While Vehicle Routing Problems have now been studied extensively for more than 60 years, those in which some parameters are uncertain at the time where the routes are planned have received significantly less attention, in spite of the fact that there are many real-life settings where key parameters are not known with certainty. In the first part of this talk, we will examine the main classes of Stochastic Vehicle Routing Problems: problems with stochastic demands, stochastic customers, and stochastic service or travel times. We will emphasize the main approaches for modeling and tackling uncertainty: a priori models, a posteriori approaches, and chance-constrained models. The second part of the talk will be devoted to a presentation of some of our recent work in the area.