Consolidation in construction logistics

Methods of logistics
Why change is needed
What is consolidation
Benefits
Business case
Reverse logistics
The future

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in the built environment

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Logistics is…

“The art of applying timely resources”

Results measured by:

- **Time to construct**
- **Build quality**
- **Economy**
- **Health and safety**
- **Environmental impact**

Flawed logistics, no matter how competent the constructor, is the developer’s and local community’s nightmare.

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Methods of logistics

Traditional		
Method 1:	The business goes to the supplier to pick up materials	About **10%** of industry
Method 2:	The business has materials delivered to site	About **50%** of industry
Method 3:	The business uses portfolio analysis to segment ordering processes and call off arrangements	About **35%** of industry
Alternative		
Method 4:	The business co-ordinates a start-to-end process and tags information, people and materials flows	About **5%** of industry

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Methods of logistics
Why change is needed
What is consolidation
Benefits
Business case
Reverse logistics
The future

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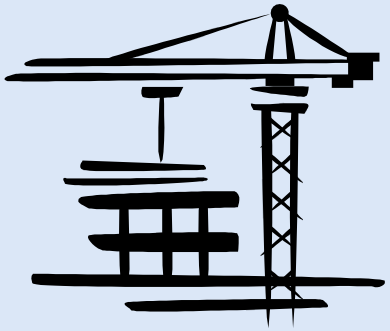
WHY is change needed?

TRADE CONTRACTORS bulk order materials

TRADE CONTRACTORS call off



T x S x D = Chaos at the gate and on the site

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WHY is change needed?

TRADE CONTRACTORS bulk order materials

TRADE CONTRACTORS call off

15% over-ordered

WASTE caused by
- **damage** (3-25%)
- **off-cuts** (5-20%)
- **packaging** - both inappropriate and poor (1-5%)
- **design change** (1-5%),
- **programming and planning** (1-10%)

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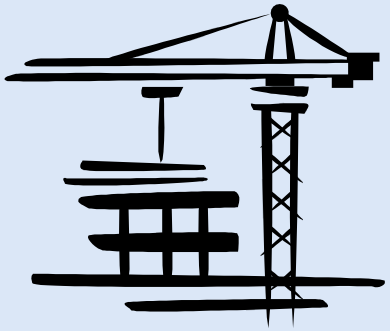
WHY is change needed?

Congestion

Pollution

Carbon emissions



TRAFFIC continues to increase as the built environment develops

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London Freight Plan

The vision:

'…the safe, reliable and efficient movement of freight and servicing trips to, from, within and, where appropriate, through London to support London's economy, in balance with the needs of other transport users, the environment and Londoners' quality of life…'

The fact:

The planned growth of London will lead to a **15% growth** in demand for freight and servicing by 2025 .

Without intervention this will increase freight's impact on congestion and climate change.

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London Freight Plan

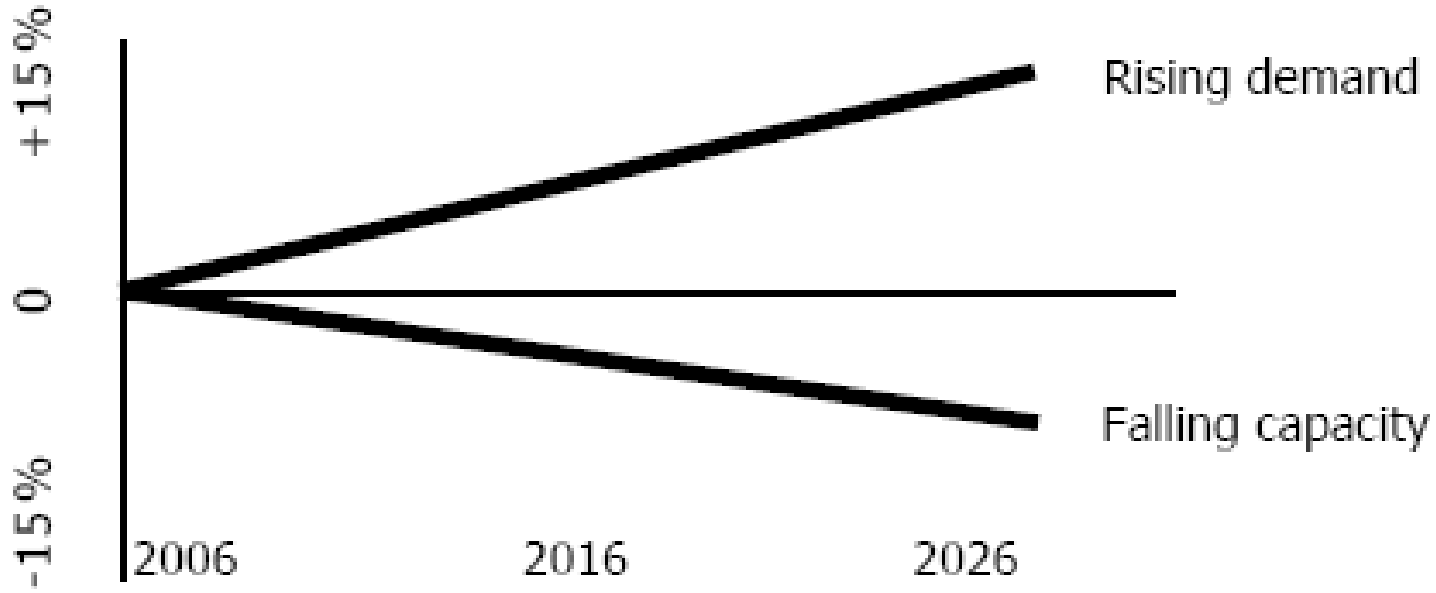

Figure A2: London's transport dilemma

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Modern logistics techniques (in Method 4)

Logistics planning across full supply chain

Consolidation centre

Just-in-time delivery to the workplace

4th party logistics

Logistics specialist on site

Demand smoothing

Integrated ICT system across full supply chain

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Consolidation in construction logistics

Methods of logistics
Why change is needed
What is consolidation
Benefits
Business case
Reverse logistics
The future

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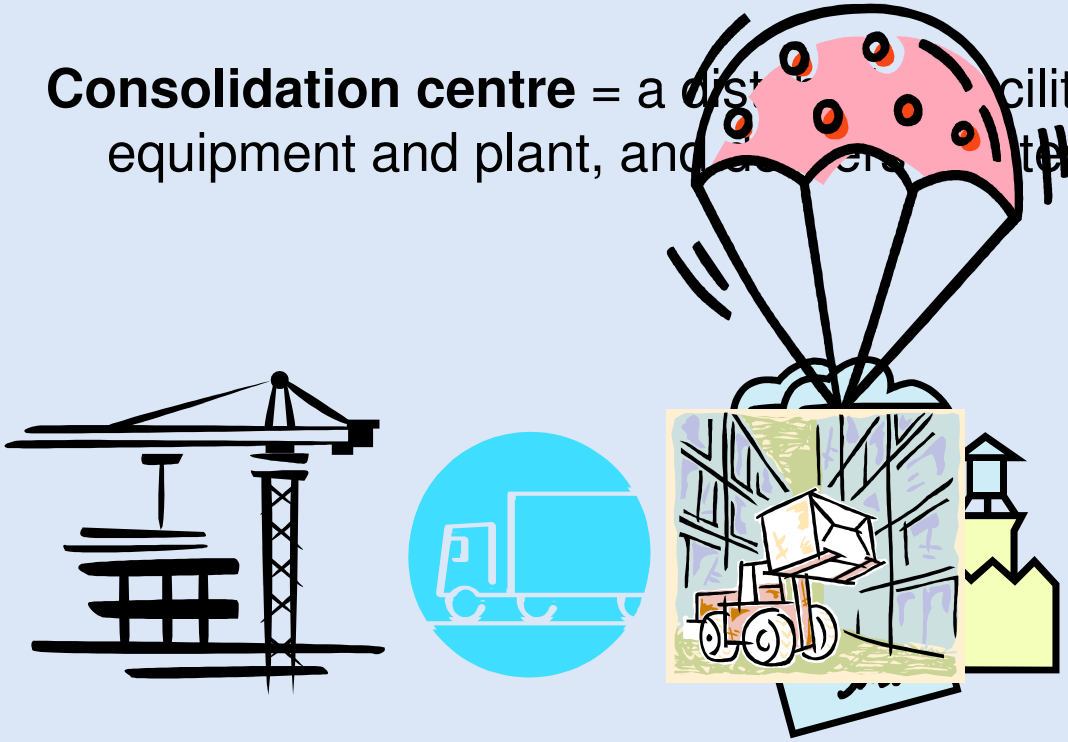
What is consolidation?

Consolidation centre = a distribution facility that receives materials, equipment and plant, and delivers them in consolidated loads



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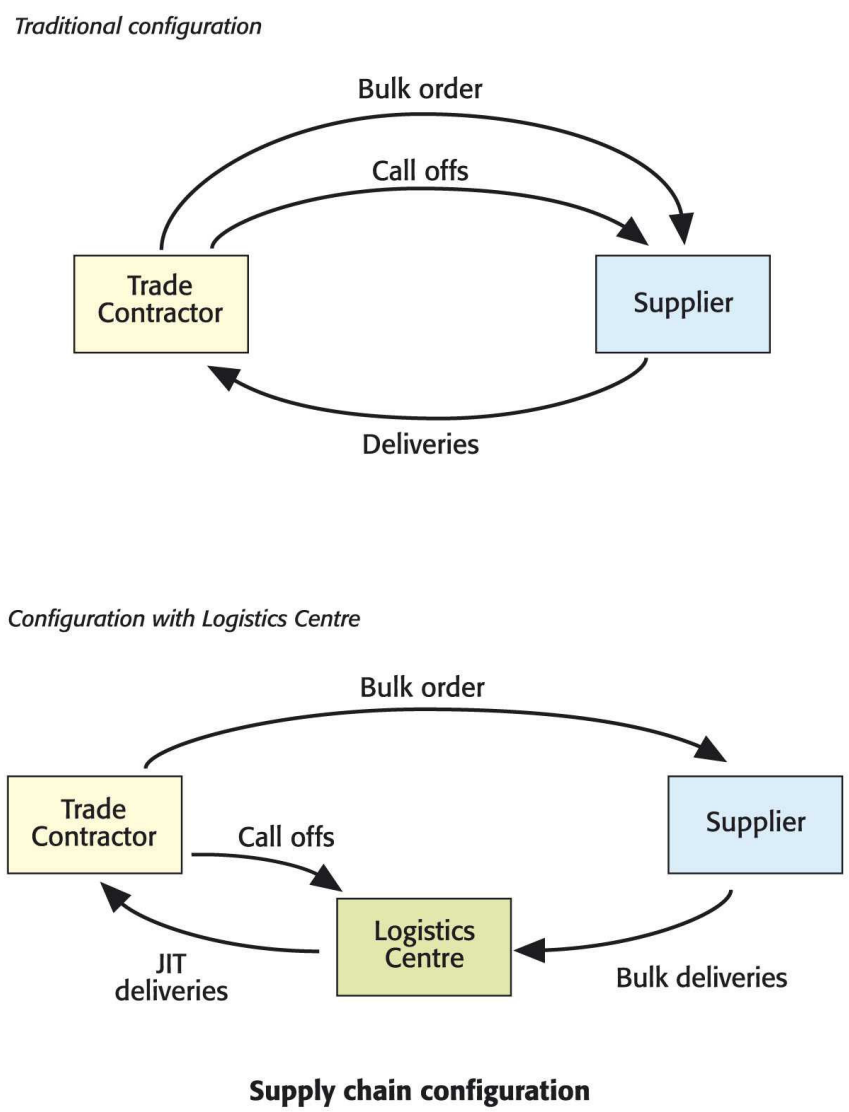
WHAT is consolidation?



Supply chain configuration

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Distribution to several sites

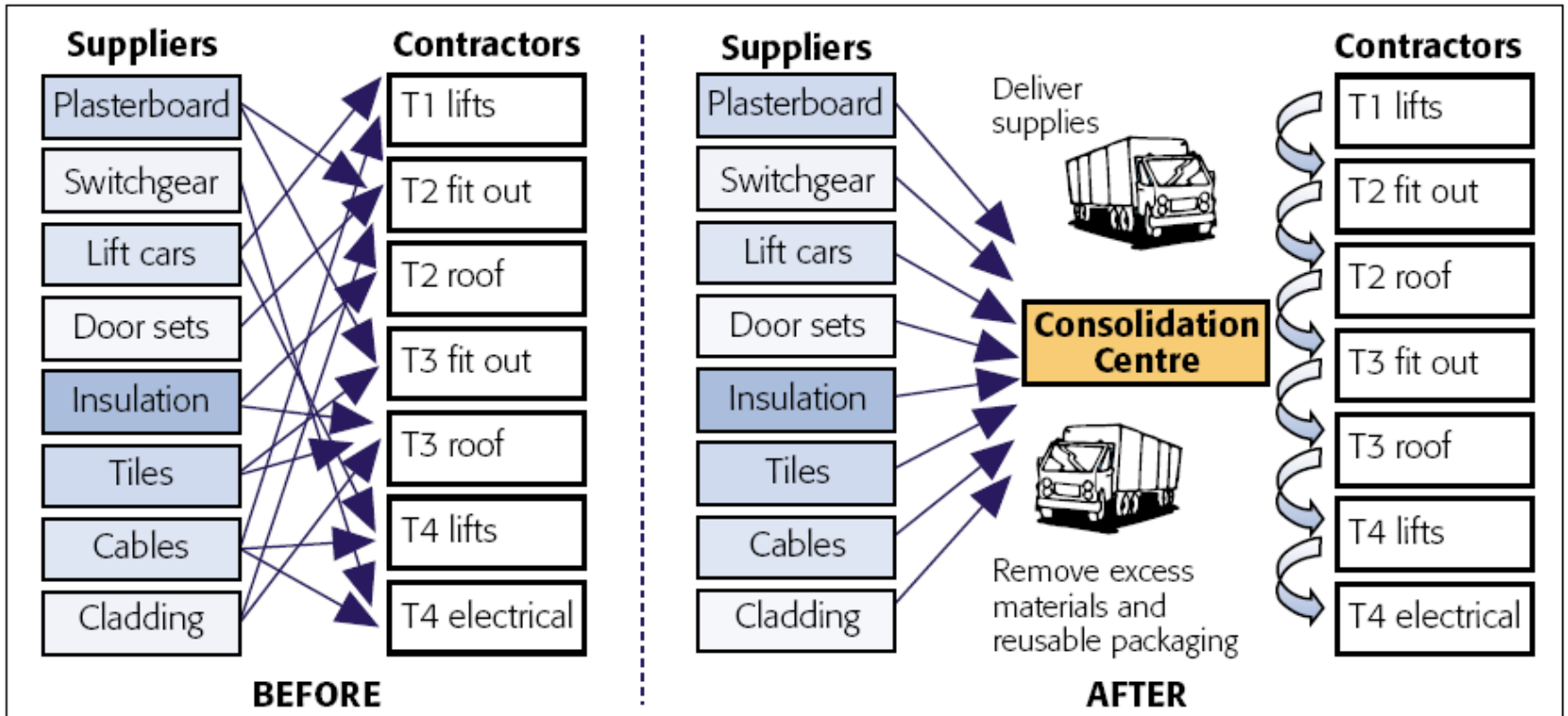

Figure 8: How consolidation simplifies distribution at Heathrow Terminals 1-4

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Reverse logistics

The future

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The benefits of consolidation

Environmental – local traffic, pollution and nuisance
Typically 70% less for freight via consolidation centre (40% overall)
MEASURED IN LONDON

Productivity on site
Typically 0.5 hour per day
MEASURED IN LONDON

Productivity of hauliers
Typically 2-hour saving in a driver's typical 10-hour day
MEASURED IN LONDON

Materials
Up to 15% saving
POTENTIAL

POTENTIALLY ABOUT **8%** OF CONSTRUCTION COST

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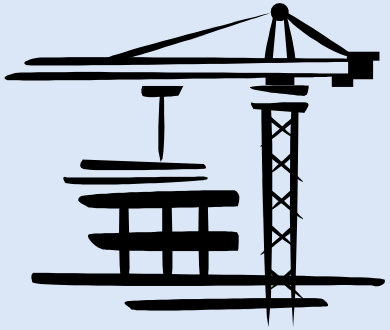
Consolidation is effective



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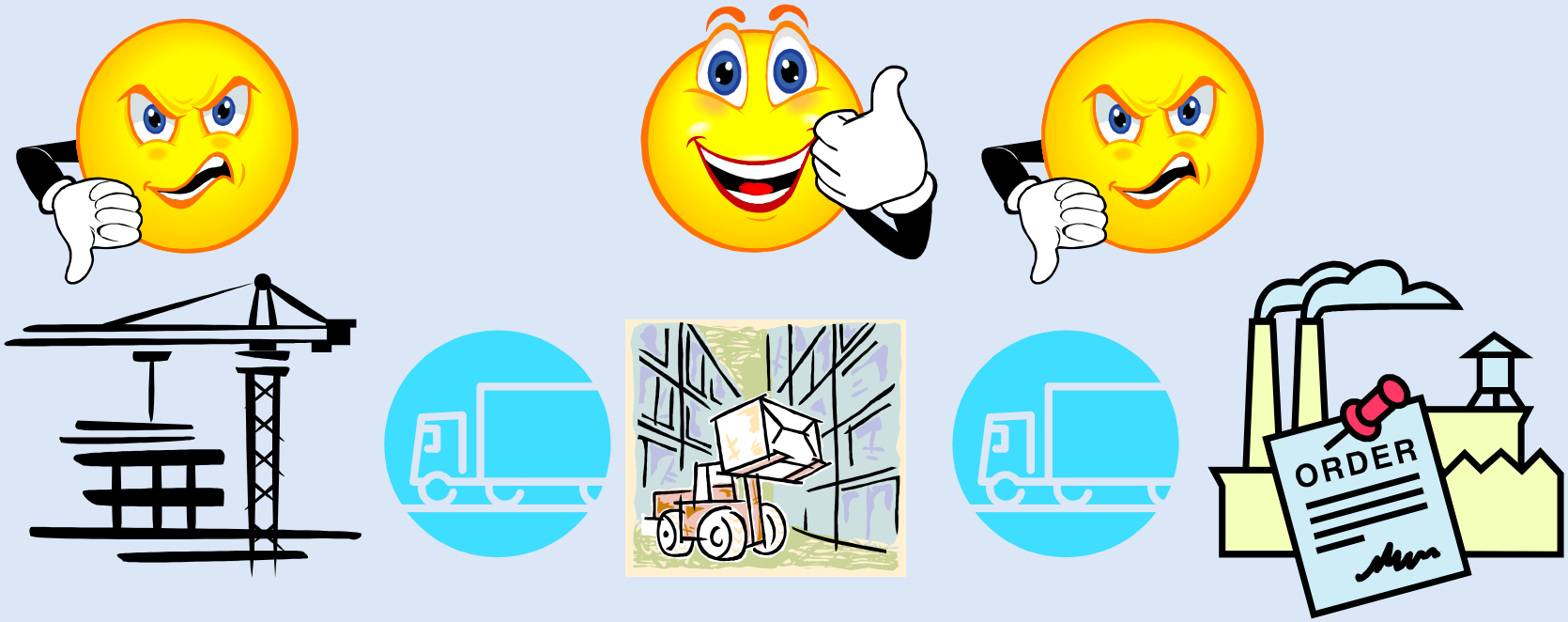
But consolidation alone is not enough



We call this the CONSTRUCTION METHOD

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Techniques in the *construction* method

Logistics planning across full supply chain	☒
Consolidation centre	☑
Just-in-time delivery to the ~~workplace~~ **site**	☑
4th party logistics	☒
Logistics specialist on site	☒
Demand smoothing	☒
Integrated ICT system across full supply chain	☒

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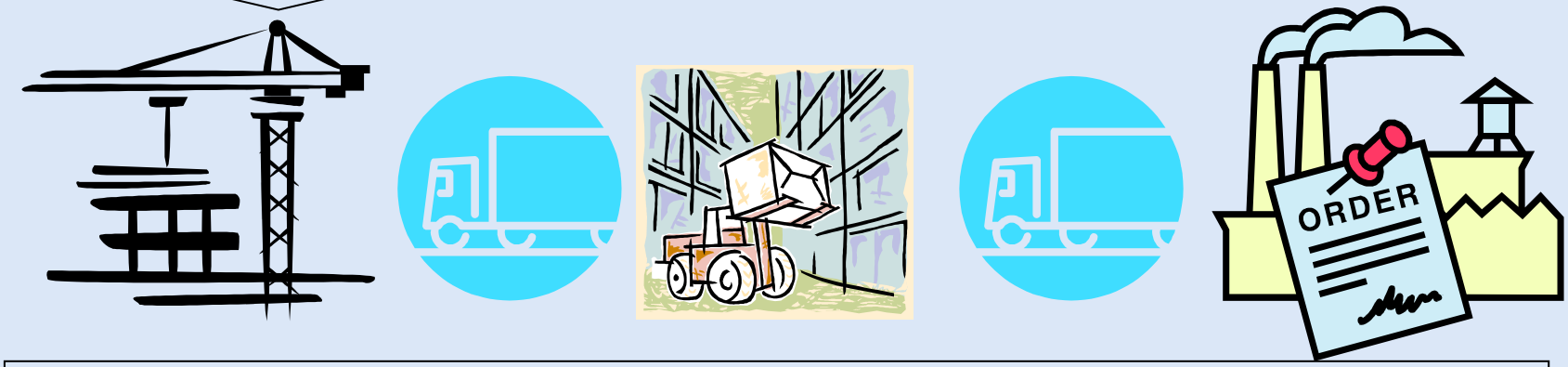
Complete supply chain management

LOGISTICS SPECIALIST calls deliveries to CCC

LOGISTICS SPECIALIST calls JIT to CC/site

LOGISTICS SPECIALIST
manages distribution on site



INTEGRATED ICT SYSTEM across the full supply chain

We call this the LOGISTICS METHOD

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Techniques used in the *logistics* method

Logistics planning across full supply chain	☑
Consolidation centre	☑
Just-in-time delivery to the workplace	☑
4th party logistics	☑
Logistics specialist on site	☑
Demand smoothing	☑
Integrated ICT system across full supply chain	☑

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Releasing potential benefits

TIME TO CONSTRUCT

DURATION

40% fewer vehicles = 40% less time to take delivery

RELIABILITY

The right quantity of the right product in the right place at the right time

Right first time!

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Releasing potential benefits

ECONOMY

PRODUCTIVITY
Supplier delivery to CC
Site workforce

Difficult to identify and share these benefits

WASTE
Remember the over-ordering!

PRICE (not to be confused with cost)

Payments for materials when fixed
Service level agreements for logistics suppliers

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Releasing potential benefits

BUILD QUALITY

LOSS & DAMAGE
Relocating material buffer to CC reduces risk

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Releasing potential benefits

HEALTH & SAFETY

CONGESTION
Relocating material buffer to CC reduces risk

METHODS
Logistics specialists (not trades) do V&H distribution
Work pack assembly in CC improves ergonomics of V&H distribution

Suitable containers in CC?

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Releasing potential benefits

ENVIRONMENT

CONGESTION
POLLUTION
CARBON EMISSIONS

70% reduction locally for consolidated loads

Discipline needed

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Consolidation in construction logistics

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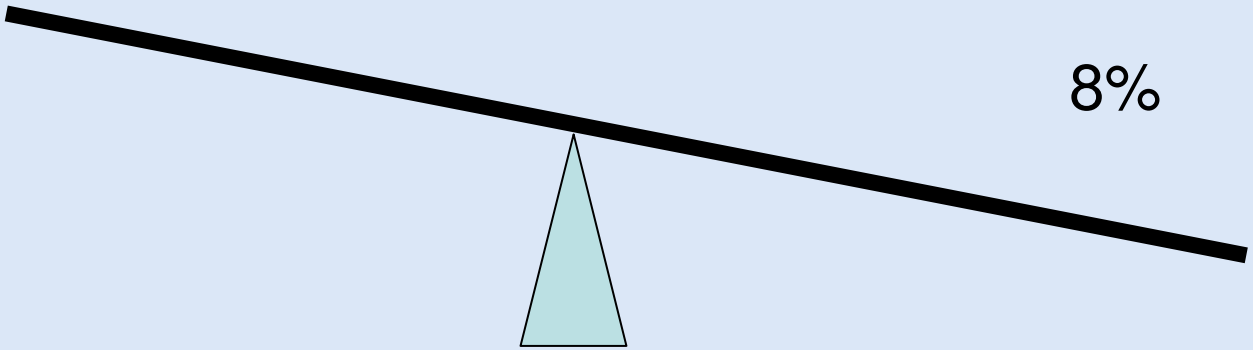
Business case

Cost of service

0.5% to 3%

Benefits

8%



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Cost

Construction type	Construction cost[11] £/m^2	Pallets/m^2	Consolidation cost £/m^2	% of construction cost
Commercial	2,000	0.45	9	0.5%
Apartments	1,500	1.0	20	1.3%
Houses	1,000	1.5	30	3.0%

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Benefits

Environmental	If 75% of materials were delivered via the CCC, there would be a 50% reduction in local traffic and emissions.	Discipline Trade contractors and suppliers to work with the logistics specialist
Productivity of construction workforce	30 minutes a day would increase productivity by 6% and reduce construction cost by 3%	Planning Behaviour Systems to identify and accrue savings
Productivity of hauliers	10-20% gain looks achievable	More transparent relationships Redistribution of some process and event risks
Material waste	Eliminating one-half of material waste would cut material bills by 7.5% and construction cost by 3%	

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BUT…

In order to make it a success…

Leadership to do something different

Logistics specialist to manage the supply chain

Configure commercial arrangements to favour co-operation

Distribute some benefits to all stakeholders

May need some pump priming

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KPIs for Consolidation

Need to measure more than the Consolidation Centre itself!

Stock turns ↑

Floor space utilisation ↑

Supply chain costs ↓

Supply chain delivery reliability ↑

Supply chain responsiveness ↑

Supply chain asset management efficiency ↑

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Consolidation in construction logistics

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Benefits
Business case
Reverse logistics
The future

CONSTRUCTING EXCELLENCE
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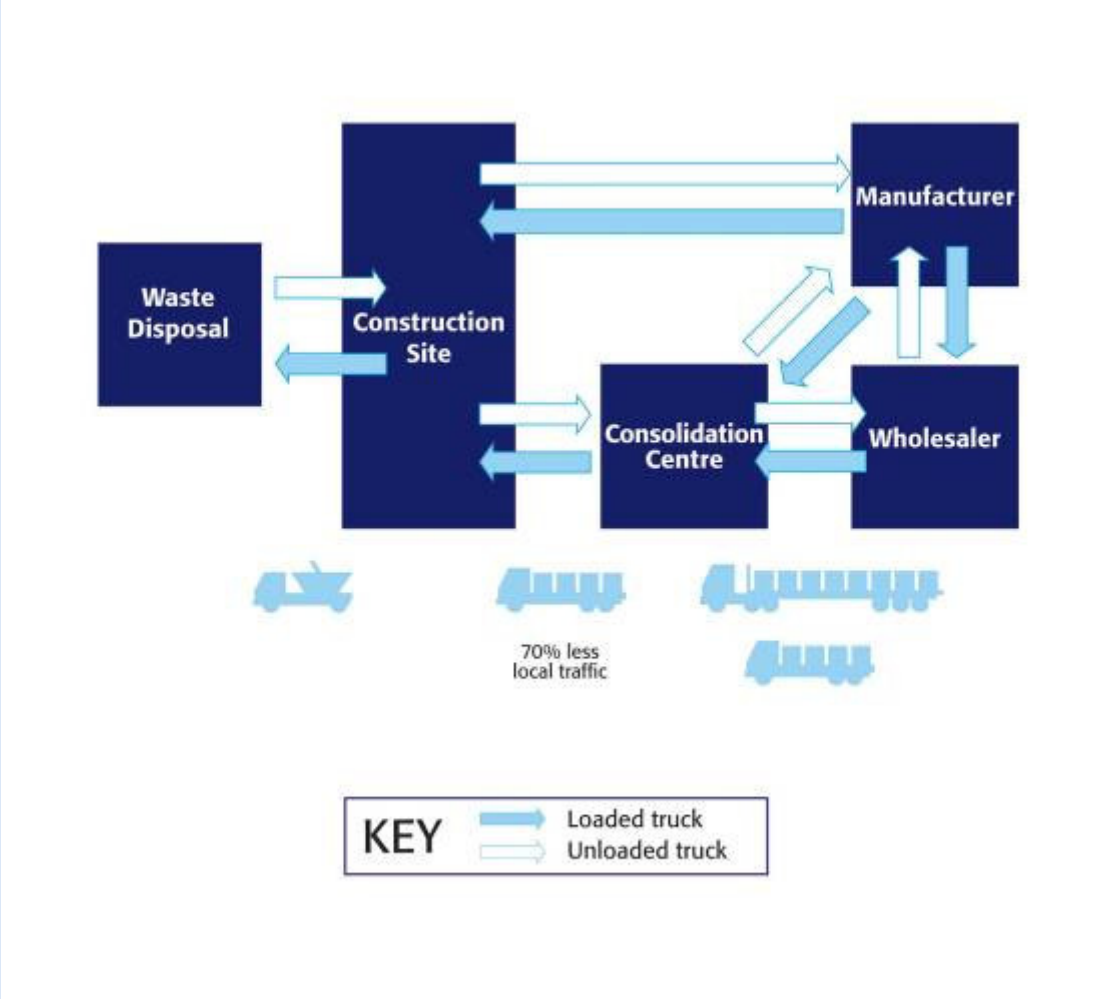
Reverse logistics



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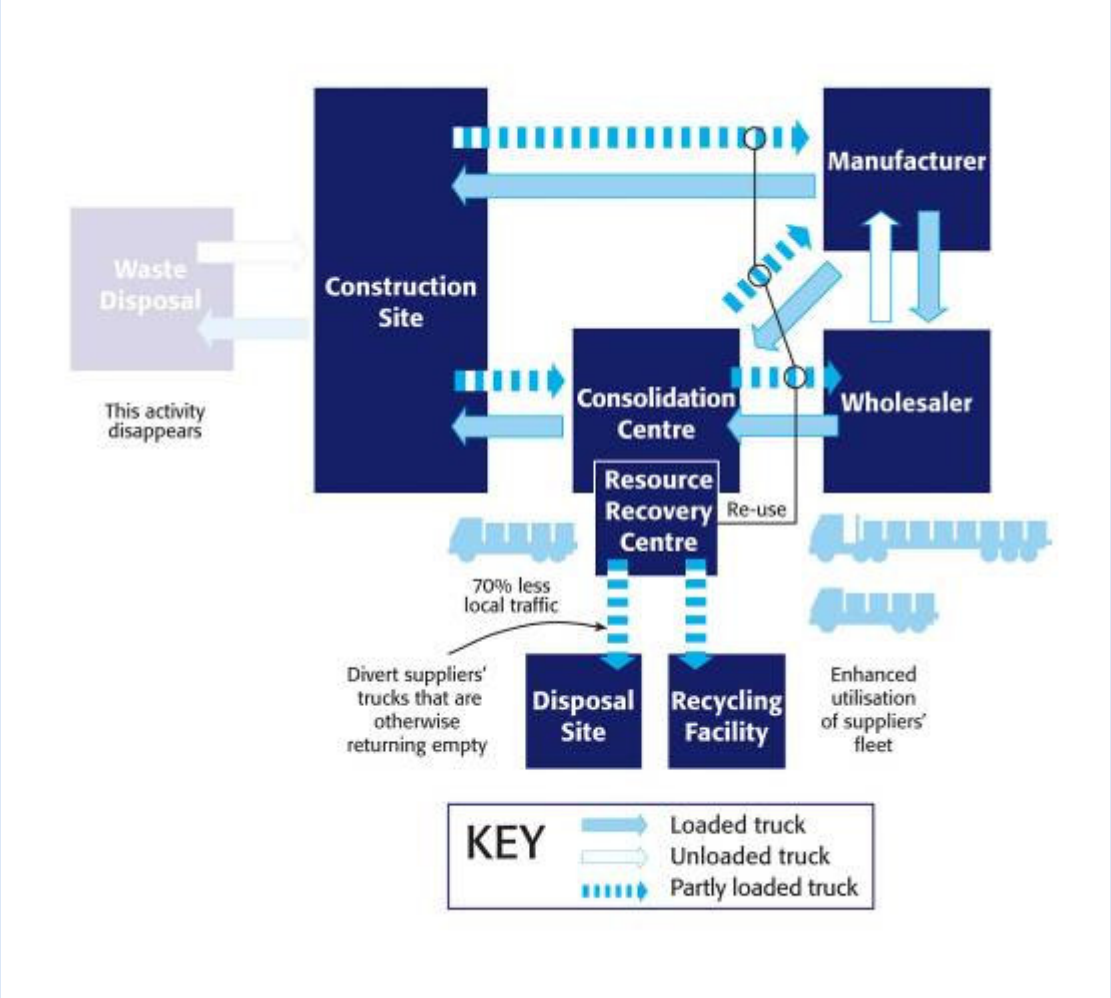
Reverse logistics



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Consolidation in construction logistics

Methods of logistics
Why change is needed
What is consolidation
Benefits
Business case
Reverse logistics
The future

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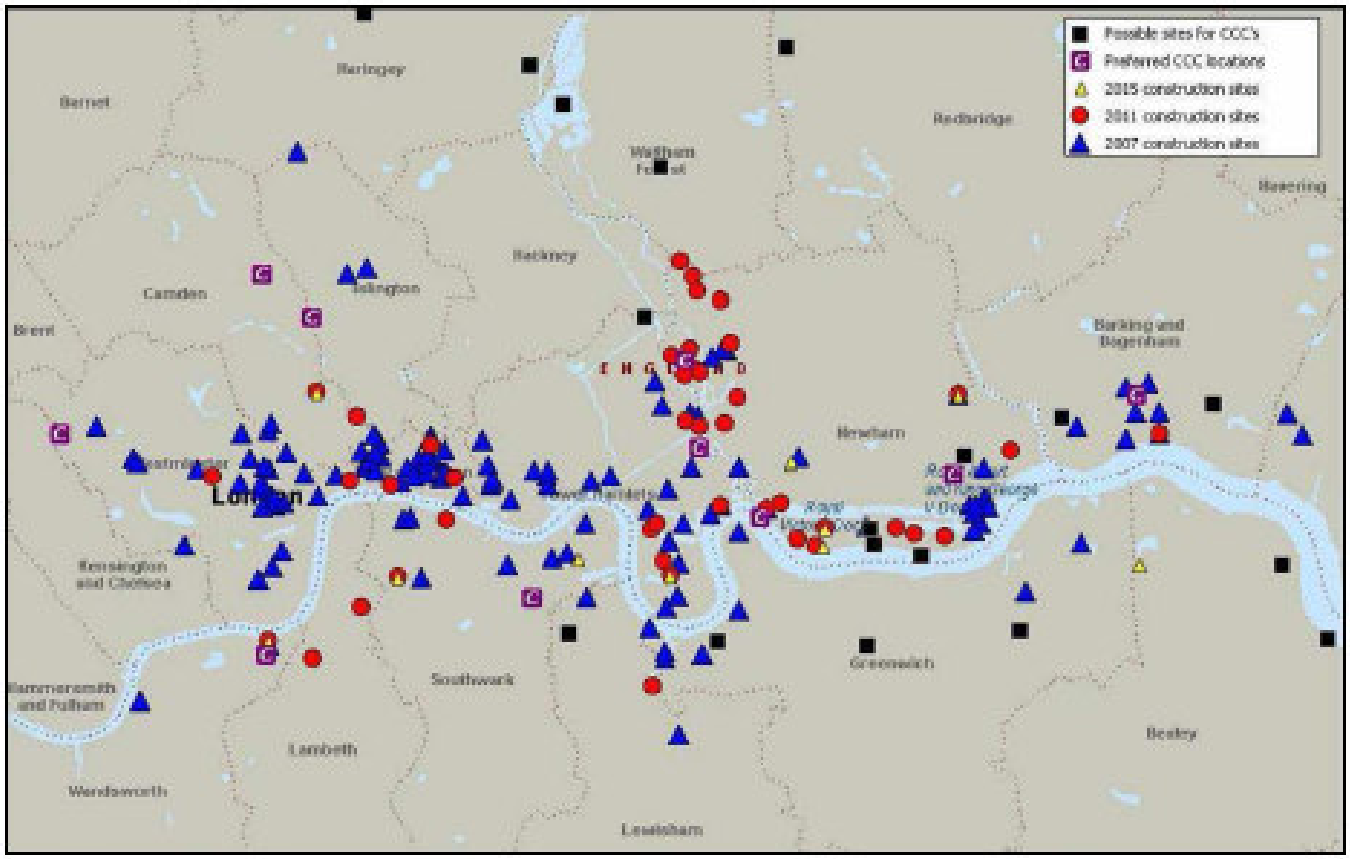
Demand centres



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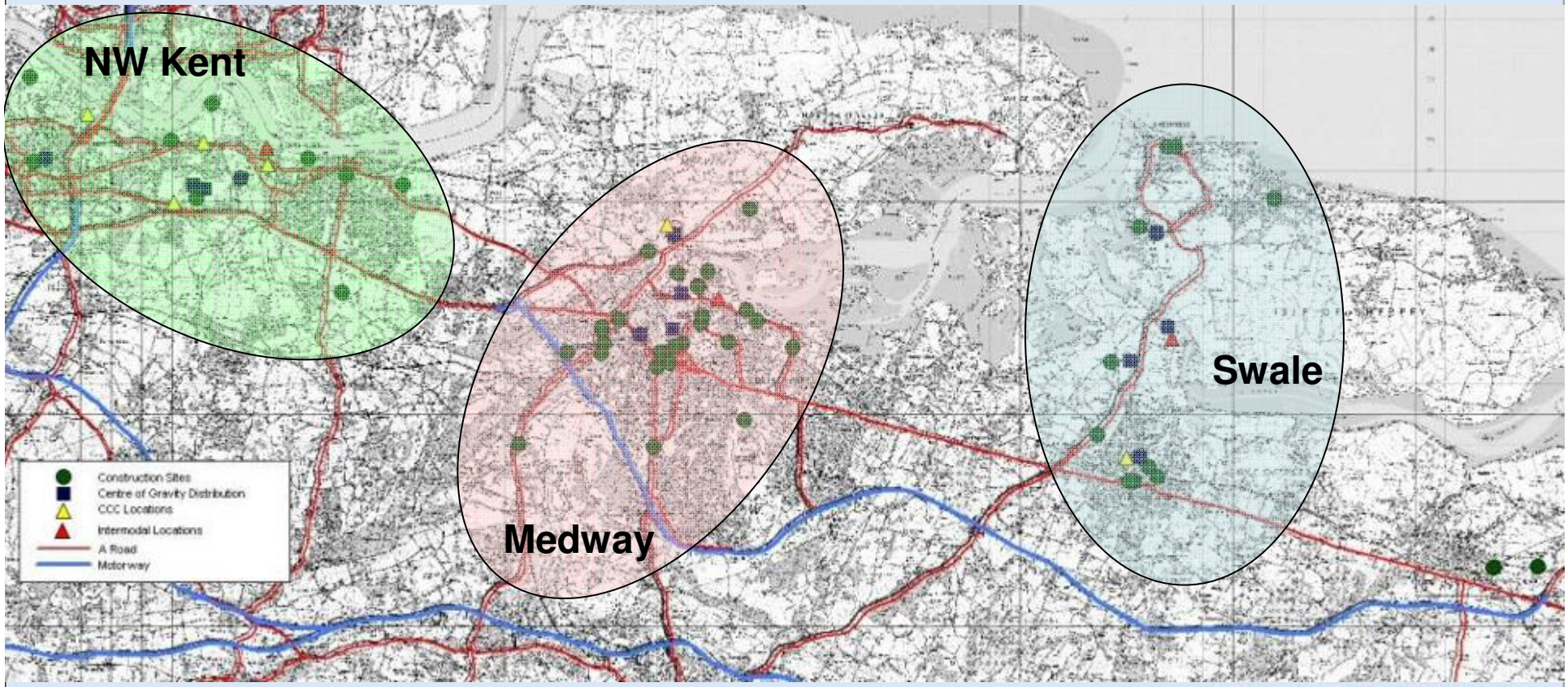
Demand centres



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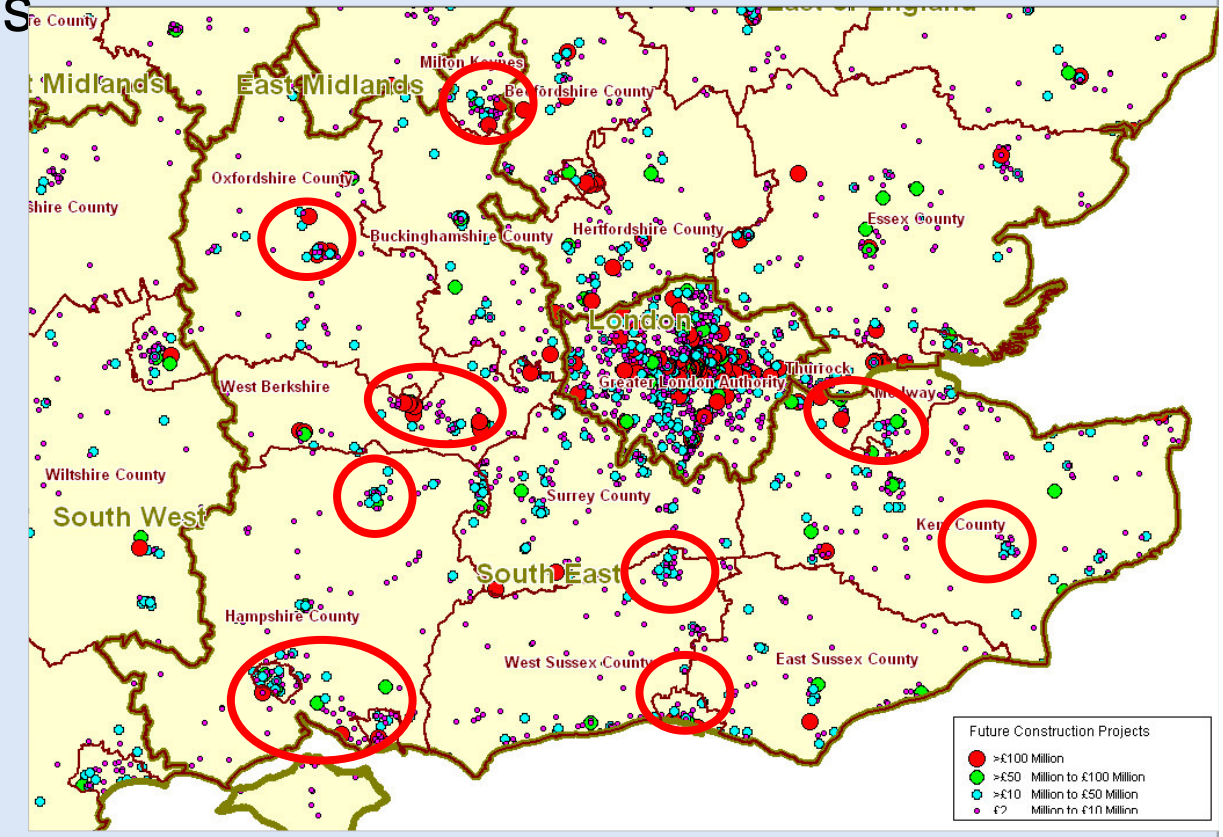
Demand centres

High growth ‘Diamonds’

- Medway
- Ashford
- Reading & Bracknell
- Basingstoke
- Soton/Portsmouth
- Crawley
- Brighton
- Oxford
- Milton Keynes



HOW will this happen?

DRIVERS affecting clients, regulators & supply chain

Improve programme certainty
Contain costs
Reduce environmental impact

INCREASING REGULATION

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HOW will this be held back?

BARRIERS affecting clients, regulators & supply chain

Ineffective leadership
Ineffective regulations
Lack of clear business case
Industry's reluctance to change
Lack of effective ICT infrastructure

BUSINESS CASE

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Further research

TO BUILD THE BUSINESS CASE

Environment – Transport Statement or Assessment

Productivity – value stream analysis of before and after

Hauliers – survey of before and after

Material waste – survey of before and after

Procurement – map supply chain and processes

ICT – staged development of systems from design output to installation and waste recovery

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