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Prioritizing Underutilized and Dangerous Streets for Pavement Repurposing in the Dallas-Fort Worth Metroplex



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Issue

Despite significant attention from engineers and planners to the issue of traffic congestion, much less consideration has been given to the opposing perspective — at what point has too much land been paved for streets? This study of excess pavement in the Dallas-Fort Worth metroplex was initially prompted by concerns about the negative fiscal, environmental, equity, and safety impacts of excess pavement. For streets in the transportation network with low usage relative to traffic volume, reallocation of public space could improve fiscal sustainability, environmental resilience, traffic safety, and equity in transportation infrastructure.

The problem of excess pavement is adjacent to many well-studied areas of urban planning and transportation engineering. However, the core question of identifying excess or overbuilt street capacity is typically only considered in an ad hoc manner in the process of studying and implementing road diets on specific corridors with particularly high rates of traffic violence. By turning the Level of Service (LOS) measure on its head, this study identifies the street segments in the North Central Texas Council of Governments (NCTCOG) planning region with the lowest ratio of traffic volume relative to roadway capacity.

Study Approach

This project takes a regional approach to identify streets with excess pavement, locate the most dangerous of these streets, and quantify the distribution of these streets from

an equity lens. The study defines excess street segments as streets in the lowest 10% of peak-period volume over capacity (VOC) ratio, which is based on the volume of traffic on the street relative to the vehicle capacity it is designed to carry. This approach does not propose a specific ratio at which a street segment has excess pavement; rather, it identifies the street segments with the lowest traffic volumes relative to capacity.

To match collision locations to streets and identify segments with high rates of traffic violence, each collision was assigned to the nearest street segment. The researcher then calculated the number of collisions per mile and identified the top 10% most collision-prone and fatality-prone street segments. The set of streets with excess pavement were then matched with the calculation of streets with the highest proportion of crashes to ascertain whether streets with excess pavement are more or less likely to be located in areas of high equity need.

Research Findings

- The most urbanized counties in the region (Dallas and Tarrant) have the highest share of excess pavement, followed by suburban counties (Collin, Denton, and Ellis), with exurban and rural counties at the lowest share (Figure 1).
- Frontage roads and minor arterials are overrepresented in the subset of street segments with excess pavement (17% and 45.6% of excess pavement lane-miles vs. 4.9% and 38.9% of all lane-miles in the region, respectively).

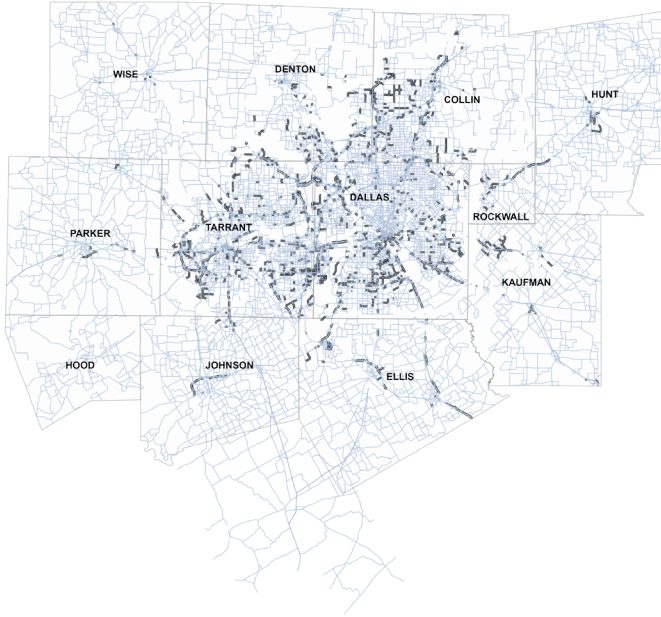


Figure 1. Distribution of Excess Pavement in North Central Texas Council of Governments

Conclusions

- The North Central Texas Council of Governments (NCTCOG) should study pavement repurposing options for different street typologies and land use contexts to understand where the benefits will be greatest relative to cost. Minor arterials and frontage roads should receive particular focus as they are the two functional classifications overrepresented in the region’s streets with excess pavements.
 - In selecting pilot sites for pavement repurposing, equity metrics and a community-driven process should complement this report’s quantitative analysis to ensure both that the benefits do not flow exclusively to high-resource neighborhoods and that these findings are enhanced with local knowledge and needs.
 - Jurisdictions in the region should also consider revising existing street design criteria. If current minimum right-of-way requirements produce streets with excess pavement, these requirements should be relaxed to allow for narrower streets.
 - NCTCOG should collect utilization data for on-street parking. Dedicated street space for parking that often sits vacant may present opportunities to relocate this additional excess pavement without impacting traffic or congestion.
- Dallas County is far ahead in overbuilt and dangerous streets. It has the majority of the region’s street segment lane-miles that are classified as excess and collision-prone (60.3%), as well as the majority that are excess and fatality-prone (54.3%). These results are significantly higher than Dallas’ share of all regional lane-miles (33.7%), all collision-prone lane-miles (48.5%), and all fatality-prone lane-miles (41.8%). Tarrant County is a distant second at 16.5% of the region’s excess and collision-prone lane-miles and 22.8% of excess and fatality-prone lane-miles, though Tarrant is slightly underrepresented compared to its share of regional lane-miles.
 - At the regional level, no clear trends emerge regarding the location of streets with excess pavement and equity metrics. However, in Dallas and Ellis counties, block groups with excess pavement or fatality-prone excess pavement have higher equity scores than the rest of their respective counties.



Jarnagin, A. (2022). Identifying Excess Pavement: A Quantitative Analysis of Streets in the Dallas-Fort Worth Metroplex (Master’s capstone, UCLA). Retrieved from <https://escholarship.org/uc/item/36k282c2>.