

A monitoring system for grain movement from procurement to distribution.

This document sets out the capabilities of a proposed operations-monitoring system for the Food Corporation of India, illustrated through a working prototype, together with an assessment of what would be required before deployment.

Consolidated tracking of grain in transit, automated reconciliation of weight and bag count at receipt, and pattern-based identification of recurring loss.

Basis for the proposed system

Foodgrain moves in large volumes between procurement centres, storage depots and distribution points under the Corporation's supply chain. Given the scale and distances involved, gaining full visibility into transit conditions, weight variance and stoppages from manifest records alone can be difficult. The capabilities below are intended to add a layer of real-time visibility and analysis on top of the Corporation's existing operational framework.

01

Live tracking & geofencing

GPS/AIS-140 positions of the truck fleet on a live map, with alerts the moment a truck stops or deviates unexpectedly.

02

Weight & bag reconciliation

Declared vs. received weight and bag count logged automatically at every depot, with a seal-intact check to confirm shipment integrity at receipt.

03

AI risk scoring

Every shipment and route gets a confidence-scored risk profile built from pattern history, not a single rule triggering a single alert.

04

Leakage pattern detection

Surfaces recurring patterns that are easy to miss manually: geographic stop clusters, systematic weight variance on one route, jute-bag discrepancies, each with an estimated ₹ impact.

05

Decision engine with sign-off

Recommends the next action with its evidence and alternatives considered, so an officer can review and sign off before anything is actioned.

06

Vigilance case management

Flagged patterns become case files with a full evidence chain, tracked to closure, FIR filing, or amount recovered.

How the pieces connect

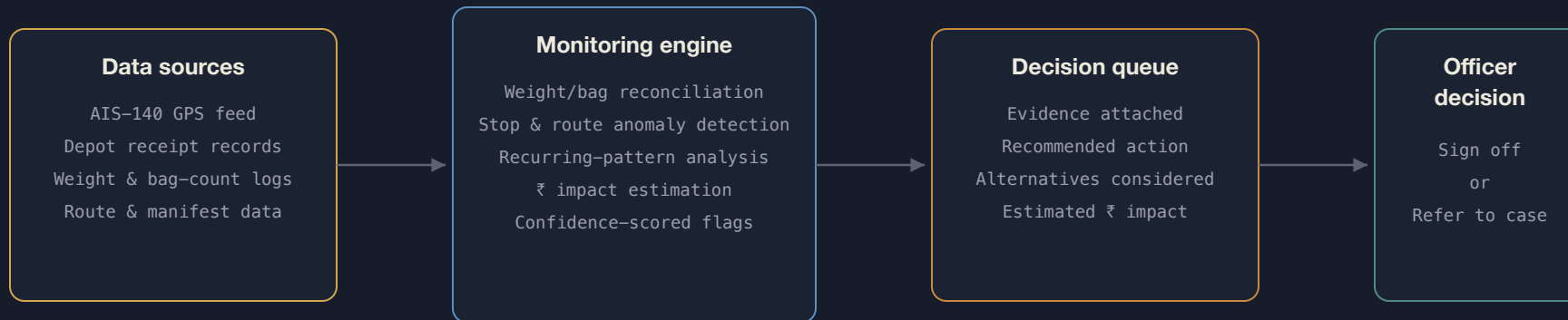


Figure 1. Data flow from source systems to a signed-off officer decision

— PROTOTYPE DEMONSTRATION

Foodgrain Supply Chain Monitoring Dashboard

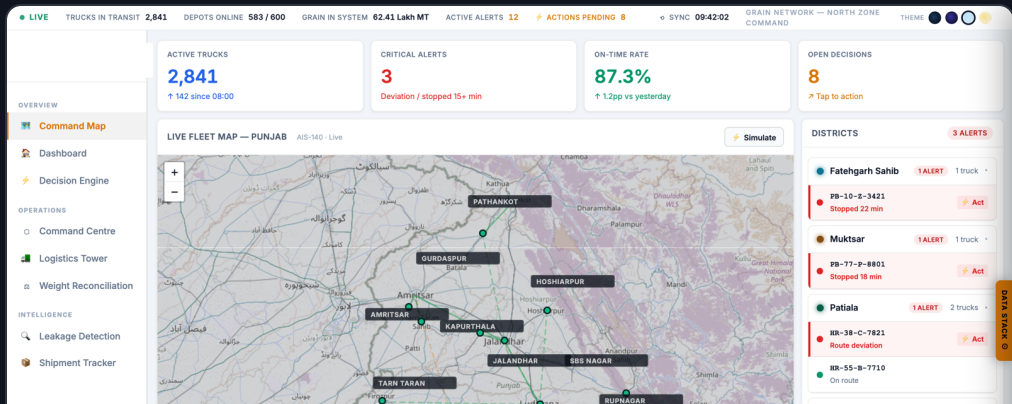
This is a functional prototype, not a static mockup: the screens described below are interactive and demonstrated in person, across four role-based views.

- Command Centre: national zone health, grain-flow pipeline, live alert feed
- Logistics Tower: fleet map, shipment/weight/journey timelines, driver comms
- Depot dashboard: incoming loads, storage %, weight & bag reconciliation
- Leakage Detection: risk donut, top risk routes, pattern cards with ₹ estimate and confidence
- Vigilance case files: evidence chain, closure outcomes, FIR & recovery tracking
- 4 role-based views: District Officer, Logistics Manager, Depot Supervisor, Vigilance Inspector

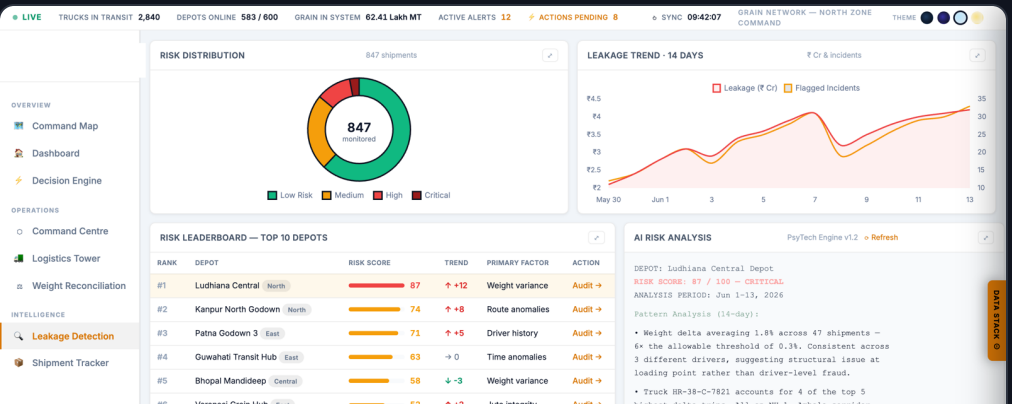
62.4L MT grain tracked nationally	2,841 trucks live on AIS-140 GPS	₹4.2 Cr monthly leakage addressed	76% AI actions resolved, MTD	₹1.8 Cr leakage prevented, MTD
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— PROTOTYPE DEMONSTRATION

Screens from the working prototype



Command Centre: live fleet map, district alerts, network-wide status



Leakage Detection: recurring loss patterns with confidence and ₹ estimate

From flagged pattern to officer decision



Figure 2. Case lifecycle, weight-variance pattern example

OFFICER APPROVAL LAYER
From Signal to Decision
PayTech Engine detects. You approve. The system executes.

AWAITING YOUR APPROVAL 8

DECISION REASONING CLICK AN ACTION TO INSPECT

OUTCOME TRACKING CLOSED ACTIONS

URGENT Physical Audit Required
Ludhiana Central
District Officer, Ludhiana
Weight delta >2% on 4 consecutive trips. Ship cluster at NH-10km 142.
Signal: Route was the issue, not driver.
Learning: NH-10km 142 added to high-risk segment watch list.

PENDING
Mark Done Escalate Reassign

HIGH Route Reassignment
Truck HR-38-C-7821
Logistics Controller
Move from NH-1 to NH-44 alternate for next 3 trips pending audit.

PENDING
Mark Done Escalate Reassign

HIGH Driver Suspension — Temporary
Driver HR-291

RESOLVED
Route Reassignment — Truck PB-10-B-4302
Outcome: Rerouted via NH-44. Weight delta dropped from 2.1% to 0.2%.
Signal: Route was the issue, not driver.
Learning: NH-10km 142 added to high-risk segment watch list.

RESOLVED
Driver Suspension — HR-291 (Temp)
Outcome: Suspended 48hrs, assigned HR-445. Zero incidents on same route with replacement driver.
Signal: Driver confirmed as contributing factor.
Learning: HR-291 flagged for mandatory retraining program.

INCONCLUSIVE
Physical Audit — Patna Godown 3
Outcome: Audit conducted. No physical evidence found.
Signal: Weight discrepancy may be sensor calibration error.
Learning: Weighbridge at Patna flagged for recalibration — scheduled Jun 14.

Decision Engine: recommended action with supporting evidence, pending officer sign-off

OPEN CASES 7 **HIGH-RISK DEPOTS** 4 **FLAGGED DRIVERS** 3 **LEAKAGE EST.** ₹4.2 Cr **NEW EVIDENCE** 2

Total Shipments Reviewed: 847 Avg Δ: 0.41% Estimated Loss (MTD): ₹4.2 Cr

REGION All Regions **AI** Normal Investigate Alert Critical Jun 1-13, 2026 Export CSV

TRUCK ID	ROUTE	DISPATCHED	RECEIVED	Δ WEIGHT	Δ%	STATUS	
HR-38-C-7821	Ludhiana → Ambala	24.80 MT	24.14 MT	-0.66 MT	-2.66%	Critical	View
PB-10-B-4302	Ambala → Delhi	23.50 MT	22.81 MT	-0.69 MT	-2.94%	Critical	View
OP-65-T-1198	Kanpur → Varanasi	25.00 MT	24.61 MT	-0.39 MT	-1.56%	Alert	View
RJ-14-GA-8832	Jaipur → Delhi	24.60 MT	24.52 MT	-0.08 MT	-0.33%	Investigate	View
DL-1-CG-9221	Delhi → Karnal	23.90 MT	23.18 MT	-0.72 MT	-3.01%	Critical	View
MP-09-D-5521	Bhopal → Nagpur	23.90 MT	23.83 MT	-0.07 MT	-0.29%	Normal	View
HR-55-B-7710	Karnal → Ludhiana	24.20 MT	24.13 MT	-0.07 MT	-0.29%	Normal	View

HR-38-C-7821 Critical
ROUTE MAP: LUDHIANA → AMBALA
Last updated: 09:42

WEIGHT TIMELINE
Dispatch Checkpoint 1 Checkpoint 2 Receipt

RISK SIGNAL CHECKLIST

Vigilance Inspector: case record with evidence chain and outcome tracking

— IMPLEMENTATION STATUS

Present state of the prototype and requirements for deployment

The prototype currently operates on illustrative data. Deployment for departmental use would require integration with the systems listed below.

CAPABILITY	STATUS	WHAT'S NEEDED FOR PRODUCTION
Command Centre, Logistics Tower, depot dashboard, case files, alert engine	DEMO-READY	Re-skin with FCI branding; connect to an existing user directory for role/login.
Risk scoring & pattern detection logic	TO BUILD	Model tuned on historical shipment data; needs a data-sharing agreement.
Live GPS feed (AIS-140 / vehicle telematics)	NEEDS INTEGRATION	API access to the existing GPS/AIS-140 vendor or fleet telematics provider.
Panic button / IoT seal sensors	NEEDS HARDWARE	Only where sensor hardware isn't already deployed on vehicles/depots.

— NEXT STEPS

Demonstration

The dashboard is available for a full walkthrough, including role-based views, a flagged pattern, and the resulting officer decision.

PREPARED BY PSYTECH AI · FOR OFFICIAL REVIEW