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When is Public Transit Too Crowded, and How Has This Changed During the Pandemic?

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Issue

One of the first measures that U.S. public health authorities recommended in response to the COVID-19 pandemic was social distancing; U.S. Centers for Disease Control (CDC) guidelines recommended that people “stay at least 6 feet (about 2 arms’ length) from other people who are not from [their] household in both indoor and outdoor spaces.”¹ Public transit agencies had to then figure out what social distancing meant for their vehicles and riders. To track and evaluate transit operator implementation of social distancing recommendations, UCLA Institute of Transportation Studies (ITS) researchers searched for and reviewed the websites of 200 transit agencies across the U.S. There is no industrywide standard for vehicle crowding before the pandemic, nor is there one now — as definitions of socially distanced transit vary widely. This policy brief summarizes what the researchers learned about agency definitions of crowding before and during the COVID-19 pandemic.

Findings

Missing crowding definitions

Of the 200 transit agencies investigated, only 92 (46%) publicized their pre-pandemic crowding standards, and only 84 (42%) publicized their pandemic-specific crowding standards. This suggests that a majority of transit operators either have not formally adopted, or do not publicize, these standards. During the COVID-19 pandemic, many transit agencies’ public documents and communications stress the importance of 6-foot social distancing by passengers and

the frequent cleaning and disinfecting of their vehicles, but do not specify the maximum number of passengers that can be safely onboard. Instead, vague references to “blocking of some seats” and “keep[ing] every other row empty” are common.

Comparing crowding definitions

For each transit operator surveyed, we sought to identify and compare the definitions of crowding before and during the pandemic. In general, pre-pandemic definitions of crowding on 35-, 40-, and 60-foot buses are consistent with those recommended in the Transit Capacity and *Quality of Service Manual*.²

Light- and heavy-rail vehicles have higher passenger capacities than most buses, though pre-pandemic standards of crowding vary substantially more than among buses, which likely reflects the enormous variance in both the age and patronage of U.S. rail transit systems, such as the 116-year-old New York subway (5,437,587 pre-pandemic weekday boardings³) and the six-year-old Sun Link light rail in Tucson (3,602 pre-pandemic weekday boardings⁴).

Amidst the pandemic, the transit agencies surveyed reduced their crowding standard from 69% to 83%, on average, to ensure social distancing among passengers. The mean pandemic crowding standard is 16.5 passengers for 35- and 40-foot standard buses (standard deviation=5.8) and 23.4 passengers on 60-foot articulated buses (standard deviation=8.7). Some of those surveyed have relaxed their pandemic crowding standards as passenger demand (if not CDC guidelines) has increased over the course of the pandemic. Thus, it appears that some systems have not

Summary of pre- and post-pandemic crowding standards at 84 U.S. transit agencies

	Pre-pandemic maximum (std dev)	Standard deviation as a % of mean	Pandemic maximum (std dev)	Standard deviation as a % of average	Percent change from pre-pandemic standard
35'/40' buses	54.9 pax (9.5)	17.3%	16.5 (5.8)	35.2%	-69%
60' buses	89.1 pax (19.5)	21.9%	23.4 (8.7)	37.2%	-74%
Light rail vehicles (LRV)	168.9 pax (52.3)	31.0%	28.1 (8.6)	30.6%	-83%
Heavy rail vehicle (HRV)	173.0 pax (90.6)	52.4%	36.6 (16.2)	44.5%	-77%

Note: numbers in parentheses are standard deviations

adopted pandemic-specific crowding standards because they are not able to add sufficient service to accommodate socially distanced demand.

During the pandemic, few transit agencies specified their crowding standards on light- and heavy-rail vehicles. Researchers need more information from agencies to draw meaningful conclusions. The table below shows a summary of pre-pandemic and pandemic crowding standards.

Conclusion

Social distancing has been a primary public health recommendation during the COVID-19 pandemic. Given that its purpose of moving people en masse, public transit is a challenging setting for maintaining social distancing. The researchers' survey of 200 public transit operators finds

that most (116 out of 200) do not publish pandemic-specific crowding standards for their vehicles. Others have standards that complicate comparisons across agencies and are difficult for riders to interpret (such as floor area per passenger). While acceptable passenger loads declined between 69% and 83% for those publishing standards, what constitutes acceptable levels of crowding varies widely across systems, transit modes (particularly rail), and in some cases over time. Finally, this research focused on the adoption and publication of crowding standards; given the many challenges to enforcing them, passengers likely find passenger loads on transit vehicles, and whether they are safe, challenging to predict.

More Information

This brief is part of the "Monitoring and Adjusting Transit Service during a Pandemic" research project, part of the UC Institute of Transportation COVID-19 Response and Recovery research initiative. More information about the research project can be found at www.ucits.org/research-project/2021-12.

¹ <https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/social-distancing.html>

² National Academies of Sciences, Engineering, and Medicine. 2013. Transit Capacity and Quality of Service Manual, Third Edition. Washington, DC: The National Academies Press. <https://doi.org/10.17226/24766>.

³ Metropolitan Transportation Authority. Introduction to Subway Ridership, n.d., <http://web.mta.info/nyct/facts/ridership/>. Accessed 18 October 2020.

⁴ Sun Tran. Monthly Operations Report, February 2020, <https://www.sunlinkstreetcar.com/documents/FEB%20%202020%20%20ST.SL.SV%20%20MOR%20.pdf>. Accessed 18 October 2020.

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