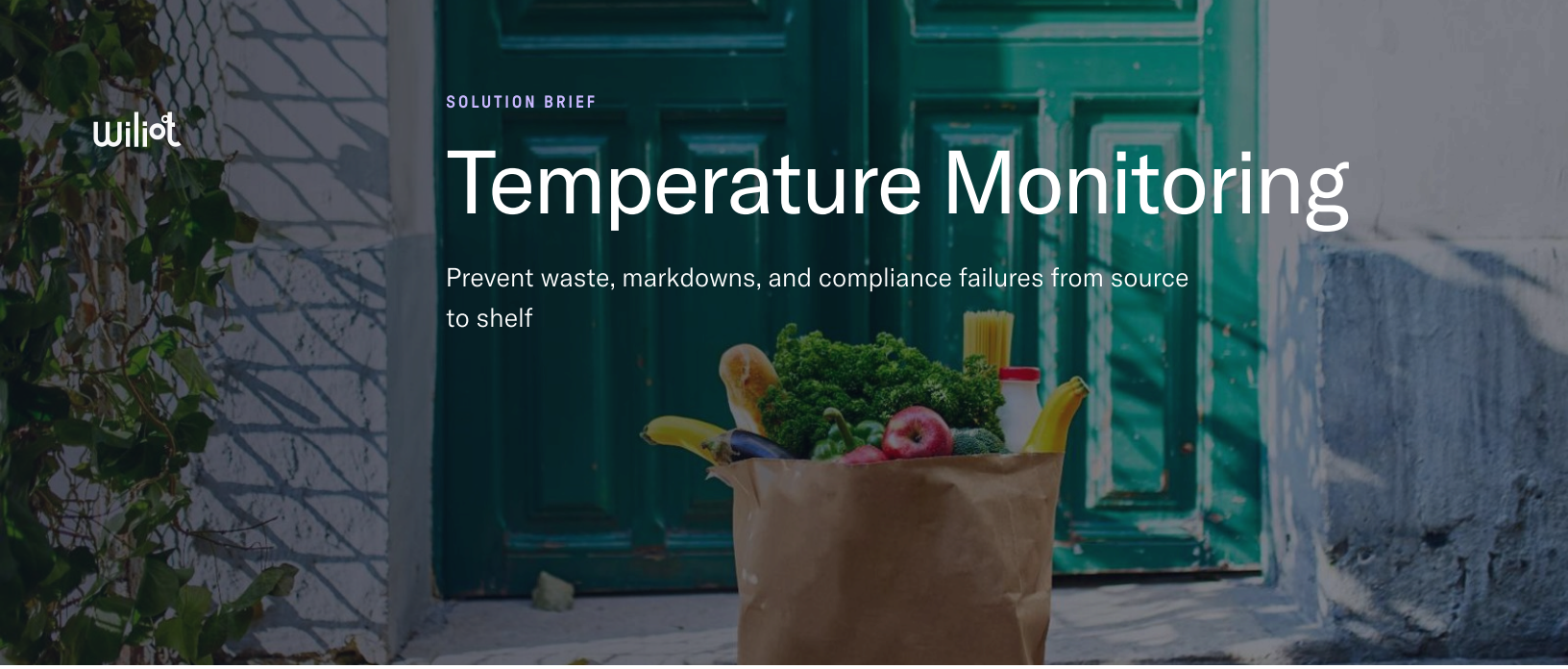


SOLUTION BRIEF

Temperature Monitoring

Prevent waste, markdowns, and compliance failures from source to shelf

SOLUTION BRIEF
SUPPLY CHAIN OPERATIONS

The challenge

$260B in perishable food lost annually to cold chain failures. Zone-level monitoring misses individual product conditions—problems found after damage.

Wiliot delivers case-level temperature monitoring—see the product itself

AT A GLANCE

99%+	$2M–$15M	< 1 year
Case-level accuracy	Annual savings	Average ROI capture

THE PROBLEM COLD CHAIN OPERATORS FACE

Temperature-sensitive products must remain within strict conditions across every handoff. Yet industry data shows the cold chain routinely breaks:

- Up to $260B of perishable food is lost globally each year due to temperature excursions, improper handling, and cold-chain failures
- Retailers experience ~7% shrink in perishables, largely driven by preventable cold-chain issues
- Up to 20% of food spoils during transport globally

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Where the cold chain breaks

THESE FAILURES LEAD TO

- Spoilage and waste, high-value products rendered unsellable
- Markdowns & reduced shelf-life forces discounting
- Regulatory non-compliance: FSMA, FDA, HACCP violations
- Brand erosion—customers lose trust in freshness and quality

KEY DIFFERENTIATOR

Wiliot sees the product itself

Most systems see only reefer temperature or cooler temperature. Wiliot sees the product itself.

CURRENT APPROACHES FALL SHORT

- Zone-level monitoring (reefer unit sensors) misses individual product conditions
- Infrequent spot checks fail to detect damaging temperature excursions
- No visibility during transfers: dock staging, loading/unloading create blind spots
- Reactive rather than preventive—problems discovered after damage is done

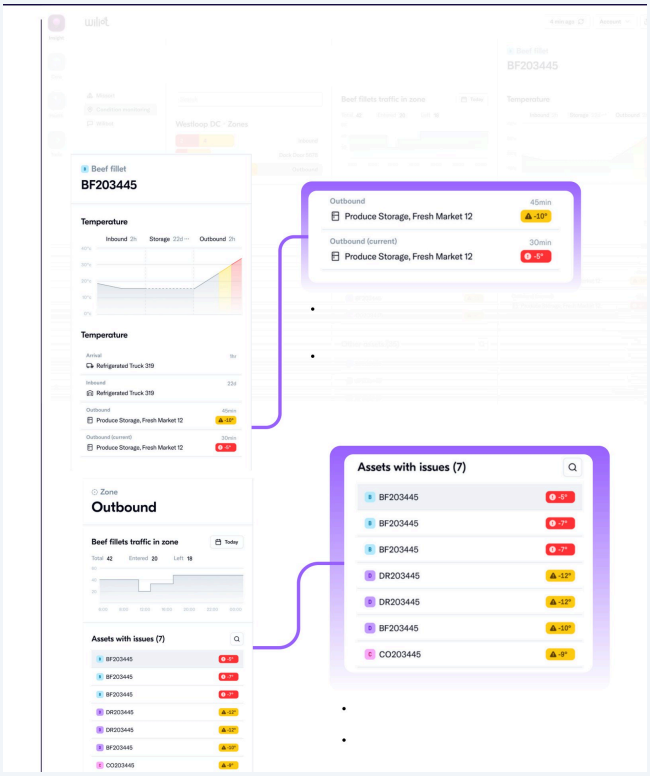
WHICH OF THESE APPLY TO YOU?

- ☑ You transport/store perishable goods (food, pharmaceuticals, biologics)
- ☑ Currently experience lost revenue and markdown losses impacting inventory value
- ☑ Regulatory compliance requires documented temperature controls (FSMA, GDP, HACCP)
- ☑ Cold chain complexity spans multiple handoffs (suppliers → DCs → stores → customers)
- ☑ Asked to comply with industry storage and freshness requirements to service customers

Wiliot business insights

WILIOT BUSINESS INSIGHTS

Views from the Wiliot solution application



01 Temperature and dwell-time sensing detects risks on perishable goods before losses occur

02 See complete temperature history for compliance audits

03 See temperature excursions in real-time and get alerts

04 Identifies specific products at risk (not just entire zones)

WHAT WILIOT PROVIDES

A continuous, case-level temperature and dwell-time visibility solution using battery-free IoT Pixels and minimal infrastructure.

The solution application automatically:

- Tracks case temperature throughout the cold chain
- Detects temperature excursions in real-time and sends immediate alerts
- Documents complete temperature history for compliance audits
- Identifies specific products at risk (not just entire zones)

Key advantage: RFID requires a complex and expensive portfolio of products to record temperature. Wiliot delivers continuous temperature sensing and more in an integrated all-in-one tag.

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How it works

HOW IT WORKS

01 Tag products at source

IoT Pixels applied to perishable cases/pallets at supplier, manufacturer, or receiving facility (integrated into existing labels)

02 Deploy minimal infrastructure

- Supplier staging/loading docks
- DC receiving/storage/shipping
- Retail backrooms/coolers
- In-transit via mobile gateways

03 Continuous temperature & dwell monitoring

- Logs temperature readings
- Detects excursions beyond thresholds
- Calculates cumulative exposure
- Dwell-time alerts for wrong areas

04 Real-time alerts

Immediate notifications when:

- Temperature exceeds safe ranges
- Dwell time exceeds limits
- Products approach shelf life end
- Anomalies detected

05 Automated compliance records

Record-keeping for audits: complete temperature history per SKU/lot, chain of custody with timestamps, exception reports, and compliance dashboards by facility/route

PROVEN OUTCOMES

Zone-level vs. product-level monitoring

ZONE-LEVEL (TRADITIONAL)	PRODUCT-LEVEL (WILIOT)
Reefer/cooler temp only	Individual case temp
Can't identify specifics	Specific at-risk products
Misses product-level issues	Catches excursions early
Reactive detection	Proactive prevention
Entire load at risk	Targeted intervention

$2M–$15M

Annual enterprise savings from reduced waste, markdowns, and compliance costs

99%+

Case-level accuracy for location and temperature tracking

Automated

Compliance documentation—full audit trail for regulatory requirements

< 1 year

Faster payback driven by reduced waste and higher product sell-through

KPIs and industry applications

KPIS DRIVING VALUE

Waste prevention
Catch temperature excursions before product damage occurs

Markdown reduction
Better shelf-life management minimizes forced discounting

Compliance assurance
Automated documentation for FSMA, FDA, HACCP, GDP audits

Quality protection
Maintain product integrity and customer trust in freshness

Risk mitigation
Avoid regulatory fines, recalls, and insurance claims

Visibility during transfers
Monitor during dock staging, loading/unloading—no blind spots

Product-level intelligence
Identify specific at-risk cases, not just entire areas

EXAMPLES OF INDUSTRY APPLICATIONS

INDUSTRY	CHALLENGE	OUTCOME
Quick-service restaurants (QSR)	Delivering fresh food to thousands of locations with tight shelf-life windows	90%+ reduction in temperature violations, fewer customer complaints about quality
Grocery retail	Managing perishables from farm to shelf with multiple temperature areas	Double-digit reduction in waste and markdowns from better cold chain control
Food & beverage distribution	FSMA 204 compliance across complex multi-tier supply chains	Automated traceability and compliance documentation, reduced audit risk
Pharmaceutical & healthcare	Strict GDP/FDA requirements for vaccines, biologics, and temperature-sensitive drugs	Reliable temperature integrity with complete chain of custody documentation
Third-party cold storage	Multi-client SLAs, providing temperature guarantees to multiple clients	Documented compliance for each client, reduced claims and disputes

Implementation & investment

IMPLEMENTATION

Timeline	System live in weeks
Infrastructure	Standard low-voltage installation Minimal out-of-the-box networking infrastructure DCs, retail stores, cold storage facilities Mobile: refrigerated trailers, delivery vehicles
Flexible deployment	Deploy at critical control points in your cold chain. Start with high-value routes or products, expand as you prove value. Fixed infrastructure at facilities, mobile gateways in vehicles for in-transit monitoring. Scalable approach accommodates growing cold chain complexity.
Integration	Seamless integration via cloud-to-cloud (C2C) data transfer, plus SDK and APIs for easy adoption.

VALUE DRIVERS

- Reduced product spoilage (caught before reaching shelves)
- Fewer markdowns (better shelf-life management)
- Avoided regulatory fines and recalls
- Improved customer satisfaction (fresher products)
- Reduced insurance claims from temperature-related losses

PAYBACK PERIOD

Less than one year (average)

Fast ROI driven by immediate reduction in waste and better product quality

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Business impact snapshot

WILIOT CUSTOMER

Grocery retailer

CHALLENGE

- 7% shrink on perishables
- $50M annual perishable sales
- Estimated $4M annual waste, ~80% temperature-related = $3.2M preventable

SOLUTION

Case-level temperature monitoring across supply chain

TOTAL ANNUAL SAVING

$3M+

Investment: ~$500K first year

PAYBACK: <12 MONTHS

RESULTS AT A GLANCE

REDUCTION IN SPOILAGE

90%

Reduction in temperature-related spoilage

REDUCED MARKDOWNS

+$400K

Reduced markdowns from better shelf-life management

ANNUAL SAVINGS

$3M+

Savings from temperature-related waste

VALUE SUMMARY

If your perishables experience >3% spoilage or markdown, or if compliance visibility is a challenge, case-level temperature and dwell-time monitoring can save millions annually, protect product quality, and reduce regulatory risk. The solution pays for itself through prevented waste and improved product quality within the first year.

Learn more at wiliot.com →