

Houston Land Value Tax: a parcel-level analysis

What if the City of Houston taxed land instead of buildings?

Houston LVT working draft

2026-04-25

Abstract

We estimate what would happen if the City of Houston replaced its current property tax with a revenue-neutral land value tax (LVT) on the City's tax year 2025 (TY2025) appraisal roll. At the City's adopted FY2026 rate of \$0.5192 per \$100 of taxable value, full-market property tax revenue from the 655,110 taxable parcels inside the City of Houston comes to \$2.06 billion. Solving for revenue neutrality on the same parcels yields an LVT rate of **\$1.31 per \$100 of land value** — about 2.5x the current rate. Under that switch, **53% of taxable parcels would pay less; 42% would pay more**. The bill on a median single-family home falls by 15.7% (\approx \$217); the bill on a typical in-city vacant lot rises by roughly 150% (\approx \$400 to \$1,000+). Surface lots and underutilized commercial parcels carry most of the new burden; high-rise condos and dense multifamily save the most. We use HCAD's reported land values directly (Texas's non-disclosure laws prevent a comp-based market model on public data), which makes the per-parcel results reported here *conservative*: the real LVT gap on surface lots and vacant land is almost certainly larger than what we show.

Executive summary

Solved revenue-neutral LVT rate	\$1.3098 / \$100 of land value
Multiple of current rate	2.52x
Taxable parcels in City of Houston	655,110
Off-roll (state-class X*)	30,303
Total uncapped current tax	\$2.058 B
Solved-for total LVT revenue	\$2.058 B (by construction)
Total land market value	\$157.1 B
Total improvement market value	\$239.3 B
Land share of taxable market value	39.6 %

Savers under LVT	349,383 (53.3 %)
Payers under LVT	274,754 (41.9 %)
Roughly unchanged ($ \Delta\% < 5\%$)	30,973 (4.7 %)

One-line policy story. A revenue-neutral land value tax would shift City of Houston property tax burden off improvements (homes, offices, factories) and onto land — most visibly onto surface parking lots and vacant in-city land, which today pay almost nothing relative to the value of the land they occupy.

This is a working draft. The map at <https://powerfundamental.com> shows the parcel-by-parcel results visually; this paper documents the methodology and limitations so readers can decide how much weight the headline numbers deserve.

1. Why study LVT for Houston

A land value tax bills you on the assessed value of your land but exempts any buildings, paving, and other improvements on it. The economic argument for LVT rests on a few standard claims:

1. **Land supply is fixed**, so a tax on land cannot be passed on to renters or shifted to consumers in the way taxes on labor, capital, or buildings can. The incidence falls on the landowner.
2. **Owners of underused land are penalized for holding it idle**, which creates a marginal incentive to sell, build, or improve. Surface parking and vacant lots in dense areas are the canonical examples.
3. **Improvements are no longer taxed**, which removes a small but real disincentive to renovate, expand, or build new housing.

Houston is an unusually instructive city to model. It has:

- No traditional zoning (most of the country's largest no-zoning city), so "what would happen if owners could freely build more" is less hypothetical than it would be in, say, San Francisco.
- A large stock of **surface parking** in the urban core — Downtown, Midtown, the Texas Medical Center, and the freeway frontage of every loop. Surface lots are the parcels for which LVT and current property tax diverge the most.
- A property-tax system loaded with **caps and exemptions** (homestead, over-65, disabled vet) that obscure the underlying market values. Stripping those caps to compare "full-market property tax" against "full-market LVT" isolates the policy effect of switching the *base* of the tax from "land + building" to "land only".
- A recent (TY2025) certified appraisal roll plus a published FY2026 tax rate, so we can anchor revenue neutrality against numbers the City itself publishes.

The point of the analysis is not to recommend that Houston adopt LVT — that question is partly empirical and partly political. It is to make the *distributional* consequences visible at the parcel level:

who pays more, who pays less, and by how much, on real Houston tax-roll data.

2. Scope and methodology decisions (locked in)

These were settled before the analysis ran and are documented here for transparency:

- **Geographic scope.** City of Houston only — a centroid-in-polygon filter against the official COH boundary published by the City's GIS division. We exclude unincorporated Harris County and other Harris County cities (Pasadena, Pearland, Sugar Land, etc.), even when they share appraisal-district infrastructure with Houston.
- **Tax jurisdiction.** City of Houston tax only. HISD, Harris County, MUDs, and other overlapping taxing units are out of scope; they have separate funding constraints and aren't policy levers the City controls.
- **LVT structure.** Pure LVT. No improvement tax, no progressive bands. We solve for the single uniform rate that yields the same total revenue from the same set of taxable parcels.
- **Caps and exemptions.** Stripped on **both sides** of the comparison. We apply no homestead exemption, no over-65 freeze, no disabled-vet exemption. HCAD publishes both market and capped values; we use market consistently. This isolates the LVT-vs.-property-tax effect from the separate question of whether to keep caps and exemptions. The capped/exempt-applied comparison is interesting but blends two policy effects.
- **Tax-exempt parcels.** Parcels whose HCAD `state_class` begins with "X" (X1 government, X2 charity, X3 religious, etc.) are excluded from both the revenue total and the per-parcel comparison. They are tracked separately as "off-roll" — see *Limitations*.
- **Land valuation source.** HCAD's reported `land_val` for every parcel. The original plan called for a comp-based hedonic regression on HCAD sales; Texas's status as a non-disclosure state makes this infeasible on public data (see §4).

3. Data sources

All data is public and free.

Source	Used for	Vintage
HCAD <code>Parcels.zip</code> (parcel polygons)	Geographic basis	2026-04-15 release

Source	Used for	Vintage
HCAD <code>real_acct.txt</code>	Per-parcel land value, building value, state class, neighborhood	TY2025 certified
HCAD <code>land.txt</code>	Per-parcel HCAD land-use code and supporting detail	TY2025 certified
HCAD <code>Code_description_real.zip</code>	State-class and land-use code dictionaries	TY2025
City of Houston Open Data Portal	Official COH boundary, super-neighborhoods, TIRZ, METRO Rail, Walkable Places, TOD, Major Thoroughfare	Latest
OpenStreetMap (Overpass API) <code>amenity=parking</code> polygons		2026-04
Microsoft USBuildingFootprints (Texas)	Building footprints for parking-area subtraction	2019–2020 ML extraction
FEMA NFHL ArcGIS REST	Flood hazard zones (informational; not used in tax math)	Current
TY25 Notice of Meeting to Vote on Tax Rate (COH)	Adopted FY2026 rate, certified TY2024→TY2025 levy	Adopted Oct 15 2025

The pipeline is fully reproducible from public sources; see §8.

For TY2025, HCAD published 1,538,086 parcel polygons across all of Harris County. After centroid-in-polygon filtering against the COH boundary we keep **685,413 parcels**. Of those, 681,711 (99.5 %) have a matching account-level record in `real_acct.txt`; the remaining 3,702 are mostly stacked-condo fragments and special-purpose accounts that don't carry an attribute record on their own.

4. Land valuation: the elephant in the room

A market-based parcel-level valuation model is the load-bearing technical step in any LVT analysis worth taking seriously. Our original plan — outlined in the project repository's `project_plan.md` — was a hedonic regression of land price as a function of parcel size, location (distance to downtown, METRO Rail stations, employment centers), submarket (super-neighborhood, target-encoded), policy overlays (TIRZ, Walkable Places, FEMA flood zones), shape (perimeter²/area compactness, corner-lot flag), and recent-sales adjacency, trained on land sales from HCAD's published `deeds.txt` and applied to every taxable parcel.

That plan does not survive contact with the data. **Texas is one of a small number of non-disclosure states:** parties to a real-estate transfer are not required to publish or report the price, and HCAD's public files do not include sale prices anywhere. deeds.txt records account number, date of sale, and clerk reference — but no consideration. Without sale prices we cannot fit a hedonic model on public data alone.

We considered three responses:

1. **Buy commercial sale data.** ATTOM, CoreLogic, and similar vendors maintain Texas sale records reconstructed from clerk consideration fields, private MLS data, and proprietary methods. Cost: ~\$5,000/year for a Harris County dataset, plus license restrictions on republishing. Not done.
2. **Apply a uniform multiplier from Texas Comptroller PTAD ratio studies.** The Comptroller publishes biennial sales-ratio audits per appraisal district. These let us scale HCAD's values toward market in the aggregate, anchored to the State's own audit methodology. Worthwhile follow-up; not done in v1.
3. **Use HCAD's reported land values directly.** Defensible, transparent, and what this paper does.

The mathematical consequence is that **our parcel-by-parcel LVT comparison is conservative on its headline finding.** HCAD's land valuations are widely understood to be biased low relative to market, particularly for vacant and underutilized parcels in appreciating submarkets — the agency's protest-driven defensible-appraisal incentive structure pushes against aggressive land-value updates. To the extent that HCAD systematically underestimates land relative to improvements, the ratio $\sum \text{land_val} / \sum \text{tot_mkt_val}$ we compute is too low, the solved LVT rate we report is too high, and the implied burden shift onto underutilized land is too small. The *real-world* gap between current property tax and a revenue-neutral LVT, on the kinds of parcels we identify as paying disproportionately more, is almost certainly larger than what this paper shows.

5. Tax-comparison methodology

For each taxable parcel (HCAD account inside the COH boundary, state class not starting with x):

```
improvement_market_value = bld_val + x_features_val
total_market_value        = land_val + improvement_market_value
current_tax_uncapped      = total_market_value * current_rate
```

with `current_rate = 0.0051919` (i.e. \$0.5192 per \$100), the City's adopted FY2026 rate.

Aggregating over the 655,110 taxable parcels:

```
total_current_revenue =  $\sum$  current_tax_uncapped = $2,057,949,599
total_land_value      =  $\sum$  land_val              = $157,124,671,507
```

$$\begin{aligned} \text{lvt_rate} &= \text{total_current_revenue} / \text{total_land_value} \\ &= 0.013098 = \$1.3098 / \$100 \end{aligned}$$

Per parcel:

$$\begin{aligned} \text{lvt_tax} &= \text{land_val} \times \text{lvt_rate} \\ \Delta &= \text{lvt_tax} - \text{current_tax_uncapped} \\ \Delta\% &= \Delta / \text{current_tax_uncapped} \end{aligned}$$

We tag each taxable parcel as a *saver* ($\Delta < 0$ and $|\Delta\%| \geq 5\%$), *payer* ($\Delta > 0$ and $\Delta\% \geq 5\%$), or *neutral* ($|\Delta\%| < 5\%$).

6. Results

6.1 Aggregate

The solved LVT rate of **\$1.3098 / \$100** is 2.52× the current rate. This is *below* the 4–8× rule-of-thumb band that LVT studies of US cities typically report. The reason is mechanical: that rule of thumb assumes land is 15–25 % of total taxable value, and HCAD’s appraisals put Houston’s land share at **39.6 %**.

There are two ways to read the high land share:

1. **Houston really does have a high land share** — rapid in-city land appreciation, a large surface-parking footprint, and lots of low-density peripheral development genuinely push the ratio above the 25 % typical of a denser US city.
2. **HCAD undervalues improvements** relative to land. That would mechanically inflate the land share. We can’t tell the two apart on public data alone; sale-data work would.

Both readings are consistent with the qualitative finding (LVT shifts burden off improvements onto land) but they pull the rate multiple in opposite directions. The white-paper headline rate of 2.5× should be read as “approximately the right order of magnitude given HCAD’s appraisals” rather than a sharp prediction.

The **uncapped revenue total of \$2.058 B** is 1.45× the **certified FY2026 levy of \$1.421 B**. The gap (\$637 M) is the implicit revenue subsidy from homestead caps, over-65 freezes, and exemption claims on the current property-tax base. It is itself a publishable headline: ending caps and exemptions on the current base, holding everything else constant, would raise roughly \$640 M/year in additional City of Houston property tax revenue.

6.2 By use category

Aggregating taxable parcels by the first letter of HCAD’s state class:

Use bucket	Parcels	Current tax	LVT tax	Δ total	Median Δ%
Single-family residential (A*)	476,251	\$1,130 M	\$1,227 M	+\$97 M	-15.2 %
Multifamily (B*)	12,075	\$253 M	\$155 M	-\$98 M	-7.3 %
Vacant (C*)	63,561	\$45 M	\$113 M	+\$68 M	+152 %
Commercial / industrial (F*)	36,246	\$558 M	\$512 M	-\$46 M	+30.5 %
Condo (Z*)	58,236	\$62 M	\$30 M	-\$32 M	-52.1 %
Other (D, E, J*, etc.)	8,741	\$10 M	\$20 M	+\$10 M	+152 %

The headline distributional finding is in the second-to-last column of the *median* row — the typical parcel of each kind:

- **Median single-family home pays 15.2 % less under LVT.** On the median Houston A1 parcel, that's a drop from \$1,479 to \$1,113 of City of Houston property tax — a **\$217 annual saving**.
- **Median vacant lot (C1) pays 152 % more under LVT** — a rise from \$262 to \$661, a \$399 annual increase. Vacant commercial (C2) sees the same multiplier on a higher base: \$553 → \$1,396, a \$843 increase. C3 (vacant not in-city) is a small bucket and behaves the same way.
- **Median commercial (F1) parcel pays 30.5 % more under LVT.** On the median F1 that's \$3,848 → \$4,775, a \$615 annual increase. The total category *drops* \$46 M under LVT because a few large-improvement properties (office towers, malls) save substantially more than the median.
- **Median industrial (F2) parcel pays 21 % more under LVT** despite a larger median property: industrial parcels are typically improvement-heavy on cheaper land, so a 21 % median increase on a high base is consistent with the story.
- **Multifamily and condo parcels save the most.** Both are dense improvement-on-land — the policy story is that LVT rewards intensive use. The condo result deserves a footnote: condo land values are split among many unit owners by HCAD's "Z" coding, so each individual unit sees only a sliver of land tax. Aggregated as a category, condo parcels pay 52 % less under LVT (median); the practical effect is concentrated in dense central multifamily.

6.3 Surface parking and underutilized land — the flagship finding

The parcels that pay the most more under LVT are the ones that hold valuable land without putting much improvement on it. Vacant parcels (the C* row above) pay 152 % more on the median, but that bucket understates the issue because the centroid-driven HCAD valuations aren't even tracking the *full* market value of land in walkable in-city neighborhoods. On the parcel inventory we build for the visual map (project plan §3), three categories of underutilized land emerge:

- **Vacant lots and tracts** (HCAD state class C1/C2/C3/XV, or zero improvement value with state-class not X/J): **74,814 parcels**.
- **Parking-primary parcels** — host parcels where the surface-parking coverage (OSM + footprint subtraction) is greater than 50 % of the parcel area: **18,773 parcels**.
- **Low-improvement parcels** — non-vacant parcels where improvement-value/land-value < 0.20: **32,759 parcels** (some overlap with the parking-primary set).

These three categories sum to roughly 126,000 parcels — about 19 % of taxable parcels in the City of Houston. They are exactly the parcels for which LVT and current property tax diverge most in dollar terms. The interactive map visualizes them as a separate toggleable layer.

6.4 Caps and exemptions

The single largest single-axis comparison the analysis surfaces is not the current-vs.-LVT split itself but the **uncapped-vs.-capped** gap on the current base:

	Amount
Σ current-tax-uncapped on taxable parcels (full market)	\$2.058 B
City's certified FY2026 levy (capped + exempt-applied)	\$1.421 B
Implicit subsidy from caps + exemptions	\$637 M / year

This number is a side-effect of stripping caps to compare apples to apples; it deserves separate billing in the policy conversation. The protective effect of the homestead cap, the over-65 freeze, and the disabled-veteran exemption on Houston's most-protected residential parcels currently shifts roughly \$640 M of would-be City of Houston property tax obligation off long-tenured residents and onto everyone else (renters, newer owners, commercial property, the unprotected). Whether that protection is good policy is a separate question; surfacing the dollar magnitude is the contribution here.

7. Limitations and assumptions

1. **HCAD land values, not market.** §4 covers this in detail. Headline: results are conservative on the surface-lot/vacant-land delta. The real LVT gap on these parcels is almost certainly larger.

2. **Off-roll parcel valuations are missing.** HCAD reports `land_val = bld_val = 0` for most tax-exempt parcels (state class X) — *the agency has no statutory incentive to appraise property that won't be taxed. The 30,303 X-class parcels in our COH set carry only \$244 M of reported total market value, an implausibly low number for a city that includes the Texas Medical Center, the downtown government complex, dozens of universities and large churches, and miles of major-roadway right-of-way. The real off-roll market value in Houston is many billions; that** is the correct denominator for any "X% of Houston is off the rolls" headline. We don't compute it in v1; we flag it as the largest single missing number.
3. **Stacked-condo polygons inflate parcel-area sums but not tax math.** HCAD's parcel layer includes one polygon per condo unit; 64,633 of the 685,413 parcels in our set are flagged `Stacked = 1`. Their polygons share a ground footprint with the building's other units, so summing parcel areas produces a city-area total of 1,095 sq mi against an actual city extent of 645 sq mi. Each parcel still carries its own tax obligation, so the LVT math is unaffected. Anyone deriving "total acres of X" from the parcel layer should restrict to `Stacked = 0` ground parcels.
4. **Centroid filter has 0.2 % outside-boundary leakage.** Two-tenths of one percent of the kept parcel area technically extends past the COH boundary (large peripheral parcels straddling the city limit). Negligible for tax math; mentioned for completeness.
5. **Hand-validation precision (200 of 300 parcels walked through, 2026-04-26).** A stratified sample (100 each of vacant, parking-primary, low-improvement) was checked against satellite imagery; the low-improvement bucket has not been validated yet. Headline precision:

Bucket	Precision	n judged
parking-primary	97 % (96/99)	99 (1 unsure)
vacant	78 % (70/90)	90 (10 unsure)
low-improvement	not yet validated	—

The vacant rule splits cleanly into two sub-rules:

- `state_class ∈ {C1, C2, C3, XV}` → **92 %** precision (48/52). Solid.
- `bld_val + x_features_val == 0` → **58 %** precision (22/38). Noisy.

The noisy half was sweeping in X-class parcels (government, charity, religious — physically built, just exempt) and J-class parcels (utilities, railroads — physically present infrastructure). HCAD reports `bld_val = 0` for these because it doesn't bother appraising tax-exempt or non-improvable property, not because the parcels are physically vacant. Pipeline patch on 2026-04-26 excludes state-class first-letters X and J from the zero-improvement vacant rule (`pipeline/05_classify.py`). After the patch, vacant count drops from 102,138 to 74,814; the 27,324 reclassified parcels move to "other" (still off-roll if X-class, still taxable but not

bucketed otherwise). The validated precision should land near the 92 % of the C/XV-rule. The validation export is checked in at `analysis/validation/results/validation_2026-04-26.json`.

- 6. Layer B parking polygons are an upper-bound mask.** Our parking-detection pipeline produces 54,948 polygons across two layers: ~20k from `amenity=parking` in OpenStreetMap, ~35k from a footprint-subtraction procedure that takes (`parcel - buildings buffered + setback`) on non-residential parcels with 5–60 % building coverage. The Layer B output is by construction an *upper bound* on parking — it includes drives, side yards, alleys. NAIP-segmentation refinement (Phase 4 Layer C in the project plan) is deferred. The parking-area totals in this paper should be read as candidate-for-parking, not proven parking.
- 7. Single-year snapshot.** We use TY2025 appraisal data and the FY2026 tax rate. The City updates its tax rate annually and HCAD reappraises every year. Reruns are straightforward (all pipeline scripts are idempotent and parameterized on tax year), but this paper is a TY2025 snapshot.

8. Reproducibility

The analysis is a numbered Python pipeline plus a static frontend. All intermediate artifacts are checked into the repository's `data/` directory structure (gitignored for size; reproducible from public sources).

<code>pipeline/</code>	
<code>01_fetch_hcad.py</code>	Download HCAD annual public-data files
<code>02_fetch_osm.py</code>	Pull <code>amenity=parking</code> polygons via Overpass
<code>02b_fetch_buildings.py</code>	Microsoft USBuildingFootprints, <code>bbox-filter</code> to Houston
<code>03_fetch_overlays.py</code>	COH boundary, super-neighborhoods, TIRZ, METRO, FEMA...
<code>04_build_base.py</code>	Parcel base layer, COH centroid filter, HCAD attr join
<code>05_classify.py</code>	Vacant / parking-primary / low-improvement bucket tag
<code>06_detect_parking.py</code>	OSM clip + footprint subtraction → parking polygons
<code>10_tax_compare.py</code>	Current-uncapped tax + revenue-neutral LVT solver
<code>11_publish_tiles.py</code>	Tippecanoe → PMTiles for the static frontend

Each script logs structured JSON-per-line records to `stderr` at every key boundary (download size, sha256, row counts, validation gates), so a rerun's output can be diffed against this paper's numbers without ambiguity. The solved LVT rate, certified-levy ratio, and per-bucket breakdowns in §6 are read directly from `data/final/summary_aggregate.json`, which `10_tax_compare.py` emits.

The interactive map at <https://powerfundamental.com> shows the same per-parcel results visually. PMTiles are served from Cloudflare R2 (custom domain `powerfundamental.com`); the frontend is hosted on Cloudflare Pages.

Repository: source code accompanying this paper, available on request. License: source MIT, data inherits the upstream license of each input source (HCAD public-data terms, OSM ODbL, Microsoft Open Data Commons-By, FEMA public domain).

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