The purpose of this paper is to clarify some important issues as regards ship speed optimization at the operational level and develop models that optimize ship speed for a spectrum of routing scenarios in a single ship setting. The paper's main contribution is the incorporation of those fundamental parameters and other considerations that weigh heavily in a ship owner's or charterer's speed decision and in his routing decision, wherever relevant. Various examples are given so as to illustrate the properties of the optimal solution and the various trade-offs that are involved.