Policy makers are considering several alternatives to counter the negative externalities of personal vehicle dependence. Towards this end, public transit investments are critical in growing urban regions such as Orlando, Florida. Transit system managers and planners mostly rely on statistical models to identify the factors that affect ridership as well as quantifying the magnitude of the impact on the society. These models provide vital feedback to agencies on the benefits of public transit investments which in turn act as lessons to improve the investment process. We contribute to public transit literature by addressing several methodological challenges for transit ridership modeling. Frist, we examine the impact of new transit investments (such as an addition of commuter rail to an urban region) on existing transit infrastructure (such as the traditional bus service already present in the urban region). The process of evaluating the impact of new investments on existing public transit requires a comprehensive analysis of the before and after measures of public transit usage in the region. Second, we accommodate for the presence of common unobserved factors associated with spatial factors by developing a spatial panel model using stop level public transit boarding and alighting data. Third, we contribute to literature on transit ridership by considering daily boarding and alighting data from a recently launched commuter rail system (SunRail). The model system developed will allow us to predict ridership for existing stations in the future as well as potential ridership for future expansion sites. Fourth, we accommodate for potential endogeneity between bus headway and ridership by proposing a simultaneous model system of headway and ridership. Finally, a cost benefit analysis exercise is conducted for examining the impact of Sunrail on the region.