Beam would improve at the unknown cost of Moon location, power generation, and infrastructure. Beam quality is however only one part of the challenge
However the first problem to solve is the pointing of an ideal Gaussian laser beam of λ≅1μm, from a ϕ=1 km mirror to a 16 m^2 sail at distances up to 20Gm. A number of conditions have to be met:

1) Pointing in αC direction with 1AU accuracy; including proper motion of αC and its planets, gravitational fields and radiation of Sun and αC systems.
2) Sail to remain on central power lob of beam and not tumble.
3) Sail temperature not to exceed melting point
4) Stress on sail not to exceed tensile limits

a) Diffraction limit is in range; beam diameter D at maximum range x_f=20 Gm:

$$D \cong \frac{\lambda}{\phi / x_f} = 20\text{m};$$

b) Heating of sail for coatings of LIGO quality mirrors R=1-15 ppm, Ab≅T≅1 ppm. R=1–(S+Ab+T), (Reflectivity, Scattering, Absorption, Transmission). For back of sail acting as black body ε=1, and $Ab/\varepsilon = 10^{-6}$, temperature has margin T=360K.
Ab and ε margin of $Ab/\varepsilon \le 2\times10^{-5}$ to maintain T≤750 K

$$T = \left(\frac{Ab \cdot P}{\varepsilon \cdot \sigma_B \cdot A_S}\right)^{1/4} = \left(\frac{10^{-6}\times15\times10^{9}\text{W}}{5.67\times10^{-8}\text{W}\cdot\text{m}^{-2}\cdot\text{K}^{-4}\times16\ \text{m}^2}\right)^{1/4} = 360\text{K};$$

http://www.sjsu.edu/faculty/beyersdorf/Archive/Phys208F07/Coatings%20in%20LIGO.pdf
http://www.phys.ufl.edu/ireu/IREU2009/pdf_reports/Badolato_Paper.pdf

c) Stresses on sail. (Sail subscript S)

$$m_S = 5\cdot10^{-4}\ \text{Kg},\ \ A_S = 16\cdot\text{m}^2,\ \rho_S \approx 2\cdot10^3\text{kg}\cdot\text{m}^{-3},\ d_s = \frac{m_S}{\rho_S\cdot\ A_S} \cong 15\ \text{nm},$$

$$F_{Beam} \lesssim 50\ \text{N}, \qquad S_S \equiv \frac{F_{Beam}}{\sqrt{\ A_S}\cdot\ d_s} < 1\ \text{GPa}$$

Modern materials and fibers have tensile strength of a few GPa.

d) Spinning the sail.
For sail rim centrifugal acceleration (at R_S = 2.25 m) to match beam acceleration a_0=10^5 m/s^2 we need ω_S = 210 rad/s or f_S = 34 Hz, achievable.

e) Sail position and/or attitude correction with photon thrusters not feasible while main beam on. Beam force transfer 100N while P_{pt}=1W photon thruster produces 3nN.

f) Sail shaping that passively preserves position and attitude in beam might be possible. Baseline approach should be a combination of sail shape and beam shaping with feedback from light reflected from sail. Due to the long delay times, up to 140 sec round trip, forward predicting algorithms and filters will be used.