

The logo for Laing O'Rourke is centered at the top of the slide. It consists of a black rectangular background. Inside this rectangle, there are two horizontal lines: a yellow one on top and a red one on the bottom. The text "LAING O'ROURKE" is written in white, uppercase letters between these two lines.

LAING O'ROURKE

DfMA Alliance & CITAC Technical Conference

**THE CHALLENGES OF IMPLEMENTING DFMA**

18<sup>TH</sup> MARCH 2019

ALAN CLUCAS FICE, DIRECTOR, EXPLORE MANUFACTURING



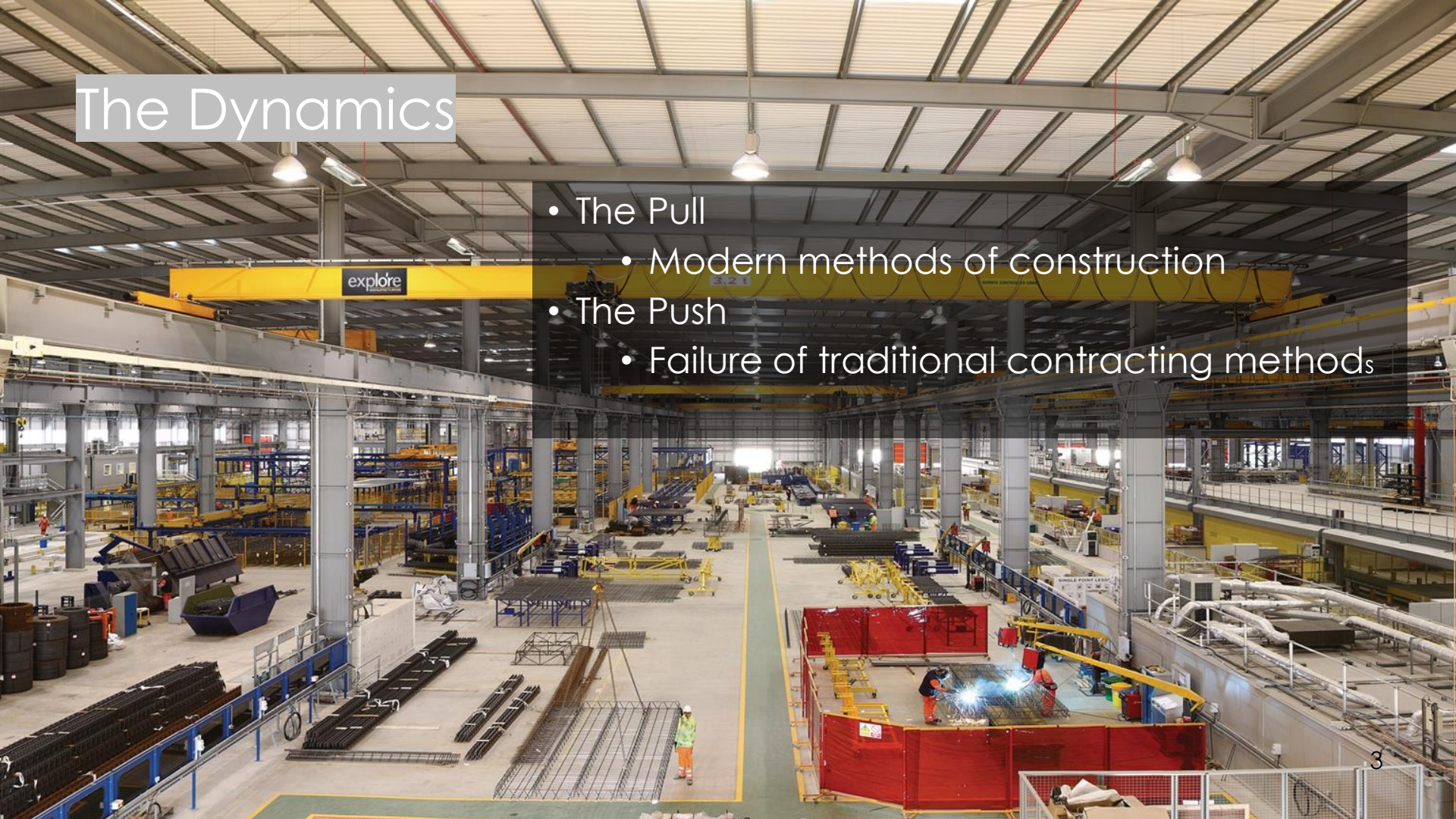
# The Challenges of Implementing DfMA

- The dynamics
- The new approach
- The challenges of an early adopter
- Lessons learnt over the last 10 years
- Now
- Next steps



# The Dynamics

- The Pull
  - Modern methods of construction
- The Push
  - Failure of traditional contracting methods



# The Leadenhall Building

Commercial. London

## The New Approach:

- A catalyst for change
- Four key areas
  - Culture
  - Technology
  - Commercial
  - Funding

# Alder Hey Children's Hospital

Healthcare. Liverpool

## Culture:

- Existing roles and relationships will change
- Focus on working collaboratively
- Site becomes a process of logistics and assembly
- New roles and responsibilities
- More process driven



# Clarges

Residential. London

## Technology:

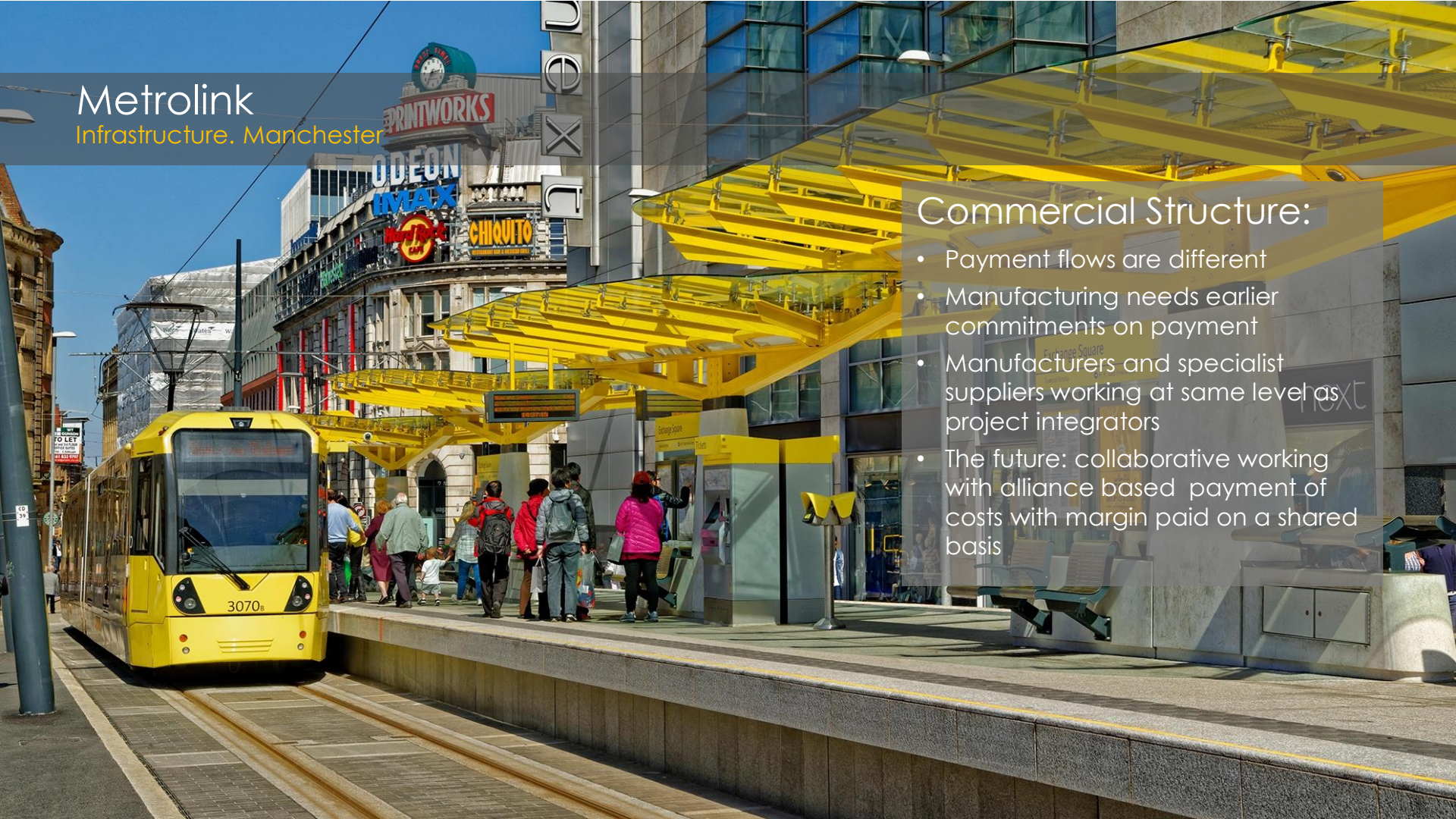
- Digitally driven BIM will become BIM+
- More sophisticated design tools
- Virtual construction
- Clash detection in collaborative model
- Product lead design
- Should lead to interchangeable solutions. The UK Government's p-DfMA

# Metrolink

Infrastructure. Manchester

## Commercial Structure:

- Payment flows are different
- Manufacturing needs earlier commitments on payment
- Manufacturers and specialist suppliers working at same level as project integrators
- The future: collaborative working with alliance based payment of costs with margin paid on a shared basis





A453

Infrastructure. Nottinghamshire

## The need for change:

- Top 25 tier one contractors in UK are posting an average pre-tax margin of 0.2%



# Canary Wharf Crossrail

Infrastructure. London

## As an early adopter LOR challenges:

- Huge investment in manufacturing capability and R&D circa £150m
- Despite the vision, investment and empowerment from our owner huge challenges
- Culture internal and external
- A need for design and technical guides
- Digital challenge
- R&D
- Exemplar projects
- Due to bespoke nature of projects R&D carried out “on the job”

# Two Fifty One

Residential, London

## Progress in last 10 years:

- Changed the culture
  - Wrong behaviours you left the business
- Reduced number of professional service providers to the “fewest best”
- Enhanced our digital engineering capability
- Build it twice once virtually once on site
- More process driven
- Product lead design



# The Challenges of Implementing DfMA

DfMA (70:60:30)

Design for Manufacture and Assembly

70

70% of construction is conducted off-site

60

60% improvement in productivity

30

30% improvement in the project schedule

# Next Steps

## Advanced Manufacturing Facility

Plans for the AMF go far beyond the achievements of the current facility, with far higher robotic content planned for a fully automated production process.

Planned Investment **£200M**

**800 new jobs**

**42,000m<sup>2</sup> factory**

10,000 dwellings annually



# The Challenges of Implementing DfMA

Products designated Designed for Advanced Manufacturing (DfAM 95:80:60) will meet new standards for productivity and off-site manufacture

95

80

60

95% of super structure is precision-engineered and pre-assembled

80% improvement in productivity

60% improvement in programme to erect superstructure 13

# Next Steps

## Advanced Manufacturing Facility



Once ramped up, 10,000 homes will leave the factory annually

Homes will have all mechanical, electrical, and plumbing elements installed, checked and tested

'Plug-and-play' site installation

Unparalleled levels of quality – 'near defect-free'



# Thank you

All materials contained in this presentation are copyright of Laing O'Rourke.