Gadsden Valuations

Technical Summary — UK Residential Automated Valuation Model

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This document provides a technical overview for underwriters, risk managers, and compliance teams conducting initial assessment. Full model documentation (GV-AVM-DOC-001) including feature-level detail, hyperparameters, and SHAP analysis is available under NDA to organisations progressing vendor due diligence.

1. Model Overview

The Gadsden Valuations AVM produces point estimates of residential property market value for properties in England and Wales, consistent with the RICS definition of Market Value (IVS 104).

For each property, the model produces:

- A point estimate of market value (£) with upper and lower bounds
- A confidence tier (1–3, or declined) with Forecast Standard Deviation mapped to the EAA common 0–7 scale
- Feature contribution breakdown showing which inputs influenced the valuation
- Comparable transactions supporting the estimate
- Downloadable PDF report with full audit trail

1.1 Intended Use Cases

The AVM is designed as a specialist tool under IVS 105.20, providing model outputs for review by a RICS Registered Valuer who applies professional judgement before issuing a Red Book compliant valuation.

- Portfolio revaluation for Basel 3.1 compliance (expected January 2027)
- Remortgage AVM-assisted valuations where physical inspection is not proportionate
- Independent cross-check against physical valuations or competing AVM outputs
- Desktop review support for Registered Valuers (VPS 1, restricted service)
- Market monitoring for the 10% revaluation threshold

1.2 Coverage

England and Wales. Four standard residential property types: detached, semi-detached, terraced, and flats/maisonettes. The model does not cover Scotland, Northern Ireland, commercial property, new-build prior to first sale, or non-standard constructions.

2. Methodology

The model is a gradient-boosted decision tree ensemble (LightGBM) trained on 8.4 million arm's-length residential transactions from HM Land Registry Price Paid, enriched with data from multiple government open data sources.

2.1 Feature Categories

The model uses 47 features across six categories. The specific feature list and importance rankings are documented in GV-AVM-DOC-001 (available under NDA).

CATEGORY	DESCRIPTION	EXAMPLE SOURCES
Spatial	Location, coordinates, geographic context	UPRN, ONS geographies
Physical	Property characteristics and construction	EPC certificates
Temporal	Transaction timing, market cycle position	Land Registry, ONS HPI
Neighbourhood	Area demographics and economics	Census 2021 by LSOA
Environmental	Flood risk, infrastructure proximity	Environment Agency
Educational	School quality and proximity	GIAS, Ofsted

2.2 Validation Approach

All accuracy metrics use strict walk-forward testing: the model is trained on transactions up to a cutoff date and tested exclusively on future transactions it has never seen. The current test set comprises 295,026 properties completing after July 2025.

2.3 Benchmark Methodology

All accuracy metrics are measured against **Land Registry completion prices** — the actual amount paid in arm's-length transactions. This is a materially harder test than benchmarking against surveyor opinion. The industry leader, Hometrack, reports ~80% PE10 benchmarked against surveyor valuations. Published PE10 figures from providers using the surveyor benchmark are not directly comparable with our figures.

3. Accuracy Metrics

METRIC	VALUE	INDUSTRY CONTEXT
Median Absolute % Error (MdAPE)	**7.8%**	Single digits considered strong (Ecker 2020)
Within ±5% (PE5)	**34.4%**	
Within ±10% (PE10)	**60.2%**	Exceeds Kirchmeyer minimum (50%)
Within ±15% (PE15)	**76.2%**	Approaching Rossini “reasonable” (80%)
Within ±20% (PE20)	**85.3%**	
Median absolute error	**£20,699**	
Test set size	295,026	Post-July 2025 transactions
Training set size	8.4M	Full LR history, arm’s-length only

3.1 By Property Type

TYPE	MDAPE	PE10	PE15	PE20	N
Semi-Detached	7.2%	63%	78%	87%	87,931
Detached	7.6%	61%	77%	86%	63,698
Terraced	7.8%	60%	76%	85%	94,834
Flat	9.2%	54%	72%	83%	48,563

3.2 By Price Band

PRICE BAND	MDAPE	PE10	N
£300K–£500K	6.8%	66%	87,005
£150K–£300K	7.2%	63%	115,433
£500K–£1M	8.1%	59%	39,915
Under £150K	11.8%	44%	46,746
Over £1M	12.3%	42%	5,927

4. Confidence Model

Each valuation receives a confidence tier based on data availability and comparability factors. This satisfies the IVS 105 requirement for accuracy measures and the EAA ESSVM requirement for a per-property confidence score.

TIER	CONFIDENCE	TYPICAL PROFILE	RECOMMENDED ACTION
1 (High)	EAA 0–2	Dense comparables, known floor area, common type	Accept for valuer review
2 (Medium)	EAA 3–4	Some comparables, partial data, less common type	Desktop review recommended
3 (Low)	EAA 5–6	Sparse comparables, missing key data, unusual property	Physical inspection required
Declined	EAA 7	Insufficient data for meaningful valuation	Cannot value

Confidence can be upgraded by the client. The most impactful upgrade is provision of an EPC (£60–120), which supplies floor area, construction age, and energy characteristics.

5. Known Limitations

The model values properties based on recorded data. It cannot account for:

- **Internal condition** — renovation status, kitchen/bathroom quality, structural issues
- **Bespoke improvements** — extensions or conversions not yet reflected in EPC or planning data

- **Legal encumbrances** — restrictive covenants, rights of way, leasehold complications
- **Micro-location** — specific view, aspect, noise, or neighbourhood factors
- **Market lag** — Land Registry data lags completion by 2–4 months

6. Data Sources

SOURCE	RECORDS	UPDATE FREQUENCY	LICENCE
HM Land Registry Price Paid	31M transactions	Monthly	OGL v3
EPC Register	29M certificates	Monthly	OGL v3
ONS Census 2021	All LSOAs	Decennial	OGL v3
ONS House Price Index	National/regional	Monthly	OGL v3
GIAS School Register	~24,000 schools	Daily	OGL v3
Ofsted Inspection Ratings	All inspected schools	Rolling	OGL v3
Environment Agency	Flood zones 2/3	Annual	OGL v3

All data sourced under Open Government Licence v3. No proprietary datasets.

7. Regulatory Alignment

STANDARD	DETAILS
RICS Red Book Global Standards (Jan 2025)	PS 1.3, PS 1.6, VPS 5. AVM output designed as input to written valuations supervised by a Registered Valuer.
IVS 105 (Valuation Models)	Sections 30–50. Model characteristics documentation, feature disclosure, validation methodology, limitation acknowledgement.
PRA SS1/23	Documentation structured to support vendor model assessment by regulated firms.
EAA ESSVM 3rd Edition (2022)	Methodology disclosure, confidence scoring on common 0–7 scale, segmented accuracy reporting.
Basel 3.1 (expected Jan 2027)	Portfolio revaluation capability for capital adequacy compliance. 10% threshold monitoring.

8. Further Information

Full model documentation (GV-AVM-DOC-001) is available under NDA to organisations conducting formal vendor due diligence. This includes the complete feature list with importance rankings, model hyperparameters, SHAP analysis, bias assessment, and governance procedures.

A sample valuation report is available at gadsdenvaluations.com/sample-report.

Contact: sales@gadsdenvaluations.com | gadsdenvaluations.com

This document is for informational purposes. AVM outputs require review by a RICS Registered Valuer before forming part of an IVS-compliant written valuation.