Identifying TOD-Capable Locations using D Variables: Flipping the Recipe on making the TOD Cake

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

Center Name: Center for Equitable Transit Oriented Communities (CETOC)

Research Priority: Preserving the Environment

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Project Partners: Denver Regional Council of Governments (DRCOG); Regional Transportation District (RTD); City of Denver's Department of Transportation and Infrastructure (DOTI); cultivando.org; GreenLatinos; fsucommunities.org

Project Funding: $60,000 (USDOT) + $30,000 (matching funds) = $90,000

Project Start and End Date: 10/01/2024 to 09/30/2025

Project Description: The transportation-land use field has argued for transit-oriented developments (TODs) due to several benefits such as reduced driving, more active travel with positive health outcomes, and decreased GHG emissions and vehicle ownership. Locations with features that align with TODs are generally unaffordable, pricing out households that may be from disadvantaged groups. In the U.S. context, the production of TODs has been relatively rare. With the intersecting crises of climate, unaffordability, and demographic shifts in the U.S. population, there is a need for effective mechanisms to help enable the production of mixed-use communities embedded in active travel and transit networks. Most often, a top-down regulatory process including zoning plus comprehensive or special plans are used to help TODs emerge. Additionally, local government actions are incentivized by private market forces such as real-estate developers who identify markets for sustainable communities. However, these processes are reactionary, while the need is more urgent. Therefore, we argue for flipping this time consuming and expensive top-down recipe. We contend that using the D variables documented in the EPA Smart Location Database (US EPA, 2021) can reveal locations that have the ingredients for making TOD-capable, mixed-use places. Our approach should be especially impactful in communities with low-income and racial/ethnic minority households, that have limited resources to impact macro-level policy, and are negatively affected through housing unaffordability and transit dependency. Over time, land use markets evolve to an equilibrium such that some locations become TOD-lite under an existing umbrella of zoning regulations; however, most places even in the same geography do not grow into mixed-use sustainable developments. A deeper investigation could help identify organically emerging TOD-capable

locations. Locations with a sub-set of features for a TOD could be incentivized to develop into a more TOD-aligned locations. In terms of the policy toolkit, a census block group (CBG) with several of the D variables showing high values but missing some key ingredients such as destination accessibility or distance to transit, could be places for strategic transit and active travel investments. Other CBGs might have lower density and diversity but might score high on other D variables. Such locations could be incentivized through mixed use and infill development, without changing anything else on the D-variable ingredient list. In essence, we contend that practitioners need a toolkit to identify sub-markets for transit capable, affordable, mixed-use developments, which must evolve in an urban setting but are often ignored because they do not rise to the level of comprehensive or special plans. Our project will create a toolkit to help identify such TOD-capable locations.

USDOT Priorities: *Equity*: This project will create a pathway to expand access to diverse and vulnerable populations (people of color, ethnic minorities, immigrants, and people with disabilities) in both urban and suburban locations through expanding mobility options (bus/rail transit, micromobility, sidewalks, and bicycle investments). *Climate and Sustainability*: This project will help advance climate justice and environmental justice considerations in S/TIP processes by enabling the identification of locations that are most likely to be multimodal hubs through effective land use-transportation integration. Thus, investments in EVs, transit, and bicycle and walking infrastructure in the identified location might have a higher chance of success of being funded. *Transformation*: This project will develop a framework and a publicly available toolkit for creating the possibility for investments in all communities including disadvantaged locations so that transformative solutions, generated by community stakeholders and practitioners in agencies, can be showcased as case studies for future collaborative work.

Outputs: 1. A practice-ready toolkit to identify TOD-capable locations, at the CBG level, across large Metropolitan Statistical Areas. 2. A replicable framework to engage community leaders from disadvantaged locations as well as practitioners in local/regional agencies for gathering input for effective TOD implementation. 3. An opensource publicly accessible web app that allows various stakeholders to learn and implement similar ideas in various geographies. 4. A public-facing technical report documenting the research approach, method, and findings. 5. Two conference presentations and journal manuscripts for a scientific audience.

Outcomes/Impacts: 1) Present lessons from the literature and best practices around the D variables to leaders from disadvantaged communities and government/agency practitioners. The resulting discussion will spread the current knowledge about D variables within communities as well as generate a robust framework for what D variables mean. 2) Using the co-produced framework, generate a replicable and cost-effective toolkit to identify locations, at the CBG level, that are most likely to have some (if not all) TOD ingredients. 3) Challenge conventional thinking about TOD production, using the stakeholder framework and toolkit, to create typologies of TOD-capable locations. 4) Affect the production of TOD-capable locations through creating a framework to link funding sources such as S/TIP RFPs with a community-led push for sustainable transportation investments, especially for populations dealing with housing affordability and transit dependency.

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