Gentrification, Displacement, and GHG Emissions at Transit-Oriented Communities

Recipient/Grant (Contract) Number: University of New Orleans; University of Utah/69A3552348337

Center Name: Center for Transit Oriented Communities (CETOC)

Research Priority: Preserving the Environment

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Project Partners: N/A

Research Project Funding: $85,216 (USDOT) + $50,604 (Matching funds) = $135,820

Project Start and End Date: 9/1/2023 to 5/31/2025

Project Description: This project will assess if transit investment is causing gentrification. This research uses household-level tracking data from Data Axle. Longitudinal American Community Survey data at the census block group level will also be used to explore and predict changes in the socio-economic status of neighborhoods. Machine learning models will be developed to calculate a gentrification score using multiple variables, such as income levels, ethnic composition, rental costs, educational attainment, etc. The analysis is conducted for the years 2010, 2020, and 2030 using tract or block-level Census data, and the physical scope of the project is the rail-served urban areas in the state of Utah. The algorithm modeling the socio-economic transition across the counties' Census tracts/block groups is trained and tested with 2010 and 2020 data and then used to predict the socioeconomic scores for the year 2030. The results are then checked against actual values for 2010 and 2020. The displacement scenario will be analyzed if the study finds any evidence of rail-induced gentrification. This project will adopt a unique and innovative method of measuring displacement at the household level by using Data Axle databases for 2006–2022 (and 2023 once that data becomes available). The initial study will be conducted for the rail-served urban areas in the state of Utah—seven counties served by the Utah Transit Authority. The Data Axle U.S. consumer database is one of the best in the industry. It combines household-level data from over 100 contributing sources and is updated monthly. The data is compiled based on information from new utility connections and changes, real estate tax assessments and deed transfers, voter registrations, credit card billing statements, telephone white page directories, public records such as pilot licenses, bankruptcies, hunting licenses, and boat registrations, as well as other sources. Possible data categories include but are not limited to household location (longitude and latitude coordinates, street address, zip code, city, county) in each year, household wealth estimate, household income estimate, household ethnicity, house value estimate, length of residence at the current location, ownership status (renter/owner), and location type (single family dwelling unit, multi family dwelling unit, retirement home, nursing home, trailer). Using the Data Axle database, individual households will be tracked as they move out of the transit buffer and either relocate within the buffer or

move away from the buffer. These groups will be stratified based on the data categories listed above to profile each of the subgroups and, as a final result, define and describe the displaced population. The end product is a detailed description of the group but also physical locations—at the most granular level, buildings that each household is moving out of and eventually into. In addition, rent level changes will be tracked for areas with the highest occurrence of displacement. This approach is innovative and highly informative. Displacement has not been studied at such a granular level before. The displacement data, which is the point data where each household is represented by a point with specific longitude and latitude coordinates, will be overlayed with the gentrification data (map) to further investigate the relationship between changes in the socio-economic status of neighborhoods at the tract and block group levels and displacement within rail station buffers. Based on the displacement findings, the study will estimate changes in vehicle miles traveled (VMT) and greenhouse gas (GHG) emissions as a result of displacement. As with the gentrification analysis, the research team will explore the possibility of using machine learning models to predict changes in VMT based on built environment features. Then GHG emissions associated with the VMT change will be calculated based on the emission factor from the US EPA. The calculated GHG emissions will be further calibrated using other sources, such as the 2022 Utah Household Travel Survey. Lastly, the research team will examine whether transit operators are adjusting routes, schedules, and service types to better serve pockets of poverty in the suburbs. In addition, the research team will investigate whether cities are adopting regulatory tools and subsidies to help such households remain in transit-rich urban areas.

USDOT Priorities: This research addressed the USDOT strategic goals of *Equity* and *Climate and Sustainability*, serving as an *Equity and Accessibility Assessment* of the impacts of transit investment and proving insights into planning for future *Decarbonization* and *Sustainable and Resilient Infrastructure.*

Outputs: The study methods and results will be published in multiple research articles and presented at scholarly conferences. In addition, the methods used in this study will be made available to the public through a project website and an interactive map showing the identified gentrification and displacement patterns as well as their associated GHG impacts within rail corridors across the U.S. or selected regions.

Outcomes/Impacts: The methods used in our study will be disseminated for widespread use. Second, this study will provide evidence on the types of housing within transit corridors that are more vulnerable to gentrification and displacement. Study results should provide evidence and tools for transit agencies to adopt more innovative policies with affordability components as well as policies for mitigating GHG emissions. This study could also help cities with rail transit systems to develop appropriate housing and climate change policies for transit corridors. If properly implemented, these changes would lead to more equitable access to transit and housing near transit while considering the impact of such policies on GHG emissions and related environmental issues.

Final Research Report: (Link to be provided after project completion).