Wiliot

CASE STUDY · 2026

FRESH PALLETS AT NATIONAL GROCER

Tackling fresh markdowns with real-time condition intelligence

A top US grocery retailer tagged fresh pallets across distribution centers and stores with Wiliot's IoT Pixels to analyze dwell times effectively and determine when markdown can still be prevented. As a result, pallets move faster, more fresh product reaches the shelf at full price, and far fewer pallets end up at the wrong store.

BUSINESS IMPACT AT A GLANCE

RETURN ON INVESTMENT

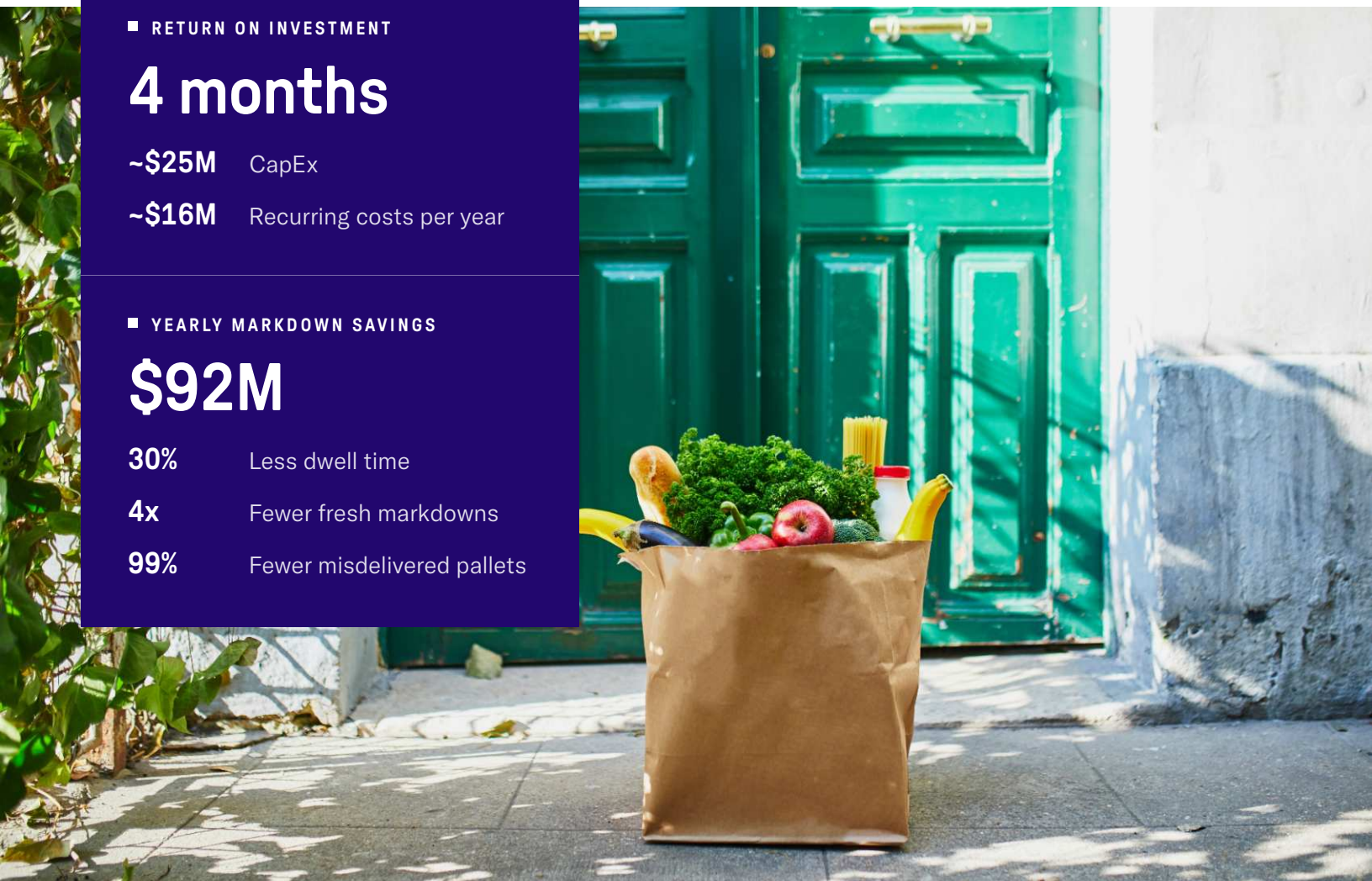
4 months

~$25M	CapEx
~$16M	Recurring costs per year

YEARLY MARKDOWN SAVINGS

$92M

30%	Less dwell time
4x	Fewer fresh markdowns
99%	Fewer misdelivered pallets



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From unseen dwell to fresh markdown reduction

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NETWORK AT A GLANCE

3,150 STORES ENABLED	**30** FRESH DISTRIBUTION CENTERS	**~13,700** DOCK DOORS FITTED
9,000 FRESH PALLETS PER STORE, PER YEAR	**150–300** FORKLIFTS PER DISTRIBUTION CENTER	**~10 mo** INSTALLATION, END-TO-END

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01

A national fresh network, faced with steep markdowns

The grocery retailer is one of the largest in the United States, running a national fresh network of 30 distribution centers feeding 3,150 stores.

THE FRESH JOURNEY

For a fresh product to make it onto the shelf, it needs to move through quite a journey: from a distribution center onto a trailer, into a store, through the back room, into the cooler, and out to the sales floor. The fresh item has roughly a week of sellable life, and the majority of it is spent within the chain. Once it leaves the refrigerated trailer, the product is out of cold storage, and every minute it waits in that transition costs sellable life.

The retailer set out to transform its supply chain logistics by using BLE, starting with the cold chain products that arrive on pallets. The company already had a well-defined receiving process and a digital process for marking products down. What it did not have was any way to see a pallet between the moment it left the trailer and the moment it reached the cooler.

That visibility gap is where retailers leverage Wiliot to identify markdowns that can still be prevented — because once fresh product reaches the cooler or the sales floor, it could be too late.

PROJECT SCOPE

3,150
STORES ENABLED

30
DISTRIBUTION CENTERS

~13,700
DOCK DOORS FITTED



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02

Invisible dwell time leads to more markdown and waste

Markdown is one of the largest problems in the business. A markdown is a discount applied to move product faster, so every occurrence is a missed sale. For fresh goods, it is closer to a straight loss, because the product leaves the shelf within about a week whether it sells or not.

Markdowns across the business can cost large retailers up to $1 billion a year. Fresh is one part of that total, but one that leaves retailers searching for an effective and scalable solution.

THE COST OF DWELL TIMES

Understanding critical freshness windows and acting on them

Fresh product begins losing sellable life the moment it leaves the trailer, and every minute a pallet waits before it reaches the cooler is life it does not get back. For the retailer, without any way to measure that wait, there was nothing to act on. The cost only became visible later, once the product had to be discounted to move it.

Before Wiliot, condition data (to evaluate freshness) came from an associate placing a thermometer against the product or scanning it with an infrared laser, then logging the temperature into an app by hand. There was no automated dwell tracking and no continuous visibility. Nobody could see how long a pallet had been sitting without walking over and looking at it — during receiving, the busiest window of the store day.



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03

Sensing that never stops, especially during dwell

Wiliot was chosen as the Physical AI solution that gave the retailer continuous visibility into its fresh pallets, following assets throughout critical freshness and dwell windows, and effectively indicating to associates which pallets were entering markdown territory.

For fresh receiving, Wiliot resolves into three critical capabilities that no other solution could combine.

VISIBILITY INTO FRESHNESS

01 **Continuous sensing, so dwell time becomes measurable**

IoT Pixels report autonomously and typically transmit several times a minute, with no gate, portal, or scan required. Because sensing never stops, the platform can calculate how long a pallet has been sitting somewhere — the data that decides whether fresh product reaches the shelf sellable, and one that periodic reads cannot produce.

02 **Dwell time and temperature, combined**

Whether a pallet should be marked down depends on how long it sat and how warm it got, together. Since IoT Pixels sense location, motion, temperature, humidity, and light at once, the two metrics arrive already joined, on the same item, on the same timeline — replacing the separate sensors that legacy technologies require.

03 **A platform that turns condition into action**

Raw temperature describes what has already happened. Reducing markdowns means acting before product degrades, which requires refining the signal into something an associate can act on in the moment. The platform's models process the IoT Pixels' data stream and push alerts to the correct associate with the required action, and the grocery retailer's own engineers layer their store logic on top of it.

WILIOT CHANGED THE QUESTION THE OPERATION COULD ASK

BEFORE

How warm was it when someone last checked?

WITH WILIOT

Does this pallet's temperature indicate that it needs to be moved now?

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04

Deploying Physical AI throughout the entire fresh network

Wiliot worked together with the grocery retailer for roughly 10 months across three parallel workstreams to reach all 30 distribution centers and all 3,150 stores in the fresh network.

NETWORK COVERAGE

30
DISTRIBUTION CENTERS

3,150
STORES

~13,700
DOCK DOORS FITTED

END-TO-END ASSET TRACKING

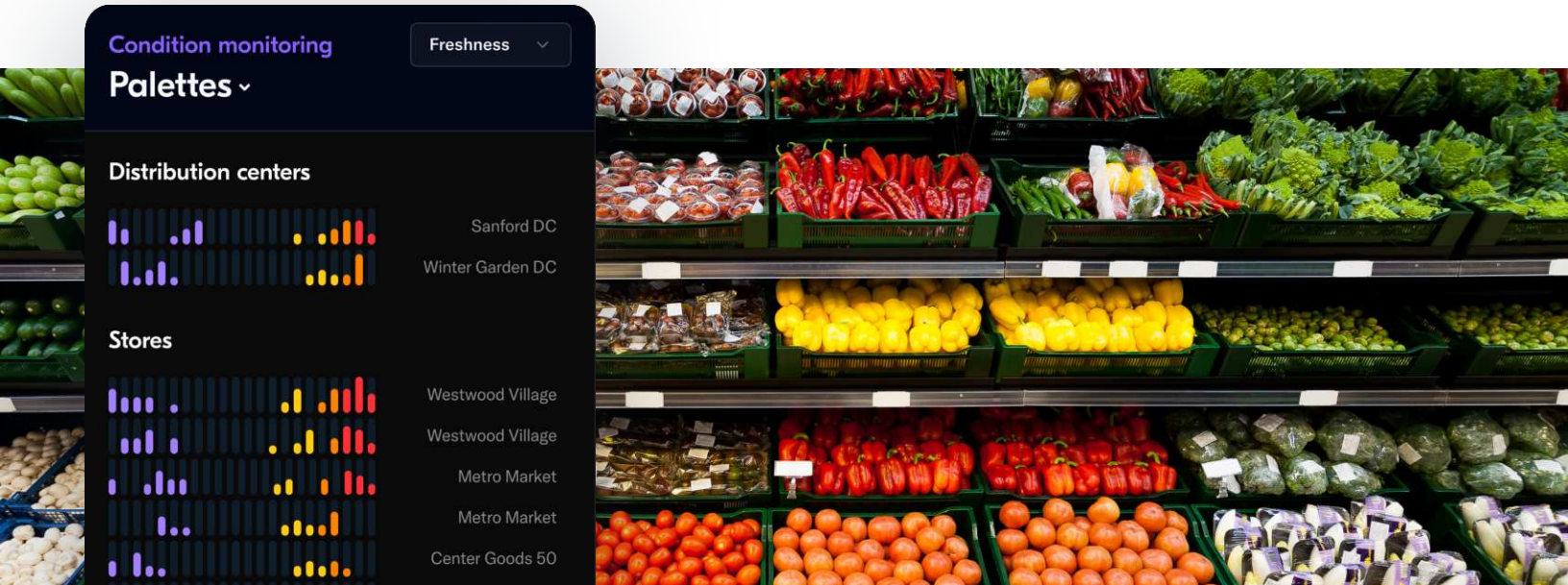
At the distribution centers, label printers were retrofitted onto every forklift (each site runs anywhere from 150 to 300 forklifts). A label carrying IoT Pixels is printed and registered with the Wiliot cloud the moment an employee shrink-wraps a pallet.

At the stores, roughly 13,700 dock doors were fitted with Bluetooth bridges at two per door. Pallets passing through generate location, temperature, and pallet-load data, and create the association between asset and pallet.

Those signals feed the grocery retailer's own databases, where their engineering team applies the store logic: which conditions raise an alert, how urgent it is, and who receives it — routing only to an associate who is on shift at that store.

THE INVESTMENT

ONE-TIME CAPEX	ANNUAL OPEX IN LABELS	PLATFORM AND DATA
~$25M	**~$9M**	**~$20M**
Full network build	$0.13 per asset	Over 3 years



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05

Wiliot enabled four use cases from one deployment

The Wiliot deployment for markdown improvement fueled four use cases that the retailer was able to leverage before the project was at full scale.

USE CASE 01

Cold chain compliance alerts

During receiving, alerts reach the associate's phone by product type and specify which action to take on which pallet. Nobody has to walk the back room to find out what has been waiting.

30% LESS DWELL TIME	**4x** FEWER FRESH MARKDOWNS

By having greater visibility into fresh dwell time with Wiliot, the retailer was able to significantly reduce markdowns. Because product condition degrades continuously from the moment it leaves the trailer, it was crucial to find a solution that would continuously track, analyze, and alert on dwell time metrics.

USE CASE 02

Wrong pallet, wrong store

Drivers sometimes shift the order of pallets while unloading, leave one at the wrong stop, and forget to load it back. Recovering these forgotten, or wrong, pallets means dealing with sending claims to a distribution center, waiting for the next route, and receiving product a day late — which would require a markdown.

With Wiliot's continuous sensing capabilities, the driver was alerted as the wrong pallet came off the trailer and was able to return the correct pallet, keeping operations on schedule. Due to this, misdeliveries fell from several a week per store to roughly one a year.

99% FEWER MISDELIVERED PALLETS

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USE CASE 03

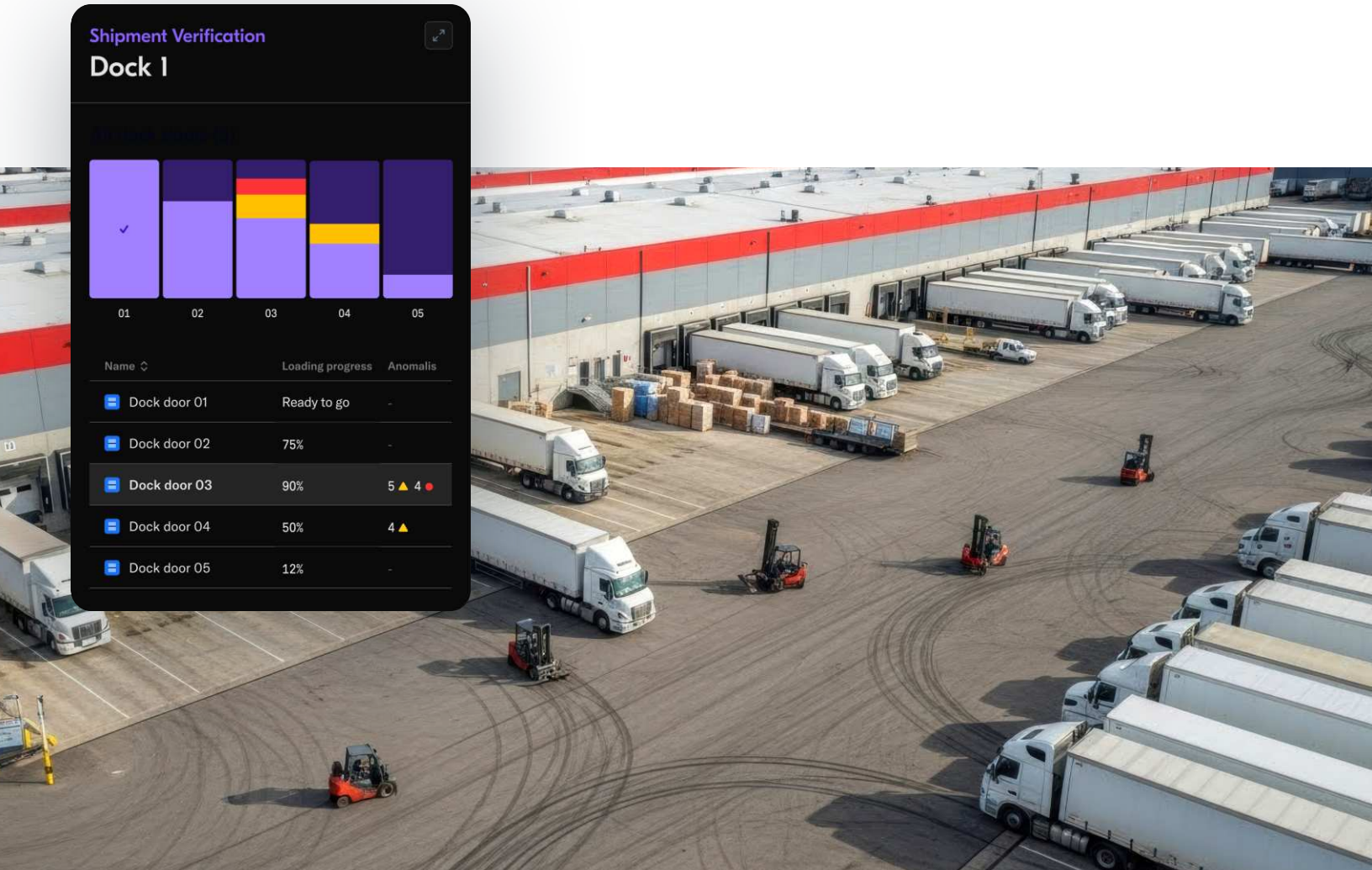
Cold chain logging

Temperature now logs itself; associates no longer hold a probe against product or scan it with an infrared reader and type the reading in. The tagged asset reports its own condition, continuously, without anyone touching it.

USE CASE 04

Labor reallocation

Reallocation of labor is an important business goal for this retailer and one it was able to achieve thanks to Wiliot and the insights gathered on manual labor intervention throughout their fresh network.



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06

Avoiding markdowns across the entire fresh network

Ultimately, the grocery retailer decided to take on the fresh markdown challenge once and for all — and saw just how continuous visibility can help avoid markdowns throughout the entire fresh network.

By having the means to ensure that every fresh pallet reaches the cooler sooner, preserving its sellable life, the grocery retailer was able to measure the markdown avoided per pallet delivered — a metric that holds steady whether sales are rising or falling.

THE RESULTS FROM THE NATIONWIDE DEPLOYMENT

~$3.25
OF MARKDOWN AVOIDED ON EVERY FRESH PALLET THAT MOVES IN TIME

×

9,000
FRESH PALLETS RECEIVED PER STORE, PER YEAR

×

3,150
STORES IN THE FRESH NETWORK

THE RESULTS AT FULL SCALE

~$92M

network-wide across 30 distribution centers and 3,150 stores

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07

Reducing fresh markdowns requires continuous visibility

RFID in cold chain confirms that a tagged pallet passed a fixed read point. Preventing a fresh markdown is a different problem, one that requires continuous visibility.

RFID CHALLENGES

Dwell is a duration, not an event

A checkpoint read indicates presence at a gate at a single moment; between reads the pallet is unobserved. In fresh receiving, that interval is the entire window in which a markdown can still be prevented.

Dependence on manual intervention

A temperature read requires a person to scan at the right moment, on every pallet, across a full shift — during receiving, the busiest window of the day, when a manual step is least likely to happen consistently and without error.

Freshness is a two-variable problem

Location and temperature become two deployments, two cost lines, and two data sets to reconcile before anyone can act. Wiliot IoT Pixels sense both on one tag, so operations can decide on the combined data.

ABOUT WILIOT

Wiliot provides real-time data mining capabilities for organizations that want continuous visibility into their physical operations. Wiliot is the only multi-modal sensing technology for asset tracking that is cost-effective and scalable across any supply chain, and so much more. If you move physical assets, we have a solution for you.

Visit www.wiliot.com to learn more.