We have investigated the expansion dynamics of neutrals and ions generated by laser ablation of Au in vacuum using time-gated imaging and Langmuir probes, respectively. When a substrate is present, a severe distortion of the plasma expansion is observed together with the appearance of a secondary plasma front expanding from the substrate surface. Quantitative and numerical analysis of the plasma dynamics evidences that neutrals and ions are respectively the respattered and back-scattered species from the substrate, produced by the large flux of high energetic ions ejected from the target.