1014-05-1083 **Jeffrey S. Powell*** (jspowel@emory.edu), Department of Mathematics & Computer Science, Emory University, 400 Dowman Drive, Atlanta, GA 30322, **Ralph J. Faudree** (rfaudree@memphis.edu), Department of Mathematical Sciences, University of Memphis, Memphis, TN 38152, and **Ronald J. Gould** (rg@mathcs.emory.edu), Department of Mathematics & Computer Science, Emory University, 400 Dowman Drive, Atlanta, GA 30322.
Menger Path-Systems and Minimum Graph Size. Preliminary report.

A graph satisfies property $P_{d,m}$ if there are m vertex-disjoint paths of length d or less between every pair of vertices in the graph. A collection of such paths is called a Menger path-system. We consider $Ext(n; P_{d,m})$, which is the minimum size of a graph on n vertices that satisifies $P_{d,m}$. Very few values of $Ext(n; P_{d,m})$ are known. We show that $Ext(n; P_{2,m}) = \frac{n(m+k)}{2}$ for certain graphs with $n < m + 2\sqrt{m} + 1$. We also show improved lower and upper bounds on $Ext(n; P_{d,m})$ when $d > 4$ and n is sufficiently large. (Received September 27, 2005)