

PLAYBOOK

True Closed- Loop Attribution

for In-Store Retail Media

How retailers can connect media exposure, shopper behavior, purchase outcomes, and omnichannel activation

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EXECUTIVE SUMMARY

Retail media has moved from test-and-learn to a core growth engine for retailers. Global investment is accelerating, brand expectations are rising, and the physical store has become one of the category's most important frontiers. Yet the store also exposes a measurement imbalance: most shopping still happens in physical retail, while most retail media measurement infrastructure was built for digital.

For in-store retail media to scale, measurement cannot be an afterthought. Brands need credible audience and impression metrics to understand reach. They need behavioral data to understand what happened after exposure. And, where possible, they need attribution that connects those behaviors to purchase outcomes — and to the next campaign. **These are not competing demands; they are layers of a single, complete view.**

This playbook lays out what true closed-loop attribution looks like inside the physical store, the building blocks that make it possible today, and how those in-store signals extend into a broader omnichannel strategy.

“Crucially, the infrastructure to deliver this is already in place for most retailers: their existing cameras, long treated as a security cost rather than a measurement asset. Paired with AI-powered analytics, those cameras can support privacy-forward measurement without major capital investment.”

BY THE NUMBERS

\$184B → \$312B

Global retail media spend, growing from 2025 to 2030.

85%

of retail purchases happen in the store.

~99%

of retail media spend goes to online channels in the U.S. market.

Sources: Forrester, Global Retail Media Forecast 2025-2030; eMarketer; US Census / industry data.

1 In-Store Retail Media Is Entering Its Measurement Era

For years, the store was a channel you could buy but couldn't truly measure: rich in shopper intent, thin on evidence. That is changing. As in-store retail media budgets grow, brands increasingly expect the same level of accountability they receive from digital channels.

What follows traces how in-store measurement is maturing, and why retailers are better positioned to deliver it than they may realize.

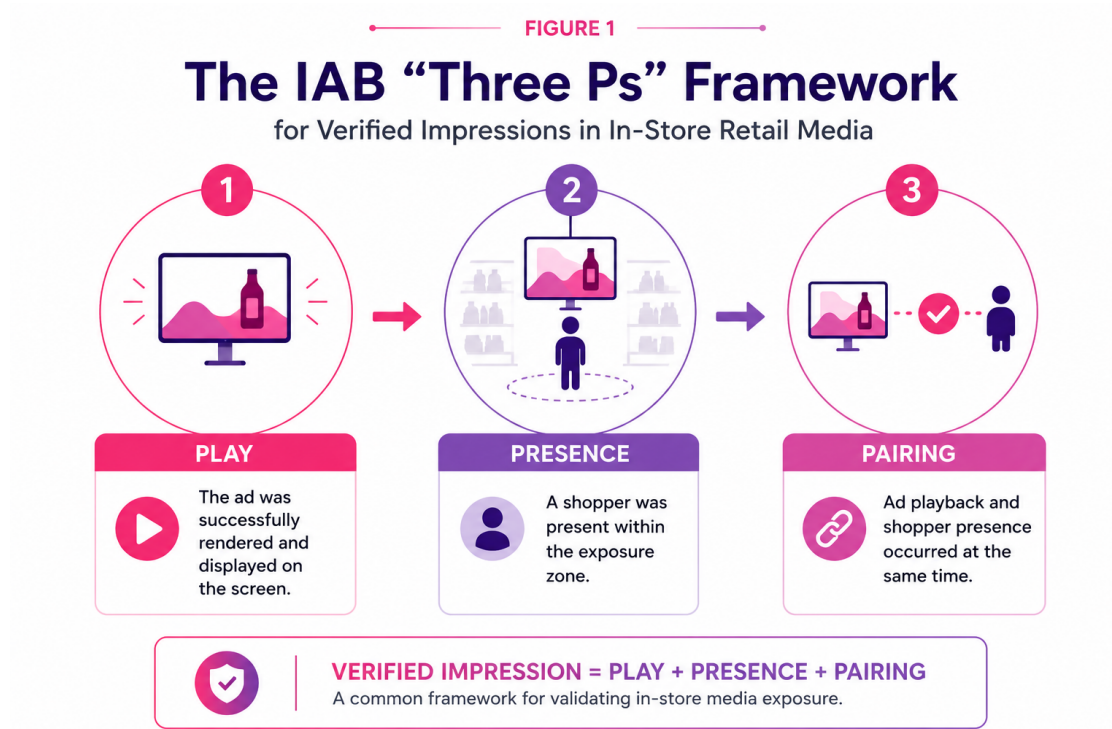
1.1 Building on Existing Measurement Approaches

In-store retail media measurement is not starting from zero. Retailers and brands have already developed a range of approaches to understand campaign effectiveness, from opportunity-to-see methodologies and store-traffic models to test-and-control frameworks and matched-market incrementality studies. These approaches have played an important role in demonstrating that in-store media can influence business outcomes.

However, most operate at an aggregate level. They can help answer whether sales changed, but often provide less visibility into what happened between exposure and purchase. As investment grows, brands increasingly want a clearer understanding of both audience delivery and shopper response.

1.2 Verified Impressions: The New Baseline

The foundation is finally getting a shared definition. The IAB's framework, *A Viable Framework for Maturing In-Store Media Measurement* (December 2025), sets a baseline for what counts as a verified in-store impression through three tests: **Play** (the content ran), **Presence** (a shopper was there to see it), and **Pairing** (the two coincided).



This raises the floor for everyone. Some retailers don't yet have accurate impression measurement at all; verified impressions give them a clear standard to build to, and brands get a common, auditable currency they can compare across campaigns and against digital benchmarks. **Verified impressions are where accountable in-store measurement begins.**

1.3 From Verified Exposure to Shopper Understanding

Verified impressions establish that exposure occurred. The next step is understanding what happened afterward: how shoppers responded, where they went, what they engaged with, and whether those actions ultimately led to purchase. Understanding exposure is important. Understanding the behavior and outcomes that follow is what creates a more complete view of media performance.

2 What True Closed-Loop In-Store Attribution Actually Means

In digital retail media, closed-loop attribution is familiar: a brand can understand whether an ad exposure led to a click, a product view, an add-to-cart event, a purchase, or a later re-engagement. The loop closes because media exposure, shopper behavior, and transaction outcome can be connected.

In the physical store, the same principle applies, but the signals are different. A shopper passes a screen, enters an aisle, pauses near a shelf, compares products, picks up an item, continues to checkout, or leaves without buying. These physical behaviors are the in-store equivalent of digital intent signals.

True closed-loop attribution in-store means connecting those signals into one evidence chain. It reconstructs the path from exposure to action to outcome, across four connected phases.

- 1 **The verified impression is the baseline:** store entry, ad exposure, and time spent in the viewable zone, confirming that a real shopper was present with an opportunity to see.
- 2 **Next comes the layer of insight that has been missing:** where the shopper moved after exposure, the aisle they visited, the product they acted on.
- 3 **Third is the outcome that closes the loop,** at checkout and purchase. At this stage, the retailer can connect what was bought to what was seen, browsed, or engaged with along the path.
- 4 **Last is re-engagement.** If the shopper showed intent but did not buy, can that signal inform the next campaign, offer, audience, or channel strategy?

FIGURE 2

True Closed-Loop Attribution

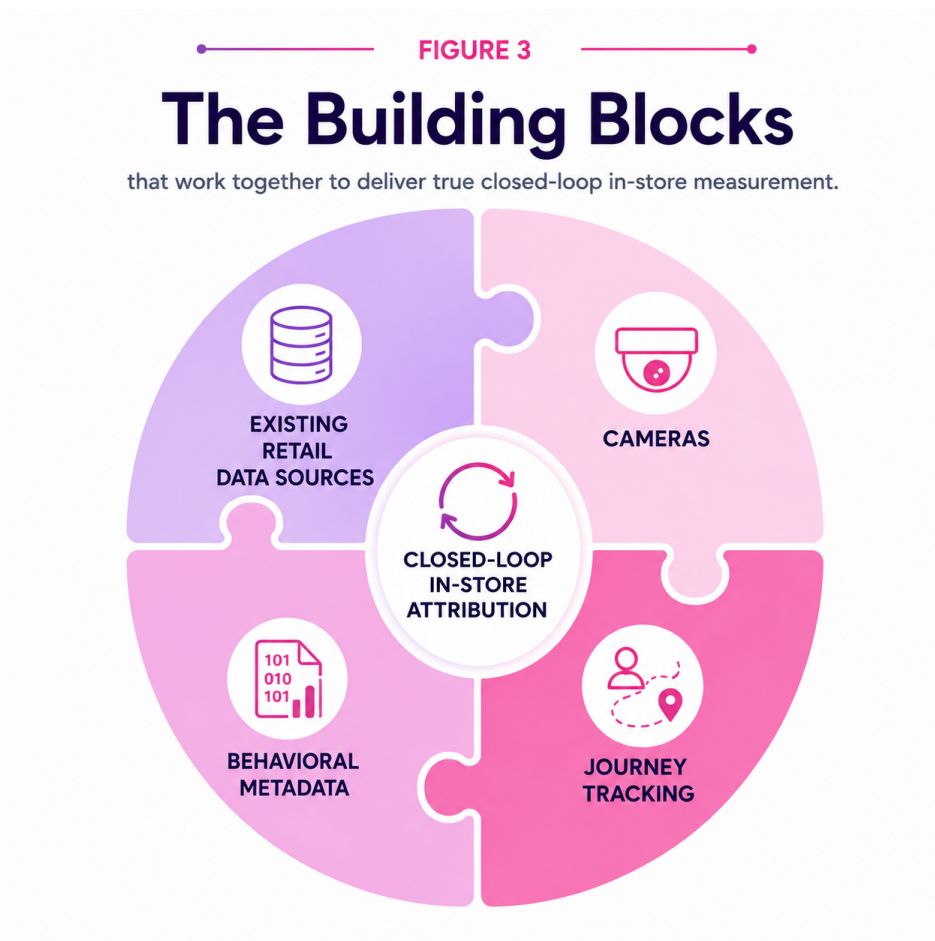


ONE JOURNEY, MANY PROOFS

The same path that shows a brand team reach and awareness can show a trade team store-level lift and incrementality, and a retail media team attribution, ROAS, and revenue impact. Closed-loop attribution resolves a problem that has long fragmented in-store media measurement: every stakeholder wants different proof.

3 The Building Blocks of Closed-Loop In-Store Attribution

Journey-level measurement is not a future capability waiting on new technology; the pieces that make it work already exist inside the store. That is what makes true closed-loop in-store attribution achievable today. It does not require retailers to rebuild the store or install an entirely new measurement network.



3.1 Existing Retail Data Sources

Retailers often possess more measurement data than they realize. In-store media delivery logs confirm which campaigns ran, on which screens, and during what time periods. Point-of-sale systems capture purchase outcomes at checkout. Existing camera networks provide visibility into how shoppers interact with the store environment.

On their own, each source describes only part of the story. Media logs can confirm that an ad played, but not whether a shopper was present. Transaction systems can confirm that a purchase occurred, but not what happened between exposure and checkout. Many retailers originally invested in these systems for operational purposes rather than measurement, so valuable data often remains siloed across different platforms.

Closed-loop attribution emerges when these sources are connected and interpreted as part of a single measurement framework. The goal is not to replace existing systems, but to bring them together to create a more complete understanding of media performance.

3.2 Cameras: The Store's Underutilized Measurement Asset

While cameras have traditionally been used for security and operations, in-store camera analytics transform existing infrastructure into a source of measurement signals. These signals help bridge the gap between exposure and purchase, making cameras uniquely valuable within the in-store measurement stack.

From a single set of camera feeds, retailers can generate a wide range of behavioral insights, including audience presence, dwell measurement, journey reconstruction, category visitation, product interaction, and basket influence analysis — often building on infrastructure that already exists.

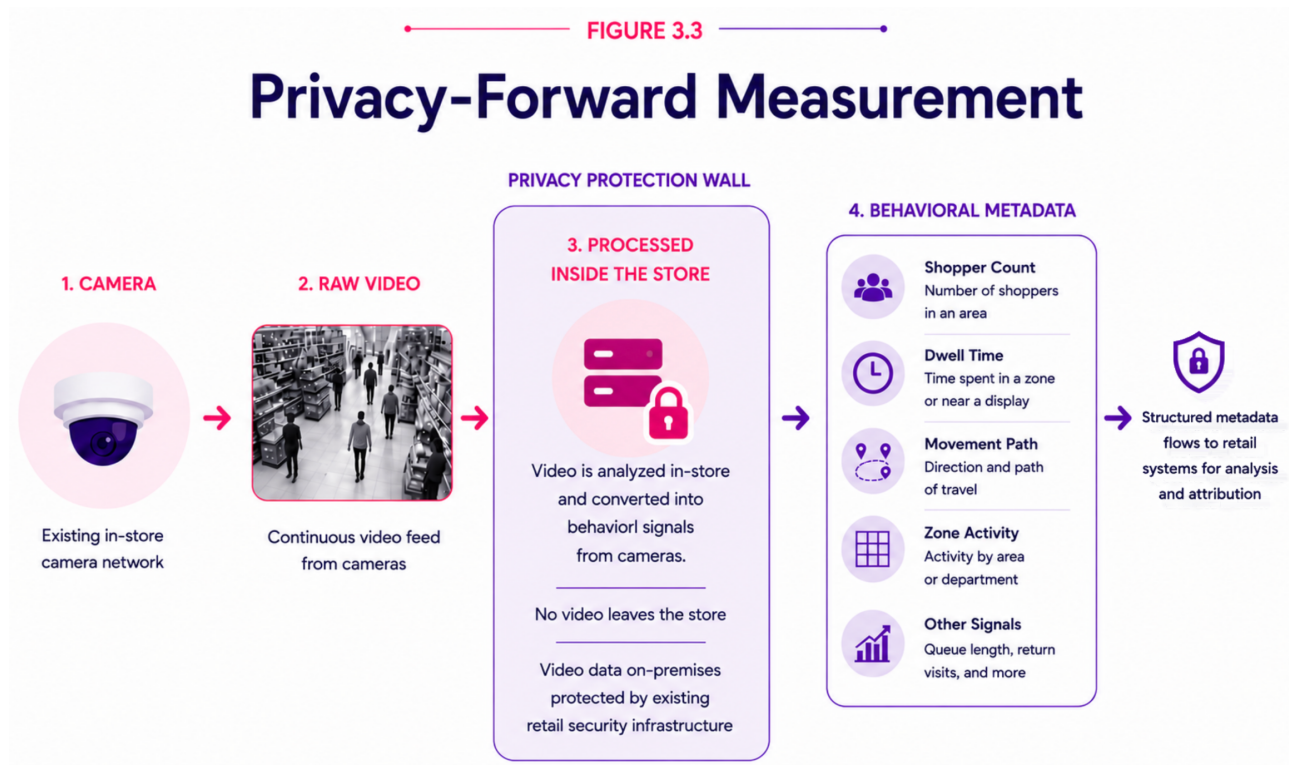


3 · THE BUILDING BLOCKS OF CLOSED-LOOP IN-STORE ATTRIBUTION

3.3 Behavioral Metadata: The Measurement Layer

Capturing shopper activity is only part of the equation. To support attribution at scale, those observations must be translated into a form that can be measured, analyzed, and connected with other retail data sources.

This is where behavioral metadata becomes a critical building block. Through in-store processing, visual activity can be converted into anonymized measurement signals: structured behavioral data, purpose-built for measurement, rather than raw video.



Importantly, source video does not need to leave the store environment. The output is not a recording of individual shoppers, but metadata that describes what happened within the space. This creates a practical way to generate the evidence needed for verified impressions, behavioral insights, and attribution while supporting strong privacy standards.

3 · THE BUILDING BLOCKS OF CLOSED-LOOP IN-STORE ATTRIBUTION

3.4 Tracking the Journey, Not the Shopper

A common misconception about in-store attribution is that it requires identifying individual shoppers. In reality, the objective is not to determine who someone is, but to understand how shoppers move through the store and interact with media, categories, and products.

Journey measurement can be performed without facial recognition, biometrics, or personally identifiable information. Instead, shoppers are represented through temporary, non-identifying characteristics like the color and style of their clothing that allow activity to be connected across views while maintaining privacy.



ANONYMOUS JOURNEYS & DWELL — MOVEMENT, NOT IDENTITY

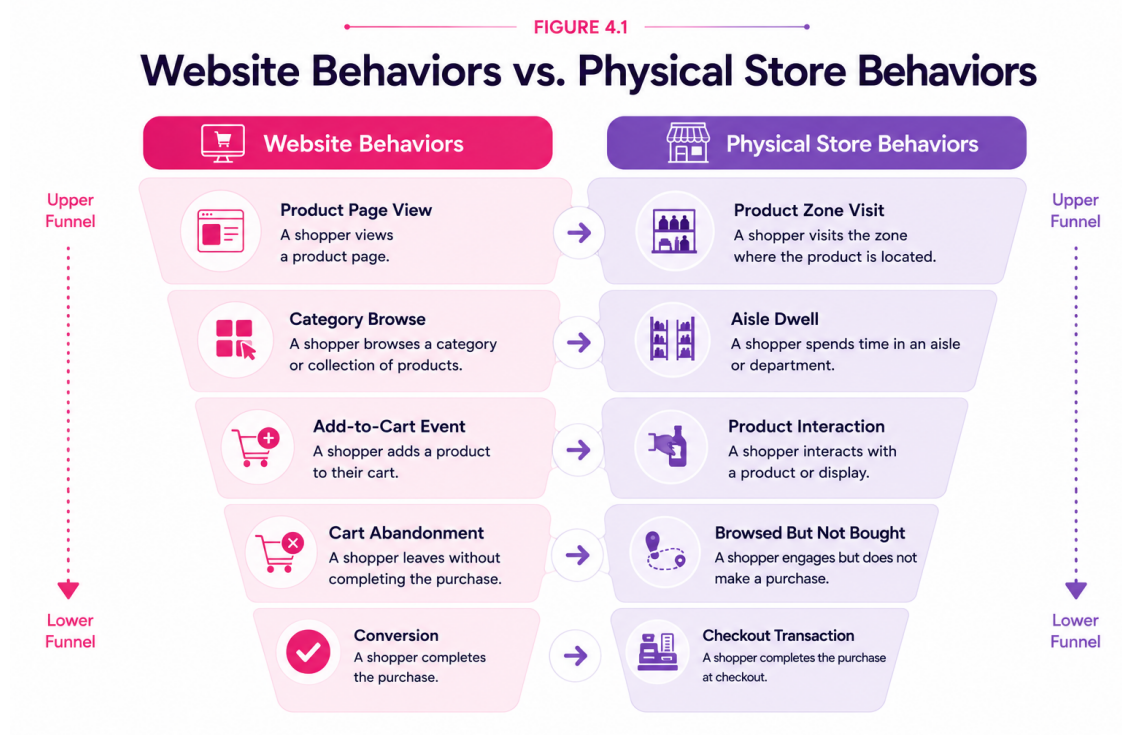
This approach enables retailers to understand the path from exposure to engagement and purchase while keeping the focus on behavior rather than identity. The result is a privacy-forward measurement framework that supports attribution without compromising shopper trust.

4 Turning In-Store Measurement Into Omnichannel Signals

The value of closed-loop attribution does not end with reporting. Once retailers can measure what shoppers saw, what they engaged with, and what they bought, those signals can inform the next campaign, the next offer, and the next channel decision. This is where in-store retail media begins to operate more like digital retail media — the physical store has always generated similar signals, but they were largely invisible. Camera-enabled measurement changes that by making in-store behavior measurable as shopper intent.

4.1 Extending E-Commerce Concepts Into Physical Stores

E-commerce teams already know how to interpret behavioral signals as indicators of shopper intent and campaign performance. The physical store generates many of the same signals; they have simply been more difficult to measure consistently. A product page view becomes a product-zone visit. A category browse becomes aisle dwell. An add-to-cart event becomes product interaction. Cart abandonment becomes browsed-but-not-bought behavior. Conversion becomes a checkout transaction.



4 · TURNING IN-STORE MEASUREMENT INTO OMNICHANNEL SIGNALS

The point is not that stores and websites are the same. In-store journeys are less linear, more tactile, and often influenced by environment, merchandising, signage, staff interaction, and impulse. But the underlying principle is similar: shopper behavior creates measurable signals that help explain how consumers respond to products, promotions, and media.

For retail media, this expands what performance can mean. A campaign may not only drive a sale. It may increase category visitation, extend dwell time, generate product engagement, influence consideration, or reveal emerging demand before a purchase occurs.

4.2 From Store Behavior to Digital Decisions

One of the most valuable outcomes of in-store measurement is that physical-store behavior can become an input into broader digital decision-making. Historically, retailers have had rich data about what shoppers purchased, but limited visibility into what they considered, explored, or engaged with before making a decision. In-store behavioral measurement helps fill that gap by revealing patterns of shopper interest that were previously difficult to quantify.

At the aggregate level, retailers can identify signals such as high category engagement with low conversion, strong interest in specific products or displays, regional demand differences, or emerging shifts in shopper behavior. In some cases, increased engagement within a category may appear in stores before it is reflected in e-commerce traffic or online demand. These insights can help inform e-commerce merchandising, sponsored product strategies, content placement, promotional planning, CRM initiatives, and media investment decisions.

In this way, physical stores become more than a point of sale — they become a source of behavioral intelligence that helps retailers and brands understand demand earlier, respond faster, and make more informed decisions across channels.

4 · TURNING IN-STORE MEASUREMENT INTO OMNICHANNEL SIGNALS

4.3 Cross-Channel Activation

Measurement becomes most valuable when it informs action. Once in-store behavior can be measured consistently, retailers and brands can begin using those signals to improve how campaigns are planned, targeted, and optimized across channels.

One application is **audience creation** — behavioral patterns observed in stores can help identify groups with shared interests, category affinities, or purchase intent. These signals can also support **campaign optimization**, helping retailers understand which placements, store environments, product categories, or creative executions generate the strongest response. And they strengthen **retargeting**: a campaign that generates awareness but not immediate conversion may still create future opportunities through other channels.

Ultimately, the goal is omnichannel activation. Insights generated in the physical store can help shape activity across retail media, e-commerce, mobile, loyalty, and other customer touchpoints, creating a more connected approach to shopper engagement.

4.4 More Accurate Online-to-Offline Attribution

Digital media increasingly influences behavior that ultimately unfolds inside physical stores. A shopper may encounter a sponsored product, retail media placement, email promotion, social campaign, or offsite advertisement before ever entering the store. Yet once that shopper crosses the threshold, traditional measurement often loses visibility into what happens next.

In-store measurement helps close that gap. By making the physical journey measurable, retailers gain a better understanding of whether digital campaigns influenced store visits, category engagement, product interaction, and ultimately purchase outcomes.

This provides brands with a more complete view of performance. Rather than evaluating digital media solely through clicks, impressions, or online conversions, they can begin to understand its contribution to real-world shopping behavior and sales. The result is more accurate online-to-offline attribution and a stronger understanding of where incremental value is being created across the retail media ecosystem.

PUTTING IT INTO PRACTICE

The Dragonfruit AI Advantage

The challenge is not a lack of data. It is turning existing store infrastructure into a practical measurement framework, simply and cost-effectively. That is the problem Dragonfruit AI was built to solve. Working with leading retailers across the globe, Dragonfruit turns existing camera infrastructure into a source of shopper intelligence for in-store retail media.



Our traffic-analysis solution measures anonymous shopper presence, dwell, exposure-zone activity, category visitation, product engagement, basket influence, and journey progression. Together, these signals support the full measurement stack described in this playbook: audience measurement, behavioral insight, and the attribution signals needed for true closed-loop attribution. Measurement and privacy are designed to work together — our architecture supports in-store processing, so source video stays within the store while only anonymized metadata is generated for measurement and reporting.



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