

Research Recap

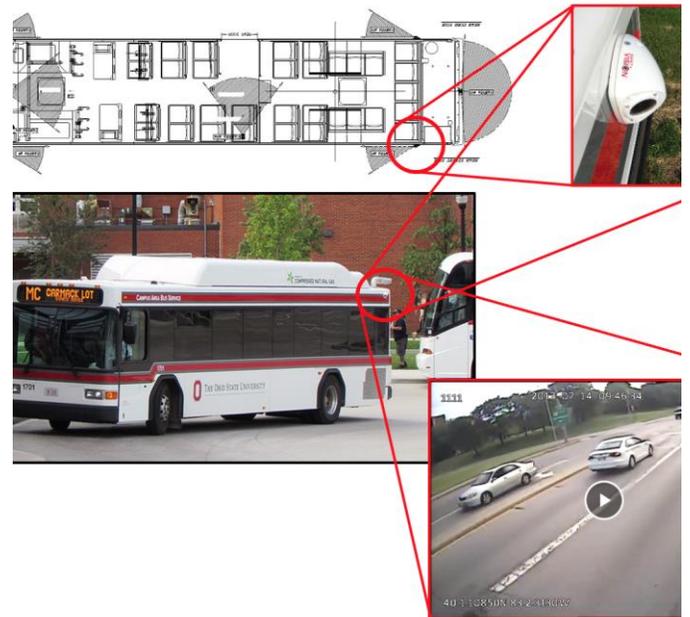
Using Municipal Vehicles as Sensor Platforms to Monitor the Health and Performance of the Traffic Control System

Purpose: This project aimed to investigate the potential to obtain traffic data from sensors on municipal vehicles for transportation planning and design. Typical ways for collecting traffic data rely on fixed sensors or human observers that provide data on a limited segment of the transportation network. By employing sensors on municipal fleets, such as transit buses, there could be an opportunity to significantly broaden the coverage for traffic data collection.

Approach: The team implemented an approach they developed to estimate traffic volumes using video obtained from transit buses servicing The Ohio State University campus. They then compared the estimated hourly volumes from the processed video to volumes obtained from data concurrently collected traditional methods (road tubes in this case of the study).

Key Findings: The magnitudes of the relative differences between the hourly estimates obtained from the video and the road tube data average approximately 20%, which might be considered large. However, the statistical relations developed in this project indicate the potential for increased performance when taking advantage of the much larger amount of video data that can be collected from the repeated coverage of transit buses through time. Also, the differences between the estimates obtained from the video imagery and the road tube data tend to cancel out when estimating traffic volumes over longer periods. Specifically, the average magnitudes of relative differences (between video- and road tube-based values) for estimates of 12-hour traffic volumes decrease to approximately 10%.

Conclusion: The empirical validation studies conducted in this project may support the potential of using imagery already being collected on transit buses to estimate traffic volumes across urban roadway networks. As with all first-time empirical studies, a similar research project could help corroborate this study's findings. The validation results allude to promising performance for extended time-of-day periods and network-level traffic measures. Additional data collected in this study and data that will be collected in a follow-on study could allow for such an empirical demonstration.



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Project Record:

- <https://ppms.cit.cmu.edu/projects/detail/76>

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