National Center for Sustainable Transportation

Managing the Impacts of Freight in California

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POLICY BRIEF

Issue

To ensure the efficiency and reliability of freight movement, California has invested a great deal in building and maintaining its freight infrastructure, but these investments are far outpaced by the rapid growth in both passenger and freight demand. The result is increased congestion, especially at bottlenecks where delays are severe.

This research was motivated by new provisions in the 2016 Fixing America's Surface Transportation (FAST) Act, which require states to consider the impact of significant freight congestion or delays on the broader transportation system. However, conventional methods of evaluating freight congestion, such as identifying freight bottlenecks, focus on how these bottlenecks affect freight transport. This research provides a statewide assessment of freight movement on all traffic congestion. It defines freight impact areas as severely congested roadway corridors with high volumes of trucks.

Research Findings

Freight impact areas on the National Highway System are concentrated on freight corridors that connect ports, intermodal terminals, and warehousing clusters. In the Los Angeles region, congestion is widespread throughout the highway system during p.m. peak hours. But considering truck volumes on the National Highway System, freight impact areas are concentrated on freight corridors that connect major freight generators, such as I-710, I-10 and US-60, as shown in Figure 1. Similar patterns are found in the San Francisco region as well.

Top freight impact areas vary in length and congestion speed but share high total volume, truck volume and congestion delay. Taking the Los Angeles region as an example, the longest freight impact area, the SR-60 west of I-15, is nearly 10 miles. The average freight impact area is a little over two miles. All the impact areas have relatively high volumes of trucks and shares of trucks. The average congestion speed of these freight impact areas is 18.6 mph, reflecting the serious congestion that exists in the region. The combination of slow traffic speed and high traffic volumes generates large delays; an average of about 3,600 vehicle hours for the daily p.m. peak.

Outside of the big two—the Los Angeles and San Francisco regions—freight impact areas are concentrated in Sacramento, San Diego and the San

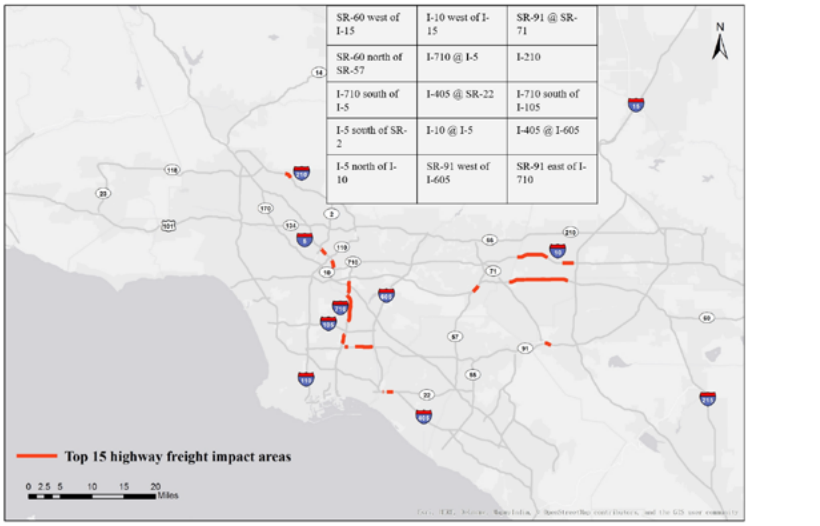

Figure 1: Freight impact areas in the Los Angeles region.

Joaquin Valley. Eleven of the top 15 freight impact areas in the rest of California are located in the Sacramento (six) and San Diego (five) regions, the third- and fourth-largest metro areas in California respectively. Both are regional freight hubs, Sacramento for the north San Joaquin Valley, and San Diego for cross-border trade. The remaining four freight impact areas are located in the San Joaquin Valley: three on SR 99 from Modesto north to Manteca, and the last just north of Fresno. The total peak hour delay is much smaller than that in Los Angeles and San Francisco, given the lower traffic volumes, less severe congestion, and shorter length of the impact areas.

Arterial freight impact areas are not only located in the urban core, but also found at many suburban locations or along major regional highway links. In Los Angeles, arterial freight impact areas are found at many suburban locations and in areas close to Los Angeles International Airport (LAX) and the Ports of Los Angeles and Long Beach. In San Francisco, impact areas are scattered; some in the urban core and some along major regional highway links. Compared to highway freight impact areas, arterial freight impact areas have lower traffic volumes, shares of trucks, and congestion speed (of course, on arterials), and therefore less significant delays.

The location of freight impact areas is highly related to freight-related facilities or activities. Taking airports in the Los Angeles region as an example, the Ontario International Airport (ONT) and LAX serve both passenger and cargo transport. However, the relative share of air cargo shipments to passenger trips in ONT is significantly higher than LAX, even though cargo volumes are much greater at LAX. These differences in airport services are consistent with the spatial distribution of freight impacts. For LAX, the high volume of passengers washes out the impact of cargo; the opposite is true for ONT. For instance, the I-405 in the vicinity of LAX is severely congested during peak hours, but it consists mostly of passenger vehicles. The freight impacts on the I-405 are therefore less significant than those on the I-60 near ONT, as shown in Figure 2.

The report identified three categories of mitigation strategies: 1) infrastructure improvements; 2) efficiency improvements; 3) policy incentives. Each group of strategies was assessed according to the following criteria: cost, effectiveness, co-benefits, technological difficulty, and implementation feasibility. Examples of the most promising improvements include truck parking facilities, integrated freight information systems, port-wide terminal appointment systems, and on-site parking and loading facilities.

Figure 2: Freight impacts at ONT, left, and at LAX, right.

Further Reading

This policy brief is drawn from the "Managing the Impacts of Freight in California" report prepared for California Department of Transportation by Genevieve Giuliano, Catherine Showalter, Quan Yuan and Rui Zhang (University of Southern California). To download the report, visit https://ncst.ucdavis.edu/project/managing-the-impacts-of-freight-in-california/.