

Systems-Based Engineering Decision Example

In a hypothetical highway construction project, the engineering team decided to increase resource allocation by adding more workers to meet an approaching deadline, aiming to reduce construction delays. Initially, this decision accelerated progress, but it led to overworked crews, increasing worker fatigue. This fatigue resulted in a higher rate of errors, lowering project quality—such as misaligned concrete sections—which necessitated rework and extended delays further. The prolonged delays intensified client pressure, prompting additional resource allocation in a reinforcing loop. However, recognizing the inefficiency, management later reduced the workforce and introduced staggered shifts, which improved quality and stabilized timelines, demonstrating a balancing feedback effect. This example illustrates how a decision to boost resources, while addressing short-term delays, inadvertently impacted fatigue, quality, and client relations, underscoring the need for a systems thinking approach to anticipate and manage such interconnections.