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Let  $H^{(u)}$  be the Hilbert transform along the parabola  $(t, ut^2)$  where  $u \in \mathbb{R}$ . For a set  $U$  of positive numbers consider the maximal function  $\mathcal{H}^U f = \sup\{H^{(u)}f : u \in U\}$ . We obtain (essentially) optimal results for the  $L^p$  operator norm of  $\mathcal{H}^U$  when  $2 < p < \infty$  and close to optimal results when  $1 < p \leq 2$ . The results are proved for families of Hilbert transforms along more general non-flat homogeneous curves. (Received January 12, 2020)