

Systems-Based Engineering Decision Example:

This abstract case on highway construction had the engineering team deciding to increase resource allocation for the trouble of meeting an approaching deadline by adding labor and experimenting with a novel system of automated concrete laying. Encourage fast progress had made fatigue come into the picture on the increased side with the dirtier side of plies, while the integration errors of the new system diluted quality-scattered sections, in some cases-prone to reworks and late delivery. Client intense pressure then further added resources into the degradative reinforcing loop (R1). Anticipating this risk on a causal loop diagram (Sterman, 2000), I altered the strategy by trimming down the workforce, refining automation, and implementing staggered shifts-stabilizing quality and timelines through a balancing loop (B1). This depicts how a systems-thinking approach with foresight into fatigue and quality impacts of innovation is then necessary to handle interconnected project dynamics (Meadows, 2008).

References:

Meadows, D. H. (2008). *Thinking in systems: A primer*. Chelsea Green Publishing.

Sterman, J. D. (2000). *Business dynamics: Systems thinking and modeling for a complex world*. McGraw-Hill.