Real time data from several traffic participants such as smart-phone users and vehicles equipped with GPS devices (taxi and bus fleets) is potentially available in the form of a continuous data stream in several mega cities. This real time data can be augmented with that from the traditional sensors for the implementation of several advanced traffic management and control strategies. In this report we present and evaluate a data driven adaptive solution for traffic flow optimization of a real world expressway by employing short-term predictive simulations.