**Constraints on Laser-Driven Accelerators for a High Energy Linear Collider**[*]**,** A.M. SESSLER, J.S. WURTELE, Lawrence Berkeley Laboratory, Berkeley, CA 94720 - General considerations of the requirements for a high energy linear collider are applied to free-space laser and laser-plasma accelerators. The luminosity, beamstrahlung, and power requirements, as determined by particle physics needs and economic considerations, are taken as inputs. Ordinary space-charge phenomena (Laslett formula), beam loading in HOM, wake-fields (both longitudinal and transverse) generated in a homogeneous plasma, plasma channels, or by discontinuities (for free-space accelerators) are estimated. The beam dynamics including these phenomena is examined. We find that the present design paradigm for high-energy (here, to be specific, taken to be 1 TeV on 1 TeV) linear colliders yields scaling laws which impose very serious constraints upon laser-driven accelerators.

* Work supported by the U.S. Department of Energy.