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K. Brooks Reid* (breid@csusm.edu), Department of Mathematics, California State University San Marcos, 333 S. Twin Oaks Valley Road, San Marcos, CA 92096-0001. *Equi-Distance Partitions in Graphs*. Preliminary report.

A company is interested in locating a distribution facility to supply clients with products that only can be delivered one at a time (because of, for example, weight, or size, or volatility). The company owns only two suitable delivery vehicles for this product, and wishes to make deliveries in such a way that the total distances traveled by each of the two delivery vehicles are as nearly equal as possible. Motivated by this situation, let x denote a vertex in a connected graph $G = (V, E)$. We show that there exists a partition of $V - x$ into two non-empty subsets A and B so that the sum of the distances between x and all vertices in A differs by at most 1 from the sum of the distances between x and all vertices in B . In some cases this gives rise to a proper 2-colorings of the graph G . Vertices for which this difference is zero make ideal locations for such distribution facilities. We also consider instances of graphs in which this difference is 0 for all vertices x in G and instances of graphs in which this difference is 1 for all vertices x in G . (Received September 20, 2012)