The goal of this research is to create a mathematical transformation that generates airfoils, which are 2D cross sections of wings, that can improve the quality of first-step analyses of new airfoils. In this paper, I therefore mathematically model the airflow around two different airfoils: an older, generally used, Zhukhovsky airfoil, and an airfoil generated from the transformation I devise. I then simulate the airflow over the older Zhukhovsky airfoil and the new airfoil in 2D and 3D with computational fluid dynamics. The flows and forces on the airfoils are then compared and a conclusion is drawn that the new transformation and its corresponding airfoils serve as more realistic alternatives to the older, generally used, Zhukhovsky airfoils in a first-step analysis of new aerodynamic surfaces.