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Executive Summary:

Testing Land Valuation Methodologies:

Lot 3: Formula-based valuation by land area

Lot 5: Innovative or experimental approaches

Combined Report



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Driving industries forward with market intelligence, Industryline Research is a specialist provider of business intelligence and market research within the housing and education sectors. Leveraging innovative data solutions, expert analysis and established methodologies, Industryline Research delivers innovative intelligence that drives growth and enables you to make informed strategic decisions backed by solid data.

Executive Summary

Purpose, scope and audited evidence boundaries

This executive summary for the Welsh Government's Testing Land Valuation Methodologies programme summarises the audited evidence from two distinct methodological strands delivered by Industryline Research: Lot 3 (formula-based valuation) and Lot 5 (participatory valuation workshops).

Both lots in this programme are research and methodological testing exercises. The outputs should not be interpreted as professional valuation advice for individual sites or transactions, and the report does not claim that any tested method replaces established valuation approaches. Instead, it assesses how different approaches operate in practice, what inputs they depend on, how outputs can be audited and explained, and what limitations those dependencies imply for any potential future application.

Study geographies and bases

Lot 3 analysis is reported for a bounded pilot geography comprising nine Lower-layer Super Output Areas (LSOAs) in Wales:

- Gwynedd 009D (W01000114)
- Flintshire 15A (W01000255)
- Powys 011C (W01000449)
- Ceredigion 002D (W01000517)
- Pembrokeshire 002F (W01000617)
- Bridgend 019D (W01001045)
- Rhondda Cynon Taf 001F (W01001233)
- Monmouthshire 006F (W01001597)
- Cardiff 032H (W01002019)

Lot 5 evidence is drawn from ten participatory valuation workshops, comprising eight public workshops and two professional workshops (63 participants in total).

Methods tested

Lot 3: Formula-based valuation by land area

Lot 3 operationalises land value as an indicative land value density signal (expressed as £/m²) applied across an analytical parcel fabric. The method was implemented as a staged 'Complexity Ladder' designed to increase data dependency and within-area differentiation as additional variables are introduced.

In the audited run, the ladder comprises four rungs: Formula 1 (FLAT) establishes a uniform baseline; Formula 2 (FLAT_RUR) introduces stepped, area-wide adjustments; Formula 3 (ACCESS) incorporates continuous penalties for accessibility and constraints; and Formula 4 (COMP) is a prototype composite model anchored to transaction evidence and treated explicitly as diagnostic rather than policy-ready. All Lot 3 findings are reported for the audited export boundary and, unless explicitly stated otherwise, relate to the INSPIRE polygon base formula runs and associated outputs. The report prioritises value density and distribution (for example, median £/m² and percentile ranges) over absolute totals, because totals are model-implied aggregates and can be dominated by a small number of very large parcels.

‘White Space’ visible in maps is definitional and structural. It represents excluded surfaces and areas that are not parcelised or not valuation-eligible by design, and it must not be interpreted as missing data or ‘zero value’. In practice, White Space mainly reflects land deliberately excluded from the valuation-eligible fabric (for example, operational transport land and other out-of-scope surfaces) and areas not parcelised within the chosen fabric.

Lot 5: Participatory valuation workshops

Lot 5 provides a fieldwork-led, workshop-based evidence stream that captures how participants interpret valuation logic and what drives perceived clarity, perceived fairness, confidence, uncertainty, and trust under facilitated conditions.

Three methods are analysed in the audited dataset and are named consistently throughout the report: Comparable (Comp), Rule-of-Thumb Residual (RotR), and Point-Factor Index (PFI). Quantitative results are framed against audited denominators (workshops, participants, parcels, and response rows). The evidence supports describing how participants reasoned and responded under controlled, facilitated conditions, but it does not support treating the outputs as market-calibrated values or as transferable valuations for other sites. Method comparisons require a further guardrail: ‘method usage’ in this dataset is a design footprint (fixed exercise exposure) rather than preference or adoption, and differences between method-labelled value summaries must not be interpreted as causal ‘method effects’.

Key findings

Lot 3: What the audited evidence shows

Coverage and parcel fabric: The Lot 3 modelled land value surface amounts to 82.5% coverage of the total specified land area within the nine LSOA boundaries, using the INSPIRE Index Polygons as the primary parcel fabric. A core delivery learning is that parcel fabric choice is decisive. Alternative open polygon sources tested during scoping did not deliver sufficient, consistent coverage for report-facing outputs. The report therefore treats a consistent, high-coverage parcel fabric (and explicit, published exclusions) as a non-negotiable prerequisite for reproducible, publishable outputs.

Ladder behaviour: The staged ladder behaved as designed for the first three rungs: Formula 1 (FLAT) established a uniform baseline, Formula 2 (FLAT_RUR) introduced stepped, area-wide adjustments, and Formula 3 (ACCESS) produced a differentiated range of indicative values by applying continuous penalties for accessibility and constraints. Formula 4 (COMP) produced outputs orders of magnitude larger, confirming its role as a prototype/diagnostic tool rather than a policy-ready approach.

Between-area differentiation: Under Formula 3, median implied land values range from £75/m² in Bridgend 019D to £165/m² in several other LSOAs, consistent with the applied schedule and penalty structures.

Totals and rung-to-rung change are not monotonic: Across the nine LSOAs, model-implied totals are approximately £42.94bn (Formula 1), £46.87bn (Formula 2), and £44.51bn (Formula 3). In this audited run, Formula 2 uplifts totals by approximately 9.2% relative to Formula 1, and Formula 3 offsets part of that uplift (approximately 5.0% relative to Formula 2), resulting in a net change of approximately 3.7% from Formula 1 to Formula 3.

Governance-relevant signals in stepped schedules: Two LSOAs show a 'silent step' where Formula 2 does not uplift relative to the flat baseline (Flintshire 15A and Bridgend 019D). One LSOA reduces under Formula 2 (Monmouthshire 006F at -5.0%). These behaviours are governance-relevant signals that the underlying flag/threshold logic requires careful scrutiny before any operational use.

Distribution and concentration risk: Rate tails and value tails behave differently: Formula 2 median rates range from 142.5 to 165 £/m², while Formula 3 penalties introduce further dispersion, with P10 rates as low as 71.3 £/m² (Monmouthshire 006F) and medians as low as 75 £/m² (Bridgend 019D). Despite capped map rates, parcel values are highly skewed because parcel areas are highly unequal. Under Formula 3, the share of total value represented by the single highest-value parcel ranges from 2.32% (Pembrokeshire 002F) to 46.46% (Powys 011C), and the top ten parcels range from 17.44% (Pembrokeshire 002F) to 78.31% (Powys 011C). Gini coefficients range from 0.537 (Ceredigion 002D) to 0.971 (Powys 011C), evidencing structural concentration risk that constrains totals-only interpretation.

Class coverage and interpretive limits: The audited export includes four NLUD classes (Agricultural, Residential, Undeveloped, Community/Amenity). Commercial/Industrial does not appear in the audited export for the nine LSOAs due to the classification-transfer boundary of the redeployment and the fallback mapping used only to resolve residual unclassified parcels. Residential accounts for 58.6% of parcels but only 0.7% of parcelised area, whereas Agricultural accounts for 28.4% of parcels and 60.7% of parcelised area (with Undeveloped accounting for 35.1% of area and Community/Amenity 4.2%). The report therefore treats class coverage as an interpretive constraint. Outputs should be read within the audited class boundary and not extrapolated to omitted classes without further evidence and governance work.

Lot 5: What the audited evidence shows

Delivery, participation and completion: Across ten workshops (eight public and two professional), 63 participants took part. Overall, 61 of 63 participants are complete (96.8%), and 2 of 63 are partial (3.2%). Partial completion is treated as evidence relevant to toolkit accessibility and comprehension under real workshop conditions, with the logged reason being a language or terminology barrier.

Method deployment footprint (design exposure): The audited dataset contains 630 value responses across the three methods. The fixed deployment footprint is 40% RotR (252 responses), 30% Comp (189 responses), and 30% PFI (189 responses).

Clarity versus fairness is a central finding: Participants do not treat 'clarity' and 'fairness' as the same concept when evaluating valuation approaches. Across all participants, Comp is most frequently ranked as clearest (25 participants; 39.68%), while PFI is most frequently ranked as fairest (28 participants; 44.44%), with RotR ranked fairest by 23 participants (36.51%). This split is policy-relevant because it indicates that a method can be perceived as procedurally fair without necessarily being comfortable or easy for users to apply.

Indicative values show meaningful dispersion even within a bounded parcel set: Across all responses, the overall value range is £49,100 to £151,700, with a mean of £96,196 and a standard deviation of approximately £24,038. The report treats spread as a more defensible route to identifying 'hard-to-value' parcels than relying on headline highs and lows alone.

Confidence is moderate overall but differs by method: Across all responses, mean confidence is approximately 6.06 on a 1–10 scale (standard deviation approximately 1.28). The method most often perceived as fairest (PFI) has the lowest average confidence (mean 5.37; median 5), compared with RotR (mean 6.14; median 6) and Comp (mean 6.65; median 7).

Qualitative mechanisms explain the quantitative patterns: This indicates that explainability is not an optional communications layer; it is a core requirement of the valuation method if outputs are to be credible in public-facing settings. Across workshops, trust is repeatedly linked to whether participants can see how a number is produced and whether the underlying assumptions are visible and contestable; 'black box' concern is a recurring legitimacy gate. Uncertainty is dominated by below-ground unknowns and hidden constraints (for example, ground conditions, abnormal costs and remediation, utilities, and constraints not visible in surface-level evidence packs). The report concludes that assumptions are the hinge between perceived fairness, perceived clarity, and confidence, and that uncertainty capture should be an explicit feature rather than forcing false precision.

Comparison of approaches and joint implications

Lot 3 and Lot 5 operationalise land value differently and produce different types of evidence. Lot 3 generates parcel-level value density signals (£/m²) over an analytical parcel fabric within a defined audit boundary. Lot 5 generates facilitated human judgement evidence (rankings, confidence, qualitative rationales, and indicative numeric outputs) over a bounded parcel set within a separate fieldwork-and-analysis audit boundary. The appropriate basis for comparison is therefore feasibility, interpretability and usability, auditability and governance, scalability and coverage potential, and public intelligibility and legitimacy.

If the objective is repeatable coverage and consistent reporting surfaces, a Lot 3-type approach is necessary. Credible use requires strong governance: stable parcel fabric and exclusions; explicit explanation of White Space; controlled and versioned parameters so changes are traceable; readiness tiering so the method does not overreach where inputs are incomplete; and publication discipline that emphasises distributional statistics over totals where concentration risk is material.

If the objective is deliberation, scrutiny, trust-building and intelligibility testing, Lot 5 provides evidence that is necessary to design a credible public-facing approach. It cannot substitute for a scalable technical method where national coverage is required, but it reduces 'translation risk' by showing how people interpret value logic, what they regard as fair, and what undermines confidence.

The programme evidence supports a combined position in which technical outputs are paired with an explainability layer informed by participatory evidence. Bridge actions include making constraints and risks salient and comparable in public-facing engagement, using participatory testing to refine how technical maps and tables are explained (particularly where within-area differentiation is pronounced), and increasing overlap between participatory parcel examples and parcels in the technical fabric where feasible, without implying that the two approaches measure the same construct.

Conclusions and further considerations

Across both lots, the programme evidences that 'land value' is not a single observable quantity that different methods simply estimate with more or less precision. It is constructed through definitional boundaries (what is included and excluded, and the unit at which value is expressed), the drivers each method is able, or chooses, to operationalise, and the way outputs are interpreted by non-specialists and professionals. A technically auditable output can therefore still fail as policy evidence if it is not intelligible, perceived as legitimate, and accompanied by clear guardrails that prevent misinterpretation.

Scalability is conditional. Lot 3 is, in principle, scalable across Wales because its core value is a repeatable pipeline and parameter-governed execution; however, scale-up is conditional on governance and data readiness. The evidence indicates that scaling will be driven less by the formulae themselves than by stable fabric construction rules, consistent feature engineering, licensing and refresh cycles, Quality Assurance thresholds, and an auditable eligibility and coverage reconciliation that prevents misinterpretation of excluded land and White Space. Lot 5 is not scalable as a Wales-wide parcel valuation system, but it is scalable as a structured engagement and legitimacy layer.

Moving towards an operational, Wales-wide evidence product requires requirements to be stated explicitly, in a way that maps directly to risks surfaced across both lots. The consolidated report emphasises: (i) a published eligibility and coverage reconciliation layer that quantifies what has been valued, what has not, and why; (ii) publication-grade parameter governance and interpretability exports (including the fields required to answer common 'why' questions using published artefacts); and (iii) a public explanation framework, informed by participatory evidence, that anticipates anchoring and place-based reasoning, distinguishes procedural clarity from procedural fairness, and makes uncertainty explicit rather than hidden.