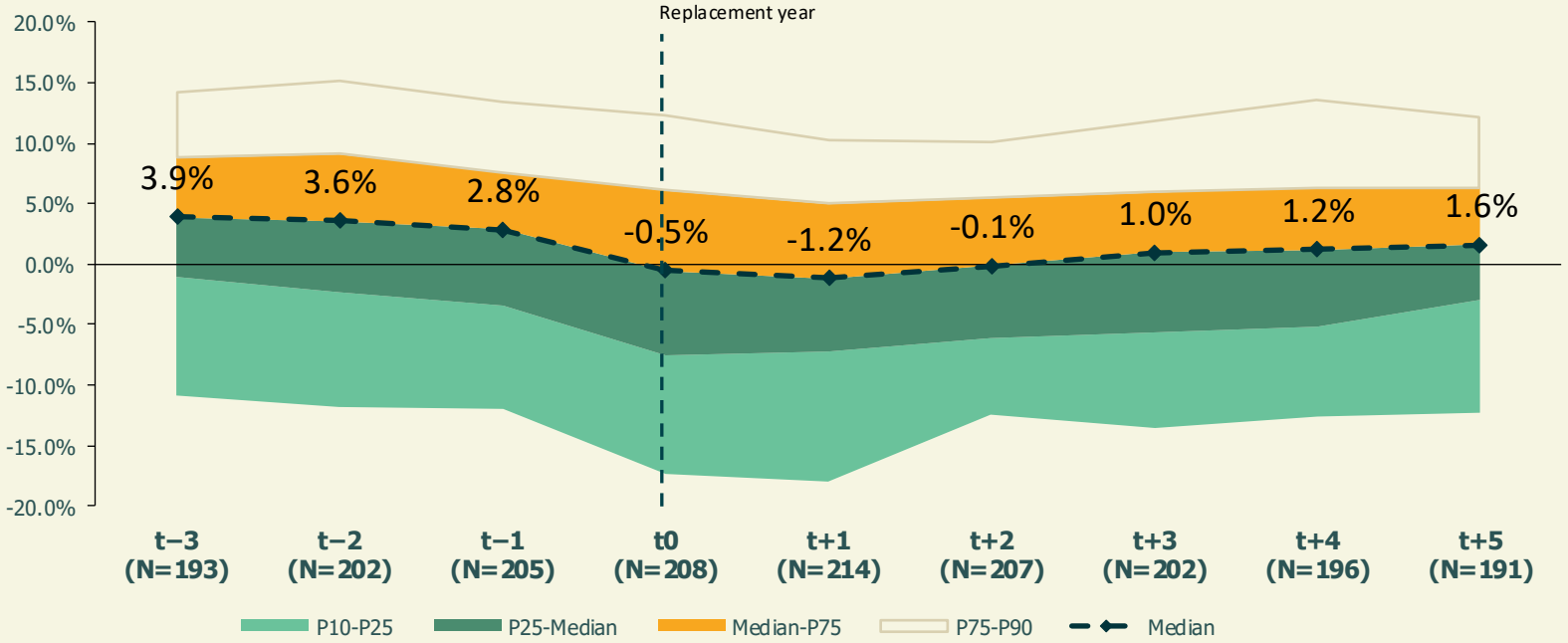
Note: the metric excludes 36.4% of hospital-year observations, above the study's 25% threshold for data reliability. Interpret with caution.

Source: CMS-2552 Cost Reports, FY 2000–2025 | Stroudwater Capital Partners and Stroudwater Associates

Operating Margin

OPERATING MARGIN VALUES BY YEAR

Operating margin erodes from 3.9% at t−3 to −0.5% at t0, bottoms at −1.2% in t+1, and recovers to 1.6% by t+5.

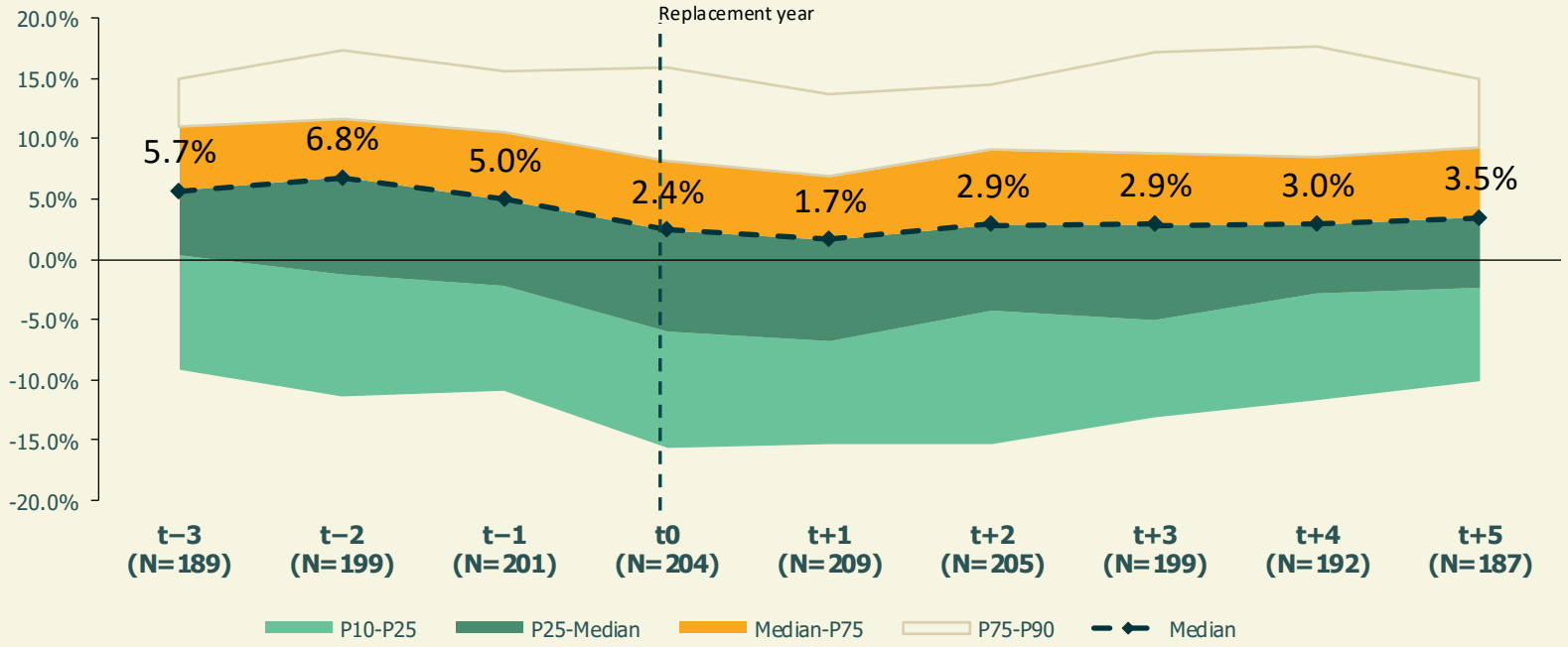


Source: CMS-2552 Cost Reports, FY 2000–2025 | Stroudwater Capital Partners and Stroudwater Associates

EBITDA Margin Less Debt Service %

EBITDA MARGIN LESS DEBT SERVICE VALUES BY YEAR

Median EBITDA less debt service bottoms at 1.7% at t+1 and otherwise runs 2.4%–3.5% from t0 through t+5, confirming that cash flow covers debt service even during the margin trough.

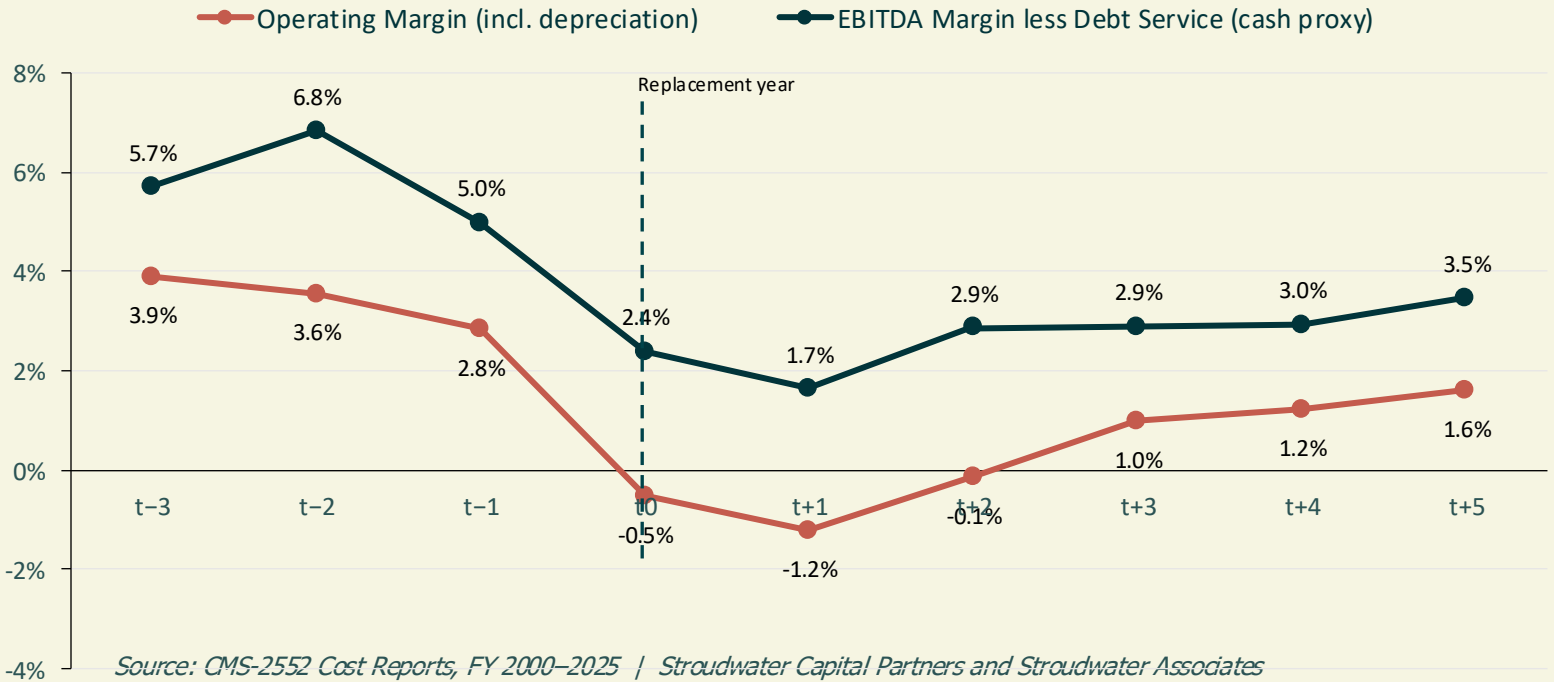


Source: CMS-2552 Cost Reports, FY 2000–2025 | Stroudwater Capital Partners and Stroudwater Associates

Cash Flow Stays Positive Through Replacement

OPERATING MARGIN VS. EBITDA MARGIN LESS DEBT SERVICE: MEDIAN % BY YEAR

Operating margin (including depreciation) turns negative at t0 and bottoms at −1.2% in t+1. EBITDA margin less debt service, the truest cash proxy, stays positive throughout despite higher debt costs, bottoming at 1.7% and recovering to 3.5% by t+5. Operations cover debt service and generate free cash flow even as accounting margins dip temporarily.



Source: CMS-2552 Cost Reports, FY 2000–2025 | Stroudwater Capital Partners and Stroudwater Associates

The Three Legs of the Stool: CAH Paths to Sustainability

Volume, expenses, and payment — the three legs of any hospital's financial stool. **— Eric Shell**

01 VOLUME

Volume loss is catastrophic.

Fixed costs run **91–95% of total costs** at the most rural CAHs (RUPRI, 2023). More patients spread that base over more units. **Instead:**

- Grow swing bed days
- Expand outpatient services
- Support primary care

02 EXPENSES

Cuts alone are a losing strategy.

Every $1 cut takes **~$0.40 of Medicare** with it — cut, lose reimbursement, cut again. **Instead:**

- Control overhead efficiency
- Invest in volume-enabling capital
- Prioritize growth over cuts

03 PAYMENT

The reimbursement bar is low.

The inverse of 91–95% fixed: variable cost is just **~7%**, so any third-party dollar amount above that is margin-positive (RUPRI, 2023). **So:**

- Keep charge master current
- Optimize payer contracts
- "One more patient" focus

Sources: Shell, E. — Cost Report for Decision Makers, Stroudwater Associates
Mueller et al., "Policy Implications of Fixed-to-Total-Cost Ratio Variation Across Rural and Urban Hospitals," J Rural Health, 2023 (RUPRI Center)

Case study

Rio Grande Hospital | Del Norte, Colorado

Rio Grande Hospital and Wellness Center

Del Norte, Colorado

“Empowering individuals and our community to embrace holistic health and wellness through innovative programs, collaborative partnerships, and compassionate care.”

REPLACEMENT CAMPUS

- 2004 — Initial replacement facility completed
- 2010 — Clinic building added
- 2017 — Outpatient expansion

WELLNESS CENTER

- 2018–19 — Planning discussions begin
- 2023 — Groundbreaking (July), after COVID-19 delays
- 2024 — Opened June

★ **Named a 2025 Top 20 Critical Access Hospital — Chartis Rural Hospital Performance INDEX™**

From Crisis to Anchor: The Investment Timeline

~$42M across four federal capital programs over 29 years, each phase sized to organizational readiness

1996
CAH

Reopen
Reopens as RGH via CAH pilot in 14,910 sq ft; 33 FTEs

2004
$12M

Replacement
First CAH to use HUD 242; new 30,761 sq ft facility (+106%)

2014
$20.5M

Expansion
USDA Community Facilities loan; campus grows to 49,000+ sq ft

2025
$9M

Wellness
NMTC funds Blue Zone wellness center and on-site staff housing

29 years after reopening, Rio Grande Hospital is thriving.

Volume grew 6.1×; revenue grew 24×; cost per unit only 2.2×.

Sources: CMS-2552 cost reports (FY 1996–2024); OFN Breakout Session RGH Case Study (2025); HUD FHA 242 program records.

Case Study: 29 Years of Growth & Impact

RGH proves the Three Legs work — when capital creates the capacity for volume to follow.

Volume

Capacity unlocked growth. 6.1× volume (10,960 → 53,936 units) as each new building filled with new services.

Expenses

Dilution did the work. Cost per unit grew only 2.2× against 6.1× volume — that gap is the margin.

Payment

CAH made it possible. Revenue grew 24× to $38.7M; total margin reached 9.7%.

Four capital events, one repeating pattern: build capacity → costs spike first → volume catches up → margin recovers.
The strategy in a nutshell: rinse, wash, repeat.

Sources: OFN Breakout Session RGH Case Study (2025); CMS-2552 cost reports (FY 1996–2024); U.S. Census QuickFacts; DataUSA Rio Grande County.

The Compounding Return on Capital

Rio Grande Hospital | FY 1996 (Reopening) vs. FY 2024 (Most Recent) | 29-Year Transformation

VOLUME — Capacity unlocked growth				
Combined Volume	8,797	→	**53,936**	6.1×
FTEs	33	→	**144**	4.4×
EXPENSES — Dilution did the work				
Cost per Unit	$281	→	**~$618**	2.2× only
PAYMENT — CAH made it possible				
Total Revenue	$1.6M	→	**$38.7M**	24.2×
Total Margin	–0.45%	→	**9.7%**	+10.1 pp

"Every incremental unit of service helps dilute fixed costs." — Eric Shell

Sources: CMS-2552 cost reports (FY 1996–2024); Shell/RUPRI CAH Framework (Barker et al. 2023).

The Directory

Interactive Peer-Matching Tool | Live Demonstration

Live Demo: CAH Replacement Directory

LIVE TABLEAU DEMONSTRATION

Switch to browser for interactive directory walkthrough

- Filter by state, net patient revenue, community population
- Highlight individual facility against matched peers
- Show pre/post financial trajectory for selected hospital

Free access: stroudwatercapital.us/directory

LIVE TABLEAU DEMONSTRATION

Peer comparison and board-ready report generation

- Enter your hospital's profile: bed count, NPR, state, community size
- See matched replacement peers with financial overlay
- Closure-to-replacement data connection
- Download PDF report for your board in under 5 minutes

Actions and Next Steps

Capital Success Playbook

A Framework for Capital Planning

Stroudwater's S.C.O.P.E. Method

S

C

O

P

E

01 Strategize
Align project to mission and debt capacity

02 Conceptualize
Translate data into design alternatives

03 Optimize
Pressure-test financial scenarios

04 Prove
Build the board-ready business case

05 Execute
Own the outcome with clear milestones

Whether you're considering replacement, renovation, or expansion, the S.C.O.P.E. framework provides a structured path from evidence to action.

Thank You!

Brian Haapala
bhaapala@stroudwatercapital.us

Jolene Robichaud
jrobichaud@stroudwatercapital.us

Keith Bubblo
kbubblo@stroudwater.com

Free Directory Access: stroudwatercapital.us/directory

SECTION

Appendix

Supporting detail and methodology

IN THIS SECTION

About the Study Authors

Stroudwater Associates and Stroudwater Capital Partners

Eric K. Shell, MBA

CHAIRMAN, STROUDWATER ASSOCIATES

For more than 30 years, Eric has helped hundreds of rural health systems improve financial and operational performance and move from fee-for-service to value-based payment. He speaks frequently at national rural health conferences and has helped design rural performance-improvement programs and demonstration payment models.

BACKGROUND & AFFILIATIONS

MBA (Beta Gamma Sigma), Simon School, University of Rochester
BS Accounting, Pennsylvania State University
NRHA Rural Health Congress & Governmental Affairs Committee
Federal Office of Rural Health Policy, Rural Hospital Issues Group
Member, AICPA

Brian Haapala, MHSA

PRESIDENT & CEO, CAPITAL PARTNERS

Brian leads Stroudwater Capital Partners with a mission to close the capital gap in rural healthcare. Over 30 years as a trusted advisor and investment banker, he has directly contributed to planning and financing more than $1.5 billion in rural healthcare projects. This work has expanded access, modernized facilities, and enabled critical services in underserved communities.

BACKGROUND & AFFILIATIONS

MHSA, University of Michigan
BA English, Albion College
Member, Rural Health Capital Council
30 years as trusted advisor & investment banker
$1.5B+ in rural healthcare projects financed

Data Quality Screening: Eight Flags

APPENDIX · DATA QUALITY SCREENING

Each hospital is checked against a set of rules on every measure. 16 hospitals with broken data are dropped from every measure; the remaining flags are calculated automatically from the raw numbers.

Flag	Rule	Scope	N
COLLAPSE	Hospital closed, changed ID numbers, or lost more than 90% of its volume	All 12 metrics	**16**
TRAJECTORY_JUMP	Adjustment Factor jumped more than 40% in a single year	Adj. Factor	**52**
UPSTREAM	Automatically applied when Adjustment Factor was flagged (since APD depends on it)	APD, FTE/APD	**52 each**
VOLATILE	Average yearly swing above 500 points, with 2+ years swinging over 200	Margin + coverage tabs	**20–38**
EXTREME_LOW	Margin dropped below −100% (losses bigger than total revenue)	Op Margin, EBITDA, EBITDA−DS	**3–9**
HIGH	Cash reserves above 500 days of operating expense	Days Cash on Hand	**40**
ZERO	Cash reserves between 0 and 1 day	Days Cash on Hand	**19**
NEG	Cash reserves reported as negative	Days Cash on Hand	**21**

A hospital can only get one flag per measure. Cutoff values were chosen so only the most extreme 5% of cases get flagged. Starting 2026-06-10, flagged hospitals are left out of medians and counts but still shown in the data for review.

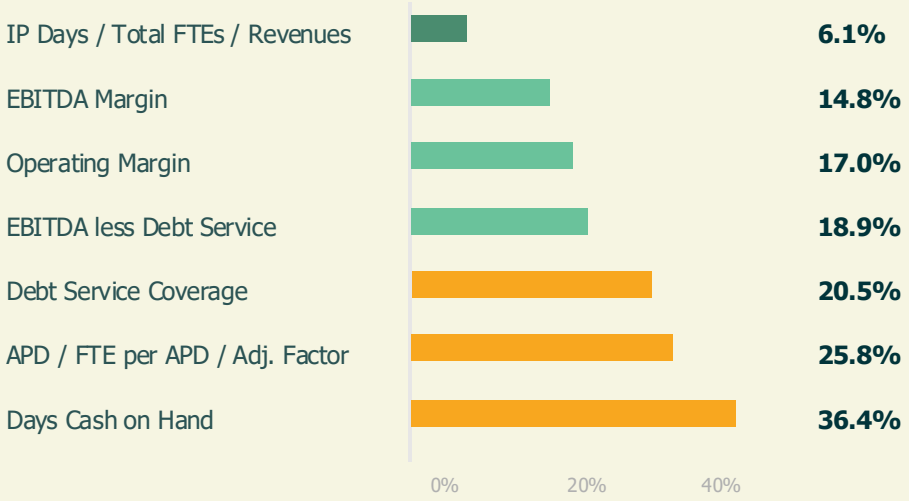
Source: CMS-2552 Cost Reports, FY 2000–2025 | Stroudwater Capital Partners and Stroudwater Associates

Exclusion Rates by Metric & Reproducibility

APPENDIX · DATA QUALITY SCREENING

Volume and revenue measures keep nearly all 264 hospitals. Financial ratios and Days Cash on Hand drop more. When more than 25% of hospitals are dropped, readers should ask whether the remaining sample still represents the group.

EXCLUSION RATE BY METRIC



REPRODUCIBILITY

Anyone can rebuild the flags from the raw data.

- Rules run in a fixed order. COLLAPSE is applied first and always wins.
- Counts match the workbook exactly: 16 COLLAPSE, 52 TRAJECTORY_JUMP, 40 HIGH, and so on.
- Only the 16 COLLAPSE cases use analyst judgment. Every other flag comes straight from the numbers.
- Full step-by-step guide and Tableau formulas are in the audit trail workbook.

Source: CMS-2552 Cost Reports, FY 2000–2025 | Stroudwater Capital Partners and Stroudwater Associates

Comparison Cohort Methodology

APPENDIX · METHODOLOGY

Matched observational study supporting causal interpretation of replacement effects.

Design. Matched observational study with difference-in-differences (DiD) estimation across event time TTR −4 through +5.

Treated cohort. 232 Critical Access Hospitals (CAHs) that replaced facilities between 2002 and 2021. Restricted from the 264-hospital universe to the 2002–2021 window (full TTR −4 to +5 event time) with complete baseline covariates.

Donor pool. 946 non-replacement CAHs from the CAHMPAS universe, after a capital-event filter excluded 124 donors whose accumulated depreciation grew by more than 50 percent in a single year.

Matching. 1:2 nearest-neighbor propensity score matching, without replacement, caliper of 0.2 standard deviations of the logit propensity score.

Match quality. All 12 standardized mean differences post-match fall at or below 0.10.

Baseline covariates (seven). Average daily census (acute), Census region, RUCA category, payer mix (Medicare percent, Medicaid percent), operating margin, days cash on hand, and adjusted patient days. Each averaged across the three pre-event years.

Primary estimator. Two-way fixed effects event-study regression with hospital and year fixed effects, standard errors clustered at the hospital level.

Robustness estimator. Callaway-Sant'Anna (2021) staggered difference-in-differences.

Sensitivity. 1:1 match re-run, alternate pseudo-event seed, and exclusion of the two 1:1-only matched pairs.

Companion workbook: CAH_Replacement_Comparison_Cohort_20260422.xlsx

Findings: What Survives Matched Comparison

APPENDIX · FINDINGS

Comparing replacement hospitals against matched peers separates real replacement effects from broader industry trends. Three apparent gains disappear; four effects come into sharper focus.

Metric	Before vs. after, replacement hospitals only	Replacement effect vs. matched peers, year 5	What it really tells you
Adjusted patient days	+2,122 patient-day-equivalents	+220 (not significant)	No real change — peers grew the same amount.
EBITDA margin	+3.66 percentage points	−0.96 pp (not significant)	No real change — sector-wide margin lift, not from replacement.
Days cash on hand	+8.3 days	+0.5 days (not significant)	No real change — liquidity gain matched what peers achieved.
Operating margin	improving trajectory	−4.29 pp ($p = 0.005$)	Real drop of ~4 pp from replacement (1-in-200 chance of luck).
EBITDA less debt service	improving trajectory	−6.11 pp ($p = 0.004$)	Real ~6 pp shortfall after debt service (1-in-250 chance of luck).
Inpatient revenues	rising	+$1.99M ($p < 0.001$)	Real $2M lift in inpatient revenue (less than 1-in-1,000 chance of luck).
Gross patient revenues	rising	+$5.58M ($p = 0.014$)	Real $5.6M top-line lift (about 1-in-70 chance of luck).

Replacement reliably grows revenue, but debt service on the new facility outpaces the gain — the loan payment, not operations, drives the margin compression.

Limitations

APPENDIX · LIMITATIONS

What the study supports and what it does not.

Selection on unobservables. Matching balanced the two groups on seven observable covariates. It did not balance them on leadership quality, board sophistication, community political support, or access to non-cost-report financing channels. Matching narrows, but does not close, the causal gap.

Capital-event filter is proxy-based. Net property, plant, and equipment was not available in the session extract. The filter used a 50 percent year-over-year accumulated depreciation growth rule as a proxy. 124 donors excluded.

CCN-chain reconstruction is partial. Four medium-confidence CCN-change candidate pairs surfaced via name-and-address matching; no merges forced. A CMS PECOS or HCRIS Provider Chain Report crosswalk would close this gap.

Donor pool not subjected to the eight-flag taxonomy. The taxonomy was developed for the 264 treated hospitals. Applying it symmetrically to the donor panel is a reasonable future refinement.

Debt Service Coverage Ratio excluded from the DiD narrative. The ratio is too skewed and too flagged for stable inference. The 95 percent confidence interval at year five spans approximately plus or minus 1,500.

External validity. Findings generalize to US Critical Access Hospitals that replaced facilities between 2002 and 2021. They do not extrapolate to non-CAH rural hospitals, replacements outside that window, or non-US contexts.

Full detail: CAH_Replacement_Comparison_Cohort_Limitations_Memo_20260422_v2.docx

Multiple-Comparison Note: Operating Models

APPENDIX · STATISTICAL NOTE

Interpreting the system vs. independent significance tests on slide 19.

Slide 19 reports significance tests across multiple financial metrics comparing system-affiliated CAHs to independent CAHs. No multiple-comparison correction was applied. With 27 tests at alpha of 0.05, approximately one to two significant results are expected by chance alone.

- Four of 27 tests show significant differences between system and independent CAHs.
- Three of those four differences appear before replacement, indicating baseline selection rather than post-replacement operating effects.
- The correct interpretation: operating model does not appear to predict systematically different post-replacement outcomes across the metrics tested.
- Establishing equivalence requires a formal equivalence test with pre-specified bounds, not a null result.

Reference: slide 19 (Operating Models analysis).