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Simulation models of real-life systems often assume stationary (homogeneous) Poisson arrivals. Therefore, when non-stationary arrival processes are required it is natural to assume Poisson arrivals with a time-varying arrival rate. For many systems, however, this provides an inaccurate representation of the arrival process which is either more or less variable than Poisson. In this paper we extend techniques that transform a stationary Poisson arrival process into a non-stationary Poisson arrival process (NSPP) by transforming a stationary renewal process into a nonstationary, non-Poisson (NSNP) arrival process. We show that the desired arrival rate is achieved, and that when the renewal base process is either more or less variable than Poisson, then the NSNP process is also more or less variable, respectively, than a NSPP. We also propose techniques for specifying the renewal base process when presented properties of, or data from, an arrival process and illustrate them by modeling real arrival data. (Received September 08, 2008)