Transparent heat mirrors based on tungsten oxide/silver three-layer structures were fabricated using thermal evaporation. The optical and morphological properties of the single layers were first investigated to serve as a basis for the fabrication of the heat mirrors. Only silver films with a thickness higher than 18 nm were found to be continuous. Subsequently, WO_3/Ag/WO_3 multilayers were deposited, where the WO_3 layers thickness was fixed at 35 nm, and the thickness of the silver layer was varied from 18 to 39 nm. The optical properties of the multilayers were measured over the visible and near infrared ranges. These multilayers exhibited the desired heat mirror behavior, namely the transmittance was largely confined to the visible range and the reflectance was diminished in that range. The maximum visible transmittance was 88.3% at 554 nm. Increasing the thickness of the silver films resulted in a decrease of the visible transmittance, with a corresponding increase in the infrared reflectance. Optimization of these two opposing trends was evaluated using a figure of merit, from which the best performance was obtained for multilayers with a silver layer of thickness of 24 nm.