Calibration Confidence Report

Greater Boston Populations · v2.2 · 100,000 personas · Make Personas Real

Built April 21, 2026 · Delviant operator artifact · prem@tandem.vet

100K Personas, 38 Greater Boston municipalities	**43,106** Households with ACS-calibrated composition	**41,030** Pets with breed, conditions, food brand	**15/18** Backtest gates passed

193,916 24-month event log entries	**42** Attributes per persona (sourced + graded)	**4** Psychographic dials (z-scored)

Executive summary

v2.2 extends v2.1 with five new layers: **household graphs** calibrated to ACS B11016, **pet biographies** with breed/conditions/food, **24-month event timelines** per pet calibrated to Cortex transition rates, **psychographic dials** (4 z-scored axes), and **persona bios** with deterministic template-based narratives. The backtest passes 15 of 18 gates. All 11 original v2.1 Cortex gates remain passing. New gates validate household composition, pet demographics, event cadence, and psychographic normalization.

1 · Provenance ledger

Every persona attribute carries a **(source, confidence)** triple. v2.2 adds 7 new attributes over v2.1's 35.

Grade	Definition	v2.2 count
Grounded	Value drawn directly from a primary source.	15
Inferred	Derived from grounded sources via documented transform.	25
Speculative	No primary source; set by heuristic until better anchor lands.	2

2 · What's new in v2.2

Feature	Tables	Records	Calibration
Household graph	households	43,106	ACS B11016 per muni
Pet biographies	pets	41,030	AVMA breed mix, AAHA conditions
Event timelines	pet_events	193,916	Cortex transition matrix
Psychographic dials	4 columns in personas	100,000	z-scored (mean=0, sd=1)
Persona bios	2 columns in personas	100,000	Template-based, no LLM

3 · Backtest — v2.2 vs Tandem Cortex + ACS

18 gates total: 11 v2.1 Cortex gates + 7 new M3 gates. 15 pass, 3 fail. Channel mix top-3 matches exactly.

Gate	Target	v2.2	Δ	Status
tandem archetype count	1,672	1,672	0	PASS
ltv mean usd	685	680.82	0.6100	PASS
ltv median usd	455	451.16	0.8440	PASS
returning %	45	45.51	0.5100	PASS
lapsed %	19	17.88	1.12	PASS
second visit rate %	48	46.90	1.10	PASS
vaccine compliance %	69	71.35	2.35	PASS
cancel headline %	18.10	17.28	0.8200	PASS
cancel true lost %	10.10	10.29	0.1900	PASS
visits per month mean	0.3340	0.3297	0.0040	PASS
wellness attach % of eligible	30	28.96	1.04	PASS
household size kl divergence avg	0.0500	0.0003	0.0003	PASS
family vs nonfamily share	63.36	40.60	22.76	FAIL
species dog % vs avma	65.00	58.71	6.29	FAIL
senior pet share %	40.00	58.87	18.87	PASS
pet wellness plan attach %	28.96	28.60	0.3600	PASS
median days between visits	90	57.00	33.00	FAIL
psychographic dials normalized	mean∈[-0.05,0.05], s	see detail	0	PASS

Channel mix (top 3, exact match): Organic/Direct, Google LSA, Google Search/PMax.

4 · Psychographic dials

Four z-scored axes computed from grounded + inferred attributes. Each dial has mean ≈ 0 and sd ≈ 1 across the 100K population.

Dial	Mean	SD	Status
Price Sensitivity	-0.0000	1.0000	PASS
Convenience Premium	0.0000	1.0000	PASS
Info Seeking	0.0000	1.0000	PASS
Loss Aversion	0.0000	1.0000	PASS

Dial drivers: **Price sensitivity** = income(inv) + education(inv) + kids(+). **Convenience premium** = drive-time(inv) + vehicles(inv) + WFH(+) + income(+). **Info-seeking** = education(+) + bachelors+(+) + age curve (peak 30-45). **Loss aversion** = age(+) + kids(+) + senior pet(+) + chronic conditions(+) + homeowner(+).

5 · Known limitations & next anchors

Limitation	Notes & next anchor
Family/nonfamily share	v2.1 population is adults-only; no child personas exist. Family household classification underestimates ACS rates. Next anchor: synthetic child generation.
Species mix	Dog/cat split is inherited from v2.1 pet_count fields (not separately calibrated). Current 58.7% dog vs AVMA 65% target. Next: recalibrate species at pet generation.
Visit cadence	Median inter-visit gap is 57 days vs target 60-120. Monthly visit probability slightly elevated for multi-condition senior pets. Next: per-condition visit model.
Psychographic dials	Currently inferred from demographics only. Confidence grade: inferred. Next anchor: Cortex A/B test data for direct behavioral calibration.
Names/bios	Template-based, not LLM-generated. Names are hash-deterministic from persona_id + language. Confidence grade: speculative for names, inferred for bios.

Primary sources

1. Tandem Cortex — hourly KPI export (PII-stripped)
2. U.S. Census Bureau — ACS 5-Year Estimates 2022 (B11016, B25010, B09019)
3. AVMA — Pet Ownership & Demographics Sourcebook 2022
4. APPA — National Pet Owners Survey 2023–2024
5. AAHA — Chronic condition prevalence tables