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AUTOMOTIVE / MANUFACTURING · INBOUND DISPATCH PLANNING

AI-Powered Inbound Dispatch Planning for a Leading Automotive OEM

OR-Optimised Supply Chain Execution · Multi-Plant · Enterprise Scale

INDUSTRY	SOLUTION	PLANTS	SUPPLIERS	SCALE
Automotive / Manufacturing	OptiRun — OR-Based Planning Engine	Multi-plant, SAP ERP integrated	Hundreds of active suppliers	Legacy Systems and Manual Processes.

IMPACT AT A GLANCE

11%	**12%↑**	**~10×**	**~6pp**
Avg Reduction in Inbound Freight Cost Per Trip — Across the network	Improvement in Vehicle Fill Rate — After OR-optimised routing	Faster Monthly Dispatch Planning Cycle — vs. manual 2–3 day process	Increase in Milkrun-Consolidated Trip Share — Through supplier clustering

BACKGROUND & SITUATION

The Operating Environment

A major automotive OEM operating multiple assembly plants in India faced growing complexity in its inbound logistics operations. With hundreds of active suppliers, diverse material types, and stringent MRP driven production schedules, coordinating daily inbound dispatch planning manually had become operationally unsustainable.

Manual dispatch planning led to sub-optimal vehicle fill rates and inflated freight costs due to under loaded trips and poor route consolidation. The absence of intelligent milkrun routing meant single-supplier trips were being dispatched where multi-supplier consolidation was viable significantly raising cost-per-unit.

TRIGGER FOR CHANGE

The Need for OR-Driven Automation

The client engaged Enmovil to design and deploy an OR-based Inbound Dispatch Planning solution branded Optirun capable of automating the network planning, routing, vehicle selection, and cost optimisation across its multi-plant supply chain.

> *"The shift from manual to OR-driven dispatch planning fundamentally changed how we approach inbound logistics — not just faster, but structurally better." — Supply Chain Leadership, Automotive OEM Client*

THE CHALLENGE

Key Barriers to Inbound Logistics Efficiency

Manual planning processes and the absence of optimisation logic created persistent freight cost, fill rate, and governance challenges across the multi-plant inbound supply chain.

Sub-Optimal Vehicle Fill Rates

Manual dispatch planning led to under-loaded trips and poor route consolidation, inflating inbound freight costs across the network.

Absence of Intelligent Milkrun Routing

Single supplier trips were being dispatched where multi-supplier consolidation was viable significantly raising cost-per-unit of inbound freight.

No Systematic Supplier Classification

No mechanism to classify suppliers into Direct vs. Milkrun categories based on daily volume, resulting in routing inefficiencies across both plants.

Unstructured Returnable Pallet Management

Returnable pallet management was unstructured, creating unplanned reverse logistics trips, added costs, and planning complexity.

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No Trip-Level Freight Cost Visibility

Planning teams lacked visibility into trip-level freight cost breakdowns (driver, tyre, repair, fuel) to make cost optimal vehicle selections.

THE SOLUTION

Optirun — Inbound Dispatch Planning Platform

Enmovil deployed Optirun, a cloud-based OR-solver powered planning engine, integrated with the client's ERP (SAP) and master data systems. The solution orchestrates the full inbound planning cycle from monthly demand ingestion to supplier pickup scheduling across two plants with distinct supplier networks.

The OR solver ingests monthly MRP driven order data per supplier and SKU, calculates daily trip requirements, and pre-pones future date orders to form Full Truck Loads (FTLs). Suppliers meeting ≥1 FTL daily with ≥70% Vehicle Fill Rate (VFR) are assigned Direct routes; the rest are routed through milkrun consolidation.

A constraint based OR solver forms optimal milkrun routes respecting max distance, inter supplier distance limits, and max suppliers-per-route rules. Vehicle selection is cost minimised per route using full fixed and variable freight modelling not just nearest available or largest capacity heuristics. Optirun includes an integrated 3D loading simulation engine that validates stacking norms, ensures geometrical fit, and respects forklift height restrictions.

CAPABILITIES DELIVERED

1 Input Optimisation Engine

- Ingests monthly MRP driven order data per supplier and SKU
- Calculates daily trip requirements and pre-pones future date orders to form Full Truck Loads (FTLs)
- Classifies suppliers into Direct or Milkrun categories based on daily volume and VFR thresholds

2 OR-Based Route Solver

- Runs a constraint based OR solver to form optimal milkrun routes, respecting max distance and inter-supplier distance limits
- Selects the optimal vehicle type per route based on lowest cost and highest VFR, eliminating vehicles exceeding distance thresholds

3 Returnable & Scheduling Logic

- Suppliers with returnable materials are automatically assigned SIDE-door vehicles; trips originate from the plant to ensure pallet drop-off before collection
- Round trip distances are accurately factored into cost calculations for returnable material suppliers
- Trip scheduling respects supplier working hours and holiday calendars, preventing invalid dispatch windows

4 3D Load Simulation

- Validates stacking norms per material type (KLT, GLT, Pallet, Wooden Box, PP Box) before dispatch
- Ensures geometrical fit within selected vehicles for every planned load configuration
- Respects forklift height restrictions for unloading eliminating field rejections due to improper loading

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5 Freight Cost Modelling

• Cost engine decomposes freight into fixed and variable components: driver wages, truck depreciation, tyre costs, and repair & maintenance

• Vehicle selection decision is cost minimised per trip not just by capacity ensuring lowest total cost of inbound logistics

• Network plan output includes route level cost, distance, VFR, and trip count for full planner visibility

6 ERP Integration & Plan Visibility

• SAP ERP integration enables real time MRP alignment and eliminates manual data re-entry between planning and execution systems

• System generated pickup schedules shared directly with LSPs, reducing coordination overhead and improving execution adherence

• End-to-end plan visibility: route, vehicle, cost, distance, VFR, and trip level details in a single dashboard

KEY VALUE DRIVERS

Freight Cost Optimisation

• OR optimised vehicle selection reduced inbound freight cost per plan run by ~11%, driven by cost-minimised vehicle type assignment using full fixed + variable freight modelling

• Intelligent milkrun clustering reduced the number of partial trips, directly improving cost-per-trip economics

• Cost minimised vehicle type selection considering fixed + variable components ensured the right vehicle was deployed for each route, not just the nearest available

• Hub based trip consolidation provided an additional layer of network optimisation for geographically dispersed suppliers

Fill Rate & Network Efficiency

• Average Vehicle Fill Rate improved by ~12% across both plants (from ~66% to ~74%), reducing the number of trips needed to fulfil the same MRP demand

• Automated Direct vs. Milkrun classification eliminated guesswork in daily planning, ensuring every route was optimally consolidated

• Milkrun consolidated trip share increased by ~6pp, reducing single-supplier partial trips across the network

• Fleet capacity freed for other routes by reducing total trips required to fulfil the same volume of inbound demand

Planning Speed & Governance

• Monthly planning cycle previously a multi-day manual exercise is now executed in hours with OR-solver accuracy and full auditability (~10x faster)

• Planners can run multiple scenario configurations (speed, distance, route constraints) and compare outputs before finalising the dispatch plan

• System generated pickup schedules shared directly with LSPs, reducing coordination overhead and improving execution adherence

• ERP integration (SAP) enables real-time MRP alignment and eliminates manual data re-entry between planning and execution systems

STRATEGIC IMPACT

"The shift from manual to OR driven dispatch planning fundamentally changed how we approach inbound logistics not just faster, but structurally better." Enmovil's Optirun platform now orchestrates the full inbound planning cycle across multiple plants, delivering consistent freight cost reductions, improved vehicle fill rates, and a planning process that operates with the speed and rigour the modern automotive supply chain demands.

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