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Is Traffic Congestion Overrated? Examining the Highly Variable Effects of Congestion on Travel and Accessibility

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Is Traffic Congestion Overrated? Examining the Highly Variable Effects of Congestion on Travel and Accessibility

Andrew Mondschein and Brian Taylor (2017)

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RESEARCH TOPIC

Traffic congestion is universally unpopular, and for good reason – delays from congestion in urban areas cost Americans billions of dollars in wasted time and fuel every year. Congestion can constrain mobility and reduce accessibility, but it is also associated with centers of activity, a byproduct of businesses clustering together. Is congestion always a problem, or could some areas be more adapted to congestion than others?

Using travel data from the Los Angeles region, researchers at UCLA and the University of Virginia measured the effects of traffic delays on travel behavior. Their findings can be used to advocate for the development of “congestion-adapted” places that host a high number of trips even in the face of intense traffic.

MAIN FINDINGS

Congestion and activity density have a very strong and direct relationship. The least congested places have less than half the number of destinations per km² as the most congested places.

Rising congestion has only a slight impact on the total number of trips an individual takes in a day (see Table 1). Travelers in congested areas take shorter trips than those in low congestion areas.

| Congestion zone | Average daily trips by mode | | | |
|--------------------------|-----------------------------|-----------------------|---------------------|---------------------|
| | All modes | Driving | Walking | Transit |
| <i>All income levels</i> | | | | |
| 1—lowest | 5.32 ^A | 4.68 ^A | 0.22 ^A | 0.04 ^A |
| 2 | 5.23 ^{A,B} | 4.61 ^{A,B} | 0.27 ^A | 0.04 ^A |
| 3 | 5.09 ^{A,B} | 4.45 ^{A,B} | 0.21 ^A | 0.03 ^A |
| 4 | 5.01 ^{A,B} | 4.26 ^{A,B} | 0.30 ^{A,B} | 0.12 ^{A,B} |
| 5 | 4.89 ^{A,B} | 4.17 ^B | 0.24 ^A | 0.08 ^A |
| 6 | 5.15 ^{A,B} | 4.45 ^{A,B} | 0.32 ^{A,B} | 0.04 ^A |
| 7 | 5.09 ^{A,B} | 4.22 ^{A,B,C} | 0.39 ^{A,B} | 0.09 ^{A,B} |
| 8—highest | 4.85 ^B | 3.69 ^C | 0.48 ^B | 0.23 ^B |

¹Statistically significant differences between the mean values for each congestion zone are denoted with superscripted letters. The letters can be interpreted as follows: if two values share a letter, they are not significantly different statistically at the 95% confidence level, estimated with pairwise t-tests of

Table 1. Trip-making and destination densities by congestion levels

The number of walking and transit trips increases with congestion, while the number of trips by car decreases. This is true across all income levels up until households earning at least \$75,000 annually, for whom travel mode has little relationship to congestion.

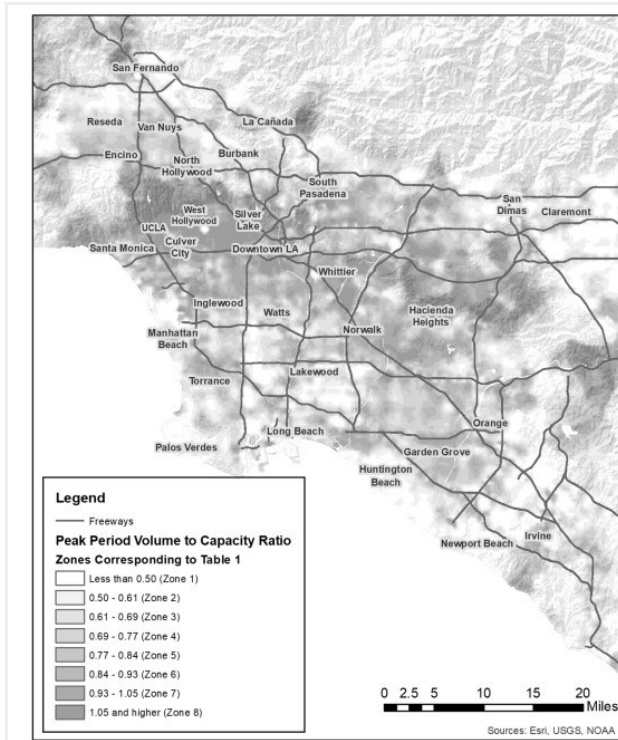


Figure 1: Traffic congestion in Los Angeles

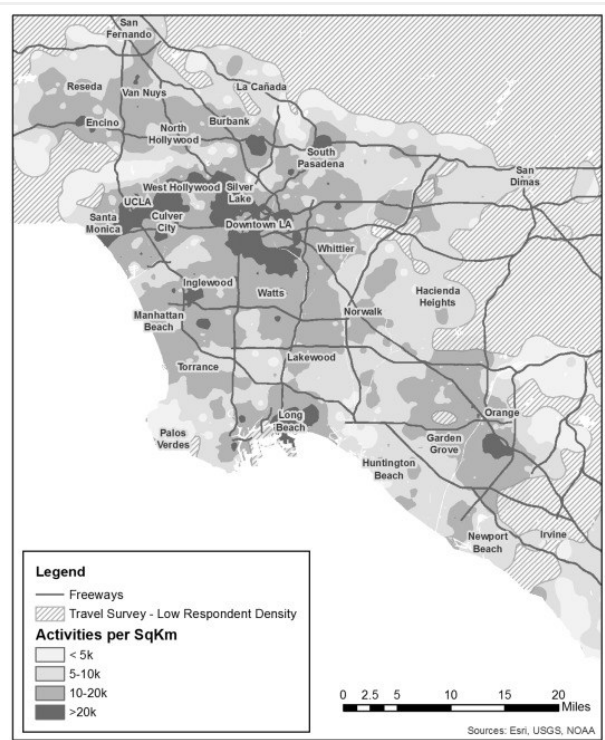


Figure 2: Activity density in Los Angeles

STUDY APPROACH

Researchers gathered travel data from the Southern California Association of Governments, including results from the Travel and Congestion Survey and estimates of traffic volumes and delays for both arterial streets and freeways. This information was mapped to show geographies of congestion and accessibility (see Figures 1 and 2). Researchers then estimated a series of regression models of trip-making to test the effects of traffic delays on behavior.

RECOMMENDATIONS

Transportation planners and engineers should not view traffic congestion solely as a cost to society. Centers of activity often give rise to congestion delays but also enable high levels of activity participation.

Planners should advocate for denser, congestion-adapted places. Such places increase total accessibility even if the process of creating them makes absolute levels of congestion worse.

Researchers should develop more inclusive, multi-modal indicators of road performance. Privileging vehicle movements over other forms of travel, such as walking and bicycling, is harmful to comprehensive planning.