

The Walkway Is Busy, the Store Decides: Decomposing Retail Visitor Types at the Line

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Abstract

We formalise and quantify a visitor-type decomposition — *passer-by* / *entering* / *bounce* — from existing line-level counters, and turn it into an answerable *shopper-intent* signal. Our measured finding has two parts. *First*, on the network-wide cohort of 194 stores with open-hours entrance-line capture (7,348 complete store-days), entering footfall is time-compressed and its measured structure is stable: the mean hourly profile peaks at 15:00 local, the peak hour carrying 13.2% of a weekday’s entrants (14.2% on weekends), and weekends are materially heavier than weekdays (among the 70 stores with matched coverage the mean weekend $\div$ weekday ratio is 1.76, and 87.1% of them are weekend-driven). *Second*, at the single passing-capable location with enough paired data to analyse (L003; 7 trading days, six paired midday hours, 12:00–17:00 local), we measure the funnel’s top rung directly (the case location’s entering series is its store-interior zone counter — see §2.4) and find the two tiers severely decoupled across the measured midday hours: passing traffic there stays flat (day-to-day coefficient of variation 0.02) while entering volume is sharply midday-peaked, and the passing line records about 190–274 $\times$ the entering volume. The resulting drop-in / conversion-likely share (entering $\div$ passing) is a single store-day index that peaks in the early afternoon and, as its construction implies, follows the entering pattern rather than the busyness of the walkway. These case-specific results illustrate a single location and are not network estimates. Every figure here is observed line-count data, expressed as a share or ratio (no absolute volumes, no store identifiers). The third tier, *bounce*, is defined and scoped: it requires resolved per-visitor journey data that the observed counters do not expose, so we document it rather than fabricate a number.

1 Problem & Motivation

Retail operators and analysts repeatedly ask how much of the footfall that passes a storefront actually walks in, and how much of a *busy* walkway reflects a *busy store*. A long-standing retail-industry adage holds that “crowd is not performance”: a store facing a steady stream of passers-by may still convert only a small, time-varying share of them into entrants. The adage itself is industry folklore rather than a finding from the peer-reviewed literature; what that literature establishes are the two halves it gestures at: [1] review decades of experimental and field evidence that atmospheric and situational cues shape approach-avoidance and purchase behaviour inside the store, while [2] show that footfall volumes and their temporal signatures differ systematically across UK activity centres — both consistent with the passing stream and its conversion being distinct, individually varying quantities; this paper measures exactly that distinction at the line level. This decomposition is also the class of question our store-analytics tool is asked to answer, and the natural third insight after visitation *structure* and *weekly shape*.

We make three contributions. (1) A *formal, data-model-grounded decomposition* of the retail visitor funnel into passer-by / entering / bounce, with each population mapped to the line-level

counters the platform actually records. (2) *A measured characterisation* of the *entering* tier across a robust network-wide cohort (its day/time structure and weekend contrast) and of the *passing-by* tier where it is configured. (3) *An answerable signal*, the *conversion-likely share* (entering $\div$ passing, the drop-in rate), that the platform can return for any store-day and that operationalises the “busy walkway vs. actual entering” distinction. As a positioning note: we are not aware of an external retail-measurement study that formalises this passer-by $\rightarrow$ entering conversion share from line-level counters; the claim is carried as [CITATION NEEDED] rather than asserted as established.

Forecast vs. observed. The platform separates measured observations from model forecasts. This paper is strictly about the *observed* line-count series; no forecast value enters any number or figure. Findings are described descriptively, every distribution’s sample size is stated, and no inferential (p-value) claims are made (see Validation).

2 Method

2.1 Conceptual model and the three populations

The platform’s data model defines a visitor journey at transitions across counting lines. A *passing-by* line sits at a location’s outer boundary (the “street outside”); an *entrance* line separates outside from the location; the location (perimeter) line encloses the store. From this it defines:

Passers-by crossings of the passing-by / outer line — the top of the funnel, the full “opportunity” of passing traffic.

Entering crossings of the entrance line — the visitors the store actually draws.

Bouncing visitors the (unique) visitors who crossed the entrance line but turned back at the location line without moving in.

Raw line-counting tallies crossings (a person passing twice counts twice) and does not, on its own, resolve journeys.

2.2 Mapping populations to canonical counters

1. **Entering** is measured by the *entrance-line visitor series* (the store’s observed, open-hours visitor counter), the same series the platform uses for “visitors”.
2. **Passer-by / passing traffic** is measured by the zone-level visits counter of the outer passing-by line (the location’s “outside” boundary). This counter exists only where a passing-by line is configured, so it is present for a bounded, much smaller subset of the network.
3. **Bounce** is a *resolved-journey* quantity: it is read off unique visitors and their behaviour at the location line. The observed production surfaces expose hourly aggregate line-crossings, not resolved journeys, so a bounce rate cannot be computed without fabricating it. We therefore mark it *not available in these surfaces*, document the measurement exactly, and scope it as future work (§5.2).

This separation is the methodological core: the paper measures what the data can honestly support and says plainly what it cannot.

2.3 Entering cohort and measurement

We reuse the complete-day cohort rule of the sibling entrance-zone analysis to avoid under-counted days. Each store’s operating window is recovered empirically from its most common contiguous block of recorded local hours (canonical open hour o and close hour c , span $s = c - o + 1$, in local time). A store-day is *complete* when all s open hours were recorded; the cohort is locations with $s \geq 4$ hours and at least 7 complete days. All entering figures use only complete store-days, restricted to the open-hours window, in each store’s local timezone (never raw UTC wall-clock).

Relative (shape) metrics are size-invariant so stores of different sizes compare like-for-like: the hourly share $p_{l,t} = v_{l,t} / \sum_{t'} v_{l,t'}$ within a day, and the day-of-week index of a store-day-of-week’s mean to that store’s own overall mean.

The grand-mean hourly profile (Fig. 1) is the mean of these per-store-day within-window shares across store-days; because each share is normalised over its own store-day’s open window and those windows differ across stores, the averaged 24-hour profile is a mean of centred shapes and its 24 entries do not sum to one.

The weekend/weekday ratio is computed per store (mean weekend daily $\div$ mean weekday daily) and summarised across the subset of stores that have both a complete weekday and a complete weekend day.

2.4 Passing-by and the conversion-likely share

Where a passing-by line coexists with entering on the same local hours, we pair the two counters at store-day $\times$ local-hour resolution and define the *drop-in rate* (conversion-likely share)

$$\rho_t = \frac{\text{entering}_t}{\text{passing}_t},$$

i.e. the entering share of passing traffic per hour. We report both counters on a per-series day-mean index so their *shapes* can be compared despite their different scales. Because the passing layer is configured only sparsely in the current network, this is reported as a clearly-labelled, well-covered single-location case study ($n=1$) — the honest read of a thin layer, not a network estimate. A share is only read once a zone has enough unique visitors for a stable rate (a handful of crossings is noise, not a rate); on that rule the passing layer here is too thin to support a network-wide rate.

One definitional note on the case study. Section 2.2 defines *entering* as the entrance-line visitor counter, but at the case location the entering series is the *store-interior zone counter* — the interior zone with the most aggregate visits at that location — because the passing-by line is co-recorded only with zone counters there. The live platform tool instead pairs the entrance-line counter with the passing-by line (a cross-counter division), so the platform’s conversion-likely share and the paper’s case-study ratio are related but not identical quantities.

3 Data

3.1 Source and processing

All data are read in read-only mode from the platform’s analytics database. We use the observed entrance-line visitor series and, where configured, the zone-level visits counter of the passing-by (outer) line. Timestamps are stored in UTC and converted to each store’s local timezone; hour-of-day and day-of-week are computed on the true local wall-clock. Every series is the *observed* measurement; forecast values are excluded. The snapshot analysed here is as of 2026-09-12. All

reported numbers are rendered from the analysis outputs; the analysis covers the observation period 2026-06-16 through 2026-09-12.

3.2 Scope and coverage

Quantity	Value
Raw timezone-located stores	231
Raw store–days in entrance series	10,490
Cohort stores (complete-window, ≥ 7 complete days)	194
Complete store–days analysed	7,348
weekday store–days	6,716
weekend store–days	632
Locations with any passing-by (outer-line) record	24
Median open hour (local)	10:00
Median close hour (local)	18:00
Median open-hours span	9 h

We emphasise the coverage asymmetry that constrains the analysis. The passing-by (outer) line is configured for only 24 locations, and most of them record only a handful of hours — in total 24 locations, all but two with fewer than 10 recorded hours. Consequently the top of the funnel is analysed as a single, well-covered case location (L003; 7 trading days) rather than as a network statistic, and the entering structure is analysed on the robust 194 store complete-day cohort. The case location is selected by a fixed, deterministic rule rather than for its result: among locations where a passing-by line is co-recorded with a store-interior zone, it is the one with the most complete paired days and hours of both counters.

A second consequence of the coverage rules concerns the weekday/weekend split. A store–day counts as complete only when it records the store’s full canonical open window — the most frequently recorded contiguous run of local trading hours, which is anchored by the weekday store–days that dominate the sample. Weekend days frequently record a shorter window than that span (typically ending earlier than the canonical close hour), so they satisfy the complete-day rule far less often than weekdays, and the weekend store–days retained here are those whose recorded window happened to match the canonical span. Whether this reflects genuinely shorter weekend trading hours or weekend capture that stops earlier cannot be separated from these aggregate counters, and the completeness effect follows either way.

3.3 Data-quality rules respected

- **Never sum per-zone counters.** Per-zone visits are measured independently and do not add up to the location total; all entering aggregation is at the location (entrance-line) level.
- **Open-hours capture only.** Daily totals and hourly shapes use open-hours capture only: each location is windowed to its own contiguous recorded open window (median across the cohort 10:00–18:00 local), not to a fixed clock window.
- **Observed, never forecast.** Every figure is a measured observation; forecast values are excluded.

- **Anonymity.** No store identifiers, brand, geography, or absolute visitor volumes appear in this paper; L-labels are anonymised store identifiers. The single passing case location is labelled L003.
- **Internal-data descriptive only.** All magnitudes reported here describe this network’s observed counters; they are not benchmarked against external retail data.

4 Results

4.1 Entering: the structure of who actually comes

On the cohort of 194 stores over 7,348 complete store–days, entering footfall is strongly concentrated in time. The grand mean hourly profile (Fig. 1) peaks at 15:00 local: the busiest single hour carries 13.2% of a weekday day’s entrants (14.2% on weekends — the weekend peak is shallow, with 15:00 and 14:00 effectively tied), and the entering day is largely inside the cohort’s median open window of 10:00–18:00 local (about three quarters of the mean-profile mass), with the remainder from stores whose own windows extend beyond the cohort median (a 9-hour median span; individual stores differ, and every hourly shape is computed within each store’s own open window; Table 1).

The week also breathes. On the size-invariant weekly index (Fig. 2), entering is near a store’s own mean for most days (Tuesday is the trough at 0.90) and surges on Saturday to a mean index of 1.46 — 46% above a store’s average day. Among the 70 stores with both a complete weekday and a complete weekend day, the mean weekend $\div$ weekday ratio is 1.76 (median 1.58; inter-quartile range 1.31–2.02), and 87.1% of those stores are weekend-driven (Table 2, Fig. 3). This mean is drawn toward a few extreme per-store ratios from near-zero weekday bases — the figure clips those at 4 while the mean does not — so the median (1.58) is the more robust centre. Because a store enters this contrast only when it has both a complete weekday and a complete weekend day, the 70-store subset is self-selected toward stores that record comparable windows on both, and the weekend $\div$ weekday contrast describes that subset rather than the full cohort.

Table 1: Entering cohort summary across 194 stores (7,348 complete store–days).

Metric	Value
Cohort stores	194
Complete store–days	7,348
weekday	6,716
weekend	632
Median open/close (local)	10:00 / 18:00
Median span (open hours per day)	9
Peak hour of mean profile, weekday / weekend	15:00 / 15:00
Weekday peak-hour share	13.2%
Weekend peak-hour share	14.2%

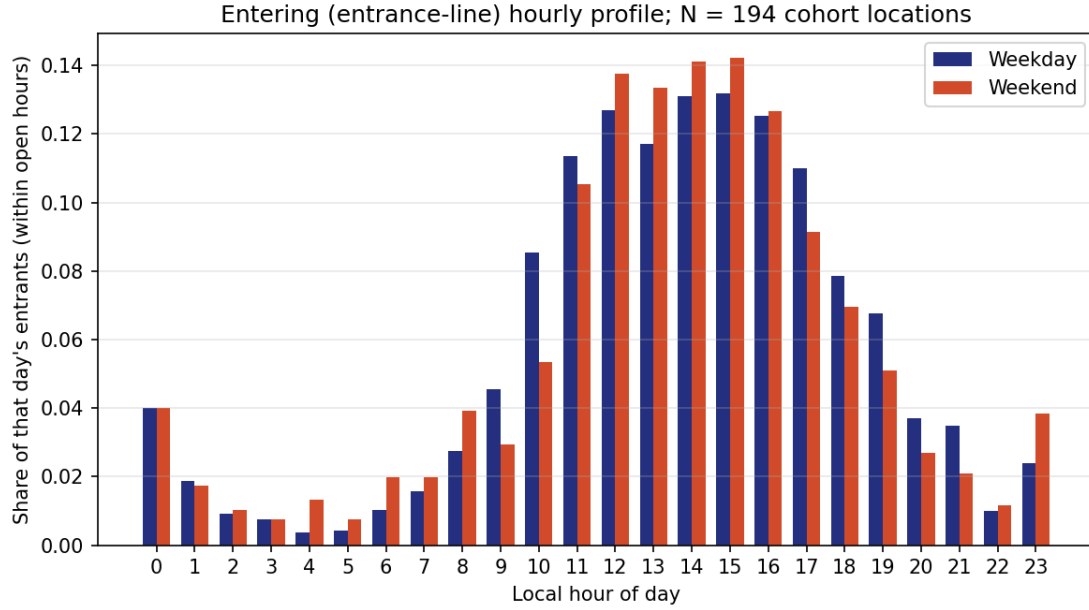


Figure 1: Grand mean entering hourly share of daily visitors, weekdays vs. weekends ($N=194$ complete-day cohort, open-hours capture). Weekday peak share 13.2% at 15:00; weekend 14.2% at 15:00.

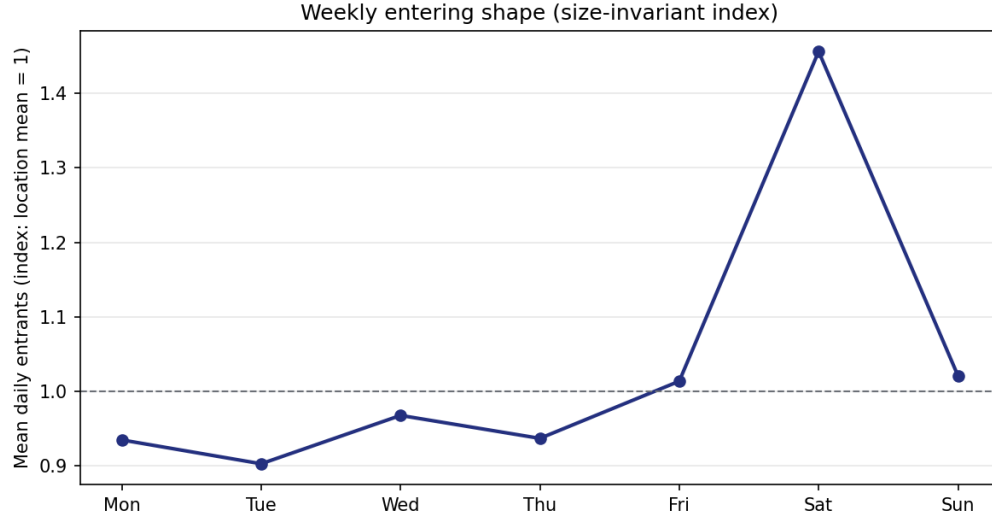


Figure 2: Weekly entering shape: mean daily entrants indexed to each store's own mean (size-invariant). Saturday is the peak at index 1.46; Tuesday the trough at 0.90.

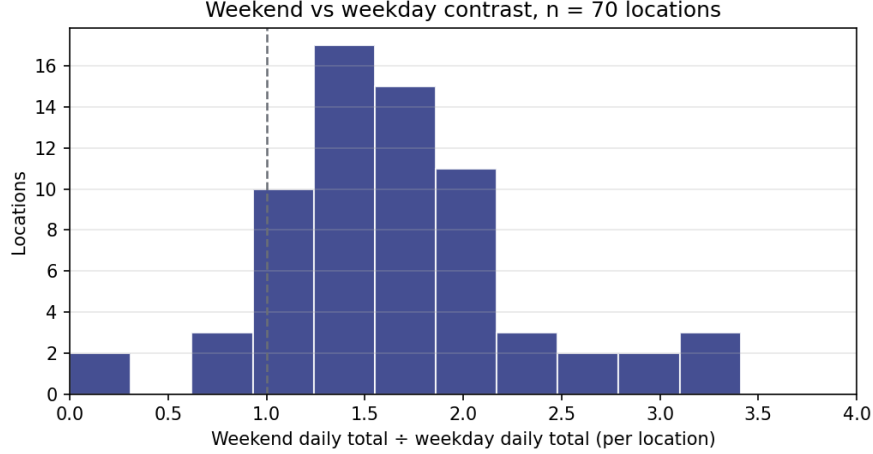


Figure 3: Distribution of per-store weekend $\div$ weekday entering ratios ($n=70$ stores with matched coverage). Most stores are weekend-driven; the reference line at 1.0 (no contrast) is dashed. A few extreme ratios from near-zero weekday bases are clipped at a ratio of 4.

Table 2: Weekend vs. weekday contrast for entering (per-store ratios, $n=70$).

Metric	Value
Mean ratio (weekend / weekday)	1.76
Median ratio	1.58
Inter-quartile range	1.31 – 2.02
Share of stores weekend-driven	87.1%

4.2 Passing-by: the busy walkway does not equal the busy store

Where a passing-by (outer) line is configured, the two tiers of the funnel behave very differently. We report a single, well-covered case location (L003; 7 trading days, six paired local hours per day, 12:00–17:00 local) as the honest read of the thin passing layer. As noted above, the “entering” series in this case study is the store-interior zone counter, paired with the passing-by line; the live platform tool pairs the entrance-line counter with the passing-by line instead, so the two are related but not identical metrics.

Passing traffic is essentially *flat*. Day to day its total is stable (coefficient of variation 0.02 across the 7 days), and through the day its per-hour index barely moves (0.98–1.035 about its own day-mean — that is, a $\pm 3.5\%$ band). Entering, by contrast, is sharply midday-peaked: it rises to 1.13 (i.e. 13% above this store’s entering mean) at 14:00 local and falls to 0.81 (19% below) by 17:00 (Fig. 4).

The two tiers also differ enormously in scale: the passing line records on the order of 190–274 $\times$ the entering volume at this location. The walkway is busy all day; the store is *entered* at midday.

Illustrative $n=1$ passing-capable location

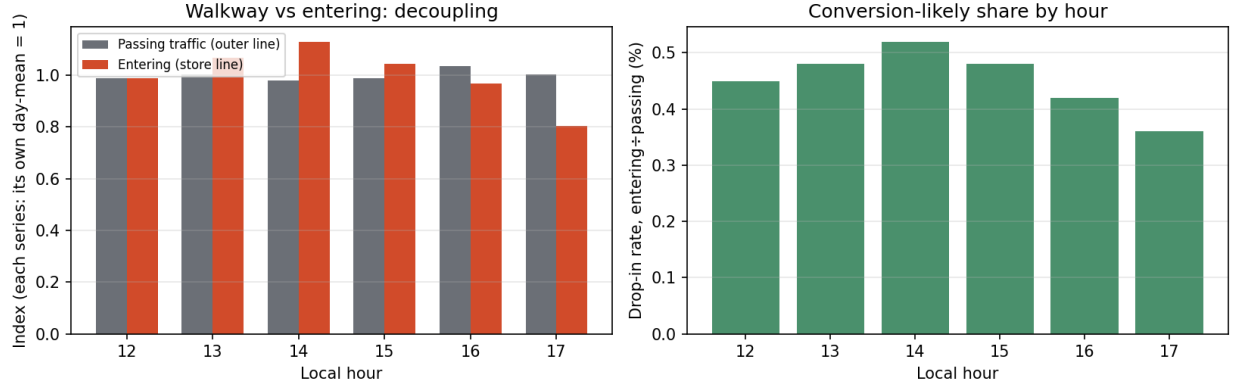


Figure 4: Illustrative $n=1$ passing-capable location (L003; 7 days). *Left*: passing traffic (outer line) stays near a flat index while entering (store-interior zone counter) peaks at 14:00 local (index 1.13) and fades by 17:00 (index 0.81). *Right*: the conversion-likely share (entering $\div$ passing) by local hour, peaking at 14:00 local at 0.52%.

4.3 The conversion-likely share (drop-in rate)

Defined as entering $\div$ passing at store-day $\times$ local-hour resolution, the conversion-likely share at the case location ranges from 0.36% (late afternoon) to 0.52% (early afternoon), with a median of 0.47% and a clear afternoon peak at 14:00 local (0.52%; Fig. 4, Table 3). Because the share is entering divided by passing and passing barely moves, its shape follows the entering shape largely by construction rather than tracking the walkway: the busiest hour for entering is the highest-conversion hour, even though passing traffic there is indistinguishable from any other hour. The conversion-likely share is therefore an answerable shopper-intent signal: a store-day’s “conversion-likely share” is a single number a retailer can query, and its day/time structure is what staffing and promotion should follow.

Table 3: Conversion-likely (drop-in) share — entering $\div$ passing — by local hour at the passing case location (L003).

Hour	Drop-in rate
12:00	0.45%
13:00	0.48%
14:00	0.52%
15:00	0.48%
16:00	0.42%
17:00	0.36%

4.4 Bounce: scoped, not fabricated

The third tier, *bounce* (entered but turned back at the location line), is a resolved-journey quantity that the observed aggregate counters cannot supply. We have deliberately *not* produced a bounce

number, because doing so would require inventing per-visitor journey behaviour that the observed visitor and zone series do not contain (see §5.2). This is part of the scientific posture of the paper: a missing, honestly-flagged quantity beats a fabricated one.

5 Validation & Quality

5.1 Quality controls

- **Reproducibility.** All reported numbers are computed from the analysis outputs over the fixed 2026-09-12 snapshot; every number in this paper traces to those outputs.
- **Observed, not forecast.** Only observed entrance- and outer-line measurements enter the analysis; forecast values are excluded.
- **Open-hours and complete days.** Entering figures use only complete, open-hours store-days, so no under-counted day biases a total or a share.
- **True local time.** Hours and days are computed on each store’s local wall-clock (never raw UTC), so “hour 15” means the local trading hour.
- **Size-invariant shapes.** All entering comparisons are indexed to each store’s own mean, so stores of different sizes compare like-for-like.

5.2 Coverage and significance honesty

1. **Passing layer is thin.** Only 24 locations configure a passing-by line, most for a handful of hours. The drop-in and decoupling results are therefore reported on a single well-covered location ($n=1$) and must *not* be generalised to the network. This is a limitation of current data coverage, not a claim about all stores.
2. **No inferential statistics.** We report descriptive distributions and their sample sizes but run no significance tests, so no p-values or confidence-interval generalisations are claimed anywhere in this paper.
3. **Bounce is not directly measured.** The observed surfaces carry no resolved per-visitor journey series. A bounce share requires unique-visitor journey data (bounce flag per unique visitor) and is left to when that data is available; the exact measurement is defined in §2.2 3.
4. **Crossing counts, not people.** Figures are line crossings, not unique individuals; all share/index patterns are unaffected by this convention (a uniform counting factor cancels in ratios).
5. **Empirical windows.** Store operating windows are recovered from the most common contiguous hour block rather than an authoritative schedule (which is not populated for this set).

6 Discussion

6.1 What the numbers mean

The measured entering structure confirms that footfall is concentrated in a narrow midday/early-afternoon band and a Saturday peak — actionable for staffing and promotion scheduling. The

genuinely new result is the *drop-in / conversion- likely share* and its relationship to the walkway: at the configured case location, the busy walkway is a poor predictor of entering (passing is flat and about $190\times$ the entering volume, while entering peaks at midday), so the share of passers-by who convert is highest when entering is highest, not when the street is busiest. Because the share divides by a nearly flat passing series, its shape follows entering partly by construction; what the walkway’s flatness adds is that its busyness carries little information about how many people enter. This is the “crowd is not performance” adage, made measurable.

6.2 Relevance to the platform

The conversion-likely share (entering $\div$ passing) is a single, answerable, per-store-day index. It lets a retailer ask “what share of the footfall passing my storefront actually comes in, and when is it highest?” and get a grounded, observed answer. As the passing-by layer is rolled out to more stores, this becomes a network-level shopper-intent signal; today it is a well-defined, honestly-scoped metric on a bounded subset.

6.3 Future work

- Extend the passing-by layer network-wide so the conversion-likely share is a cohort statistic rather than a single-location case.
- When resolved journey data exists, add the *bounce* tier (bounce share = bounced $\div$ unique visitors) to complete the three-population funnel.
- Investigate the causal question of whether store actions shift the drop-in rate (a natural follow-on once a cohort of passing-by stores is available).

References

- [1] L. W. Turley and R. E. Milliman. Atmospheric effects on shopping behavior: a review of the experimental evidence. *Journal of Business Research*, 49(2):193–211, 2000. doi:10.1016/S0148-2963(99)00010-7. Peer-reviewed. Reviews the experimental and field evidence that store-environment cues shape approach, entry, and purchase behaviour — the inside-the-store half of the passer-by/entering distinction this paper decomposes.
- [2] C. L. Mumford, C. Parker, N. Ntounis, and E. D. W. Dargan. *Footfall signatures and volumes: Towards a classification of UK centres*. Environment and Planning B: Urban Analytics and City Science, 2020. doi:10.1177/2399808320911412. Peer-reviewed. Shows footfall volumes and their temporal signatures differ systematically across UK activity centres — the walkway side of the distinction this paper decomposes; the paper’s own line-level measurement supplies the conversion side.
- [3] Indivd Analytics. *Data model*, visitor types and passing by; and the platform’s data-quality rules. Defines passers-by, entering, and bouncing visitors and the passing-by / drop-in rate. Internal source-and-method documentation; anchors the measurement layer, not the methodological positioning.
- [4] Indivd Analytics. The platform’s store-analytics tool; this paper’s conversion-likely share is structured to answer its shopper-intent questions. Internal platform documentation; cited as the internal product context for the motivation, not as a methodological anchor.

- [5] Indivd Analytics Research. *Entrance-Line Visitation Patterns in Retail*: the sibling entrance-zone analysis whose complete-day cohort rules this analysis reuses. Internal sibling paper; source-and-method anchoring only.