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Using Real-time Crowding Data as a Rider Communication Strategy in the COVID-19 Pandemic

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Issue

In response to the COVID-19 Pandemic, many transit agencies have embraced real-time crowding data as a rider communication strategy. These data allow riders to see the current level of crowding on individual transit vehicles in real time. Most operators share these data using GTFS Realtime, an extension to the General Transit Feed Specification that already powers trip-planning applications such as Transit App and Google Maps.

Offering these real-time data helps riders make informed travel choices that allow them, for example, to avoid crowded transit vehicles. However, actual implementations vary widely and may not always provide useful information to transit riders or other interested parties. This policy brief summarizes the current state of real-time crowding data in September 2020, and provides recommendations for ongoing improvements.

Findings

Missing crowding definitions

GTFS Realtime and other communication standards offer a viable platform for sharing crowding data, and popular third-party trip planning apps readily consume these data. These standards continue to evolve.

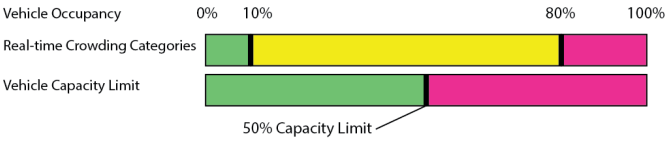
There are a variety of challenges that may discourage operators from publishing real-time crowding data. Agencies mainly use Automated Passenger Counters (APCs) to generate crowding data, which are not always accurate. When used for longer-term ridership reporting, transit agency staff often apply complex averaging methods to compensate for variation in APC data. This is not possible in real-time, so agencies may face a choice between offering potentially inaccurate information, or a low level of detail in their crowding data, or investing staff time and resources to devise and implement alternative methods to enhance accuracy. Furthermore, while APCs are common on buses, they are generally not installed on rail vehicles, so the data are often uneven across modes. Alternative methods for measuring crowding, such as image recognition or weight sensors, are perhaps feasible but not widely implemented.

Inconsistent levels of standardization may confuse riders, and surely puzzle researchers.

Almost all transit agencies have adopted three standard categories that claim to represent low, moderate, and high levels of crowding. However, there is no universal standard as to what actual level of crowding these three categories represent. Some agencies use definitions that correspond to a reduced occupancy for social distancing, while other agencies use the full capacity of a bus. Since trip planning applications present these data using simple icons and text that may not change according to each agency's underlying standard, riders unfamiliar with a particular agency's crowding methodology may be surprised when it's time to board.

This wide variance in what constitutes crowding also poses a challenge to researchers hoping to collect these data and compare levels of crowding across systems and across

Figure 1. Broad Categories May Overlap Capacity Limits, Causing Confusion



regions, since any such comparison requires the researcher to also understand how each agency is choosing to report crowding as well as any capacity limits they may enforce.

The most common crowding implementations offer limited information.

Many agencies share crowding data using an "empty" category that corresponds to less than 10% of vehicle capacity, a broad middle category that covers 10% to 80%, and a "full" category that covers 80% or above. This middle category is too broad to inform riders as to whether the actual crowding exceeds a socially distanced capacity limit of 50%, for example, and whether they will be able to board the next vehicle.

Recommendations

Consider integration with social-distancing standards.

Transit agencies should consider matching their real-time crowding data to their social-distancing standards. If an agency aims to enforce their pandemic-specific capacity limits, their crowding data should inform riders as to whether that limit has been reached. Reporting crowding based on social-distancing standards may better match rider expectations during COVID-19.

Absent a universal standard, transparent and detailed explanations of each agency's particular implementation will benefit riders.

Real-time crowding data are new to most transit riders. While some agencies produce lengthy descriptions of these data and how to interpret them, others have rolled the feature out quietly without much explanation. Apps displaying crowding data to riders offer an intuitive display of these data, but they do not necessarily reflect real-world conditions. When introducing such crowding data, agencies should introduce the feature and its limitations to riders using social media, signs at stops and on vehicles, etc. This information should include whether their agency reports crowding based on pre-pandemic and pandemic-specific capacity.

Providing real-time crowding data is only one part of an effective crowding strategy.

Although riders value crowding data, the availability of crowding data alone does not prevent riders from experiencing crowding. For example, the ability to allow a crowded vehicle to pass and wait for the next one depends on the frequency of service, whether the rider can reasonably expect a subsequent vehicle to be less crowded, and the flexibility of the rider's schedule. An essential worker who has to be at work on-time may choose to board a crowded bus anyway if they lack easy access to later vehicles or other modes.

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.

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