Recent advances in communication and computing technology have made travel time measurements more available than ever before. In urban signalized arterials, travel times are strongly influenced by traffic signals. This study presents a novel method based on well-known principles to estimate traffic signal performance (or more precisely their major “through” movements) based on travel time measurements. The travel times were collected between signals in the field by using point-to-point travel time measurement technologies. Closed-circuit television cameras and signal databases were used to collect traffic demand and signal timings, respectively. Then, the Volume/Capacity ratio of major downstream signal movements was computed based on demand and signal timings. This Volume/Capacity ratio was then correlated with travel times on the relevant intersection approach. The best volume-delay function was found, along with many other functions, to fit the field data. This volume-delay function was then used to estimate Volume/Capacity ratios and, indirectly, a few other signal performance metrics. The method, called Travel Time based Signal Performance Measurements, was automated and displayed on a Google Map. The findings show the proposed method is accurate and robust enough to provide necessary information about signal performance. A newly developed volume-delay function was found to work just slightly better than the Bureau of
Public Roads curve. Several issues, which may reduce the accuracy of the proposed method, are identified and their solutions are proposed for future research.

**Stichworte:**
Intersection Performance Measure, Volume/Capacity Ratio, Travel Time, Volume-Delay Function, Traffic Signals

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