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Emily Carter* (egc3964@rit.edu), School of Mathematical Sciences, Rochester Institute of Technology, Rochester, NY 14623, and **Danielle Gonzalez** (dng2551@rit.edu), Department of Software Engineering, Rochester Institute of Technology, Rochester, 14623. *A graph theoretic analysis of betweenness centrality in transportation and biological networks.*

In transportation and biological networks, certain vertices play a vital role in the connection of subnetworks. This is quantified by betweenness centrality, which is the frequency at which a vertex appears on a shortest path between two other distinct vertices. We precisely compute the betweenness centrality for vertices in several families of graphs including paths, cycles, complete multipartite graphs, and various Cartesian products. Finally, we investigate powers of paths and cycles and present a connection to partitions of integers and integer linear programming. (Received July 30, 2013)