A time operator of a self-adjoint operator H is defined as a symmetric operator T which satisfies the canonical commutation relation with H on some domain, i.e., TH-HT=i. A time operator is related to "time" in the sense that the decay of the transition probability. We study time operators for quantum walks. In the case of the continuous-time quantum walk, the time evolution is described by the Hamiltonian H of the system. However, in the case of the discrete-time quantum walk, the time evolution is described by a unitary operator. Hence, we need a notion of time operators of unitary operators. In this talk, we define a (strong) time operator of a unitary operator. We will construct strong time operators for one-dimensional discrete-time quantum walks, and calculate their deficiency indices and spectra.