The moduli space of hyperplanes in projective space has a family of geometric and modular compactifications that parametrize stable hyperplane arrangements with respect to a weight vector. Among these, there is a toric compactification that generalizes the Losev-Manin moduli space of points on the line. We study the first natural wall crossing that modifies this compactification into a non-toric one by varying the weights. As an application of our work, we show that any Q-factorialization of the blow up at the identity of the torus of the generalized Losev-Manin space is not a Mori dream space for a sufficiently high number of hyperplanes. Additionally, for lines in the plane, we provide a precise description of the wall crossing. This is joint work with Patricio Gallardo.