ShipFlow – Part II

Signal-Based Dynamic Warehouse Operations

Designed for real-world warehouse operations

The Real Operational Problem

- Limited physical lanes (e.g., 16)
- Large number of shipment codes (e.g., 120+)
- Codes rotate constantly throughout the shift
- Volume is unknown and unpredictable
- WIP tool assigns codes to any available lane

This creates scattered staging, excessive walking, and CPT risk.

Why Traditional Organization Fails

- One code per lane is not scalable
- Fixed lane-to-code assignments break under rotation
- Pre-planned volume assumptions are unreliable
- Workers spend time searching instead of moving freight

The problem is not the system, it is organization under uncertainty.

Do not predict volume.React to live signals

Decisions are driven by what exists now, not by forecasts.

Live Signals Used by ShipFlow

- Live cart accumulation per code
- CPT proximity
- Staging availability on the floor
- Trailer readiness

No forecasting. No assumptions. Only observable signals.

Dynamic Lanes (Not Fixed Lanes)

- Physical lanes remain stable
- Shipment codes rotate freely
- One lane can temporarily hold multiple codes
- Organization is controlled by rules, not assignments

Example: Lane 3 → Code 12 | Code 47 | Code 89

Threshold-Based Decision Rules

- 1–2 carts → remain mixed in lane
- 3–5 carts → group within the same staging zone
- 6–8 carts → prioritize movement toward staging
- 9+ carts → Ship Clerk review triggered

Threshold values are adjustable per warehouse and shift conditions.

Staging Zone Design Logic

- Divide staging into fixed physical zones (A, B, C, D)
- Assign each zone to a maximum cart capacity
- Keep overflow lanes clearly marked and temporary
- Maintain visual separation between active and idle lanes

Design Steps:
1. Measure available dock space
2. Mark zones using tape or floor paint
3. Label zones with large visible signage
4. Train teams on zone limits

Dynamic Lane Allocation Strategy

- Lanes are assigned dynamically, not fixed to codes
- High-volume codes get priority lane access
- Low-volume codes share flexible lanes
- Lane reassignment happens in real time

How It Works:
1. Monitor live volume per code
2. Rank codes by current demand
3. Assign lanes starting with highest volume
4. Reclaim lanes when volume drops

Goal: Maximize lane utilization while minimizing cart movement

Handling Unknown Volume Classes

- Volume class is not predefined
- Codes change behavior throughout the shift
- System adapts based on live flow
- Decisions are made from observation, not prediction

Adaptive Logic:

- Start all codes as neutral
- Track cart buildup rate
- Escalate lane priority as flow increases
- De-escalate when flow stabilizes

Example: Code A starts low-volume → becomes high-volume → gains priority lane

Role of WIP Tool in Dynamic Distribution

- Assigns incoming work to any available lane
- Optimizes for lane availability, not fixed codes
- Reacts in real time to congestion
- Maximizes throughput under uncertainty

ShipFlow complements WIP Tool by organizing what WIP cannot predict.

System Reality: WIP Tool does not control flow it reacts to operational constraints.

16 Lanes / 120 Codes Operational Complexity

- 16 physical lanes serving up to 120 rotating codes
- Codes change daily based on volume and demand
- No fixed mapping between code and lane
- Staging areas spread across the building

Why This Fails:

- Lane congestion
- Excess walking
- Late CPT carts
- Unclear trailer priorities

This is not a people problem, it is a distribution optimization problem.

ShipFlow Part 2 — Adaptive Lane Strategy

- Lanes are treated as flexible resources, not fixed assignments
- Codes are grouped dynamically based on real-time volume
- High-volume codes get priority lane placement
- Low-volume codes share lanes intelligently

Key Principle:Design lanes around flow,not around labels.

Real Scenario Example: Adaptive Lane Allocation

- 16 lanes available
- 120 active codes
- Volume unknown at shift start
- Truck assignments vary based on live volume

- WIP Tool assigns codes to any open lane
- High-volume codes collide with low-volume ones
- Staging spreads across the building
- Ship clerks react late → CPT risk

- Group codes dynamically
  - High volume → 4–5 lanes
  - Medium volume → shared lanes
  - Low volume → flexible buffer lanes
- Reassign lanes every X minutes based on flow
- Ship clerk controls trailer priority using live staging data

Reduced walking distance,Faster CPT decisions,Clear lane ownership,Less congestion & rework

Founder & Next Steps

Founder: Melat Mekonnen

Built from real Amazon ship dock experience

ShipFlow Part 2 solves:

- Dynamic lane allocation
- Adaptive code grouping
- Real-time trailer and staging coordination

We welcome: Pilot opportunities, Feedback from warehouse teams, Collaboration to refine and scale ShipFlow