1067-05-359 **Eva K. Belmont*** (ebelmont@fas.harvard.edu), Department of Mathematics, FAS, Harvard University, 1 Oxford St., Cambridge, MA 02138. *Paths as m-step Competition Graphs.*

For any digraph D let the m-step competition graph $C^m(D)$ be the graph with the same vertices as D, where x and y are connected in $C^m(D)$ if there are m-step paths in D from x and y to a common vertex z. G.T. Helleloid (2005) showed that if $m \geq n$, then the path P_n on n vertices is not an m-step competition graph for any digraph D. J. Kuhl and B.C. Swan (2010) showed that P_n is not an m-step competition graph for $\frac{n}{2} \leq m \leq n-3$, and that P_n is an m-step competition graph if either $m|n-1$ or $m|n-2$. We show that these conditions are necessary; that is, P_n is an m-step competition graph if and only if the aforementioned divisibility conditions hold. (Received August 26, 2010)