Case Study Title: GEM Construction building on success

Company Overview | GEM Construction | gemconstruction.ie

Since 1978, GEM has stood out as a trusted partner in the Irish construction industry. Committed to delivering high-quality projects while prioritising the health, safety, and well-being of their workforce. GEM combine expert project management with high-quality construction to bring visions to life. With a team of over 100 employees, they ensure every project is completed on time, within budget, and to the highest standards. Safety is a core value, reflected within their ISO full certification to ISO 9001, 14001, and 45001 by the National Standards Authority of Ireland (NSAI).

- Company website address: https://gemconstruction.ie/
- Founded: 1978
- Offices: Dublin and Longford
- Service lines: Main contractor, Design & Build, Refurbishment, Fit out, Development
- Sectors: Residential / Student Accommodation, Education & Public Sector, Commercial, Science & Health, Retail
- Operating across: Ireland

Author

Wayne Fowler

Author

Barry Connolly

Author

Christy Murphy

Overview & Background to the Lean Initiative

Overview: Lean Initiative – Implementing Digitalised Last Planner System - CoPlan at GEM Construction

GEM Construction is embarking on its next transformative phase in Lean Construction by integrating CoPlan, a collaborative construction planning tool developed by our Lean Training Partner – Crystal Lean Solutions, across its projects. This follows two successful years of implementing the Last Planner System (LPS), which significantly improved project efficiency, reduced waste, and enhanced team collaboration. The adoption of CoPlan aligns with GEM Construction's strategic goal of leveraging innovative solutions to build on the momentum of LPS and further refine its Lean practices.

The CoPlan initiative aims to streamline project planning, scheduling, and execution by providing a unified digital platform for all stakeholders. By enabling real-time updates, enhanced communication, and transparent workflows, CoPlan is set to address challenges in managing complex projects while reinforcing the company's commitment to continuous improvement and operational excellence. It is a user-friendly platform that enables even an untrained person to follow the phased, make ready and weekly work plan with considerable ease.

Background: The Journey to CoPlan Implementation

The Foundation: Success with the Last Planner System

In 2023, GEM Construction, with support from Crystal Lean Solutions and Enterprise Ireland introduced the LPS as its first major step toward embedding Lean Principles into its operations. LPS emphasized collaborative planning, where project teams worked together to ensure realistic scheduling, accountability, and alignment with project goals. Over two years, LPS has led to:

- Improved Project Delivery: On-time completion rates increased significantly as teams became better at anticipating and resolving potential bottlenecks well in advance of the critical path.
- Waste Reduction: Material waste and rework decreased due to better coordination and proactive problem-solving. It gives certainty on lead times for material deliveries and prevents over ordering.
- Team Empowerment: Field teams took ownership of project planning, fostering a culture of accountability and trust.

While LPS yielded substantial benefits, GEM Construction recognised the opportunity to address certain limitations, particularly in areas requiring deeper integration of technology for real-time updates, enhanced data visualization, and more dynamic collaboration among dispersed teams. The information flow is faster and allows root cause analysis to be determined well in advance of potential issues on site.

The Leap to CoPlan

CoPlan was identified as the ideal next step in GEM Construction's Lean journey. Unlike traditional manual systems or spreadsheets, CoPlan offers:

- Digital Integration: Seamless linking of schedules, resources, and workflows in a centralised platform.
- Real-Time Communication: Instantaneous updates accessible to all stakeholders, improving transparency and decision-making.
- Data-Driven Insights: Enhanced analytics to measure project performance and identify areas for improvement.

By building on the strong foundation established with LPS, CoPlan will enable GEM Construction to tackle more complex projects, particularly Design & Build contracts, with higher efficiency, ensuring sustained growth and alignment with Lean construction goals.

Through this initiative, GEM Construction reaffirms its commitment to innovation, sustainability, and industry leadership.

Lean Initiative Undertaken – Lean Thinking, Tools, Techniques

Lean Initiatives at GEM Construction: Building on Success

GEM Construction's adoption of Lean practices has been a cornerstone of its operational strategy, starting with the successful implementation of the Last Planner System (LPS) and now progressing to the integration of CoPlan. These initiatives reflect the company's dedication to fostering a culture of collaboration, efficiency, and continuous improvement, particularly in our Design & Build Contracts

Last Planner System (LPS): The Foundation

Introduced in 2023, the Last Planner System marked GEM Construction's first significant Lean initiative. It provided a structured framework for collaborative planning and execution, emphasising:

- Pull Planning: Tasks were scheduled based on the needs of downstream activities, ensuring a smoother workflow.
- Lookahead Planning: Teams reviewed upcoming tasks over a 6–8-week horizon to identify potential constraints and resolve them proactively.
- Commitment-Based Scheduling: Field teams made reliable commitments to deliverables, fostering accountability and reducing variability.
- Weekly Work Planning: Frequent reviews ensured that short-term plans aligned with broader project milestones and goals. GEM also introduced safety and quality prompts into the WWP, which has improved all aspects of the build.
- Variance Tracking: Continuous feedback loops helped measure plan adherence and identify opportunities for improvement.
- Milestone boards: Assists in the lean process, highlights the critical path and look ahead requirements to maintain the construction programme.

LPS significantly reduced project delays and waste, while empowering teams to take ownership of their tasks.

CoPlan: A Digital Evolution

Building on the success of LPS, GEM Construction recognised the need for a digital platform to address the complexities of modern projects. CoPlan enhances Lean construction efforts through:

- Integrated Workflows: Centralised dashboards provide a comprehensive view of schedules, resources, and task dependencies, reducing miscommunication and delays
- Real-Time Collaboration: Digital updates allow immediate communication of changes, ensuring all stakeholders remain aligned.
- Enhanced Visualizations: Dynamic Gantt charts, heatmaps, and predictive analytics tools make it easier to manage and mitigate risks.
- Mobile Accessibility: On-site teams can access and update project information in real time via mobile devices, bridging the gap between the field and the office.

Together, LPS and CoPlan represent a synergistic approach to Lean implementation, driving efficiency, reducing waste, and promoting continuous improvement.

Lean Thinking and Techniques at GEM Construction

GEM Construction has deeply embedded Lean thinking into its culture, aligning its projects with the principles of value delivery, waste minimisation, and respect for people. Key techniques and philosophies include:

1. Value Stream Mapping (VSM)

- GEM Construction employs VSM to identify value-adding and non-value-adding activities across project workflows. This helps streamline processes, reduce waste, and ensure that every action aligns with client expectations.

2. Continuous Improvement (Kaizen)

- Teams at GEM Construction hold regular retrospectives and improvement workshops to identify lessons learned and refine their practices. Incremental changes are encouraged to maintain momentum and address inefficiencies. CoPlan has a lessons learned section built into the model and can be referenced in real time.

3. Just-In-Time (JIT) Delivery

- To minimize inventory costs and on-site congestion, GEM Construction schedules material deliveries precisely when they are needed, leveraging data-driven insights from CoPlan to forecast requirements accurately.

4. 5S Methodology

- On-site organisation is maintained through the 5S

Figure 1: Integrated Workflows

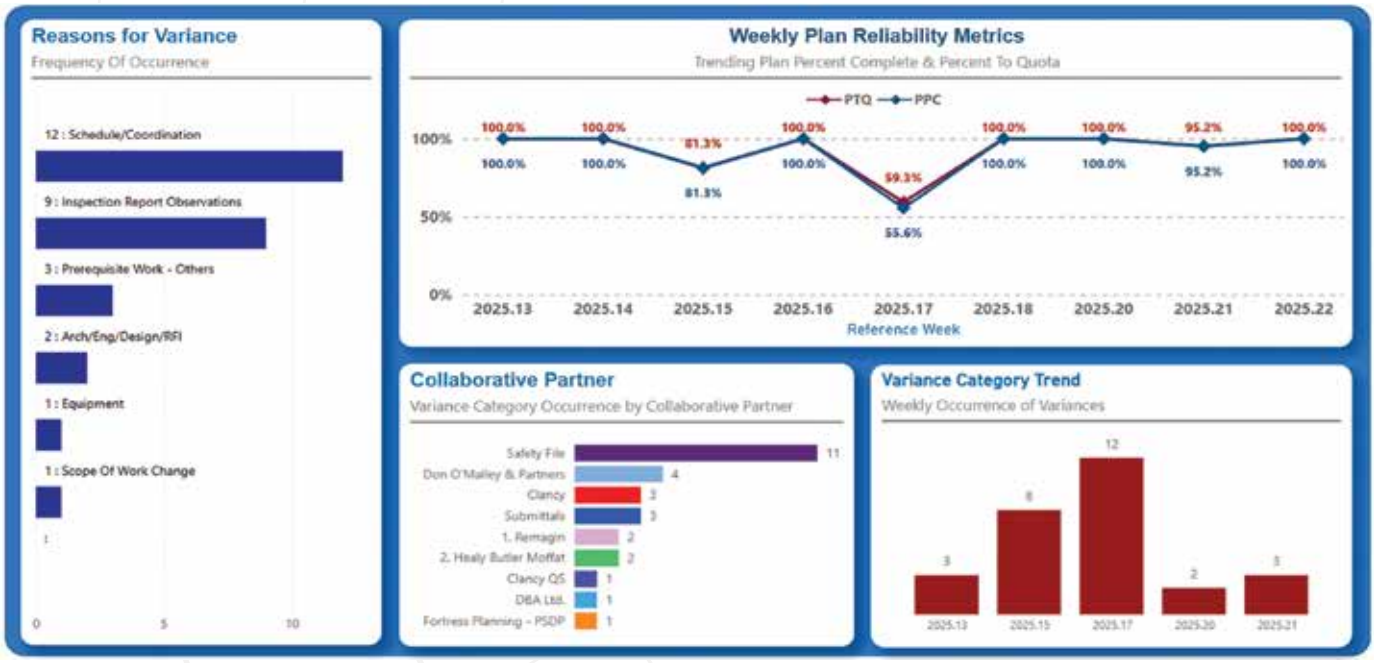

Figure 2: Enhanced Visualisations

principles—Sort, Set in Order, Shine, Standardize, and Sustain. This ensures a safer, more efficient working environment and improves productivity.

5. Root Cause Analysis

- Challenges are addressed through tools like the Five Whys and Ishikawa (fishbone) diagrams, enabling teams to resolve issues at their source rather than treating symptoms. The site teams provide feedback from on-site experience having gained experience in the lean process

6. Visual Management

- GEM Construction utilises visual tools such as color-coded task boards and progress charts to make project status and potential issues immediately apparent to all team members. Recovery plans are also a key part of the process if a problem is identified.

7. Standardised Work

- While retaining flexibility for customisation, GEM Construction develops and refines standard operating procedures (SOPs) to ensure consistent quality and efficiency across projects.

8. Respect for People

Central to GEM's Lean philosophy is the respect for team members at all levels. Open communication channels, shared decision-making and professional development opportunities are critical elements of this approach.

By combining these Lean initiatives, techniques, and philosophies, GEM Construction has built a robust framework for delivering high-quality projects efficiently while fostering a collaborative and innovative work environment. The integration of CoPlan represents the next step in this evolution, reinforcing the company's leadership and commitment to Lean Construction.

Figure 3: Visual Management

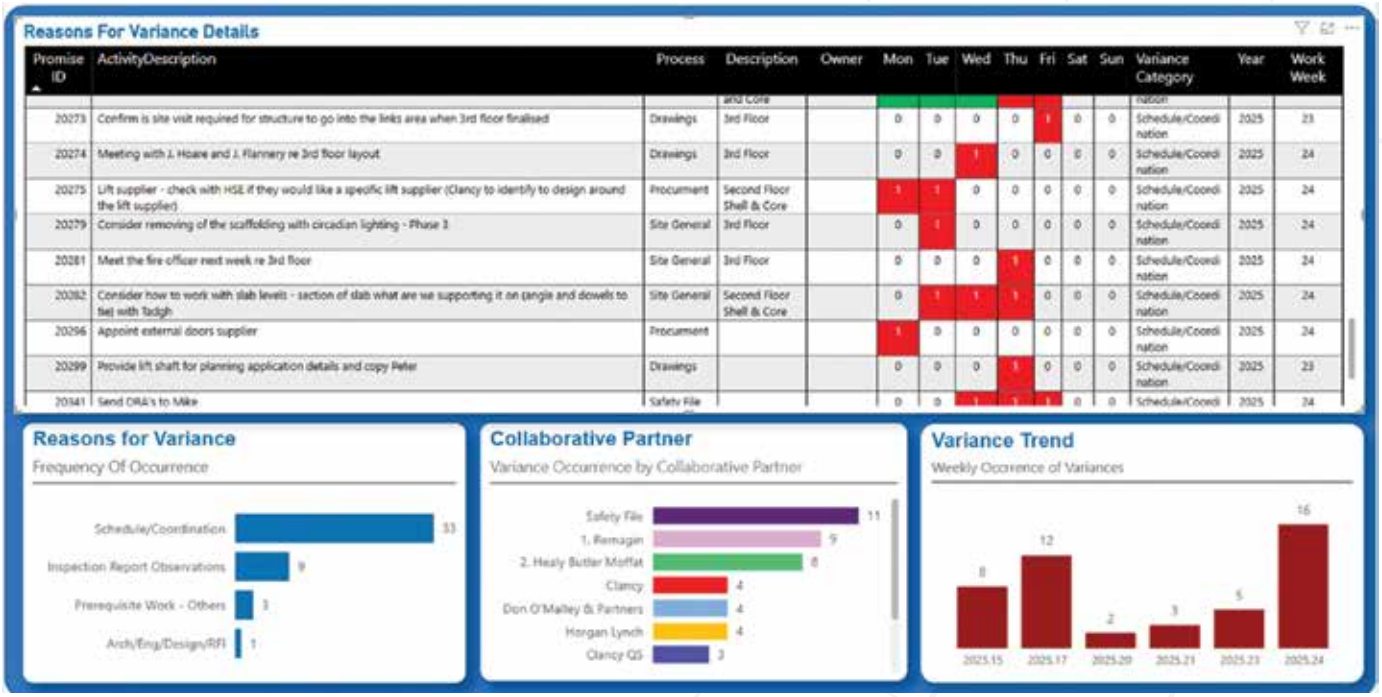

Figure 4: Variance Dashboard

Lean Initiative Improvements & Impact

Key Improvements

1. Enhanced Collaboration and Communication

- Centralized Platform: CoPlan consolidates all project data into a single, accessible digital hub, reducing silos between teams.
- Real-Time Updates: Stakeholders receive instantaneous notifications of schedule changes, task completions, and potential bottlenecks, enabling proactive responses.
- Transparency: Visual dashboards and reports ensure everyone has a clear understanding of project status, bridging the gap between design and construction.

2. Improved Planning Accuracy

- Constraint Management: Teams can identify and resolve constraints earlier, reducing delays and increasing plan reliability.
- Data-Driven Decisions: Historical and real-time data are used to optimise workflows and resource allocation and identify contractors' performance on the project.

3. Increased Efficiency

- Reduced Waste: Accurate scheduling ensures materials, labour, and equipment are utilised effectively, reducing idle time and unnecessary expenditure.
- Seamless Integration: CoPlan integrates with other construction software (e.g., Primavera P6 & ASTA), streamlining workflows and reducing redundant tasks.

4. Higher Stakeholder Satisfaction

- Faster Response Times: Real-time issue tracking enables quicker resolution of concerns raised by clients or subcontractors.
- Predictable Outcomes: Improved planning and execution reliability enhance trust and confidence in GEM's ability to deliver.

5. Empowered Teams

- Accessibility: Mobile-friendly interfaces ensure field teams can access and update plans directly, increasing ownership and accountability.
- Training and Support: Implementing CoPlan has provided opportunities for staff to develop new digital skills, enriching their professional growth.

Impact of CoPlan Implementation

Whilst the full effect of implementing a digitalised solution of The Last Planner System has not yet been realised due to the early stage of adoption, GEM has seen significant benefits in using LPS and we believe the adoption of CoPlan will transform how GEM Construction approaches project management and will yield tangible benefits. Our expected measurable KPI's are:

- Project Delivery Times: Average project durations decrease by 10-15% due to improved coordination and reduced delays.
- Cost Savings: Operational costs reduce by 8-12% through better resource management and waste minimisation.
- Productivity: Team productivity increases by 15%, with streamlined workflows enabling more tasks to be completed in less time.
- Safety & Quality: Enhanced oversight and collaboration will lead to fewer errors and higher-quality deliverables.

Summary and Lessons Learned

Lessons Learned

1. The Importance of Change Management

- Transitioning to CoPlan required a deliberate change management strategy, including staff training, phased rollouts, and continuous support. Early challenges, such as resistance to adopting a new technology, highlighted the need for clear

communication about benefits and ongoing engagement with all stakeholders.

2. Adapting to Technology

- While CoPlan brought significant benefits, its integration required upfront investments in both time and resources to align the software with existing workflows. GEM learned the value of customising tools to suit operational needs while maintaining Lean principles.

3. Collaboration is Key

- The success of CoPlan reaffirmed the importance of fostering a collaborative culture. Engaging field teams and subcontractors in the planning process ensured better buy-in and execution. Introduction presentations and continuing information workshops assist in rolling out the system.

4. Continuous Improvement is Essential

- Even with a robust tool like CoPlan, Lean practices like root cause analysis and retrospective reviews remain vital for identifying further opportunities to refine workflows and processes. We always seek perfection.

5. Data Utilisation

- The ability to leverage real-time and historical data was a game-changer for decision-making. However, ensuring data accuracy and consistency required disciplined data entry and verification processes.

Summary

The implementation of CoPlan will elevate GEM Construction's Lean capabilities, building on the successes of the Last Planner System to address more complex project challenges. Through enhanced collaboration, improved planning, and increased efficiency, CoPlan will contribute to tangible improvements in project outcomes, stakeholder satisfaction, and team empowerment. The journey so far has provided valuable insights into the role of technology, change management, and culture in driving continuous improvement.

By embracing these lessons and maintaining its commitment to Lean principles, GEM Construction is well-positioned to sustain its leadership in the construction industry and deliver ever-greater value to clients and stakeholders.