1065-18-142 **James R. Hughes*** (hughesjr@etown.edu), Mathematical Sciences Department, Elizabethtown College, Elizabethtown, PA 17022. *A Groupoid Model for Voice Leading in Music.* Preliminary report.

Voice leading— the specific means by which sequential sets of musical pitches or pitch classes (chords) are connected through assignment of melodic lines (voices)— is an important consideration in both the composition and the analysis of music. Music theorists have found it helpful to use mathematical tools in the study of voice leading. In particular, a recent paper of music theorist Dmitri Tymoczko gives mathematically precise definitions of voice leadings between pitch sets and pitch class sets, and uses them to develop analytical tools focusing on the role of efficiency of voice leadings across musical contexts. We offer a recharacterization and extension of Tymoczko's definitions using the categorical, topologically motivated theory of groupoids. The groupoid approach allows for incorporation of a wide variety of voice leading phenomena that occur in music. Its categorical aspect provides a connection with the work of mathematical music theorist Guerino Mazzola and others. Moreover, the utility of groupoids in the study of quotient maps and orbit spaces holds the promise of deeper mathematical application to the idea of generalized voice leading spaces found in recent work of music theorists Callender, Quinn, and Tymoczko. (Received September 11, 2010)