Let $V(K_n) = \mathbb{Z}_n$ and define the length of an edge $\{i,j\} \in E(K_n)$ to equal $\min\{|i-j|, 2n+1-|i-j|\}$. A Rosa-type labeling of a graph $G$ with $n$ edges is an embedding of $G$ in $K_{2n+1}$ (with $V(K_{2n+1}) = \mathbb{Z}_{2n+1}$) that has exactly one edge of each length $i$ for $1 \leq i \leq n$. Rosa-type labelings with additional restrictions lead to cyclic $G$-decompositions of either $K_{2n+1}$ or of $K_{2nx+1}$ for all positive integers $x$. Understandably, labelings that lead cyclic $G$-decompositions of $K_{2nx+1}$ are deemed more useful. We introduce the concept of a $\lambda$-fold Rosa-type labeling of a graph $G$ of size $n$ and show that some of these labelings lead to cyclic $G$-decompositions of the $\lambda$-fold complete multigraph $\lambda K_{2nx+1}$ for all positive integers $x$. These results were obtained at an REU Site for Pre-service and In-service Secondary Mathematics Teachers at Illinois State University. (Received September 22, 2009)