1135-91-1798 **Rachel Matheson*** (ramatheson@vassar.edu), 124 Raymond Avenue, Box 1633, Poughkeepsie, NY 12604-1633, and **Jaysha Camacho**, **Juliana Noguera**, **Brandon Summers**, **Nanda Mallapragada** and **Baojun Song**. *Transportation Networks Optimized for Various Income Groups and their Impact on the Spread of Airborne Disease.*

With growing reliance on mass transit systems in American cities, questions of access become more important. This study aims to explore the spread of infectious disease across a transportation network created to optimize access to most frequented destinations for distinct socioeconomic groups. First, we develop a theoretical model of a city, based on the Kohl model for urban growth which assumes distinct regions where transit-dependent income groups live and work. In this framework, we maximize "satisfaction," a measure of how easily the population of a neighborhood can travel to desirable destinations, through placement of bus routes. Within this framework we connect a single-outbreak multi-patch SIR model of Influenza A, incorporating the effects of attraction and travel time into the incidence rate. We track the populations' interactions through contact within their neighborhoods, within the transit network, and with other transit-connected neighborhoods. We observe how the basic reproductive number is affected by the layout of the optimized transportation network. Results show that use of public transportation largely does not affect the global epidemic but that more equal time spent in transit leads to less disparate patch-specific epidemic outcomes. (Received September 24, 2017)