

ABSTRACT

This thesis examines how potential accessibility (A(P)) through transportation over the time span of this study (1830-2010) affected population growth by county for the state of Tennessee. It focuses on shifts in transportation networks from waterways to rail, and rail to roadways, using decennial census data and likewise temporally adjusted county boundaries. The span of this study was broken into four individual time periods to best measure major transitions in transportation: waterways (1830 - 1850), railways (1860 - 1920), historic roads (1930 - 1970), and modern roads (1980 - 2010). Potential accessibility, which was anticipated to have influenced the population change taking place within the state over time, was measured using Esri ArcMap geographical information system (GIS) and a series of network datasets. Calculations of population sums, geographic measurements, and network accessibility were accomplished using both Microsoft (MS) Excel and Esri ArcMap. Linear regression modeling was performed using Statistical Package for the Social Sciences (SPSS). The results suggest that the variable influence was dependent on the study period, and although conclusively correlated at times, other variables in addition to or other than transport accessibility also proved significant in several of the study periods. Specifically, the waterways study period showed a direct correlation with the population growth and transport networks during this time, though additional variables could have contributed to population change as well. The railway network did not significantly contribute to population changes going on during this time, likely directly related to the onset of the civil war which hindered the development and growth of this transport system. While starting population share proved to be significant, with higher growth in counties that started out with larger populations, again additional variables could help explain population growth during the railway study period. Potential accessibility and starting share collectively explained almost 90% of the variance within the historic road model, proving significant and likewise leaving very little of the change in population unexplained during that time period. Oddly, while the potential accessibility was significant, unlike theorized within this study counties less accessible to transport networks actually grew more quickly than those with higher accessibility. Finally, modern roads were found to be significant in population change as well and highly correlated. Additional steps to improve on this study in the future would include considering connections outside of the state, particularly in non-Tennessee peripheral localities with high populations. Secondly, investigation of additional variables such as economic data over a shorter overall

time span, or using dasymetric allocation methods, could also provide further explanation behind population changes taking place over time.