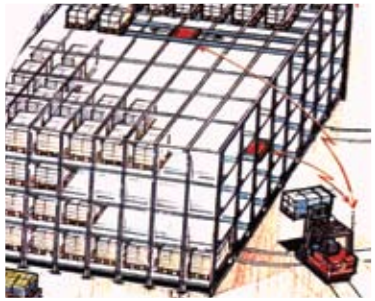
Driving Down Costs in High Density Storage



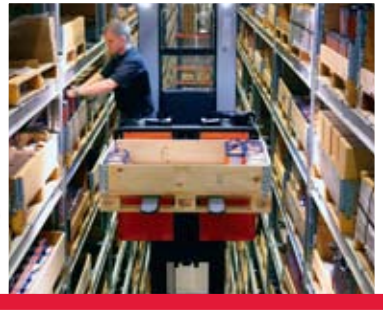






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Driving Down Costs in High Density Storage

Making the most of space is an important factor for many businesses, and it can have a significant impact on a company's bottom line. The cost of space varies according to location, but industry estimates suggest that the cost of a pallet position is around €2.00 –€3.00 per week, allowing for land, building and associated costs. With large storage facilities housing tens of thousands of pallets it is not surprising that space costs become key, and the concept of high density storage highly relevant.

However, it is not just in large-scale operations that high density storage can play a vital part. It can become an important consideration in any facility that is reaching full capacity and needs to find a better way of using existing space. Or for operations that need to reduce cost by scaling down use of existing facilities.

There are many ways to create high density storage, block stacking of loads being an obvious and low cost example. But it is essential to take into account other factors such as flexibility, selectivity and storage and retrieval time.

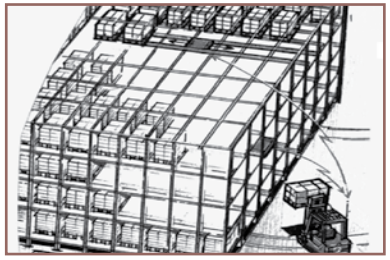
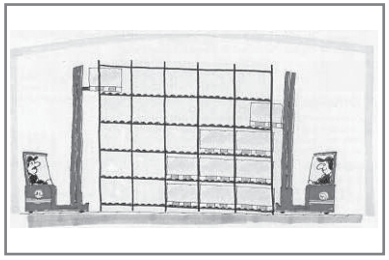
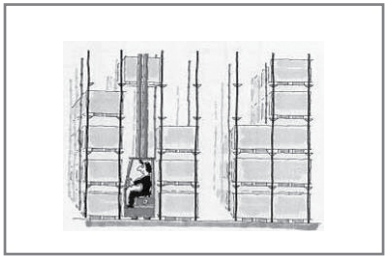
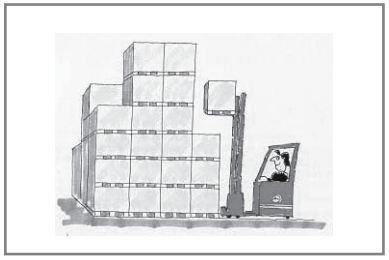
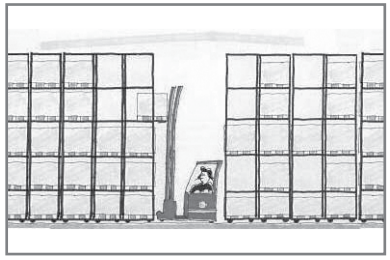
Toyota Material Handling Europe (TMHE) has extensive experience in high density solutions. We understand the reasons why customers choose this approach. It's all about driving down costs. This brochure illustrates some of the ways that we can reduce costs further.

How much effective use of storage space do

The exact amount of effective load space offered by by different storage systems will vary according to individual circumstances. However these percentages give a relative indication.

Non-selective options:

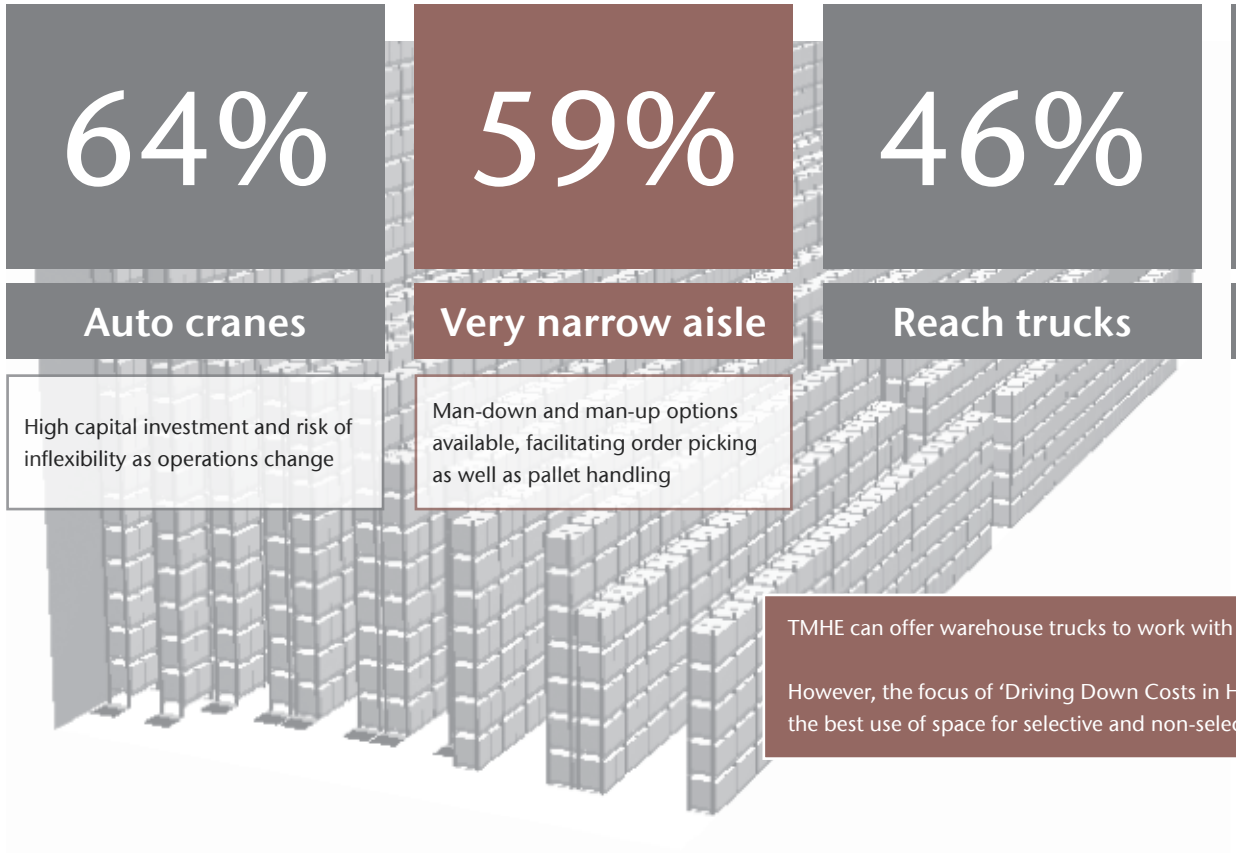
Non-selective solutions offer higher levels of storage density, but at the expense of accessibility, which varies with different solutions.

85%	80%	65%	65%	60%
Aisle-free	**Gravity-fed**	**Drive-in racking**	**Block stacking**	**Mobile racking**
Loads stored in ‘tunnels’ accessed by radio-controlled shuttle units	Requires specialist racking that feeds loads through by gravity. Racking requires maintenance	Requires specialist trucks adapted to fit within racking system. Very limited accessibility	The simplest form of storage, but with very limited accessibility and load weight/stability issues	Requires specialist racking. Slow in use, requires maintenance, breakdowns a major issue
				

different solutions offer?

Selective options with conventional racking:

Conventional racking allows access to all pallet locations. It is mainly the width of the transfer aisle that determines use of space.



64%	59%	46%	40%
Auto cranes	**Very narrow aisle**	**Reach trucks**	**CB trucks**
High capital investment and risk of inflexibility as operations change	Man-down and man-up options available, facilitating order picking as well as pallet handling		

TMHE can offer warehouse trucks to work with virtually all of the solutions shown.

However, the focus of 'Driving Down Costs in High Density Storage' is on VNA and aisle-free solutions as these offer the best use of space for selective and non-selective operations respectively (without investment in auto cranes).

High performance – low energy

The concept of VNA storage is well-established and there are thousands of operations where the basic infrastructure for VNA pallet storage and order picking is well-established, but trucks require renewal.

For this type of situation TMHE has a perfect solution – the BT Vector C-series of man-up VNA trucks.

Available in capacities of 1000 kg, 1200 kg and 1350 kg, these machines have industry-standard footprints, which means they can be specified to work perfectly within existing operations.

However, the performance and energy characteristics of the BT Vector C-series mean that, as well as the space saving benefits, companies can enjoy productivity benefits too.

– *standard footprint*
– *and so easy to get started*

8% more throughput
The combination of high travel speed and fast lifting means that the Vector C-series range can deliver 8% more throughput than comparable trucks in operations requiring capacities up to 1000 kg. This saves operator time as well as truck time and in larger fleets can reduce the number of machines required to do the job.

25% more work per charge
Exceptional energy efficiency and a well-designed hydraulic system means that 25% more work can be accomplished on a single charge. This drives down the cost of energy used.

5% saving in capital cost
A key factor in the capital cost of VNA trucks is installation and commissioning. This invariably requires specialist lifting equipment to assemble the truck on site.

The BT Vector C-series has a unique drop-down mast design, which means that the truck is 'folded' for shipping, with a maximum travel height of just three metres. As a result the truck can be delivered ready-to-drive, with just a few hours work required to reposition the mast unit and undertake final commissioning. The savings in installation cost can represent around 5% of total capital cost.

Advanced VNA – unique to TMHE –

Further cost-of-space savings – typically €20,000 per annum
TMHE has developed 'Advanced VNA' storage, which delivers further cost-saving benefits compared with conventional VNA solutions.

It is based on the unique BT Vector A-series range, which has a 4-wheeled articulated chassis design. This means that the truck requires much less space to transfer from one aisle to another compared to other VNA machines.

As a result the storage aisles can be longer, delivering an extra pallet location at each end of the storage aisle, and on both sides. That means four locations per level. Based on a typical eight-level-high storage facility this gives 32 more pallets stored per aisle. And at around €2.50 per location per week this equates to cost benefits of €4,000 per annum.

Due to high productivity the BT Vector A-series can typically service five aisles, giving total cost benefits of €20,000 per annum on space alone.

and driving costs down further

Productivity – save a truck and a driver
Advanced VNA with the BT Vector A-series goes beyond improved use of space. Productivity is another key benefit, achieving up to 150 pallet movements per hour.

This is due to high speed travel, lifting and lowering, and diagonal driving to reach the next location in the shortest possible time.

Put into context, this level of performance means that four BT Vector A-series trucks can normally do the same amount of work as five conventional VNA trucks. This not only drives down the cost of the trucks themselves, but also has a substantial affect on driver costs, which are by far the largest element of cost in most handling operations.

Energy efficiency – double shifts on a single battery
Because of the four-wheeled chassis design, the BT Vector A-series does not require the type of counter-weighting that is necessary in conventional three-wheeled designs. This alone reduces the weight of truck by over 500 kg. Aluminium and other lightweight materials are used to further reduce weight. TMHE has also developed the Advanced Lifting System (ALS) for this range. It is based on storing hydraulic energy in compression units, which effective mean that very little electrical energy is required to elevate the weight of the cab unit.

As a result the BT Vector A-series can accomplish two full shifts on just one battery charge, driving down energy costs and eliminating the need to invest capital in extra batteries.

Aisle-free storage from TMHE –

Aisle-free storage based on the BT Radioshuttle concept gives outstanding benefits when it comes to driving down costs.

Space-cost benefits of up to 40%
85% effective use of storage space can make a substantial difference to cost. With guideline cost levels of €2.50 per pallet position per week, benefits are easy to assess, equating to around €1.00. Apply this to a 2,000 pallet facility and benefits of €100,000 per annum can be shown.

The cost-of-space benefits of the BT Radioshuttle are particularly relevant when a business can take advantage of the technique to improve use of space in existing buildings rather than investing in additional facilities.

A good example is a business working with block-stacked loads, two high. By switching to a BT Radioshuttle solution, loads could be stored four high, with improved selectivity. By doubling the storage capacity of the existing building savings were achieved through not requiring overflow space. The cost of the BT Radioshuttle investment could be recovered in one year.

85% space efficiency – 100% experience

The BT Radioshuttle aisle-free storage concept offers other cost-saving benefits.

One driver, multiple movements
Because all movements within the storage system are handled automatically by the shuttle units, multiple movements take place with a number of shuttles being controlled by just one truck driver, whose tasks are limited to just feeding pallets into and out of the system.

Compare this to conventional storage systems, which require a driver for every individual pallet movement and the cost-saving benefits are clear.

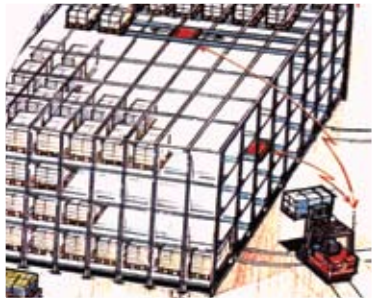
100% experience
TMHE has a long experience working with the BT Radioshuttle concept. As a result there is a complete organisation that is geared-up to provide support for our installations.

Customers using BT Radioshuttle technology include Ikea, Coca-Cola, Unilever, British American Tobacco, McCain, Arla, DHL, Frigoscandia, Ericsson, Exel, McDonalds, Sainsbury's, Procter and Gamble, LG and JVC, to name but a few. It illustrates the experience that we have gained, driving down space cost in customer operations.



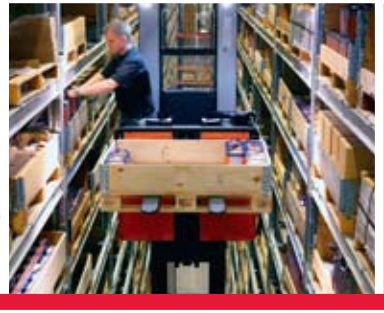






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