

## Define

- Organisational silos within HE prevents the lifecycle approach leading to at least 20-30% waste.
- Evidence from interviews show that there are problems with information flow affect the efficiency of project delivery.
- There is an opportunity to improve information flow with Intelligent Products – a product centric framework enabled by Internet of Things and BIM

## Deliverables

- Clear problem definition through interviews and literature review
- A requirements framework to enable Intelligent Products in Highways England
- A solution candidate in form of a prototype

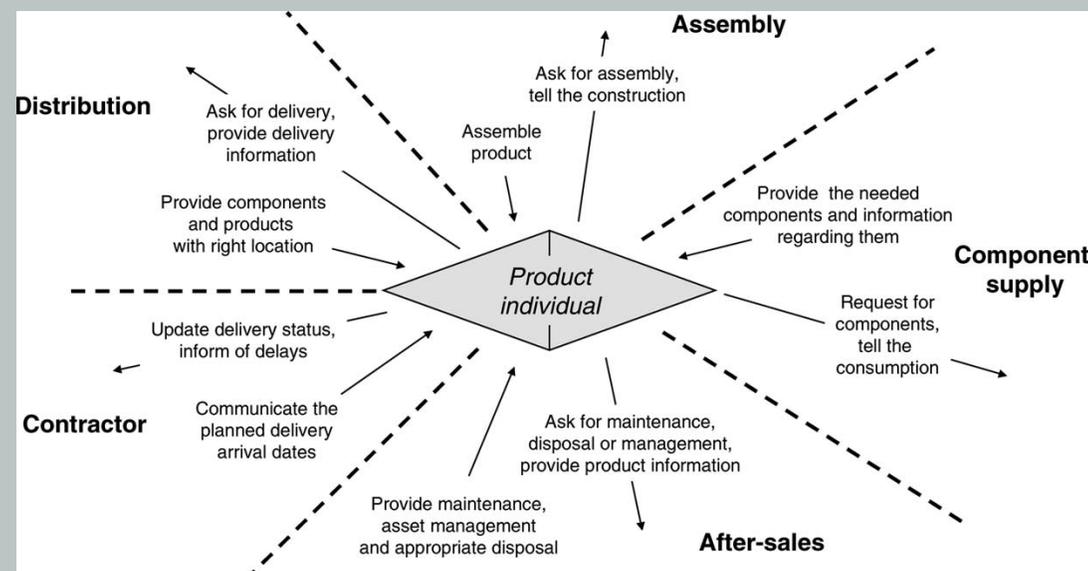
## Planned benefits

- Savings as high as 50% on lifecycle costs
- Improved quality, and safety
- Optimisation of long term asset operating costs
- Closing the gaps through feedback loops from each stage in the lifecycle
- Holistic/lifecycle view of assets enabling flow rather than “local” optimisations
- Ubiquitous technology that cuts across silos

## Methodology

- Literature review to identify the current state-of-the-art and the major gaps
- Interviews with Highways England tier 1 supply chain members. Project managers, Lean practitioners and designers
- Development of a requirements capture framework through Quality Function Deployment technique
- Prototype development to highlight the opportunity

## Findings and analysis



- Information delivery and coordination across the Highways England supply chain are key problems affecting project efficiencies by as much as 30-40%
- Silos prevail across Highways England and supply chain causing major problems with information flow
- One of the key reasons is that the main project control logic is outside-in
- Pilot studies are needed to evaluate the practical impact of the concept and actual benefits and challenges in the field

## Conclusions and Recommendations

- Intelligent products have the ability to transform the information flow and lifecycle management for Highways England bringing significant cost savings
- Highly efficient knowledge transfer (the knowledge is embedded within the asset)
- The concept of intelligent products has strong synergies with Lean Principles and BIM

## Related projects

- Reduction of 20-30% in lead time, handling and quality errors has been achieved on other projects
- Otaniemi3D – Real time monitoring of assets through the lifecycle with BIM
- S4Fleet – Intelligent Products concept applied to fleet management
- Fin3D – Application of IP concept to the manufacturing (foundry) industry

## Next steps

- Benefits can only be realised if applied on a real-life project
- Long term pilot projects on live projects
- Integration of Intelligent Products with Highways England supply chain