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Restoring public transit amid COVID-19: What European cities can learn from one another

As cities end coronavirus lockdowns, public-transit authorities will need ways to increase ridership—safely. Early attempts in some European cities can offer lessons to those elsewhere in Europe.

This article was a collaborative, global effort by David Chinn, Carsten Lotz, Luuk Speksnijder, and Sebastian Stern, with Raphaelle Chapuis, Ruby Holmes, Arthur Knol, Karim Tadjeddine, and Koen Wolfs, representing views from the Public & Social Sector and Travel, Logistics & Infrastructure Practices.

The past several weeks have seen European cities such as London, Munich, and Paris relax lockdown measures intended to slow the spread of the coronavirus. With those adjustments has come a challenge: enabling people to get around. For many who live, work, and attend school in cities, getting around means taking a bus or train—and often riding shoulder to shoulder with fellow passengers. So how can all those people cross town using public transit while keeping a safe distance from one another?

The short answer is that they can only do so in much smaller numbers than before. Maintaining physical distancing will reduce the capacity of public-transport systems to between 15 and 35 percent of prepandemic levels. Metro systems, built for high passenger density, may see the steepest reductions. Transport for London, the government body responsible for the public-transportation system in Greater London, estimates that with 2.0 meters (approximately 6.5 feet) of physical distancing, the London Underground, or Tube, will be able to carry 13 to 15 percent of the passengers that it normally does, even at full service. McKinsey analysis of regional rail lines in the Netherlands suggests that the capacity of those lines could be cut to 20 to 25 percent because of physical-distancing rules requiring 1.5 meters (approximately five feet) of separation between people.

Because of lockdowns, these limitations have not presented much of a problem. Stay-at-home orders and workplace closures have lowered public-transit ridership to 10 to 15 percent of the usual level, according to McKinsey analysis of multiple European countries. But as lockdowns ease and businesses reopen, more people will want or need to move about. In the short term, transit authorities must somehow enable ridership increases, which will support an economic recovery, and also maintain public-health measures that will help stifle a recurrence of the virus. In the medium term, transit operators must restore riders' confidence in public transport. And they must figure out a way to deal with the financial losses that the

decline in ridership—which is likely to persist for several years—will cause (a topic we will revisit in a forthcoming article).

In this article, we look at three methods that some cities are already using to solve the short-term challenge of accommodating more transit passengers: limiting riders to enable physical distancing, staggering ridership throughout during the day and across the transit system, and instituting rules and changes that safely increase system capacity. These measures will also be instrumental in bolstering travelers' confidence, given that a medium-term modal shift toward the use of private cars would increase congestion and make it more difficult to reach environmental targets.

Limit ridership to enable physical distancing

Under normal circumstances, most public-transit trips are taken by office workers, university students, and people headed to or from recreational activities (Exhibit 1). Encouraging these kinds of passengers to stay at home or to use other modes of transportation can free capacity for people who most need to take public transit, such as those who hold jobs where they must be on site (for example, healthcare professionals, first responders, grocery-store staff, and other essential workers) or who have a housing situation that is not conducive to working from home, or are lower-income workers who cannot afford more expensive transportation alternatives such as taxis or private cars. In the Netherlands, for instance, 25 percent of people with low incomes rely on public transportation to get around, while just 11 percent of people with high incomes do so.[1]
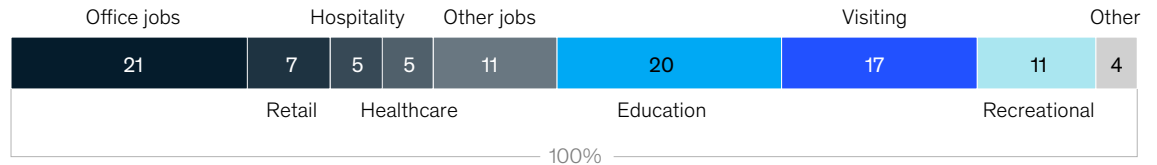
McKinsey analysis of ridership in one European country illustrates this challenge. During lockdown, ridership dropped to about 10 to 15 percent of prepandemic levels. The few riders who remained mostly worked in essential sectors that required workers to come to a workplace, such as healthcare,

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[1] Mobility; Per Person, Personal Characteristics, Modes of Transport and Region Database, CBS Statline, updated on March 11, 2020, opendata.cbs.nl. "Low income" means people in the lowest 20 percent bracket of incomes; "high income" means people in the highest 20 percent bracket of incomes.

Exhibit 1

Office workers, students, and riders making recreational trips account for most of the passenger kilometers traveled on one European country's public-transit system.

Share of passenger kilometers traveled during lockdown, by passenger type, %[1]

Office jobs		Hospitality		Other jobs		Visiting		Other
21	7	5	5	11	20	17	11	4
	Retail	Healthcare			Education		Recreational	

───── 100% ─────

Note: Figures may not sum to 100%, because of rounding.
[1] Based on analysis of one European country.

law enforcement, and the food supply chain. As sectors reopened and more people needed to move from place to place, demand for public transport started to grow. Yet the percentage of train occupancy that allows passengers to practice strict physical distancing is just 20 to 25 percent. That leaves little room for passengers other than the essential workers who must travel to their jobs.

To prevent crowding, governments may want to consider continuing to advise against all nonessential trips. They can also collaborate with employers on continuing to allow people to work from home (people with office jobs account for more than 20 percent of passenger kilometers). And they can work to minimize on-campus activities for students (who account for another 20 percent of passenger kilometers). Government agencies might also collaborate on making it easier for people to walk and bicycle to their destinations, instead of using public transport. Cities such as Bogotá, London, Mexico City, Paris, and New York have all announced or taken action to expand cycling routes.

Merely discouraging or restricting nonessential trips, however, won't always leave enough capacity for essential trips, because those trips don't hold steady at 10 to 15 percent of capacity throughout the day. To accommodate all essential trips, further measures are necessary.

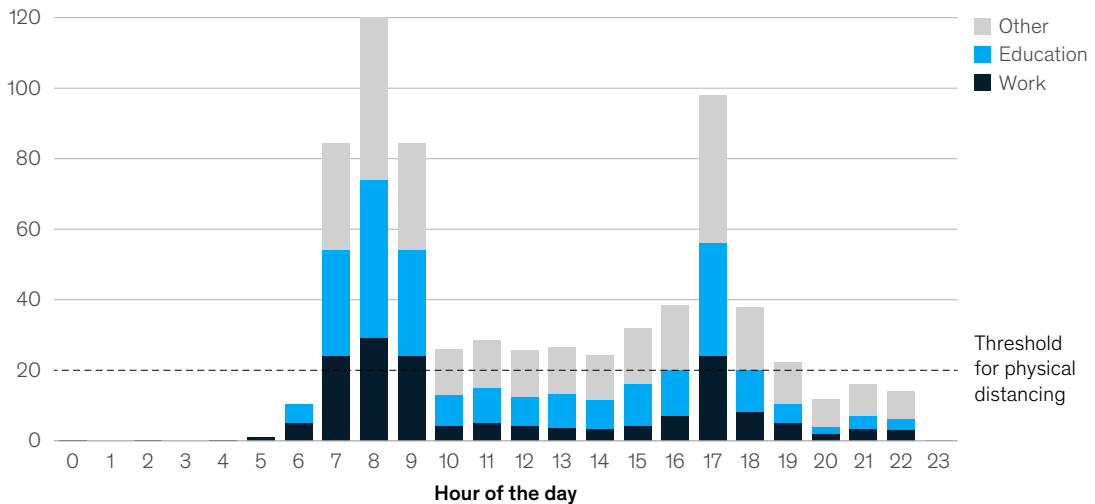## Stagger ridership throughout the day and across the transit system

Demand for public transportation spikes during the morning and evening rush hours. Compared with midday, the morning rush hour can see transit occupancy increase fivefold, with the busiest lines running well above full capacity and standing passengers crammed into buses and train cars (Exhibit 2). Shifting demand away from peak times will not only enable physical distancing but also make riding public transit more pleasant.

To do this, some transit operators and city governments have implemented several changes, largely aimed at allowing workers and students to alter their commuting schedules. One change is staggering start times for schools, public services, and offices so that fewer people need to board public transit during rush hour periods. Some parts of Israel, for example, are opening schools in shifts, which reduces transportation congestion and crowds around schools. Similarly, some schools and universities in the Netherlands have spread start times over the day. Meanwhile, in France, only trips to and from work and school are allowed during peak periods. In addition, some transit operators have created extra waiting capacity at busy hubs.

Exhibit 2

Public-transit occupancy during peak travel periods can far exceed the level that permits safe physical distancing.

Occupancy of public transport, %

It's also possible to help riders make choices that alleviate crowding. While some public rail operators have traditionally offered reservations on long-distance trains, they have begun to do so for light-rail systems as well. The Danish rail operator DSB has added advance-booking capabilities, which have helped keep trains from getting full. Taiwan has gone further, instituting a strict reservations policy on suburban and intercity rail to limit occupancy and put safe physical distance between passengers. Other operators guide travelers toward spare capacity. DSB has introduced an app showing which services and carriages have the most space for physical distance. Use of the app helped increase transit ridership by 6 percent during the first week of lockdown easing.

Another approach to dispersing riders involves limiting service. Some cities, such as Paris, have suspended access to certain stations or reopened lines at different rates. Other cities have limited stops at rush-hour choke points, including major intersections. This compels riders to walk more or take alternative routes. Crowd controls and station closures can also prevent

people from gathering too closely. The key to limiting service effectively is constantly monitoring demand and watching for choke points so operators can quickly counteract crowding.
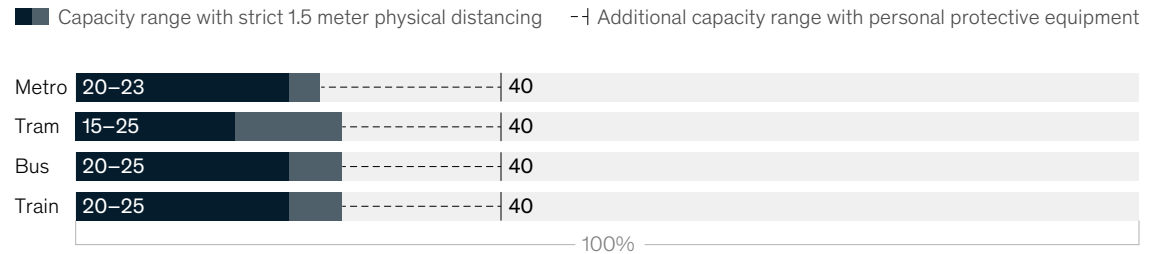
Institute rules and changes that safely increase system capacity

Rules requiring passengers to observe health precautions are fundamental to safely increasing the capacity of public transit. Many countries in Asia, Europe, and North America either recommend or require face covers. Some operators have installed plastic screens on buses and trains to put barriers between riders, as well as to separate transit workers from riders. Using protective equipment will increase safe-occupancy levels to up to 40 percent of pre-COVID-19 levels (Exhibit 3). Another rule, which some Chinese provinces have enacted, requires passengers to undergo temperature screening before entering public transport—something that has not seen widespread adoption in Europe.

Exhibit 3

Physical distancing will cut transit capacity to 15 to 25 percent of normal levels, but use of personal protective equipment could increase capacity to 40 percent.

Available capacity of transportation modes, illustrative data for the Netherlands, %

■■ Capacity range with strict 1.5 meter physical distancing ⊢---⊣ Additional capacity range with personal protective equipment

Metro	20–23	40
Tram	15–25	40
Bus	20–25	40
Train	20–25	40

100%

Source: Government of the Netherlands; International Association of Public Transport; *Open Data Inventory 2018/19 Annual Report*, europeandataportal.eu; McKinsey analysis

Because trains, metros, and trams travel on fixed lines and run at maximum occupancy during peak periods, increasing capacity on critical lines could require opening parallel bus routes. This technique, which was already being used in certain countries to increase peak capacity, could help transit systems carry more workers and students.

It could be a long time before physical distancing is no longer required and office workers can resume commuting every day, students are invited back to university campuses, and city dwellers can resume normal leisure activities. Until then, cities and their public-transit systems will have to function in a state of partial openness. Careful management and safety measures can allow public-transit authorities to accommodate more passengers, so they can avoid delaying economic recovery without contributing to a recurrence of the coronavirus. But public-transport operators cannot do it alone. They will need to work closely with (local) government officials on measures such as staggering school hours. Transport operators will also need the technology to constantly monitor demand and manage scheduling. And they will need to safeguard their employees. Riders, too, will play crucial roles in bringing public transit back up to speed by adapting their travel habits and behavior.

Raphaelle Chapuis is a consultant in McKinsey's Paris office, where **Karim Tadjeddine** is a partner; **David Chinn** is a senior partner in the London office, where **Ruby Holmes** is a consultant; **Arthur Knol** is a fellow in the Amsterdam office, where **Luuk Speksnijder** is an associate partner and **Koen Wolfs** is a consultant; **Carsten Lotz** is a partner in the Stuttgart office; and **Sebastian Stern** is a senior partner in the Hamburg office.

This article was edited by Josh Rosenfield, an executive editor in the New York office.