

Proactive Management of Mobility Impact of Interdependent Subsurface Utility and Roadway Construction Through Incentives

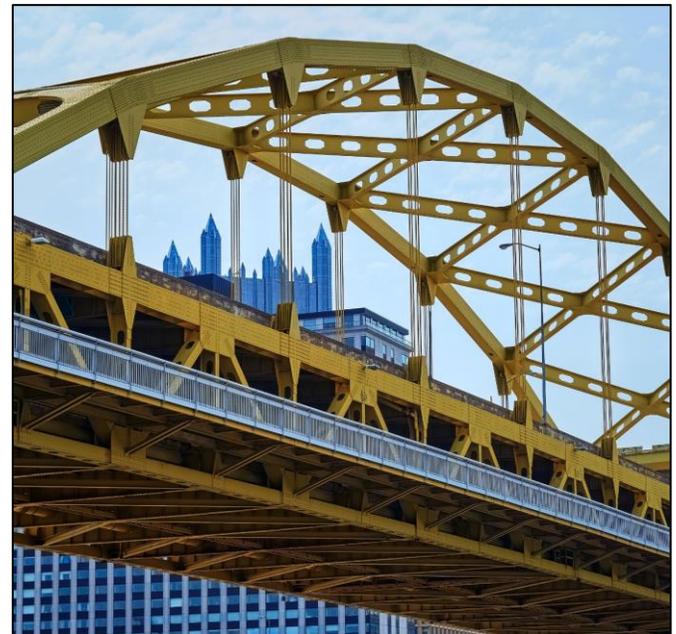
Purpose: This study aims to assist agencies in scheduling maintenance activities by assessing the costs of conducting maintenance, impacts on traffic, and the risk of crashes during the presence of the maintenance activity.

Approach: This study focused on bridges in Pennsylvania specifically due to the availability of annual maintenance expenditure data for bridges. The team leveraged that data to evaluate annual maintenance expenditures, review traffic simulation impacts and estimate crashes.

Key Findings:

- **Annual Maintenance Expenditure Model** - The predictive infrastructure maintenance expenditure model predicts reduced annual routine maintenance expenditures of bridges whose structural conditions are improved due to the scheduled maintenance. The team found that if the superstructure condition rating is one unit better than the condition rating inspected one year before, the annual maintenance expenditure of bridges is expected to decrease by 22.1%.
- **Traffic Simulation Tool** – This tool estimates road users' detour costs based on anticipated maintenance. The results show that trucks all over the Greater Pittsburgh area will experience 1,133 additional hours of travel time and produce 157.5 kg additional CO_2 .
- **Crash Risk Estimation Tool** – The tool estimated the odds of crashes occurring in roadways with work zones are 1.47 times higher. This model also found that a 1% increase in traffic volume is associated with 1.008 times higher crash occurrences.

Conclusion: This study helps agencies scheduling and assessing the potential impacts of maintenance activities on bridges. Future studies could test the methodologies proposed in this study on data from other states, allowing researchers to compare the potential impact of maintenance activities.



Research Team:

- Burcu Akinci (Principal Investigator)
<https://orcid.org/0000-0002-0544-3068>
- Sean Qian (Co-Principal Investigator)
<https://orcid.org/0000-0001-8716-8989>
- Zhuoran Zhang
<https://orcid.org/0000-0001-5527-7996>
- **Project Record:**
<https://ppms.cit.cmu.edu/projects/detail/198>

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