Access to basic food resources is an issue of global significance. This is especially true in urban environments where dependence on stores for food is high. Given this, do inequities in access to basic food resources exist in urban environments? If so, what populations lack adequate access or are most vulnerable to fluctuations in food availability? In this thesis, approaches for measuring access to urban food are examined and a modeling methodology for assessing the sensitivity of populations to changes in food availability is proposed. The developed approach is applied to a Midwestern community for which findings and implications for access to food are discussed.