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**shimao fan\*** ([shimao@illinois.edu](mailto:shimao@illinois.edu)), 115 Sterling Ct, APT 302, savoy, IL 61874. *Data-Fitted Generic Second Order Macroscopic Traffic Flow Models and Model Accuracy on Real Data.*

The Aw-Rascole-Zhang (ARZ) model is a “second order” macroscopic traffic model that possesses a family of fundamental diagram curves, rather than a single one as in the “first order” Lighthill-Whitham-Richards (LWR) model. Hence, the ARZ model can agree better with historical fundamental diagram data, especially for set-valued regime in congested traffic. However, the ARZ model also has some obvious shortcomings, e.g., it possesses various stagnation traffic densities. To overcome these drawbacks, we consider a Generalized ARZ model (GARZ), fitted to real historic traffic data. A systematic approach to generate more realistic “second order” models is proposed, under a generic framework. Based on GARZ model, we propose a phase-transition-like model, that allows flow rate curves to coincide in the free flow regime. To investigate to which extent the generalized models improves the prediction accuracy of models, we perform a comparison of data-fitted generalized models with two types of data-fitted LWR models and their second order ARZ generalizations, via a three-detector problem test. We consider two different kinds of traffic data during model construction and validation: detector data and vehicle trajectory data. (Received September 08, 2013)