ISSUE BRIEF

UCLA Institute of Transportation Studies

July 2020

Need for Speed: Opportunities for Peak Hour Bus Lanes Along Parking Corridors in Los Angeles

Mark Hansen, MURP

Issue

As congestion worsens in Los Angeles, public transit riders lose countless hours aboard buses stuck in traffic. Despite carrying many more people than the average passenger car, buses must share space on equal terms with cars and trucks on most of the city's major streets. Expanding the bus lane network can alleviate slow bus speeds to improve transit travel times and the experience of bus riders. Recently, the new peak-period bus lane on Flower Street in downtown Los Angeles demonstrated the effectiveness of bus lanes, decreasing bus travel times by 20% and reducing the variability in bus travel times. To build on this success, LA Metro managers have set out to identify more opportunities for flexible, peak-period bus lanes like the one on Flower Street.

Many corridors in Los Angeles feature curb lanes that allow vehicle traffic during peak hours but restrict access to allow for parking in the off-peak. Most of these corridors consist of three peak-period travel lanes in each direction, meaning a new bus lane would reduce general traffic vehicle capacity by only one lane in each direction, and preserve parking in the off-peak. This research uses real-time, publicly accessible bus data to describe the current speed of buses on these types of lanes, known as peak-hour parking restriction (PHPR) lanes, investigate the potential travel time savings of bus lanes, and detail the possible changes in net person throughput.

Research Findings

- Bus speeds throughout Los Angeles are slow (6 to 17 mph) but more so in the dense city center (6 to 12 mph) and areas outside the San Fernando Valley.
- In general, bus lanes improve bus travel times, but the greatest improvements occur when buses run both fast and frequently. Estimated improvements from exclusive bus lanes, while positive for all studied PHPR lanes, will have the most effect on routes moving more people per hour and per day, even if the estimated individual travel time savings per bus are relatively modest.
- With the implementation of a bus lane, person throughput in peak period traffic volumes varied across multiple corridors (Figure 1). Peak period traffic volumes compared against the scheduled capacity of LA Metro buses predicted a varied spread of changes to person throughput with the implementation of a bus lane. Half of PHPR corridors showed a positive increase in net person throughput. Again, the most benefits are realized along corridors offering the most frequent bus service.

Study Approach

Over the course of two months, the researcher collected bus location coordinates from LA Metro's API (application

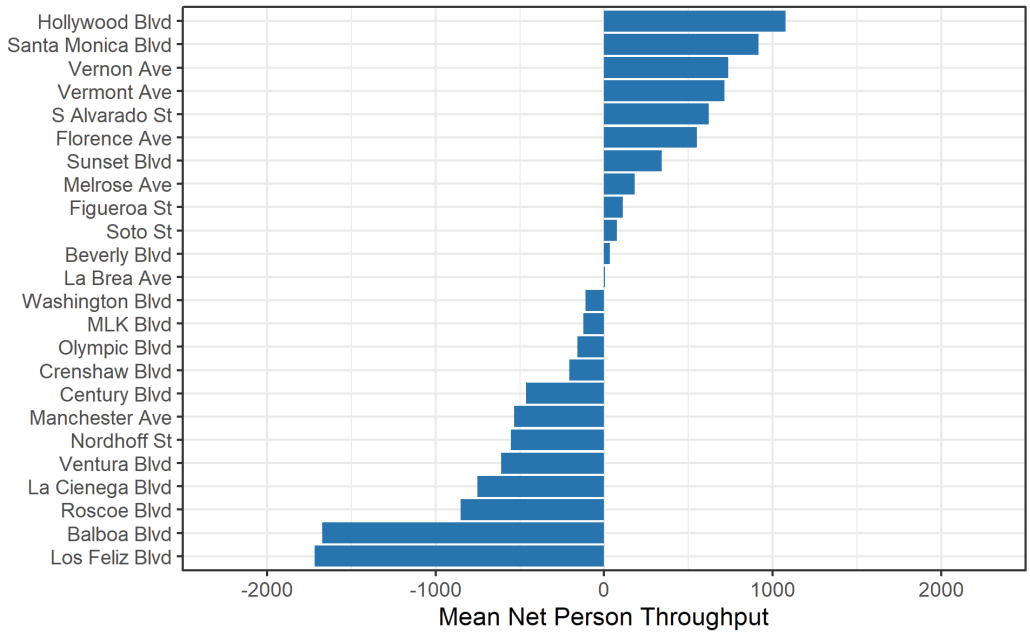

Figure 1: Estimated changes in net person throughput on select PHPR bus lanes.

programming interface) using a web-scraping program developed for this project. The researcher then processed these data to determine bus speeds and spatially combined them with all known PHPR lanes in the city of Los Angeles. After adjusting for the time that buses spend at stops (i.e., dwell times), the result was a unique inventory of LA Metro bus speeds on all PHPR lanes. These speeds were used to detail the performance of buses on PHPR lanes in Los Angeles and to predict the travel time savings if bus lanes were implemented. Then, to weigh the person throughput trade-offs of bus lanes, the researcher compared traffic volume data from the Los Angeles Department of Transportation against the scheduled capacity of buses in the new LA Metro NextGen Bus Plan, modeling the net person throughput if bus lanes were present on PHPR lanes.

Conclusions

- Improving the speed of buses naturally leads to a positive travel time savings in all cases, but the findings suggest it makes most sense to prioritize transit on corridors where buses can be both fast and frequent, and where the effect on adjacent motor vehicle traffic is offset by better transit performance.
- Bus lanes would have a positive peak period net person throughput effect on some, but not all, PHPR lanes in Los Angeles. Bus lanes will improve travel times for transit riders but will also reduce vehicle capacity, and likely person throughput, in adjacent lanes. However, on some PHPR corridors, this reduction in vehicle capacity is offset by an overall increase in the amount of people able to travel the corridor via bus.
- Peak-hour traffic volumes are high in Los Angeles, and the current policy of opening PHPR lanes to general traffic during peak periods increases vehicle capacity. Still, in many cases, this analysis shows that dedicating a lane to transit has a positive effect on net person throughput, despite this methodology likely overestimating vehicle counts and underestimating the amount of buses using the corridor. More sophisticated traffic engineering models can improve on these assumptions and strengthen these findings even further.

Hansen, M. (2020). Need for speed: Opportunities for peak hour bus lanes along parking corridors in Los Angeles (Master's capstone, UCLA). Retrieved from: https://escholarship.org/uc/item/7fv44138

Project ID UCLA ITS-LAS2009| DOI:10.17610/T6SP4M