

INDUSTRIAL PATTERNS

Reference Editions

Add-On Density Atlas

An annual atlas of US county geography

Module 3 · 2023 Edition

HVAC & Plumbing

Services and Distribution

United States · Peer set of 3 NAICS codes · 238220 + 423720 + 423730

2023 Edition

First HVAC and plumbing atlas · CBP 2023 cross-section

Edition lock date: 11 June 2026

Drift windows: 2019–2023 (five years) and 2021–2023 (three years)

SOURCES

U.S. Census Bureau — County Business Patterns 2019, 2020, 2021, 2022, 2023

Establishment counts by county and 6-digit NAICS

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SAMPLE · FREE PREVIEW

About this sample

This document is a free preview of HVAC & Plumbing Add-On Density Atlas — 2023 Edition, the inaugural Add-On Density Atlas edition for the US plumbing, heating, and air-conditioning services-and-distribution complex. It contains the front matter, the methodology summary, one headline mapping section (§1 Contractor Density — the national footprint and dispersion structure of the contractor industry), and the limitations section. The full edition runs approximately 17 pages and contains six mapping sections: contractor density (238220), hydronics distribution density (423720), warm-air distribution density (423730), dispersion and regional footprint, drift at five- and three-year horizons, and a trade-versus-channel cross-layer.

The atlas is anchored to U.S. Census County Business Patterns 2023 — the most recent CBP release — with a comparable-cell drift panel covering 2019–2023 for the structural trend and 2021–2023 for recent movement. Edition lock date is 11 June 2026; figures are not revised within an edition.

Edition

HVAC & Plumbing Add-On Density Atlas · 2023 Edition
Industrial Patterns Module 3

Edition lock date

11 June 2026

Cross-section: CBP 2023. Drift windows: 2019–2023 and 2021–2023.

Peer set

3 six-digit NAICS codes · 238220 + 423720 + 423730
Contractor + hydronics wholesale + warm-air wholesale.

Publisher

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ADD-ON DENSITY ATLAS · 2023 EDITION

Add-On Density Atlas is an annual reference that maps where the establishment universe of each peer-set NAICS code sits across the United States, and how that footprint has drifted over the trailing five years and the trailing three. It is the spatial complement to Operating Benchmarks (which describes the distribution of operating outcomes) and Industry Structure Reference (which describes the structural context). Together the three modules answer how a peer set performs, how it is structured, and where it is. Add-On Density Atlas describes where the universe of establishments sits. It does not measure market quality, demand, saturation, or opportunity, and is not site-selection, market-entry, or acquisition advice.

Contents

Front matter — How to read this atlas	●
Scope, method, and the edition model	●
1. Contractor density (national footprint, dispersion structure)	●
2. Hydronics distribution density	○
3. Warm-air distribution density	○
4. Dispersion and regional footprint	○
5. Drift — five years and three	○
6. Trade vs channel	○
7. Methodology appendix	●
8. Glossary	○
9. Limitations and closing	●
Terms of sale and licensing	○

● Section included in this sample. ○ Section in the full edition only.

How to Read This Atlas

This atlas maps where the HVAC & plumbing services-and-distribution universe physically sits: establishment counts by county for one contractor industry and two distribution industries, a drift layer showing how that geography moved over five years and over three, and a cross-layer relating trade density to channel density. The subject is geography; the audience is anyone who needs a stable, neutral picture of where the establishment base is, separate from claims about market quality or opportunity.

Each section presents its subject three ways — a map, a data table, and written narration — carrying the same figures. The mapped unit is the establishment (a physical location): firm-level data stops at the state line, so county geography is necessarily establishment-based. Establishment counts in the maps reflect Census County Business Patterns disclosure: counties below the publication threshold (three establishments) are absent rather than zero, and the share denominators in this atlas refer to published county establishments rather than to the national total — the distinction matters at code level for the smaller industries.

Atlas editions are annual

Each edition is a full current-year cross-section plus a trailing drift window, reported at two horizons so recent movement can be read against the structural trend. The 2023 Edition is anchored to County Business Patterns 2023 — the most recent CBP release — with the drift panel covering 2019–2023 for the five-year structural trend and 2021–2023 for recent movement. Both windows are computed on the same comparable-cell panel (county × industry cells published in every year of the window), so threshold crossings are never read as real change. The panel holds 96 to 98 percent of establishment volume across the three industries.

What this atlas does not say, by design

Density describes where the universe sits. It is not a measure of market quality, demand, saturation, or opportunity, and the atlas draws no such conclusions. Nothing in this atlas is site-selection, market-entry, or acquisition advice. The atlas does not score counties, characterize geographies as attractive, or rank markets. Interpretive observations identify where the geography bears on commonly underwritten theses; they are descriptions of the data, not recommendations to act.

Scope, method, and the edition model

Scope

The atlas describes the three NAICS codes that comprise the named complex: plumbing, heating, and air-conditioning contractors (NAICS 238220); plumbing and heating equipment and supplies wholesalers, the hydronics side (423720); and warm-air heating and air-conditioning equipment and supplies wholesalers (423730). Each industry maps at the finest tier — county by exact six-digit code. County coverage runs 87 to 99 percent of national establishments. The contractor side appears in 2,474 of 3,143 U.S. county equivalents; the two distribution industries in 537 and 507 counties respectively.

Density and coverage conventions

Every county share printed in the atlas is a share of published county establishments — not of the U.S. total. Coverage (the gap between published county establishments and the U.S. total) is reported per code and is the volume below CBP's publication threshold; that volume is visible at state level in the companion Industry Structure Reference. The governance floor of 0.55 used across Industrial Patterns atlases is retained and disclosed as non-binding for this peer set — coverage is high enough that the floor never binds.

Drift methodology

The drift layer is computed on the comparable-cell panel: county-by-industry cells published in every year of the window. Cells that flicker in and out at the disclosure threshold are excluded so threshold crossings are never read as real change. The 2023 Edition reports drift at two horizons on the same panel: a five-year window (2019–2023) for the structural trend and a three-year window (2021–2023) for recent movement. Where the two diverge — for example, where five-year drift is positive and three-year drift is negative — the divergence is a structural fact about the period, reported as such.

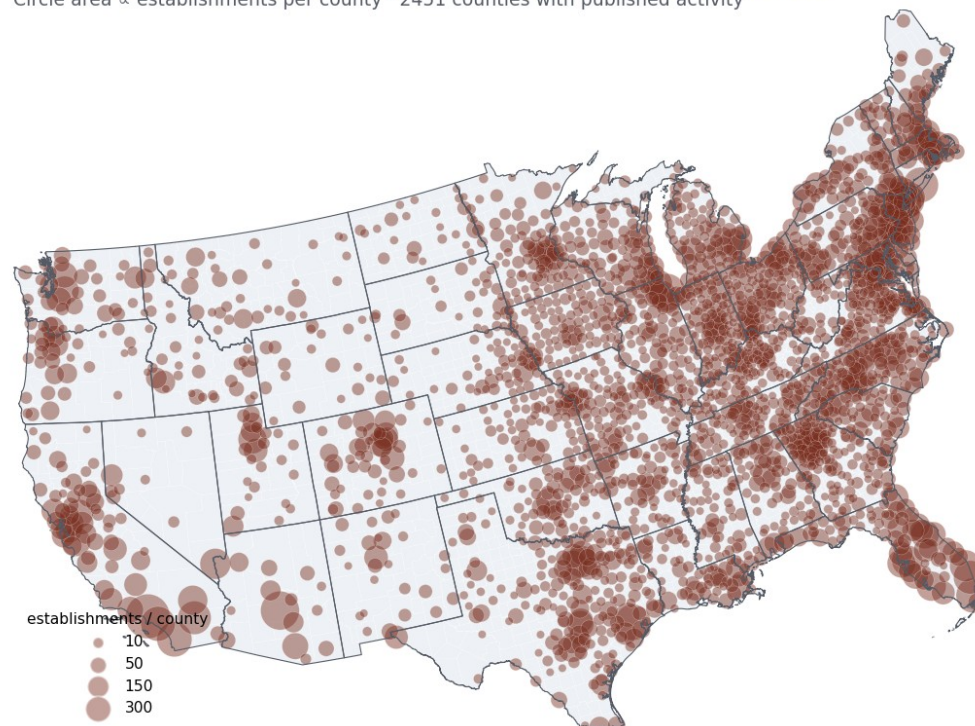
1 · Contractor Density

A trade that exists essentially everywhere people live

This section maps the national establishment footprint of plumbing, heating, and air-conditioning contractors (NAICS 238220) by county at the 2023 Census County Business Patterns vintage, and reports the dispersion structure that the map describes. The map shows each county with at least three contractor establishments — the disclosure threshold; counties below the threshold are absent rather than zero, enumerated in the methodology.

Plumbing & HVAC contractors — establishment density, 2023. Circle area is proportional to establishments per county across the 2,451 counties with published contractor activity.

Plumbing & HVAC contractors — establishment density, 2023
Circle area $\propto$ establishments per county · 2,451 counties with published activity



Source: U.S. Census Bureau, County Business Patterns 2023 (establishment counts, exact). Add-On Density Atlas · HVAC & Plumbing · Industrial Patterns.

Observations

- Contractors publish in 2,474 of 3,143 U.S. county equivalents (2021 boundaries) — this trade exists essentially everywhere people live. The ten densest counties

hold just 11.8 percent of published establishments; the geographic Herfindahl-Hirschman index of 0.0031 sits about eight times the uniform-spread floor of 0.0004 ($1 \div 2,474$), indicating mild concentration relative to perfect dispersion but very low concentration in any absolute sense.

- Los Angeles County leads at 2,765 establishments — more than most states — yet holds only 2.5 percent of the published county footprint. No county dominates the trade; the largest single-county share is the same order of magnitude as the largest single-state share reported in the Industry Structure Reference.

- For an acquirer, dispersion of this depth means the add-on universe is local everywhere: density maps describe how many targets share a market, not where the only markets are. The atlas reports the geography; it does not rank counties or characterize any geography as attractive.

- Coverage in this section is 99 percent: about one contractor establishment in a hundred sits in a county below CBP's publication threshold. That residual is visible at state level in the companion Industry Structure Reference (§7), but cannot be placed in the map at county resolution.

Interpretation boundary

Establishments are locations, not firms: a platform's branches and an independent's single shop count identically. Ownership geography is invisible to this source; firm structure lives in the companion Industry Structure Reference. The dispersion measure is geographic, not competitive — a county with many contractor establishments may host a competitive local market, a consolidated one, or anything in between; the atlas does not claim to know which without the firm-level data the Industry Structure Reference provides.

Methodology appendix (excerpt)

§7.1 Source and vintage

County Business Patterns 2023, U.S. Census Bureau — the establishment-count series at county and six-digit NAICS detail. CBP is the freshest leg of the federal data stack used across Industrial Patterns: it publishes annually, typically within eighteen months of the reference year. Edition lock date: 11 June 2026. The next edition follows CBP 2024's release (expected summer 2026).

§7.2 Disclosure threshold and absent cells

CBP publishes county cells at three or more establishments. Counties with one or two establishments are absent rather than zero; the atlas does not infer establishments into absent cells. Coverage (published county establishments as a share of the U.S. total) is reported per code at every exhibit and is 87 to 99 percent across the three industries. The residual sits in counties below the publication threshold and is visible at state level in the companion Industry Structure Reference.

§7.3 The comparable-cell drift panel

Drift is computed on a panel of county-by-industry cells that publish in every year of the window. Cells that flicker across the disclosure threshold within the window are excluded so threshold crossings are never read as real change. The panel holds 96 to 98 percent of establishment volume across the three industries. Drift at five-year (2019–2023) and three-year (2021–2023) horizons is computed on the same panel, so the two horizons are directly comparable.

Methodology appendix (continued)

§7.4 NAICS basis and geographic continuity

One NAICS basis (2017) spans the entire 2019–2023 window — no crosswalks are required, and no boundary bridges are applied. County geography is stable through CBP 2023 (Connecticut's planning-region transition enters CBP at the 2024 vintage; the 2024 edition will handle that transition per the methodology row in the next release).

§7.5 What this atlas does and does not synthesize

No figure in this atlas is interpolated or allocated across counties. No external or proprietary dataset is layered onto CBP. The geographic Herfindahl-Hirschman index reported in each density section is computed from published shares; the uniform-spread floor (1 divided by the count of published counties) is the comparator. No site-quality scoring, demand modeling, or market-attractiveness inference enters the atlas.

§7.6 Reproducibility

Every figure in the atlas is generated from the same frozen build as the Data Companion, which carries an integrity manifest (SHA-256 of every file in the bundle). Locked edition files are never altered; errata, if any, are published at industrialpatterns.com/errata and noted in the next edition.

Limitations and closing

Establishments are locations, not firms: a platform's branches and an independent's single shop count identically. Ownership geography is invisible to this source; firm structure lives in the companion Industry Structure Reference. County cells below the publication threshold are absent rather than zero — an absent county may host up to two establishments of a code. Coverage is disclosed per code, and the drift panel excludes flickering cells for this reason.

Density describes where the universe sits. It is not a measure of market quality, demand, saturation, or opportunity, and this atlas draws no such conclusions. The next edition follows CBP 2024's release (expected summer 2026). Locked edition files are never altered; errata, if any, are published at industrialpatterns.com/errata.

THE FULL EDITION

HVAC & Plumbing Add-On Density Atlas

2023 Edition · Approximately 17 pages · Six mapping sections · 3 NAICS codes

The full edition contains all six mapping sections — contractor density (238220), hydronics distribution density (423720), warm-air distribution density (423730), dispersion and regional footprint, drift at five-year and three-year horizons on the comparable-cell panel, and the trade-versus-channel cross-layer that maps where distributor branches are present relative to contractor activity. A machine-readable Data Companion (workbook and CSV bundle) ships with the edition, carrying the complete county-by-county detail and an integrity manifest covering every file in the bundle.

Edition	Cross-section	Lock date	Price
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2023 (inaugural)	CBP 2023	11 June 2026	\$2,750
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Visit industrialpatterns.com/editions to purchase.

Each edition is delivered as a PDF together with a machine-readable Data Companion (workbook and CSV bundle). Same edition is provided to every reader; no customization is offered.