1020-60-21 **Lee R Gibson*** (lrgibs01@gmail.com), Department of Mathematics, 328 Natural Sciences Building, University of Louisville, Louisville, KY 40292. *The Mass of Sites Visited by a Random Walk on an Infinite Graph.* Preliminary report.

In 1979 Donsker and Varadhan proved that for an explicitly computed constant $c(d,\nu)$ the simple random walk in $\mathbb{Z}^d$ satisfies

$$\lim_{n\to\infty} n^{-d}\log\mathbb{E}\left[\exp\left\{-\nu R_{n^{d+2}}\right\}\right] = -c(d,\nu),$$

where R_n denotes the stationary measure of the sites visited by the random walk. Here we use a simple coarse graining technique to show that when $V(x,n)$ (the stationary measure of path length balls about x) does not depend asymptotically on x

$$\log\mathbb{E}^x\left[\exp\left\{-\nu R_{n^\beta V(x,n)}\right\}\right] \simeq -V(x,n),$$

either when $V(x,n)$ satisfies volume doubling and the random walk generator satisfies a Poincaré inequality with parameter $\beta = 2$ or when the random walk transition probabilities satisfy a two-sided sub-Gaussian estimate with parameter $\beta > 2$. These results apply, for example, to the Cayley graphs of finitely generated groups with polynomial volume growth and to certain fractal-like graphs. (Received July 05, 2006)