1146-05-402 **Ervin Győri**, **Michael D Plummer** and **Dong Ye*** (dong.ye@mtsu.edu), Department of Mathematical Sciences, Middle Tennessee State University, Murfreesboro, 37132, and **Xiaoya Zha**. *Cycle Traversability for Claw-free Graphs and Polyhedral Maps.*

Let G be a 3-connected graph. It is interesting to ask how many vertices a cycle of G can pass through but avoid a specific given vertex. In this paper, we are able to show that a 3-connected claw-free graph always has a cycle passing through any given five vertices but avoiding any other one specified vertex. We also show that this result is sharp by exhibiting an infinite family of 3-connected claw-free graphs in which there is no cycle containing a certain set of six vertices but avoiding a seventh specified vertex. A direct corollary of our main result shows that, a 3-connected claw-free graph has a topological wheel minor W_k with $k \leq 5$ if and only if it has a vertex of degree at least k. Finally, we also show that a graph polyhedrally embedded in a surface always has a cycle passing through any given three vertices but avoiding any other specified vertex. The result is best possible in the sense that the polyhedral embedding assumption is necessary, and there are infinitely many graphs polyhedrally embedded in any surface having no cycle containing a certain set of four vertices but avoiding a fifth specified vertex. (Received January 27, 2019)