Title

Construction Delays: Quantifying Time Loss inActive Transportation Program Funded Projects

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I. Background:

Infrastructure projects in California and the United States as a whole take much longer and cost a lot more than similar projects in the past, even accounting for inflation (Shane et al.; Chen et al.). Because of this, fewer projects are able to be completed and communities remain underserved. Municipalities are unable to deliver the critical infrastructure improvements needed by the communities they serve. Each project ends up taking a larger portion of the limited resources available.

The California Transportation Commission's Active Transportation Program (ATP) grant aims to strategically target funds to improve the state's roadways. ATP also aims to reduce greenhouse gas emissions and improve public health by making improvements to California roadways to promote walking and cycling. Active transportation reduces car dependency by encouraging alternative modes of transportation, especially walking, cycling, and transit. This can limit the deleterious effects of driving in cities, which contributes to ambient air pollution linked to premature death, cardiovascular disease, childhood asthma, type 2 diabetes, dementia, and more (Glazener & Khreis, 2019, p. 23).

II. Methodology

Grant funded infrastructure projects require regular progress reporting to the agency providing the grant. For ATP projects, grant recipients share data on planned and actual completion dates every three months for the following project milestones: Project Approval and Environmental Document (PA&ED), Right-of-Way Certification (RW Cert), Ready to List (RTL), Begin Construction, and End Construction.

Using progress report data for projects funded in ATP cycles 3-5 in Los Angeles, Sacramento, San Diego, San Francisco, and San Mateo counties provided by Caltrans, I compared planned milestone completion dates in the first progress report for each project with the planned/actual milestone completion date in the most recent progress report from April 2024. This allowed me to quantify the delay in each project phase, defined as the difference between the number of days originally allotted to finish each phase and the number of days allotted to each project phase in the updated schedule. This value was saved in a new column in my data set for each project phase. I also compared the original planned project completion date with the actual or updated planned completion date to find the overall schedule delay faced by each project.

III. Findings

Nearly every project of the 53 studied was delivered or is on track to be delivered behind schedule to some degree. The median overall project completion date was delayed by 835 days, over two years. Several projects were delayed by over three or four years. The project facing the most severe delay was the Central Community Mobility Enhancements in National City. The project, which had originally planned to complete construction in March 2023, is now expected to be completed by the end of 2028.

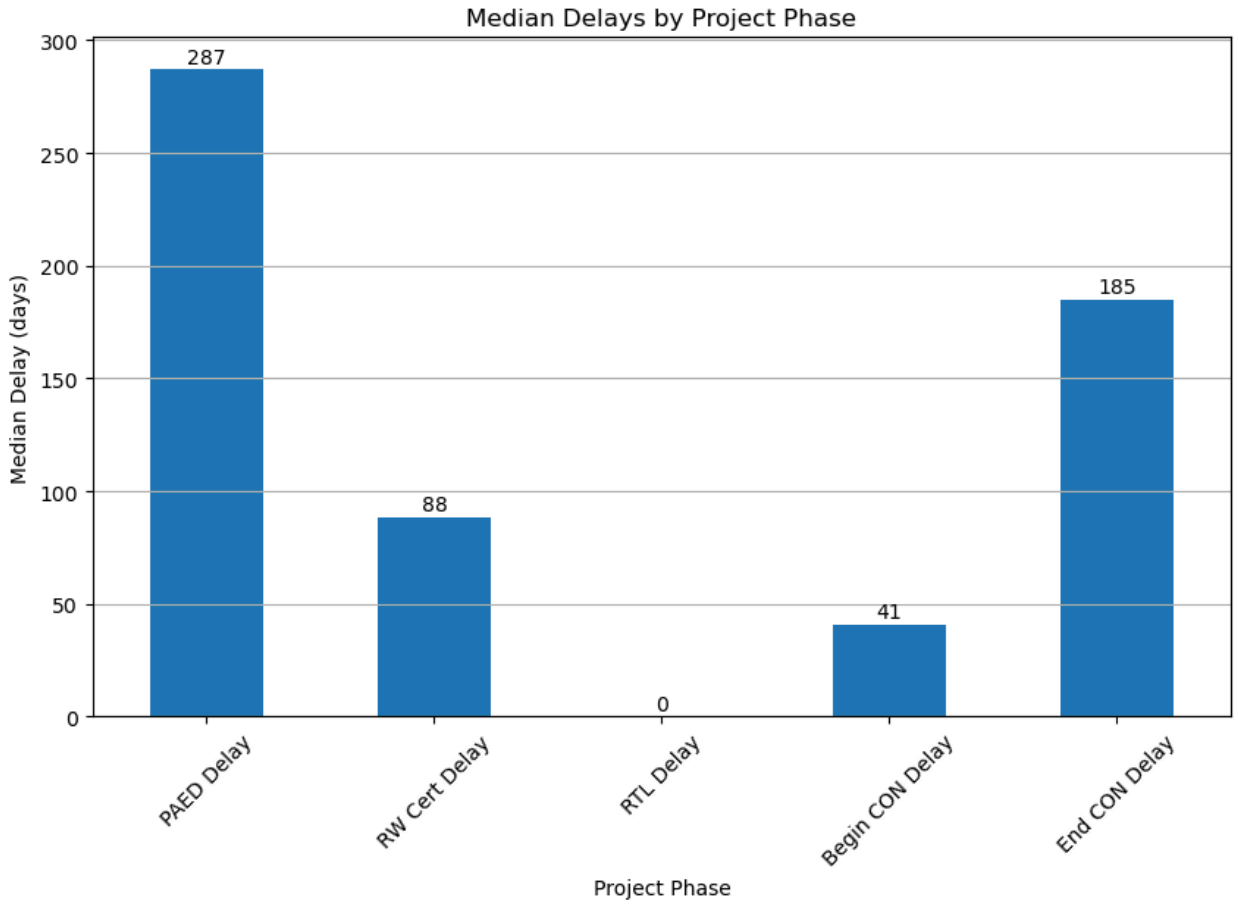

Figure 1: Median Delays by Project Phase in Days

The most significant cause of delays among the projects considered were the project approval and environmental review documents required before construction can begin. Administrative burdens in the PA&ED phase caused a median delay of approximately nine months. Delays encountered during construction were the second most significant, putting the median project approximately six months behind schedule. Right-of-way certification and acquisition added 88 days to the median project duration. Issues encountered after the

finalization of planning and engineering and before the start of construction, including project advertisement and contracting, accounted for another 44 days of delay for the median project.

IV. Policy Recommendations:

A. Environmental Review

While environmental review is certainly an important consideration, California Environmental Quality Act (CEQA) and National Environmental Protection Act (NEPA) regulations often become expensive, time-consuming hoops for projects like these to jump through. The Project Approval and Environmental Document phase can already take years to complete without unanticipated delays. Most projects funded by ATP have negligible or positive environmental impacts. CEQA reform is needed to allow these projects to move forward on schedule.

B. Construction

Construction delays were the second most significant of any phase considered in this study. These have the most varied causes and are the most difficult to pinpoint with the data available. However, construction delays are commonly caused by poor communication between agencies and contractors, staffing issues, and design errors (Tafazzoli & Shrestha, 2017, p. 114). Ensuring that project managers, engineers, and contractors have enough capacity to communicate more frequently and effectively could improve construction efficiency. Employing in-house construction teams where appropriate may also reduce these inefficiencies.

V. Limitations

This study used a very small sample size of projects ongoing as of April 2024. A larger study would minimize any bias encountered in this sample. The projects considered also vary in size and scope, which may be confounding variables. Additionally, many of the studied projects were ongoing at the start of the COVID-19 pandemic and subsequently faced unanticipated challenges and delays which may have affected the data.

VI. References

Chen, Q., Jin, Z., Xia, B., Wu, P., & Skitmore, M. (2016). Time and Cost Performance of Design–Build Projects. *Journal of Construction Engineering and Management*, *142*(2), 04015074. https://doi.org/10.1061/(ASCE)CO.1943-7862.0001056

Glazener, A., & Khreis, H. (2019). Transforming Our Cities: Best Practices Towards Clean Air and Active Transportation. *Current Environmental Health Reports*, *6*(1), 22–37. https://doi.org/10.1007/s40572-019-0228-1

Shane, J. S., Molenaar, K. R., Anderson, S., & Schexnayder, C. (2009). Construction Project Cost Escalation Factors. *Journal of Management in Engineering*, *25*(4), 221–229. https://doi.org/10.1061/(ASCE)0742-597X(2009)25:4(221)

Tafazzoli, M., & Shrestha, P. (2017). Factor Analysis of Construction Delays in the U.S. Construction Industry. *International Conference on Sustainable Infrastructure*, *2017*, 111–122.