



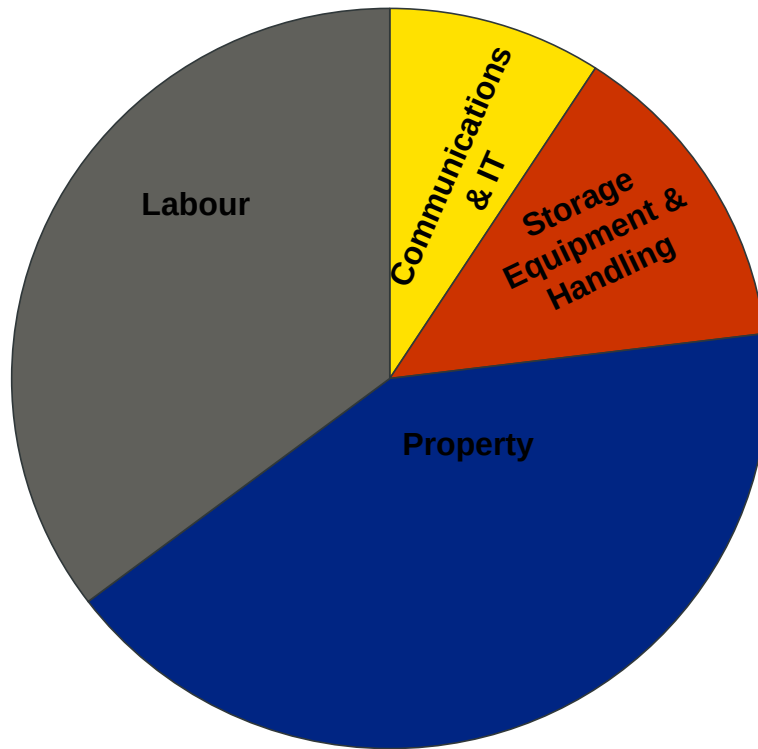
Volumetric Efficiencies in Warehousing

Critical Factors

- **Buildings and Labour**
- **Elements of Materials Handling**
- **Warehouse Management Systems**
- **Materials Handling Equipment**
- **Yard Management**



Warehousing Costs – Conventional Warehouses



■ Communications & IT 10 - 15%

■ Storage & Handling Equipment 12 - 15%

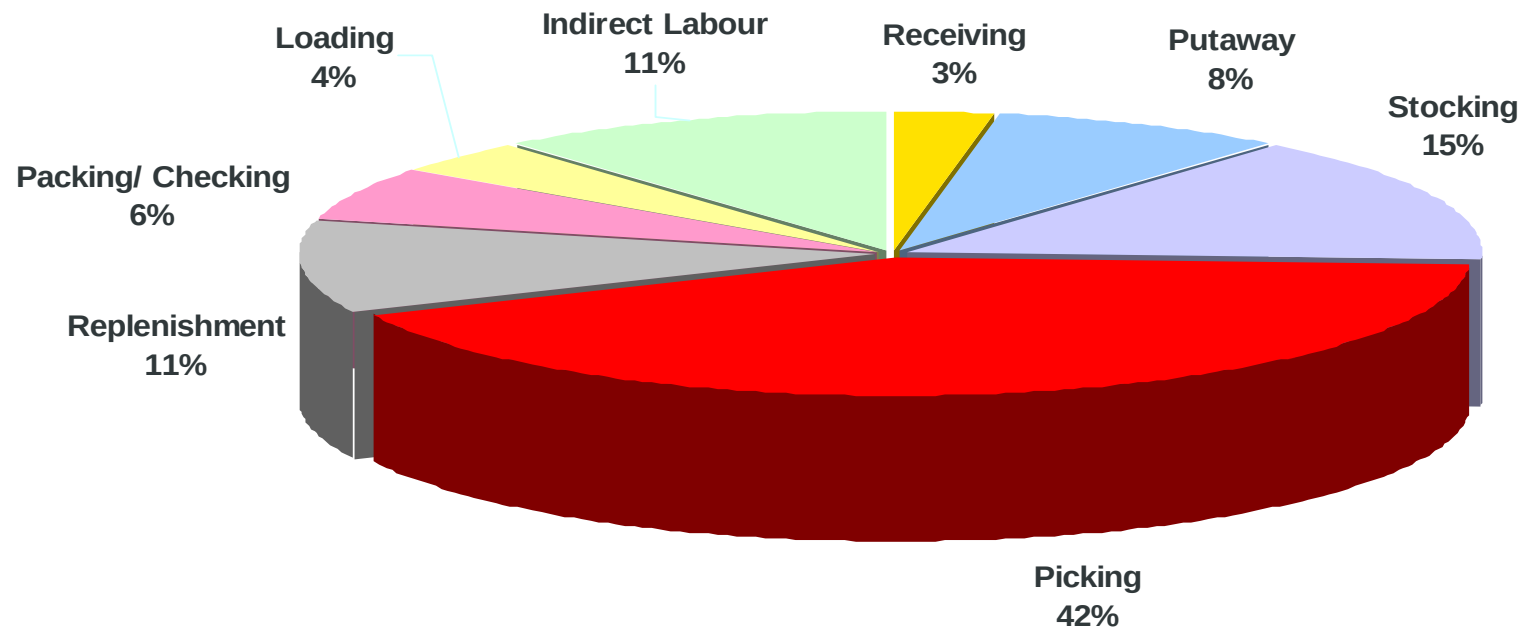
■ Property 40 - 45%

■ Labour 25 - 38%

Warehouse Buildings

- 40-45% of warehousing costs are property-related
- Building upwards is less expensive per cu.m. than building outwards
- Taller buildings relate to modern storage and handling technology
- Modularity with storage and handling systems is essential
- Over-development of sites is to be avoided

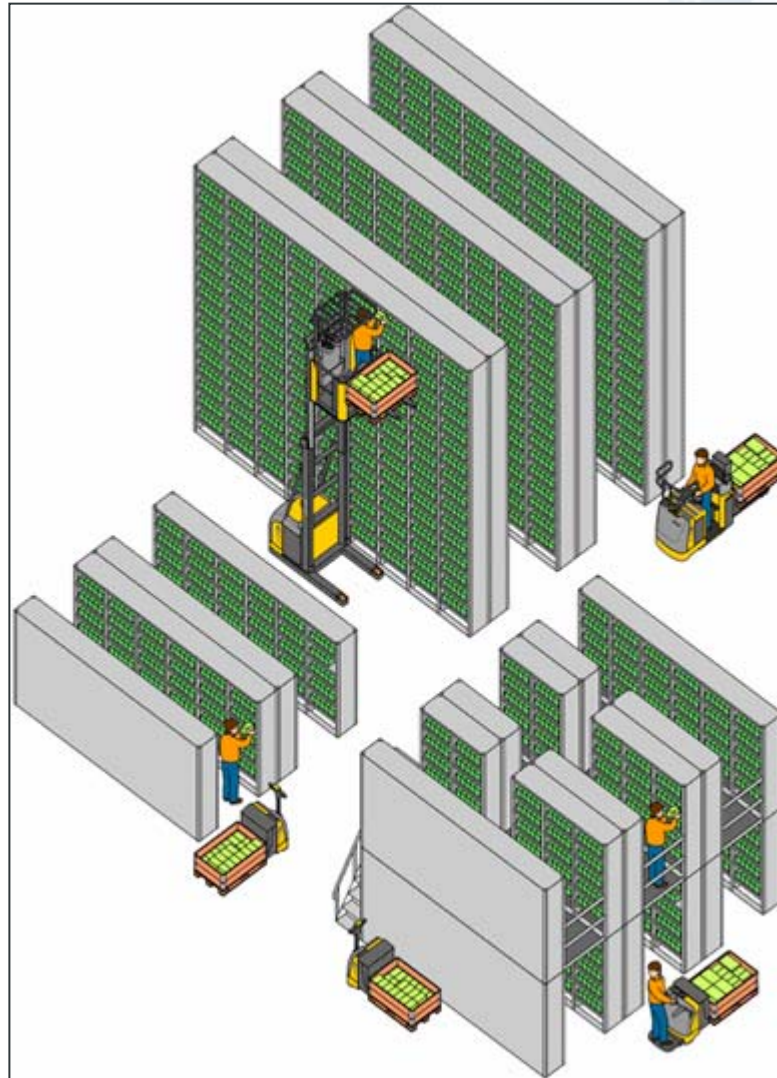
Warehouse Labour Costs



Source: KOM International



Elements of Materials Handling



Traceability – What is it ?

By batch, sub batch, pallet, roll, manufacture date

Raw materials, work in progress, finished goods

Where is it gone

Where's it from

Who or what touched it, processed it, checked it, packed it, QA'd it, held it, released it

Tree up, tree down



Drill down, drill up

Traceability – what does it involve ?

Extensive data collection

The need for accurate data

Validation

Large, fast databases

Industrial strength, 24 / 7 databases

Good archiving / back ups

Flexible reporting



A light blue world map is visible in the background, partially obscured by a yellow curved shape in the top left corner.

Product Identification

Bar codes

Electronic tags

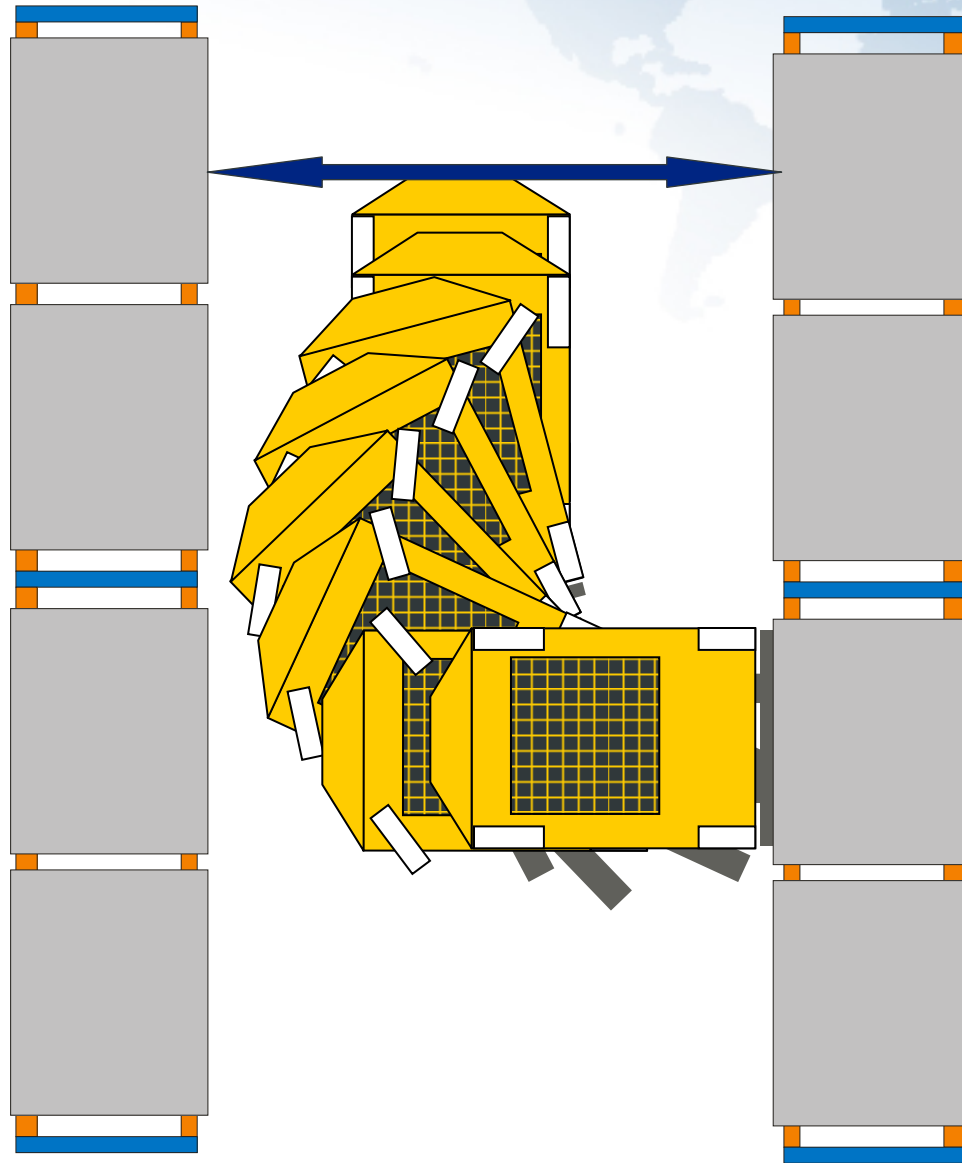
Voice recognition



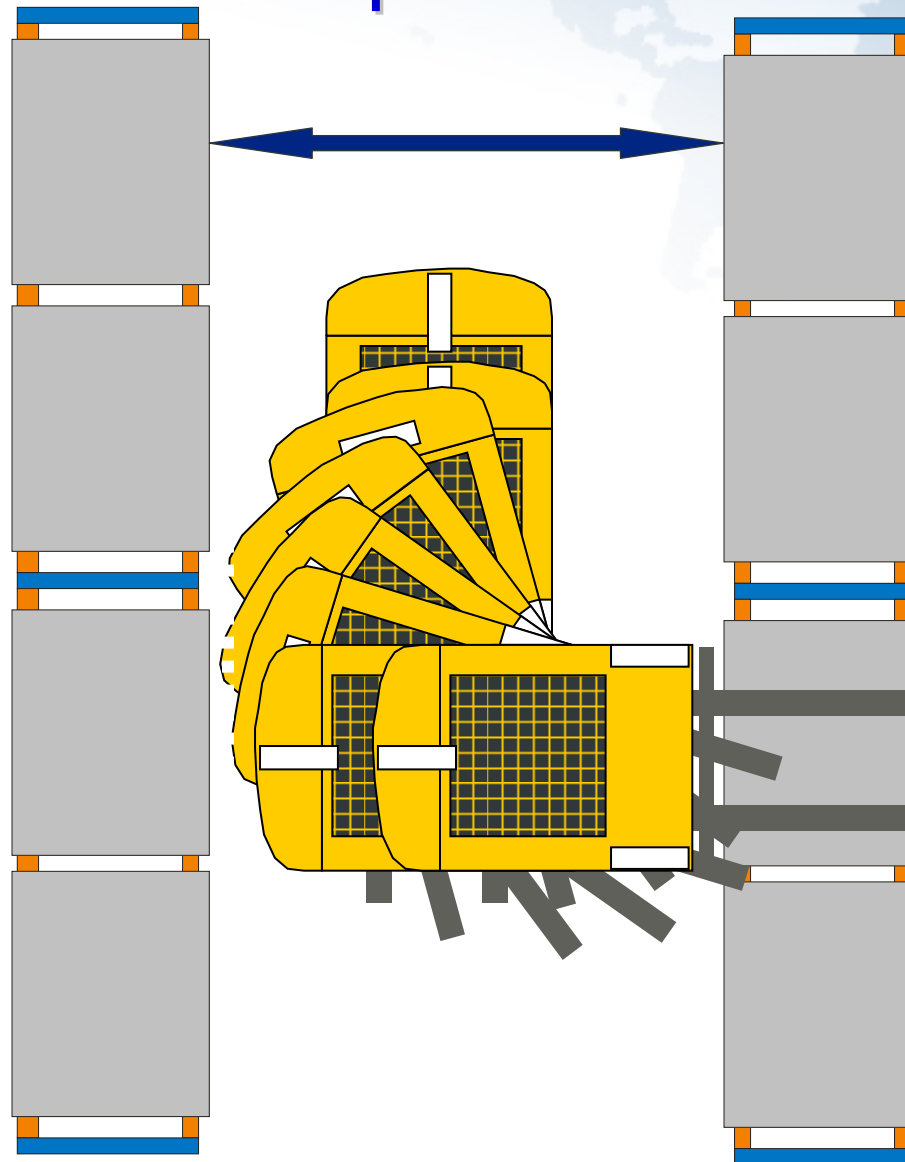
Lift Truck Development



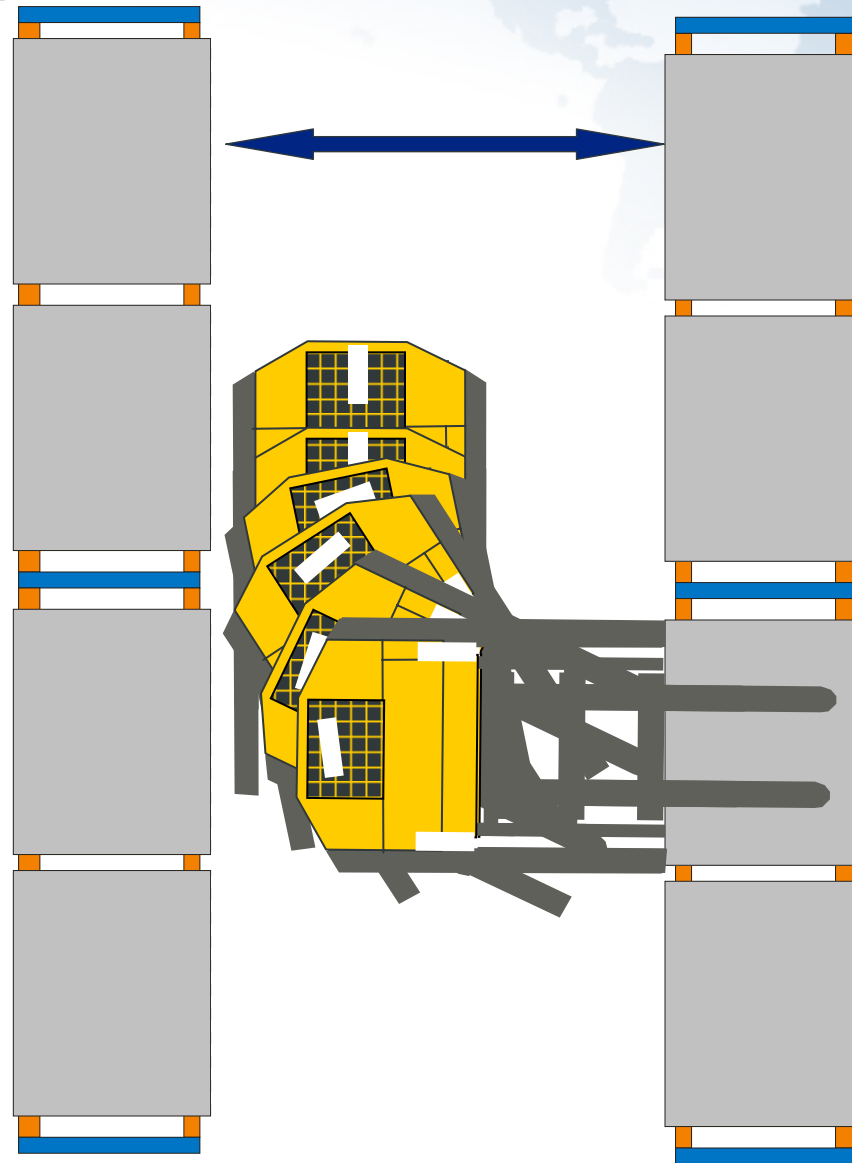
4 Wheel Counterbalance Operation



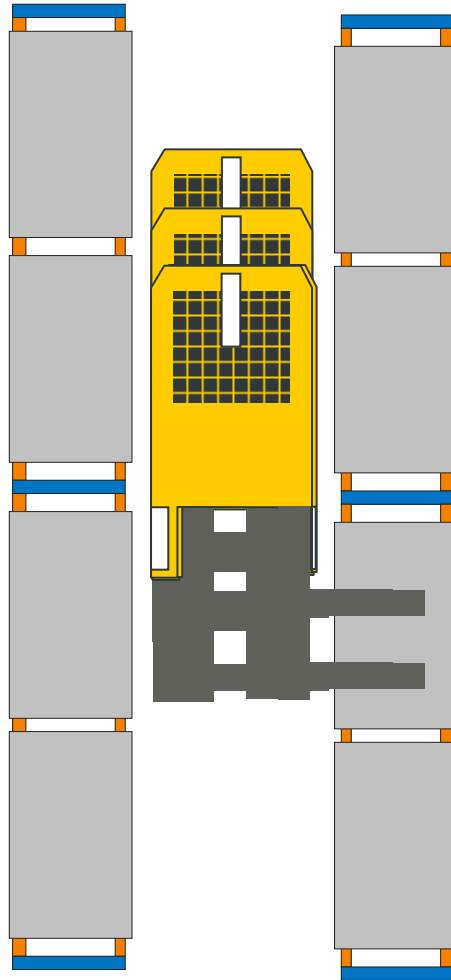
3 Wheel Counterbalance Operation



The Reach Truck Operation

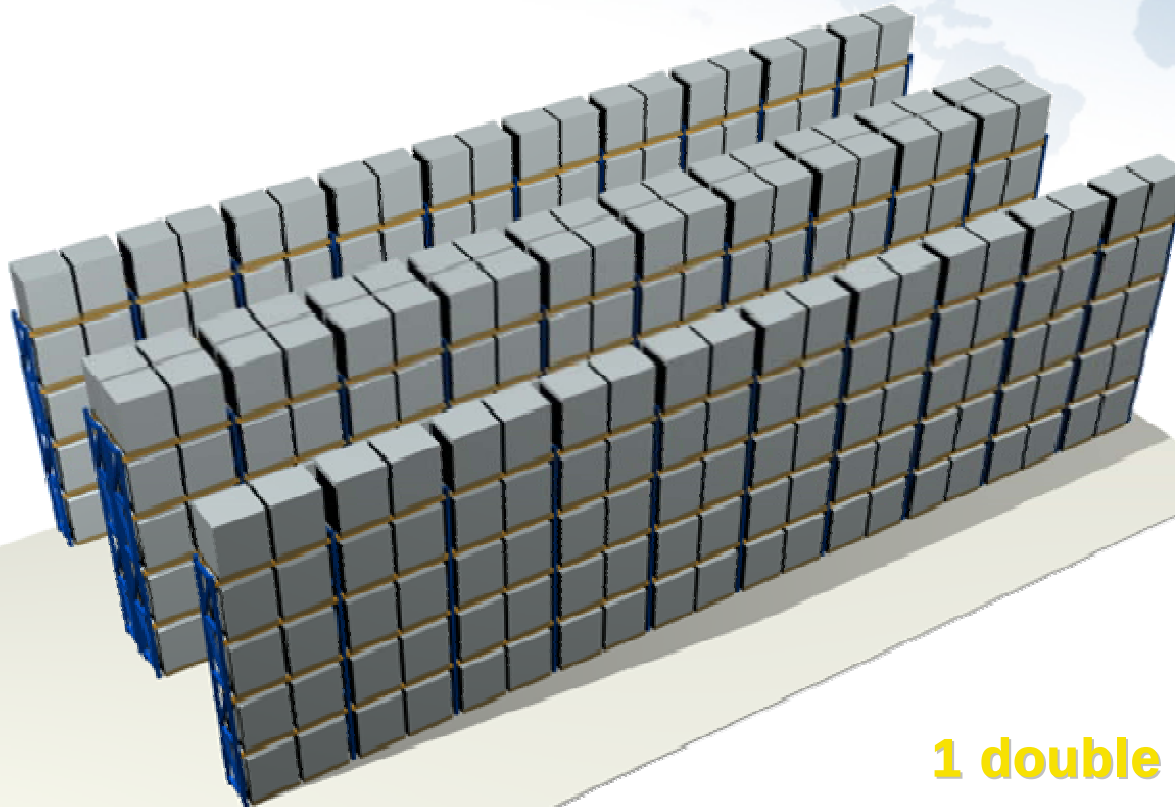


Man-Down Turret or Very Narrow Aisle (VNA)



4-wheel counterbalance

Storage Density



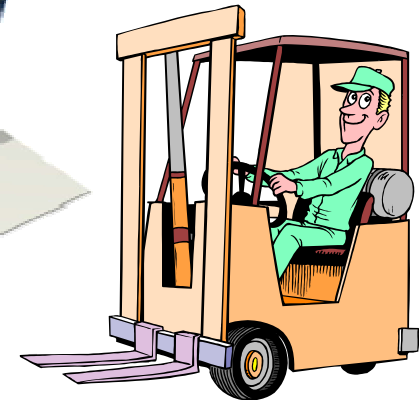
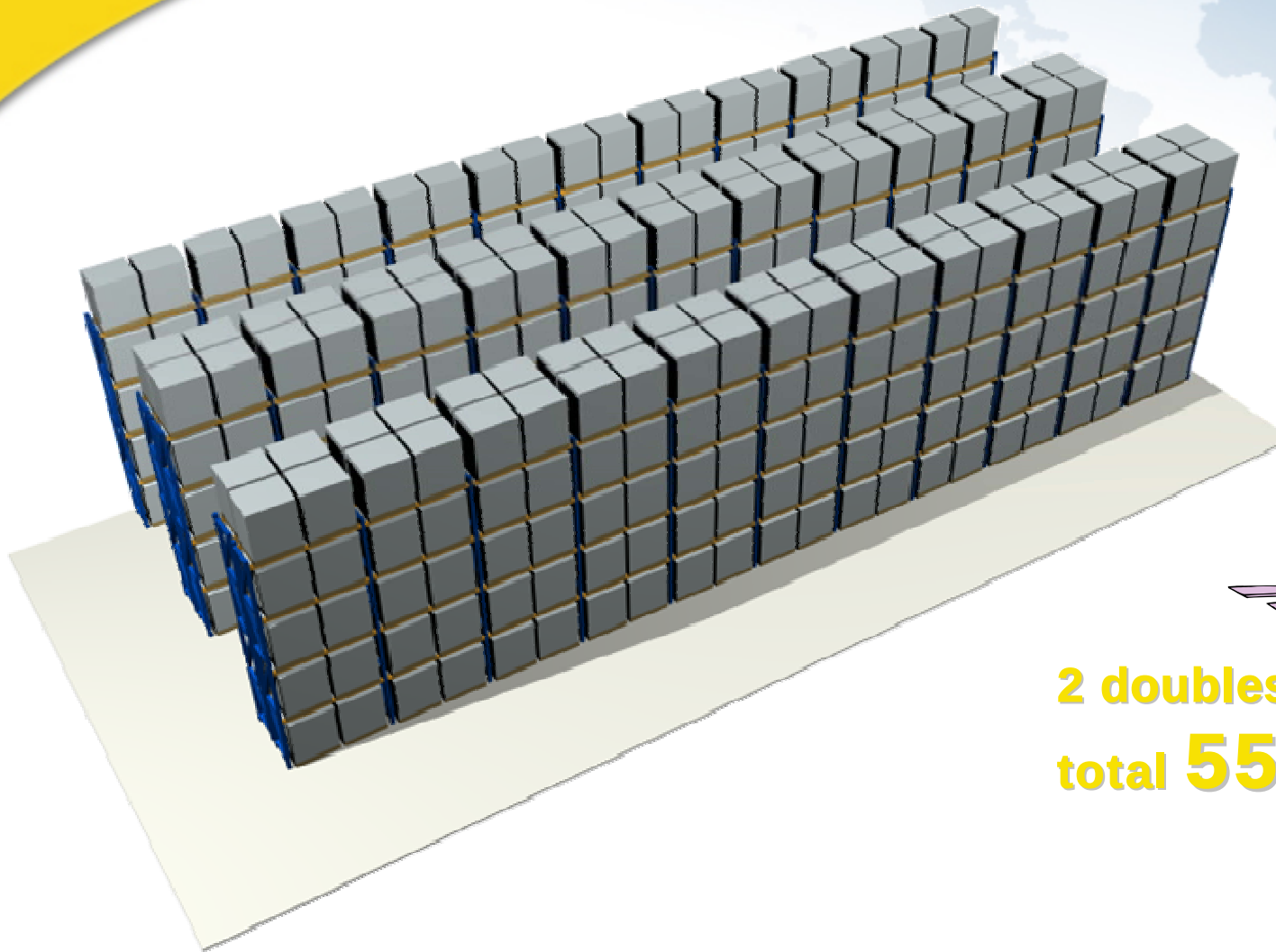
1 double + 2 singles
total **400** locations



Overheads / 400 = cost per pallet stored

3-wheel counterbalance

Storage Density

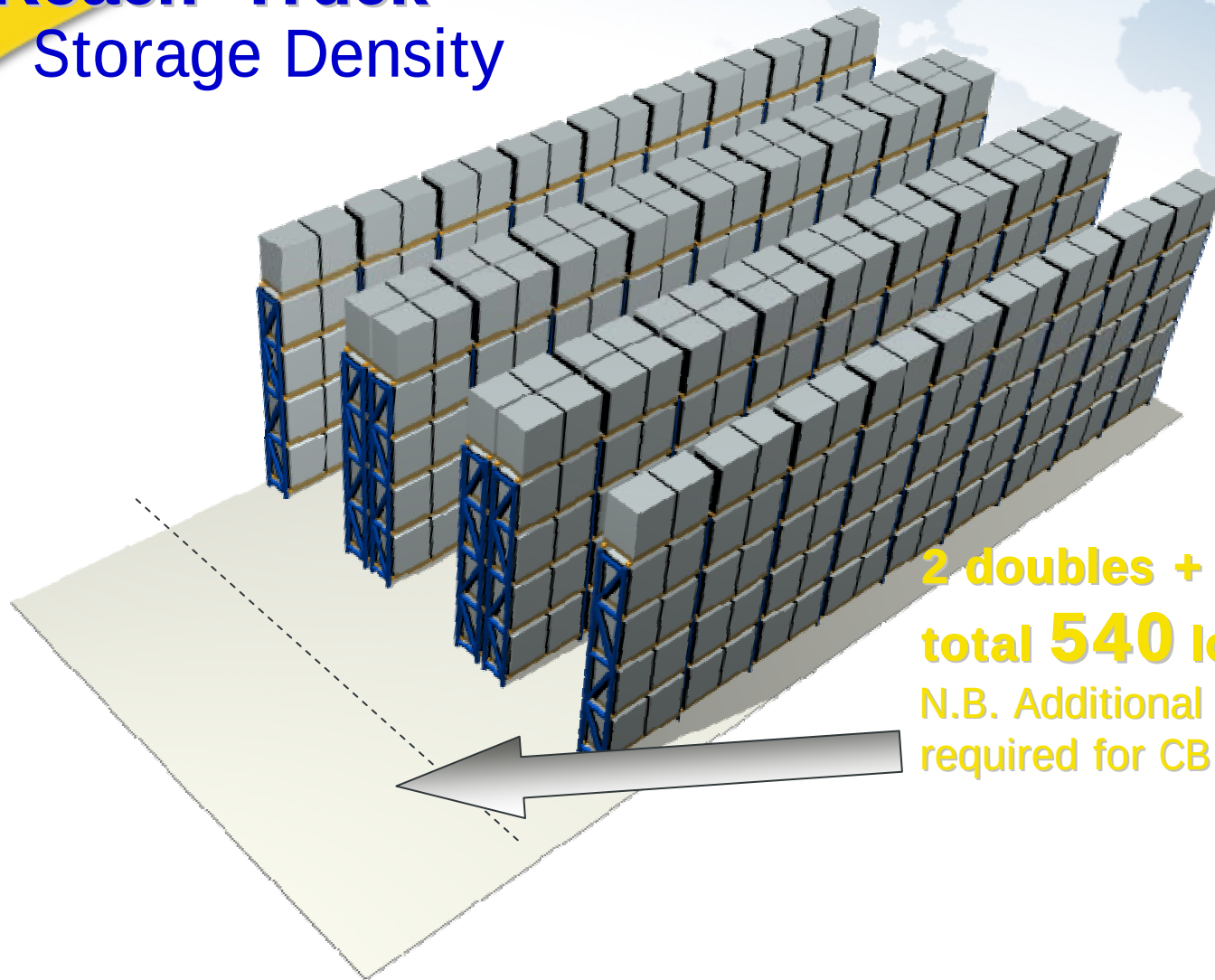


2 doubles + 1 single
total **550** locations



Overheads / 550 = cost per pallet

Reach Truck Storage Density



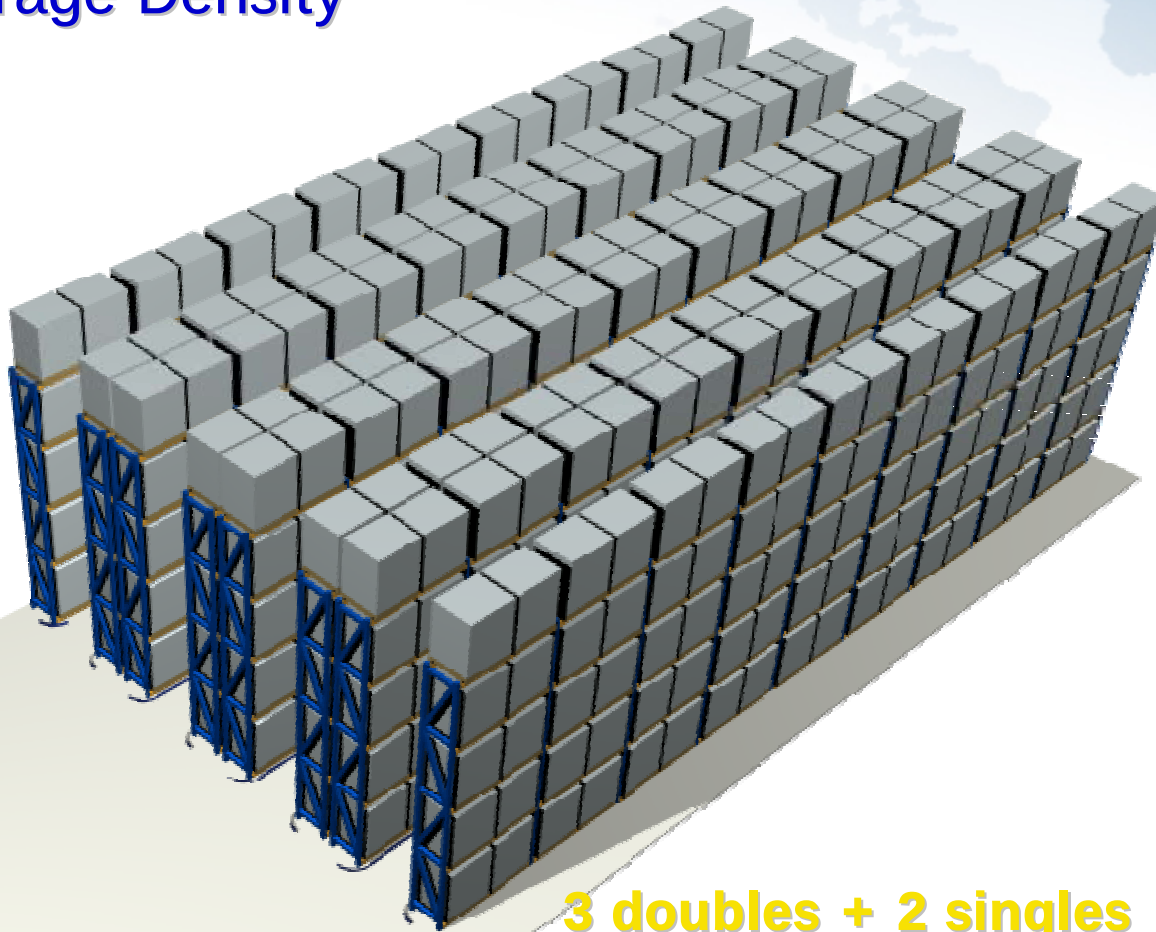
2 doubles + 2 singles
total 540 locations.
N.B. Additional area
required for CB drop area



Overheads / 540 = cost per pallet

VNA Truck

Storage Density



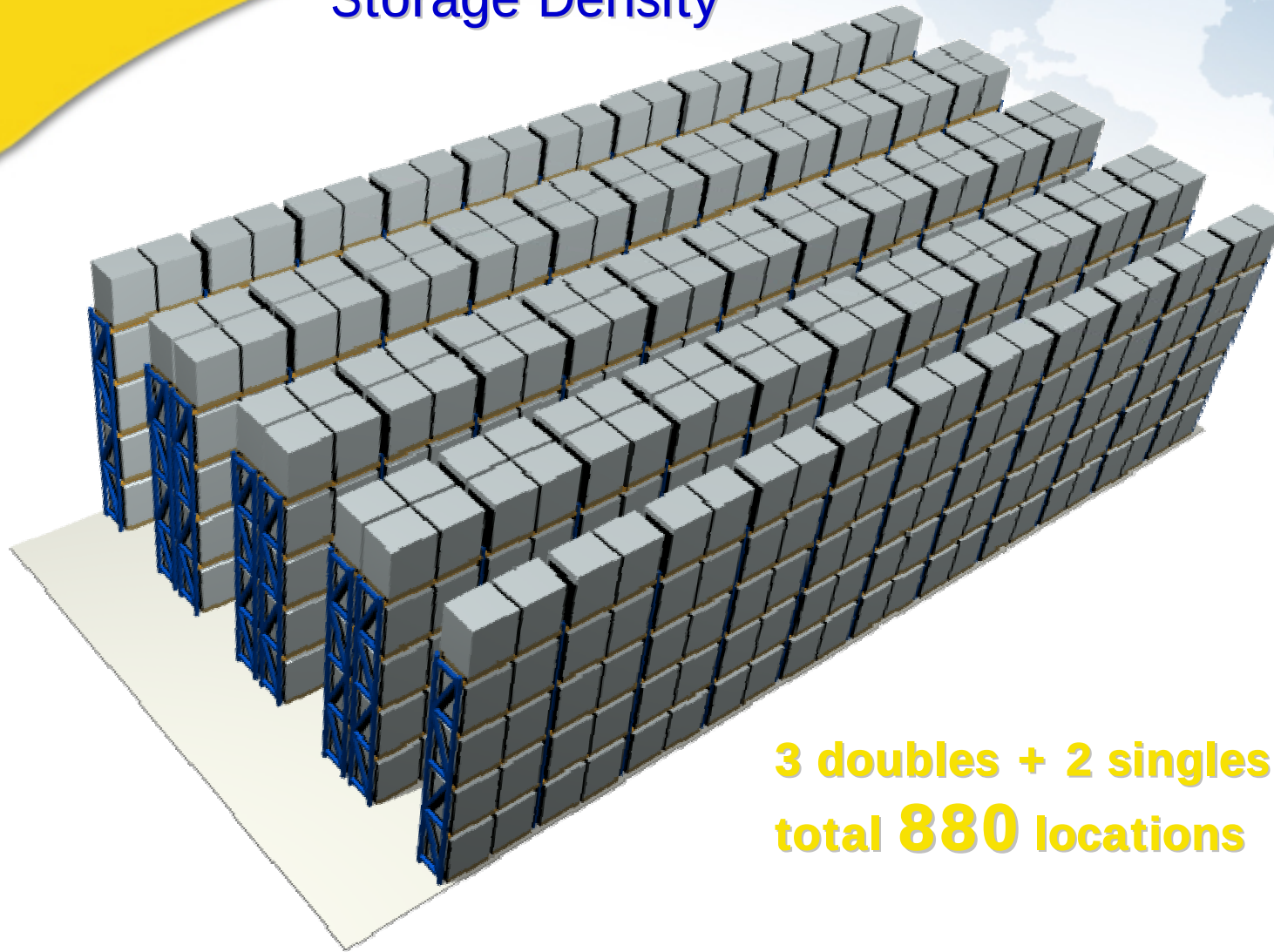
**3 doubles + 2 singles
total 720 locations**

Overheads / 720 = cost per pallet



Articulated Truck

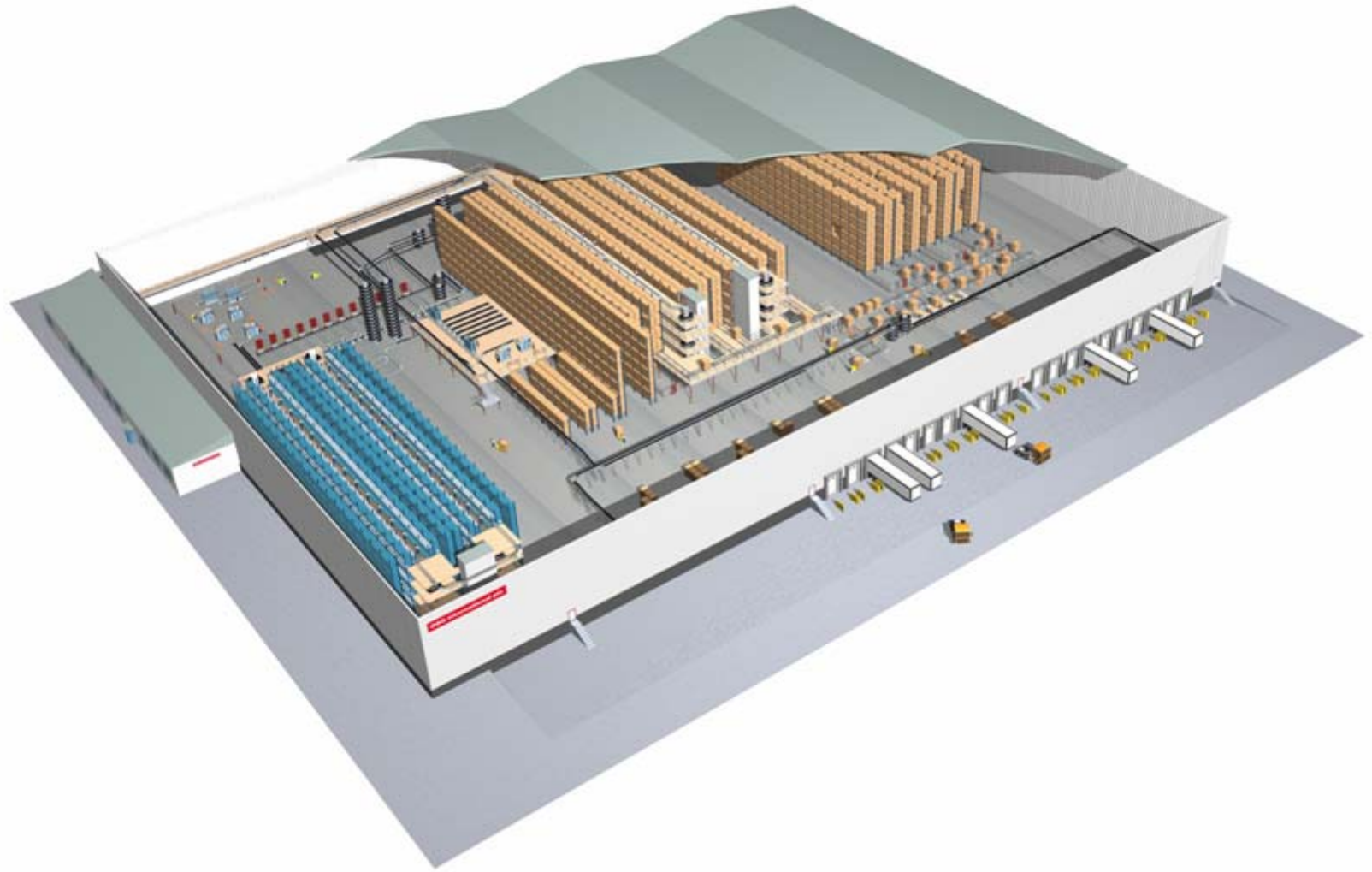
Storage Density



**3 doubles + 2 singles
total 880 locations**



Overheads / 880 = cost per pallet



High Volume Storage



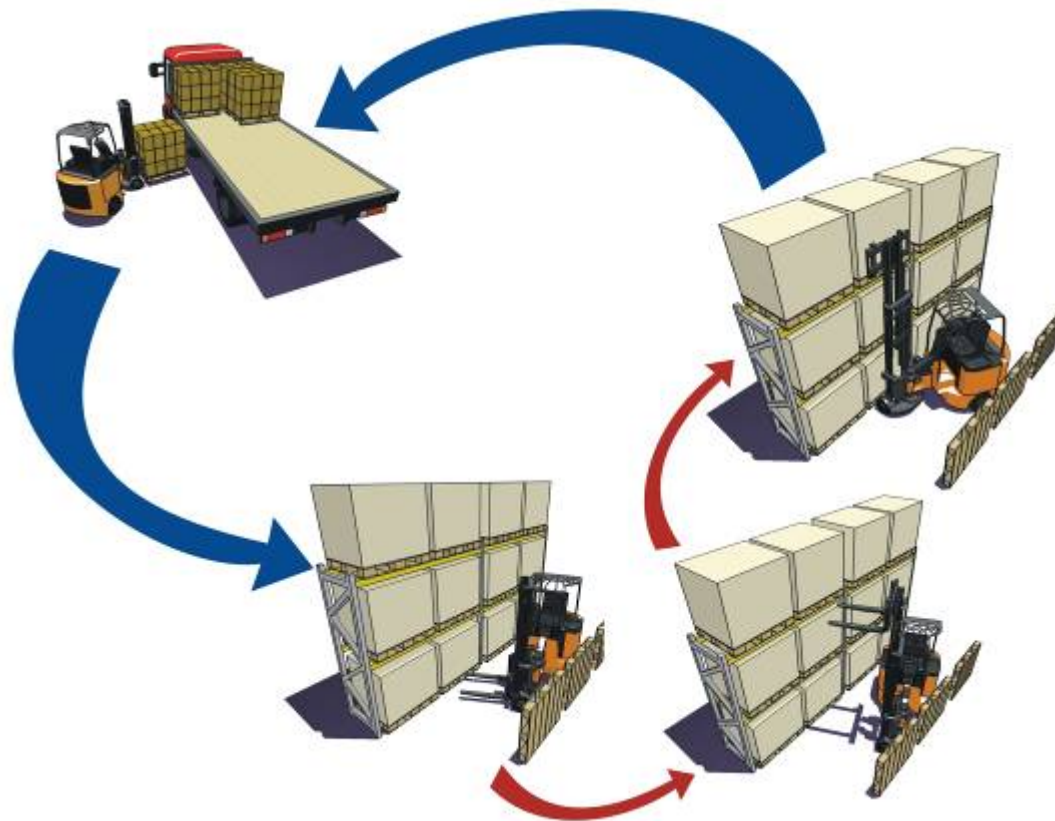
What is a Articulated Truck ?

Counterbalance VNA truck



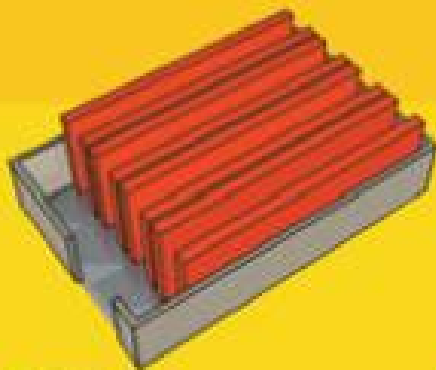
Multi Purpose

Unload a lorry – load straight in to 1.6m aisles

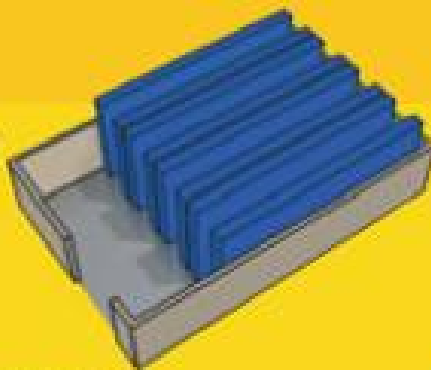


Primary Function

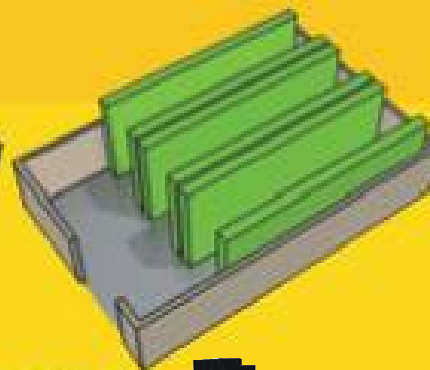
To Save Space



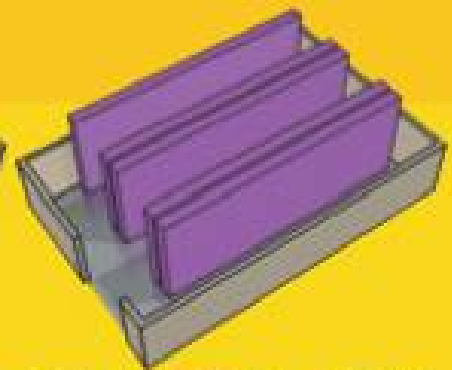
BENDI



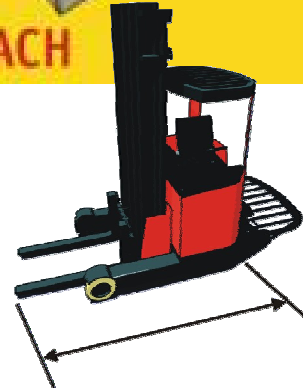
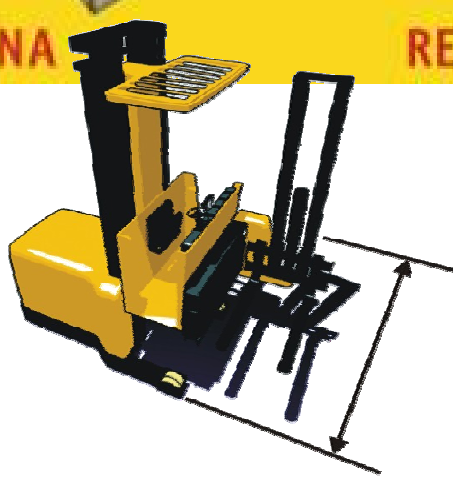
VNA



REACH

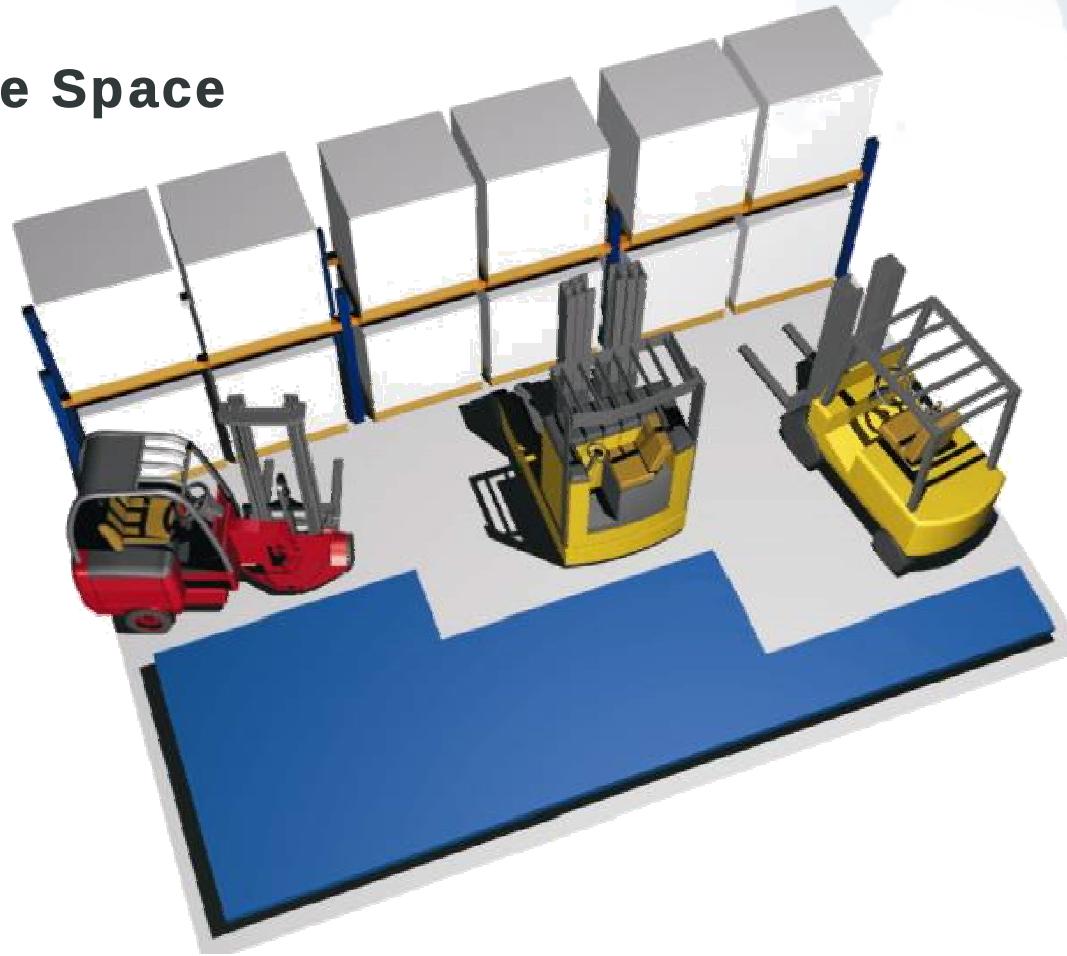


COUNTERBALANCE



Primary Function

To Save Space



Secondary Function – Pallet Through Put

Double Handling

Ease of operation

