Random walk on the comb

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We study the path behavior of general random walks, and that of their local times on the 2-dimensional comb lattice $\mathbb{C}^2$ that is obtained from $\mathbb{Z}^2$ by removing all horizontal edges off the x-axis. We prove strong approximation results for such random walks and also for their local times. Strong limit theorems, like the joint Strassen type law of the iterated logarithm of the two components, as well as their marginal Hirsch type behavior will be discussed.