

# Study IDs trouble areas, aims to speed up construction projects

September 5 2013, by Matt Shipman

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Even small time buffers can lead to thousands of hours of delays on construction projects. Credit: North Carolina State University

Research from North Carolina State University identified factors that

cause construction site managers to schedule more time than necessary for specific tasks. Understanding these factors and whether they can be reduced or eliminated could help the industry complete construction projects more quickly.

At issue is a [construction](#) planning concept called a time buffer. A time buffer is the difference between how long it should take to accomplish a task based on optimum productivity, and how long you think it will take in the real world. On any job, things can go wrong; [bad weather](#) or broken equipment can delay completion of a task. To account for these unforeseen events, construction foremen add time buffers into their schedules.

For example, if the optimum time for a task is three days, and a foreman adds one day of buffer time, the foreman tells his supervisor and project manager that the task will take four days.

"This is important, because construction projects – like building a school or hospital – can consist of thousands of tasks," says Dr. Min Liu, an assistant professor of civil, construction and environmental engineering at NC State and senior author of a paper on the research. "If every site manager builds a small buffer into every task, it can come to thousands of hours.

"Time buffers are contingencies that are built in, in case something goes wrong – but there is something called student syndrome," Liu says.

"Student syndrome says a student won't do his [homework](#) until the night before it is due. Similarly, if a foreman thinks a task will take three days, but allots four days to do the work, the work is more likely to take the full four days. It's similar to Parkinson's Law, which says that a task will fill the amount of time allotted to complete it.

"We did this study to better understand how people determine when to

add time buffers, and the length of those time buffers," Liu says. "This helps us determine how much of a time buffer is actually necessary, and will help us find ways to minimize wasted time in [construction projects](#)."

The researchers analyzed survey results of 180 construction industry professionals from across the United States. They found a number of factors that contribute to time buffers.

Some factors are frequent contributors to time buffers, but do not increase the time buffer by very much. An example of this is a desire to protect the reputation of the construction company. Some factors occur infrequently, but can significantly lengthen a time buffer. An example of this is a delay in getting a necessary permit. And some factors are both frequent and significant. For example, if the task is part of a complex project – like a laboratory facility – that complexity often leads to lengthy time buffers.

"Project managers can use the factors we've identified to prioritize their review of construction tasks and target issues related to time buffers," Liu says. "For example, managers can pay particular attention to factors that are most likely to result in lengthy time buffers in order to determine if those time buffers are necessary or can be reduced."

**More information:** The paper, "Application of Time Buffers to Construction Project Task Durations," is published online in the *Journal of Construction Engineering and Management*.

[ascelibrary.org/doi/abs/10.1061/%28ASCE%29CO.1943-7862.0000735](https://ascelibrary.org/doi/abs/10.1061/%28ASCE%29CO.1943-7862.0000735)

Provided by North Carolina State University

Citation: Study IDs trouble areas, aims to speed up construction projects (2013, September 5)

retrieved 25 April 2024 from <https://phys.org/news/2013-09-ids-areas-aims.html>

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