Cluster cooling flow models that include both AGN heating and thermal conduction have lower overall mass cooling rates and simultaneously sustain density and temperature profiles similar to those observed. These computed flows have no \textit{ad hoc} mass dropout. To achieve this agreement, the thermal conductivity must be about $0.35 \pm 0.10$ of the Spitzer value, similar to that advocated by Narayan & Medvedev. However, when applied to galaxy/group scales the synergistic combination of AGN heating and conduction is less satisfactory. When the computed density profile and the global cooling rate are lowered by AGN heating to match observations of these smaller scale flows, the gas temperatures within $\sim 10$ kpc are too large. In addition, best-fitting flows in galaxy/groups with AGN heating and thermal conduction require conductivities much closer to the Spitzer value $\sim 0.5 - 1$. Another difficulty with galaxy/group flows that combine AGN heating and conduction is that the iron enrichment by Type Ia supernovae is more effective when the gas density is lowered by heating to match the observations. The hot gas iron abundance in galactic flows with heating and conduction greatly exceeds observed values throughout most of the galaxy. Galactic/group flows with central heating and conduction therefore require an additional process that removes the iron: failure of Type Ia ejecta to go into the hot phase, selective cooling, etc.