Extremal density for sparse minors and subdivisions

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We prove an asymptotically tight bound on the extremal density guaranteeing subdivisions of bounded-degree bipartite graphs with a mild separability condition. As corollaries, we prove that: $(1+o(1))t^2$ average degree is sufficient to force the $t \times t$ grid as a topological minor; $(3/2+o(1))t$ average degree forces every t-vertex planar graph as a minor, and the constant $3/2$ is optimal; a universal bound of $(2+o(1))t$ on average degree forcing every t-vertex graph in any nontrivial minor-closed family as a minor, and the constant 2 is best possible. This is joint work with John Haslegrave and Hong Liu.