Project Title: Electric Vehicle Charging Station Expansion Plans under Uncertainty

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Project Summary: With the advancement of battery technologies, more electric vehicles are expected to get introduced in the market. The energy needed to run those batteries is enormous. This calls for developing optimization models that help governments plan for energy expansion and to coordinate the efforts between energy suppliers and charging station investors. To supply this need, in this project we explore the development and use of a two-stage stochastic mixed-integer programming (MIP) formulation to establish a dynamic multi-period plan that maximizes the expected monetary return from expanding power cells to electric vehicle charging stations over a pre-specified planning horizon. We employ a Sample Average Approximation (SAA) algorithm to solve our proposed optimization model. Washington, DC will be used as a testing ground to visualize and validate the modeling results. It is our goal that the computational results will demonstrate the robustness of the proposed algorithm while providing a number of managerial insights of value to decision makers.