

Platform Concept and *Kit of Parts Construction*



CEA – Oct 2024
William Johnston

WSP

Intro

William Johnston



Let's Set the Scene

The Platform Concept and Kit of Parts Construction –
*why are we still talking about it, why hasn't it taken off
and why is it still relevant?*

Let's Set the Scene

we struggle with Stigmas

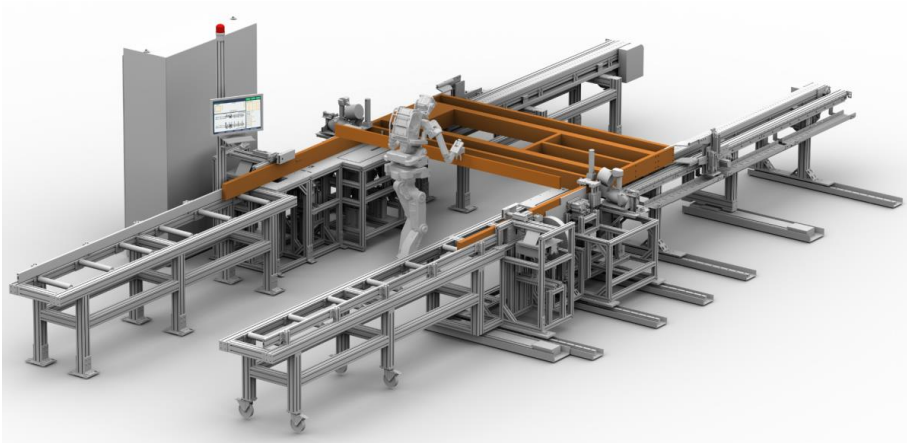
Let's Set the Scene

first we said **Modular**



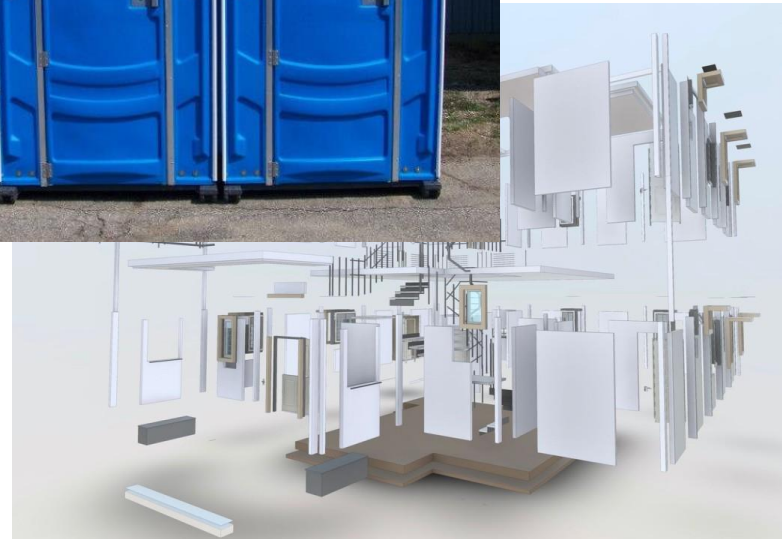
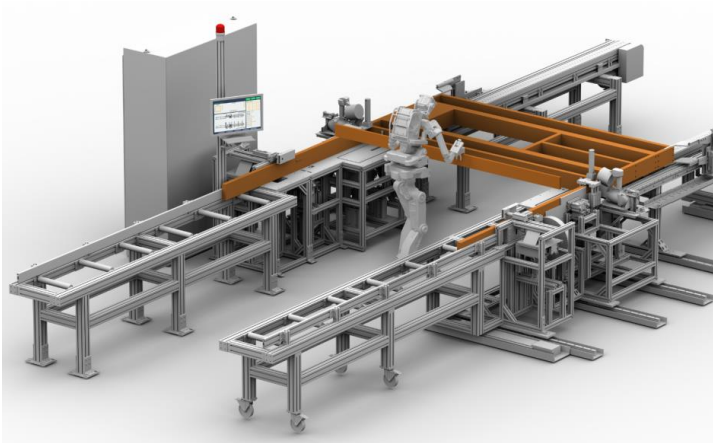
Let's Set the Scene

and it could have meant anything clever and repetitive



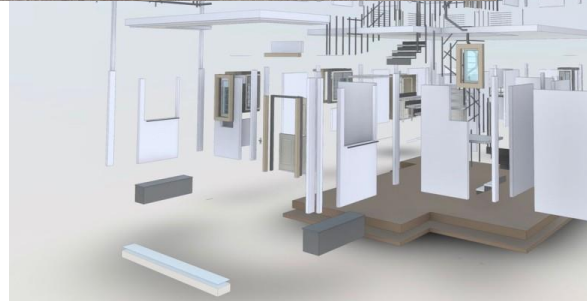
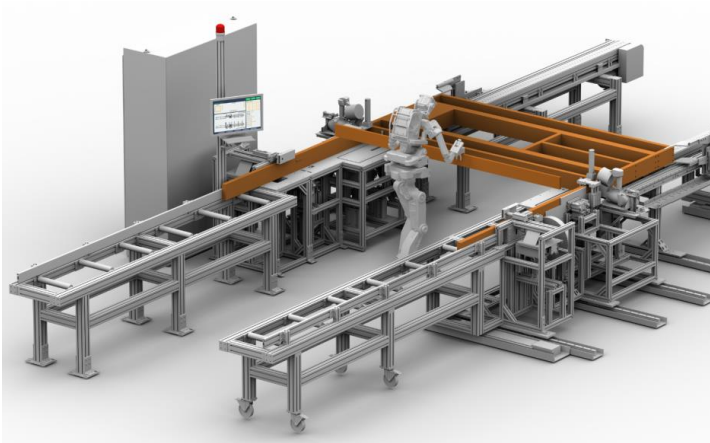
Let's Set the Scene

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Let's Set the Scene

and it could have meant anything clever and repetitive



Let's Set the Scene

but it started to mean this...



Let's Set the Scene

but it sta



Let's Set the Scene

so we came up with new names

- like **Prefabrication**
 - *a clever and useful term*
 - *which became **Prefab***
 - *which is Latin for Cheap*

Let's Set the Scene

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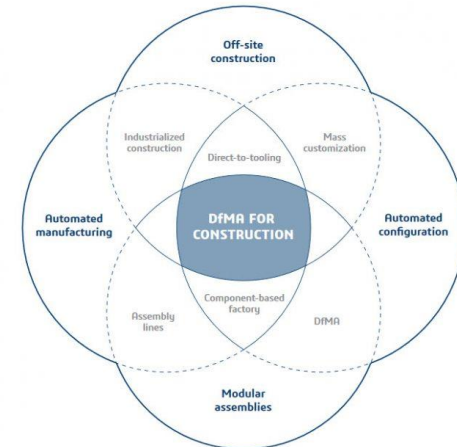


Let's Set the Scene

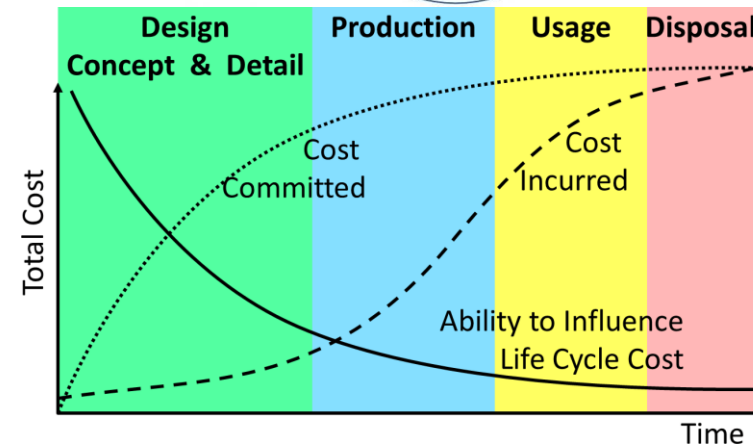
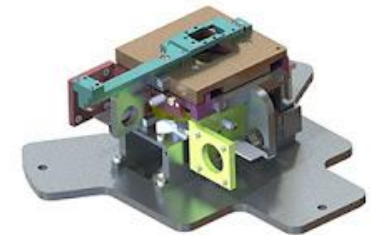
so we then became bullet proof and invented

DfMA = Design for Manufacture and Assembly

- lots of graphs
- lots of analysis
- very descriptive
- very specific



Before DFMA
111 Parts



After DFMA
32 Parts



Let's Set the Scene

now it's just **MMC – Modern Methods of Construction**

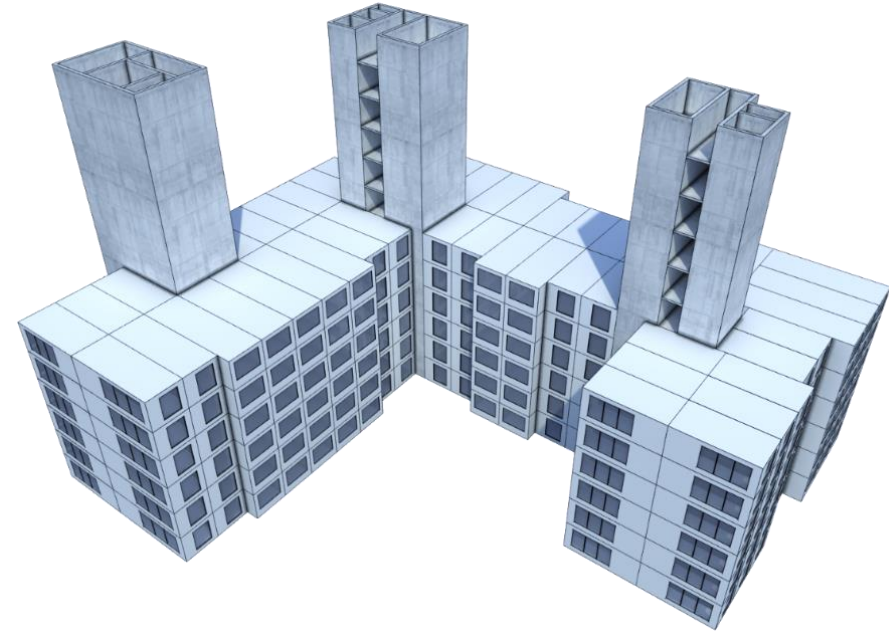
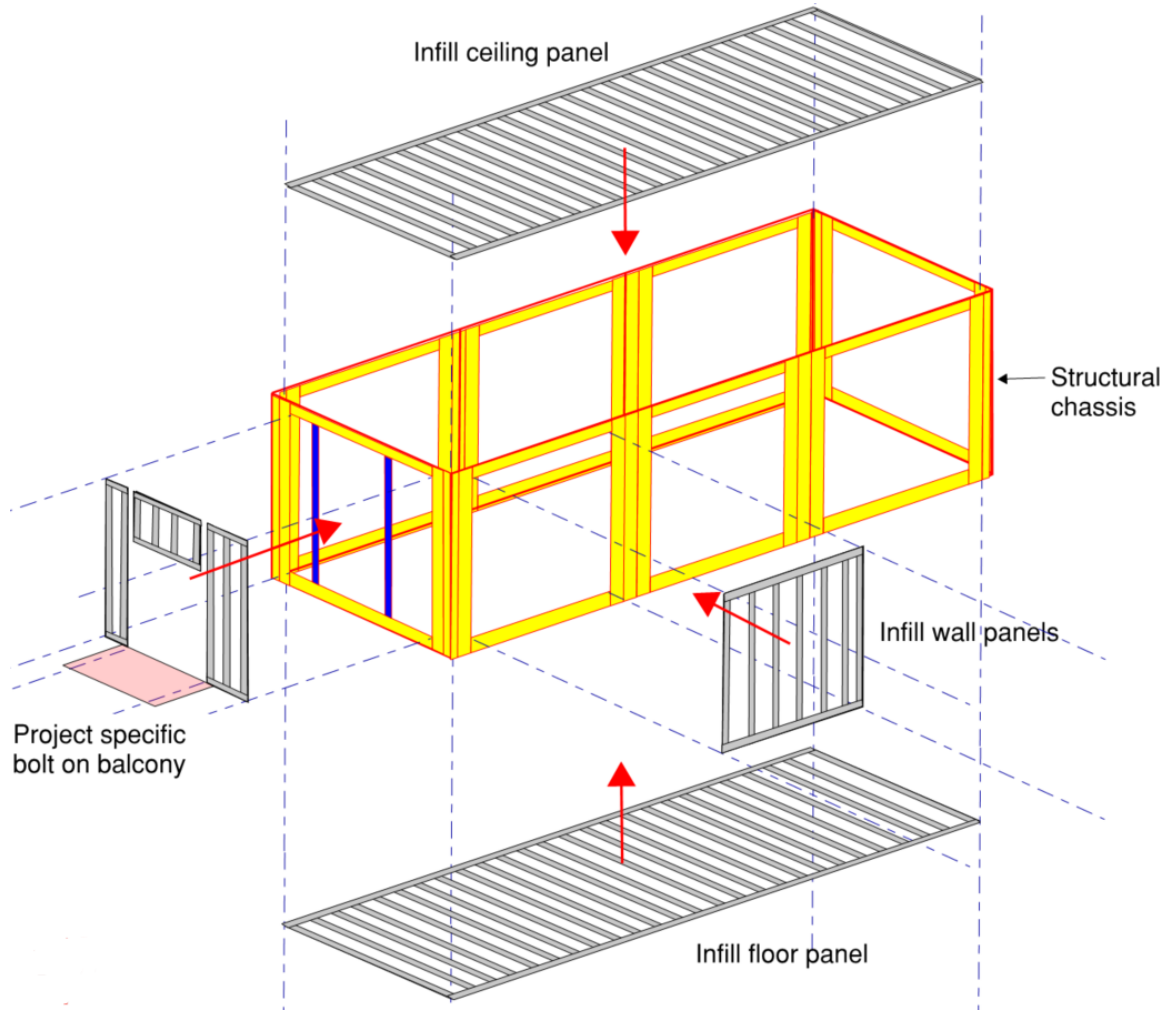
- lots of flexibility
- all encompassing
- volumes, panels, components

Why are we still talking about this

countless studies and designs

Case Study MMC Category 1

Xxxx Modular, London



Upfront carbon (A1-5)

Volumetric modular system

- Primary Frame 361 kgCO₂ / m²
- Turnkey 432 kgCO₂ / m²





10-storey structure

- Primary Frame 490 kgCO₂ / m²
- Turnkey 561 kgCO₂ / m²

Sara Culture Centre, Sweden



Volumetric Modular Systems - Deliveries

Volumetric Modular	General	Typical floor plate	Assumptions	
	1No. Turnkey VM 54m ²	12No. deliveries	650m ²	
Traditional Flat Slab		225thk Slab Only 35m ²	20No. Concrete deliveries	650m ²
		Rebar Formwork & Props Temporary works	8No. Rebar 6No. Formwork & Props 6No. Temporary works	4No. pours as minimum
		Follow-on trades MEP, Finishes, Facades, Ancillary	20-40No.	Estimate
		Waste	14No.	Min. 1 per day for construction waste
		Total c. 100No. deliveries		

Case Study MMC Category 2

Panelised - Deliveries

Panelised



General

Up to 80m²

Typical floor plate

9No. deliveries

Assumptions

650m²

Total c. 50No. deliveries

Traditional Flat Slab



225thk Slab Only
35m²

20No. Concrete deliveries

650m²



Rebar
Formwork & Props
Temporary works

8No. Rebar
6No. Formwork & Props
6No. Temporary works

4No. pours as minimum



Follow-on trades
MEP, Finishes, Facades,
Ancillary

20-40No.

Estimate – required in both



Waste

14No.

Min. 1 per day for
construction waste

Total c. 100No. deliveries

Why are we still talking about this

we all know it makes sense, no?

- Schedule benefits
- Better quality
- Safer
- Less waste
- Lower carbon
- Good for skills shortage
- Weather agnostic
- Cheaper

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- **Cheaper ...??**

Why are we still talking about this

why hasn't it taken off?

- it isn't cheaper

Why are we still talking about this

why hasn't it taken off?

- it isn't cheaper

Why?

- too many small distinct solutions
- no economy of scale, or critical mass
- no secure pipeline
- it's complicated

Let's ask some questions and bust some myths

Buildings are unique

Let's ask some questions and bust some myths

Buildings are unique, but not that unique

Let's ask some questions and bust some myths

Buildings are unique, but not that unique



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Ineos Grenadier
4,000 since Oct 2022
\$100,000 - \$200,000



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Land Rover Defender
350,000/yr (110,000 Defenders)
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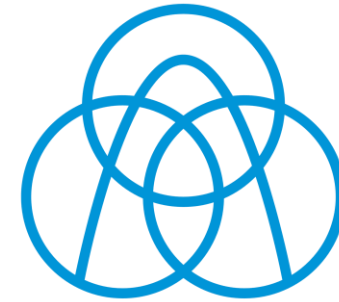
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Let's ask some questions and bust some myths

OTIS



Schindler

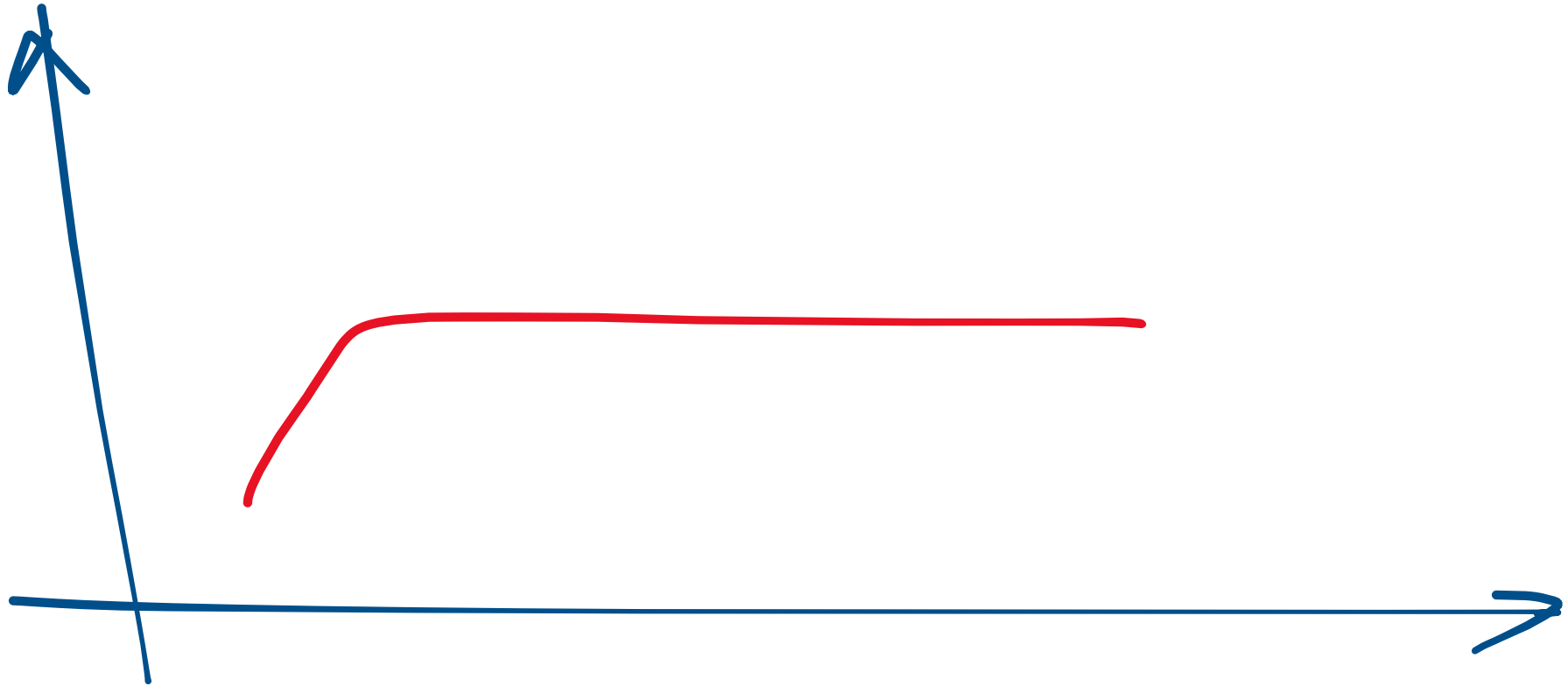


thyssenkrupp



Let's ask some questions and bust some myths

Elevators



Let's ask some questions and bust some myths

Schools



Let's ask some questions and bust some myths

Schools



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Schools



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Schools

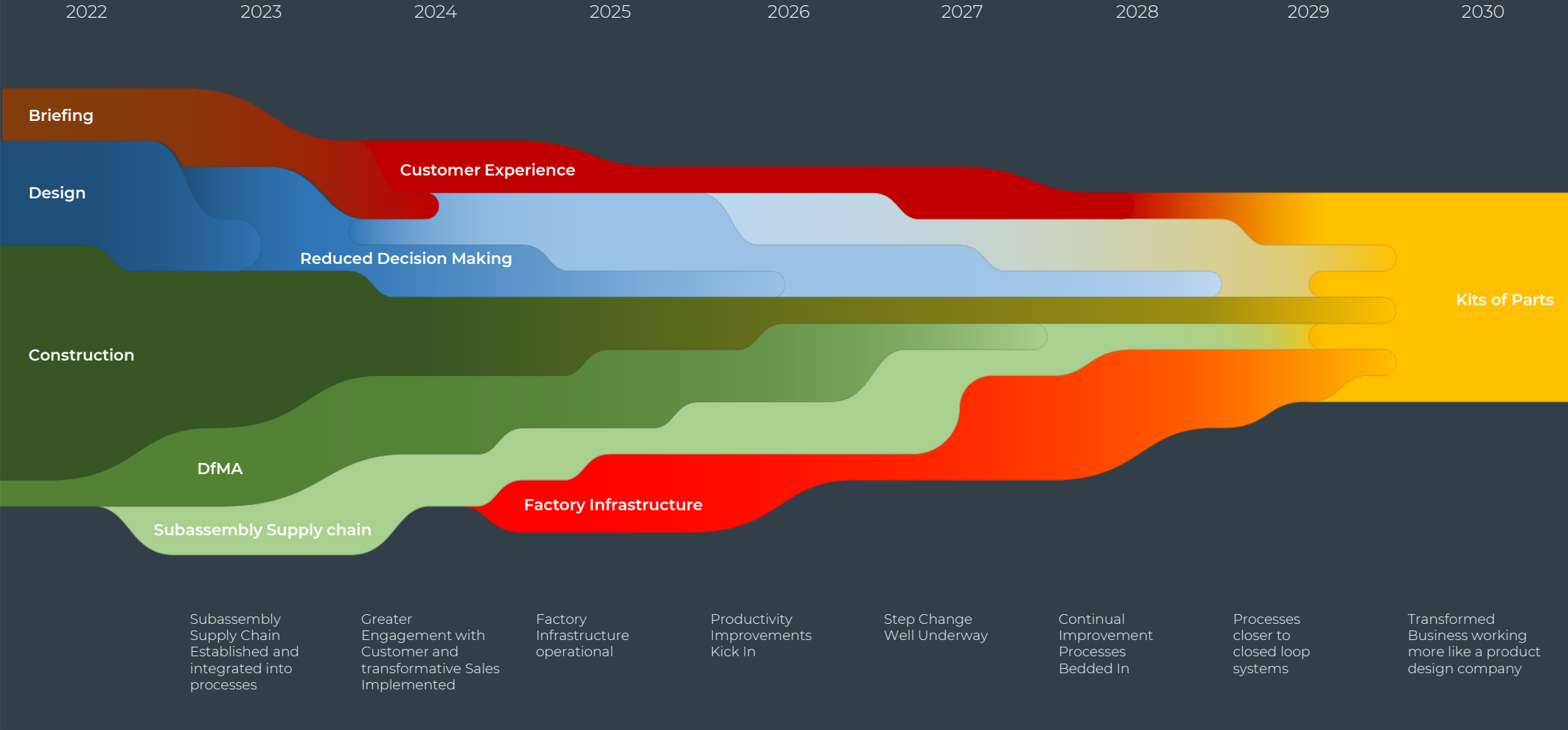


What is platform Construction?

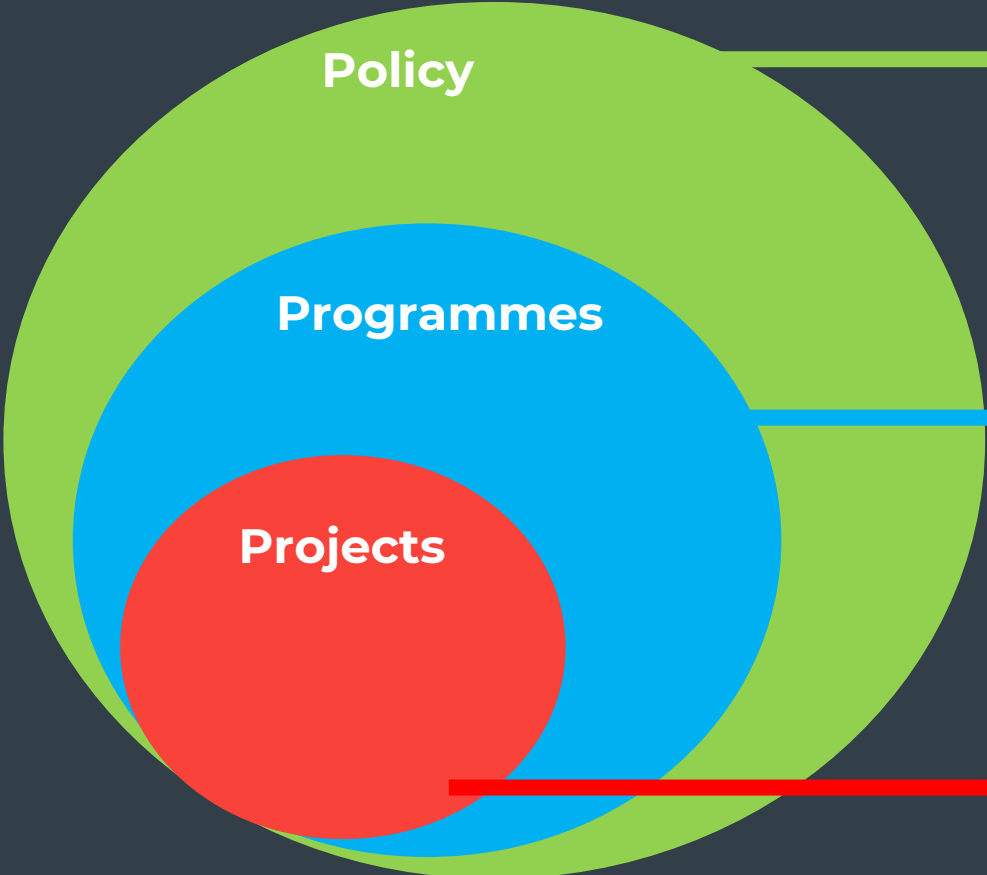
A Platform Approach considers a program

- Uses processes geared towards repetition
- Leverages offsite and predefined components
- But looks at the entire ecosystem

PROJECTS TO PROGRAMS



KIT OF PARTS LAYERS



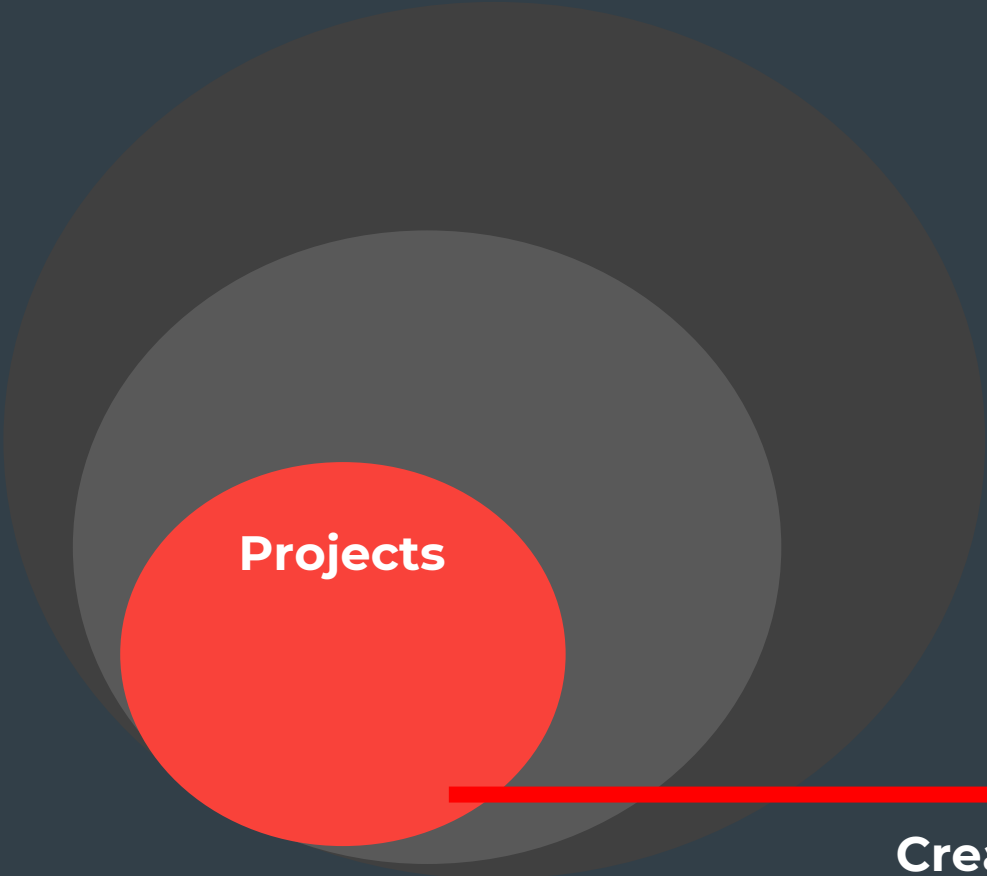
Shifting effort from site to factories opens a wealth of social value opportunities and through aggregation enables robotics and automation to scale

Once created, the Kit of Parts uses catalogues and configurators to balance reuse and repetition with customisation and configuration enabling more focused decision making on projects

A redefined project process that helps the selection of the most efficient offsite manufacturing solutions, delivering them into large subassemblies that accelerate project delivery

Kit of Parts

PROJECTS

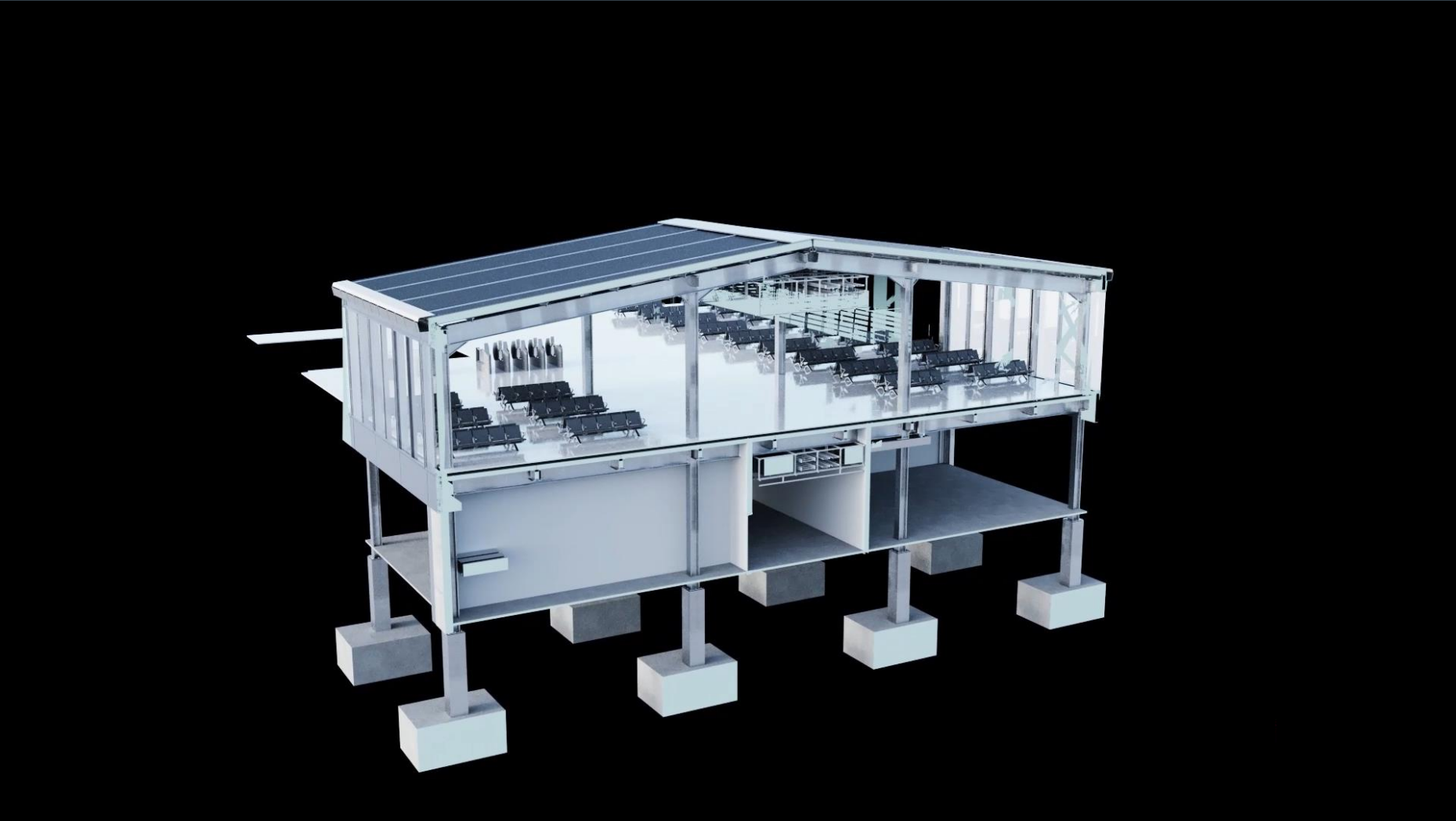


Projects

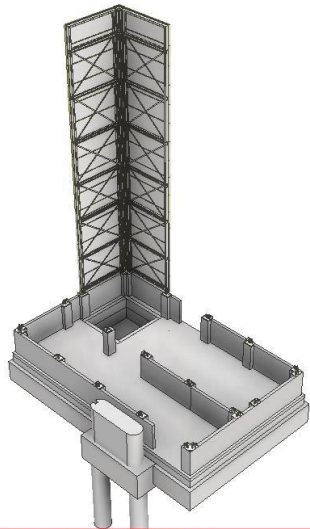
A redefined project process that helps the selection of the most efficient offsite manufacturing solutions, delivering them into large subassemblies that accelerate project delivery

Creating the Kit of Parts

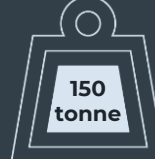
KIT OF PARTS



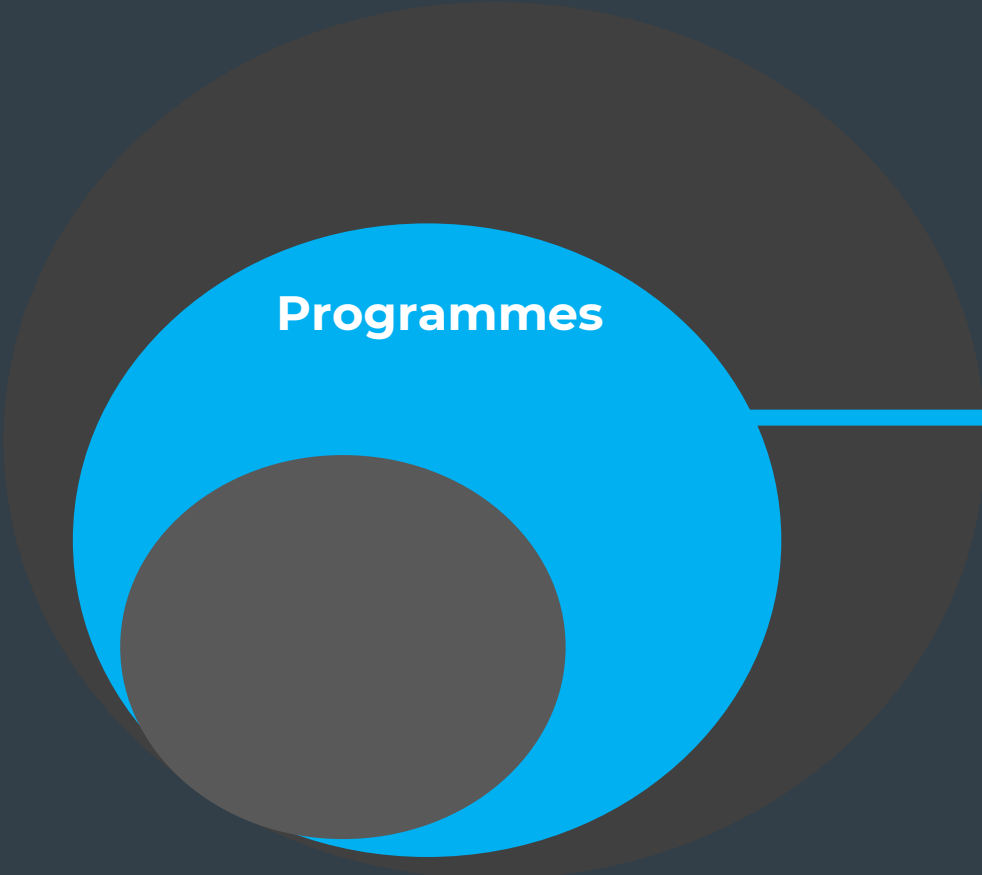
LOGISTICS AND ASSEMBLY



WSP - Work-In-Progress - Single Node - Initial Sequence
07/03/2023

	Kit of Parts	Modular
Total Subassemblies	300	600
Total Volumetric	-	120
Loads Site	55 (Standard truck) 	120 (Low Loaders) 
Crane	 50 tonne	 150 tonne
Erection Speed	12 units/day	4 units/day

KIT OF PARTS LAYERS



Programmes

Once created, the Kit of Parts uses catalogues and configurators to balance reuse and repetition with customisation and configuration enabling more focused decision making on projects

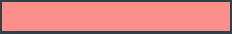
Using the Kit of Parts

LEFT SHIFT

1



Preparation
and Briefing



2



Concept
Design



3



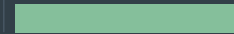
Spatial
Coordination



4



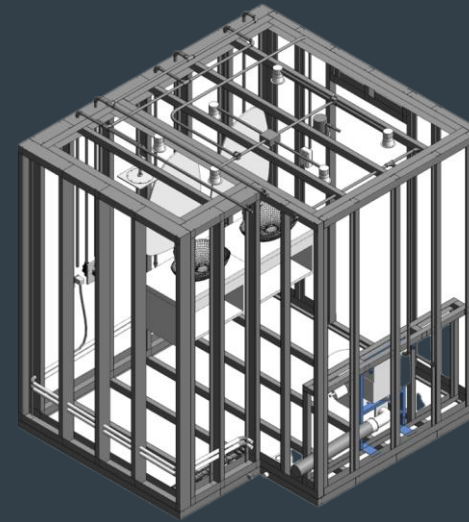
Technical
Design



5



Manufacturing
and Construction



OUTPUT

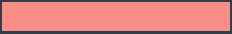
Downstream
innovation has
limited impact

LEFT SHIFT

1



Preparation
and Briefing



2



Concept
Design



3



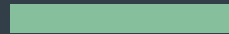
Spatial
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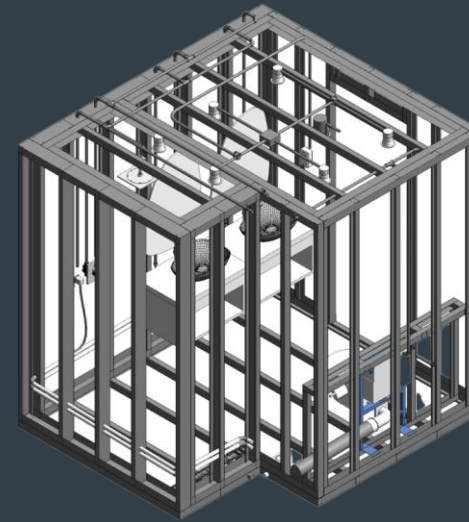
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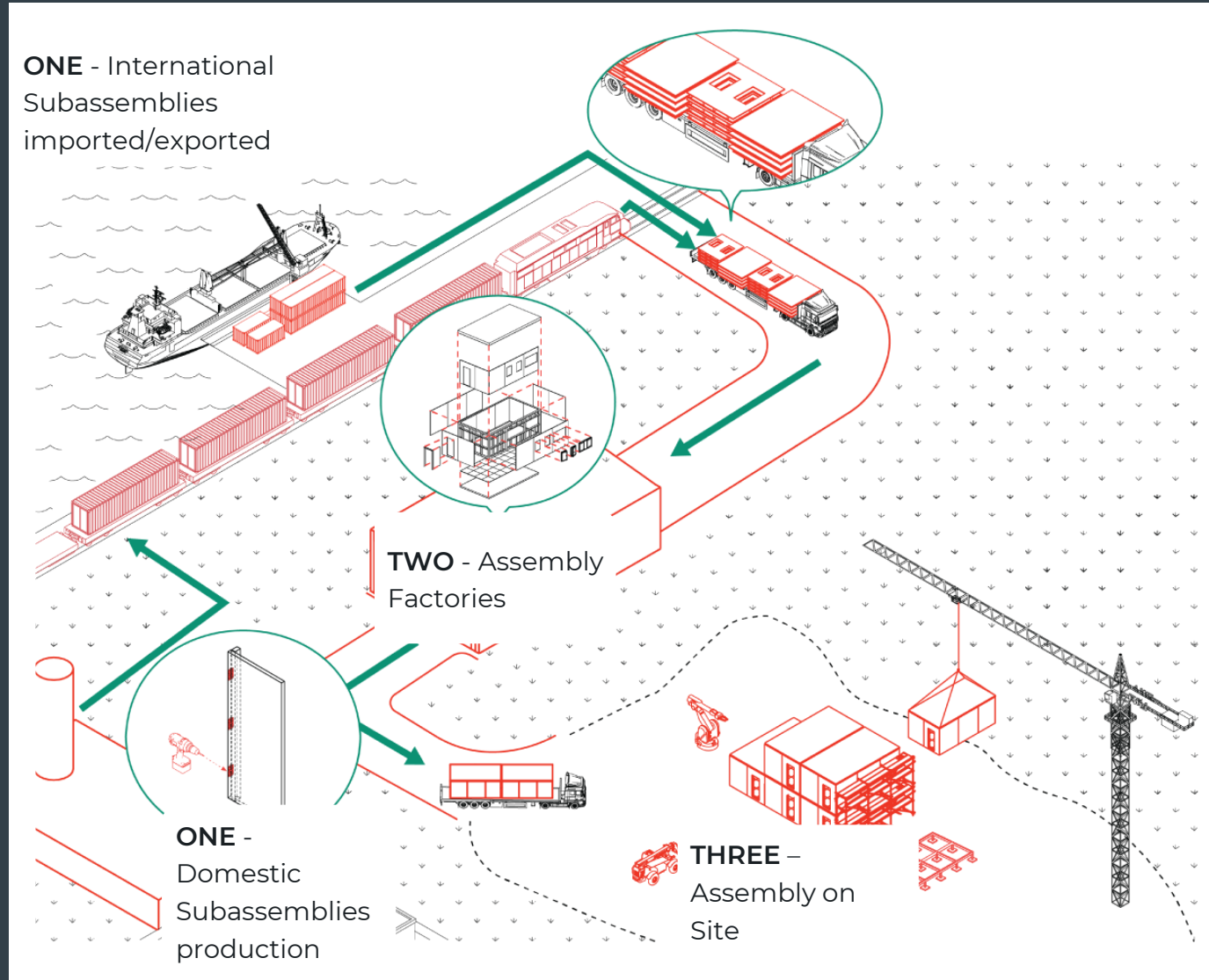
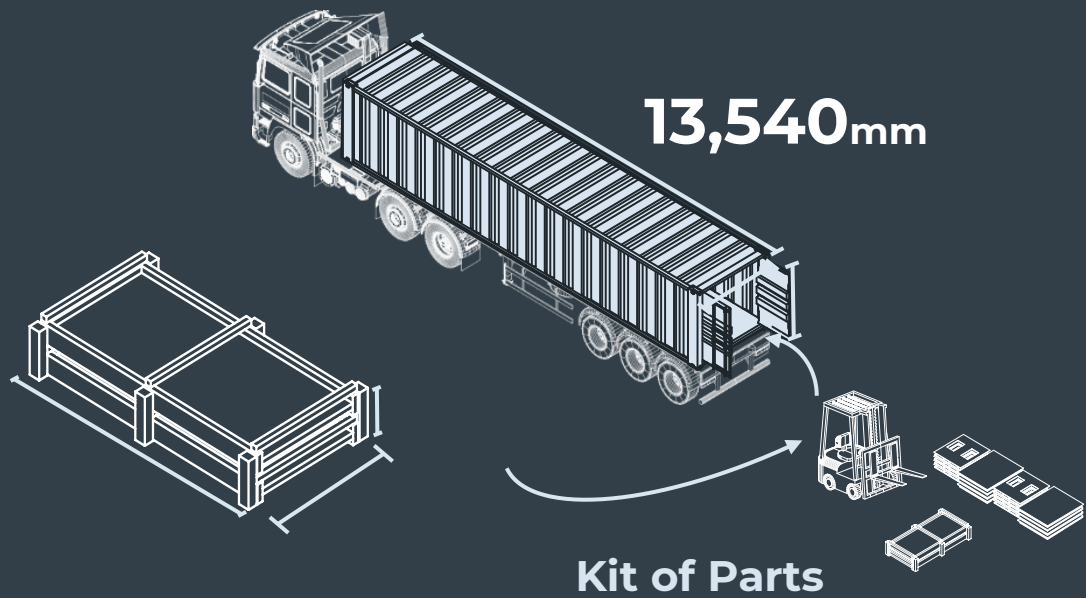
Manufacturing
and Construction



INPUT

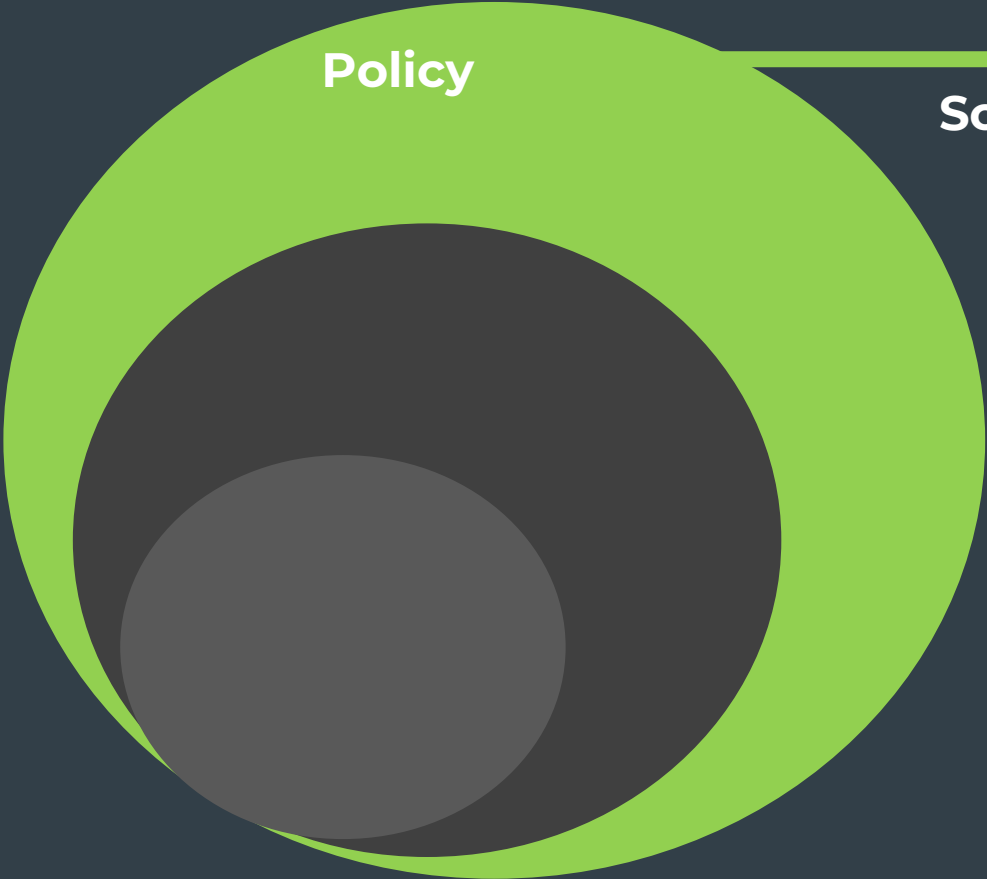
**Upstream
innovation drives
transformation**

NEW SUPPLY CHAINS AND PROCUREMENT STRATEGIES



KIT OF PARTS LAYERS

Shifting effort from site to factories
opens a wealth of social value
opportunities and through aggregation
enables robotics and automation to scale

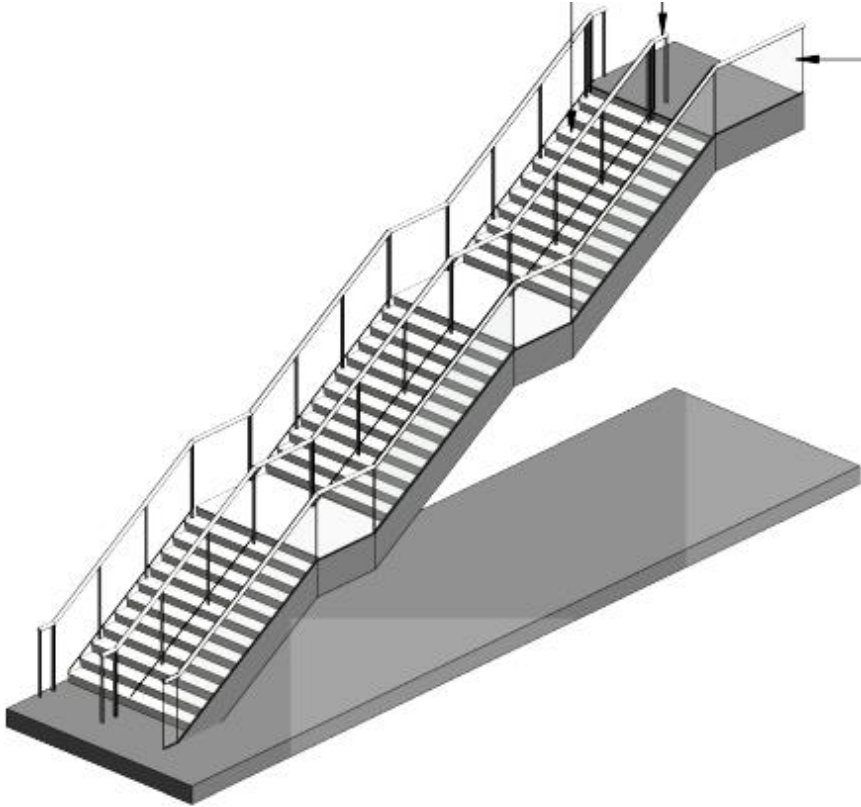
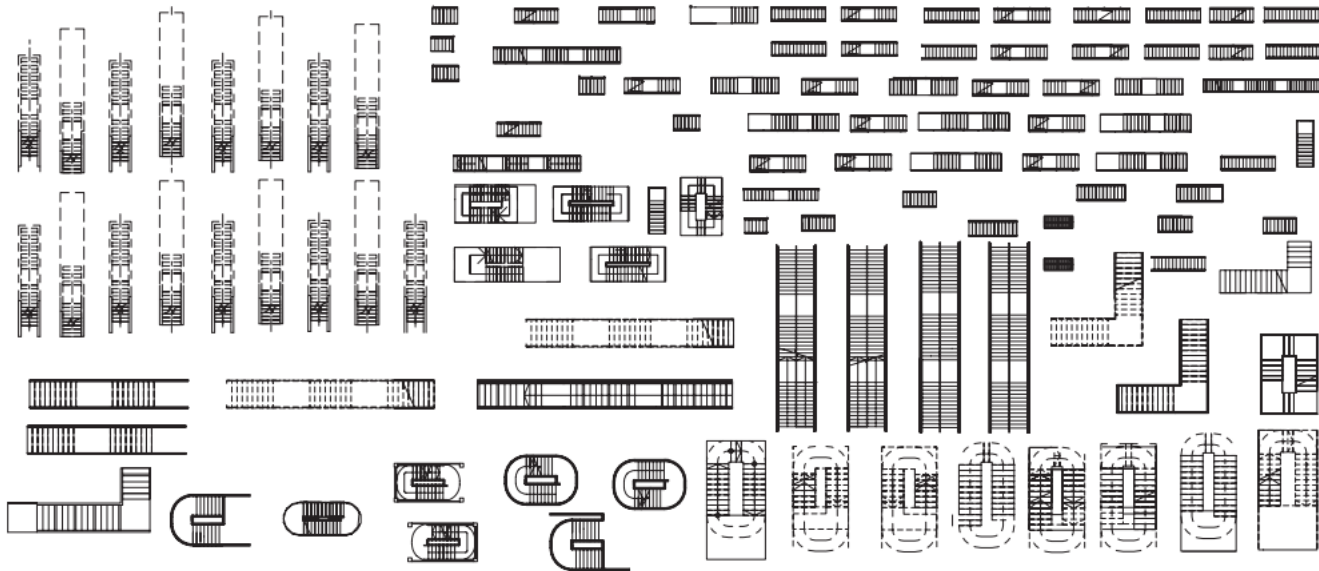


Scaling the Kit of Parts

KIT OF PARTS LAYERS



ECONOMIES OF SCALE



What can we do?

Learn from others

POLITICAL INTERVENTION



 **HOUSE OF LORDS**

Built Environment Committee
 House of Lords
 London
 SW1A 0PW
 Tel: 020 7219 3140
builtenvironment@parliament.uk

Secretary of State for Levelling Up, Housing and Communities
 2 Marsham Street, London, SW1P 4DF

26 January 2024

Dear Michael,

Modern methods of construction in housing

I write following the Built Environment Committee's brief inquiry into modern methods of construction.

Please find attached the committee's views on the topic with conclusions and recommendations, which draw on the evidence we received.

I would be grateful if you could respond to the committee's conclusions and recommendations within six weeks.

Yours sincerely,

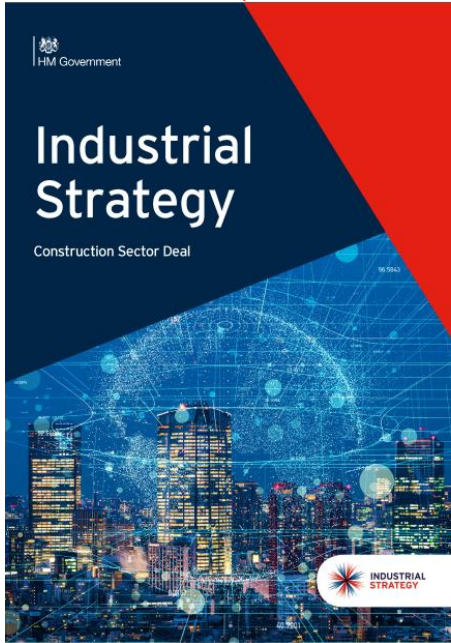


Lord Moylan
 Chair, Built Environment Committee

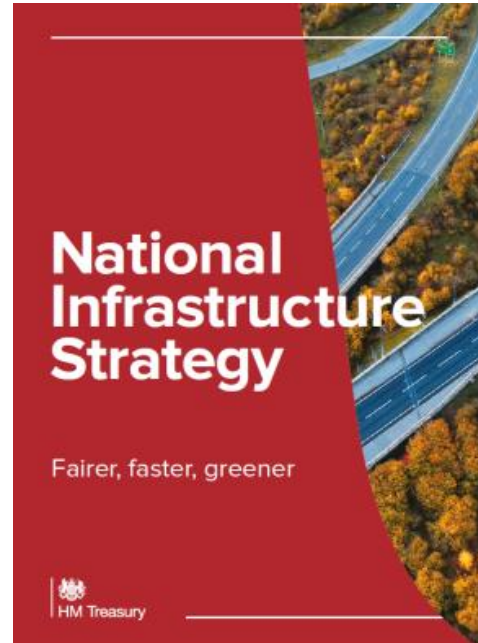
CC: Baroness Neville-Rolfe,
 Minister of State (Cabinet Office)

Source: ONS

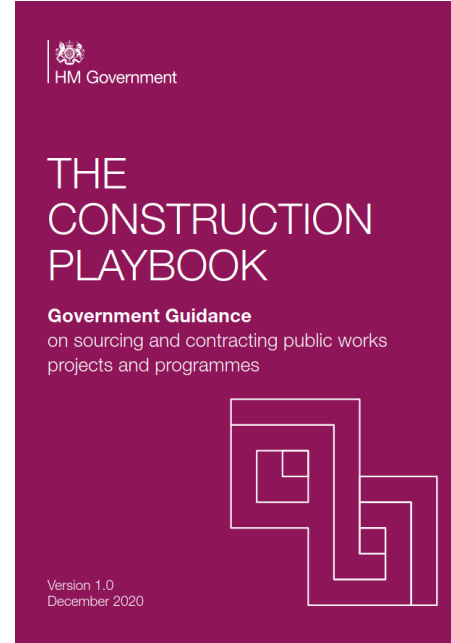
What can we do?



2018 - Government paper responding to commitment to leverage its buying power to modernise construction



2019 - IPA's Transforming Infrastructure Performance (TIP) Programme started



2020 - Chapter 2 of Construction Playbook is on MMC
Platform approach advocated



2022 (& 23) - The Product Platform Rulebook published – to support development of product platforms

What can we do?

It is the responsibility of the industry,
to change the industry

wsp



*Thank
you*