ABSTRACT. We show that for each control metric (i.e., Carnot-Caratheodory metric), there is an equivalent metric which has the maximal expected degree of smoothness. The equivalent metric satisfies the natural differential inequalities with respect to the vector fields used to define the metric. This generalizes the regularity of the usual Euclidean metric in \mathbb{R}^n . There are also corresponding differential inequalities for scaled "bump functions" supported on balls associated to these metrics. The smooth metrics and bump functions are particularly useful in problems of harmonic analysis in situations where the given metrics arise.