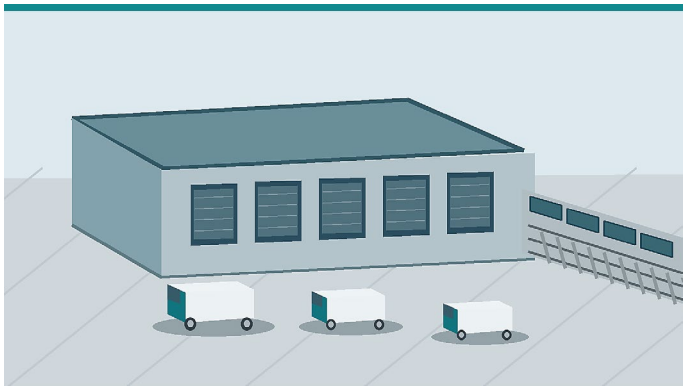
Rail-Connected Logistics

Integrated logistics modelling to validate throughput, infrastructure capacity and operational flexibility.

A proposed logistics facility combined warehousing, truck loading, rail handling and shared yard infrastructure. Although each area had a design capacity, the interactions between train movements, forklifts, truck arrivals and service times created uncertainty about achievable throughput. Simulation assessed the integrated design and identified the resources and operating rules most likely to affect performance.



Integrated warehousing and logistics analysis

Project objective

Validate planned import and export capacity, test competing infrastructure configurations, and establish requirements for loading, handling and queuing under variable operating conditions.

KEY INFRASTRUCTURE AND OPERATING DECISIONS

Warehousing

Truck-loading bay capacity

Service times, forklift routing and storage

Rail

Track sizing and flexibility

Loading, shunting and train occupancy

Site traffic

Scale staffing and queues

Truck arrivals and yard congestion

Decisions supported

Confirmed that target import and export volumes were achievable within the modelled operating assumptions. Assessed truck-bay needs, rail-track options, forklift resources and weigh-scale staffing, while identifying where queues and conflicting movements could affect service.

Integrated logistics model scope

WAREHOUSE → TRUCK BAYS → YARD + RAIL

Warehouse & storage

Pallet storage, inventory flow and surge conditions.

Loading & forklifts

Bay service, forklift cycles, routes and train interference.

Rail & train handling

Train arrivals, track occupancy, shunting and load/unload.

Yard & weigh scales

Truck arrivals, service times, queuing and scale staffing.

Where operating constraints emerged

Distinguishing spare capacity from usable capacity

The analysis found sufficient overall capacity to meet planned volumes across tested conditions, but infrastructure utilization alone did not determine service performance. Forklift travel and truck-loading arrangements were important to meeting daily targets. Alternative rail layouts improved operating flexibility, and weigh-scale staffing affected queue lengths. The model highlighted which constraints called for design changes versus operational management.

Transferable insight

Spare capacity in individual assets does not guarantee reliable logistics performance. Truck queues, shared handling resources and train movements must be assessed together to size infrastructure and establish workable operating rules.

KEY-PERSONNEL EXPERIENCE

Yes | Bryan Monk, P.Eng., model lead

MISIM CORPORATE ENGAGEMENT

No | prior-employer project

CLIENT

Anonymous

Historical key-personnel project experience developed during employment at Wood.