1086-VN-2171 **Mari F Castle***, mfc7379@kennesaw.edu, and **Joe DeMaio** and **Keegan Gary**. *Total Efficient Dominating Sets in Cayley Graphs of Dihedral Groups.*

A set $S \subseteq V$ is a **total efficient dominating set** (**TEDS**) of a graph $G = (V, E)$ if each vertex in V is adjacent to exactly one vertex in S. From the work of Gavlas and Schultz we have that a TEDS S exists on the path graph P_n if and only if $n \not\equiv 1 \mod 4$, and that a TEDS S exists in the cycle graph, C_n, if and only if $n \equiv 0 \mod 4$. A **circulant graph** $\mathbf{Circ}(n; X)$ is defined for a positive integer n and a subset X of the integers $1, 2, ..., \left\lfloor \frac{n}{2} \right\rfloor$, called the **connections.** The vertex set is $\mathbb{Z}_n$, and there is an edge joining two vertices j and k if and only if the difference $|j - k|$ is in the set X. A circulant graph is a special case of a Cayley graph. DeMaio and Castle have shown that for all positive integers n and k, such that $2k \mid n$ there exists a set C of order k such that $G(\mathbb{Z}_n, C)$ admits a TEDS S. In this talk we will extend this result to Cayley graphs of dihedral groups. (Received September 24, 2012)