The 1980 Winter Olympic Games stimulated the development and use of snowgrooming technology for cross-country ski trails. Proper snow preparation provides a stable surface for kicking, gliding and pole planting. With proper preparation, the ski tracks are durable and firm, with snow of consistent grain size. These conditions allow safe, fast skiing, easy waxing and optimum skier technique and performance.

Track bed preparation is a prerequisite to actual track setting. Snow must have adequate density, hardness and durability. With new snow, proper density is achieved by compressing with a snow vehicle and roller or pan. Hardness and durability are achieved by inducing metamorphism and sintering. Dragging a horizontal cutting, milling and mixing bar through new snow promotes metamorphism via sintering, leveling of the snow surface and mixing. After a short time, this snow becomes dense and hard with consistent grain size. A sled then sets ski tracks by cutting, slicing and molding. Old snow or ice can be pulverized, churned and mixed by a rototiller before being smoothed and leveled prior to track setting. Timing is critical in above freezing and freeze-thaw periods.

Trial measurements in day-old spring snow verify that compression increases density while milling increases hardness and durability. Snow vehicle compression increased density from 0.2 to over 0.4 g/cm³ and increased resistance to penetration from 0.0069 to 1.1 kg/cm². Snow vehicle compression and dragging with a horizontal bar did not further increase the density, but did increase resistance to penetration to 1.9 kg/cm².