Buses, Yes Buses, Are 'the Hottest Trend in Transit'

Technology, declining ridership and changing demographics have spurred cities across the country to redesign bus systems that are more convenient. It's no easy task.

BY: [Daniel C. Vock](#) | September 2017

A few years ago, as the Central Ohio Transit Authority (COTA) was marking the 40th anniversary of its bus service in the Columbus area, a new employee came into the office of Curtis Stitt, the agency's president and CEO. She brought him a copy of a 1974 annual report that she had stumbled upon while going through the archives. As Stitt looked over the decades-old document, one thing stuck out at him. "The system map from 1974 looked very much like the system map for 2014," Stitt says. "Forty years later, the routes looked pretty much the same. The question it naturally raised was: Does this system still work? The answer was no."

Since the 1970s, Columbus has grown by nearly 60 percent, to a population of 860,000. It is now the 14th largest city in the country. Its geographic area has grown by a third as well, and the suburbs have sprawled in every direction. Jobs have followed people away from downtown, and the nature of the jobs has also changed. With the growth of the service economy, more residents work on nights and weekends instead of 9 to 5.

That meant that the traditional hub-and-spoke arrangement of the city's bus routes didn't make sense anymore. If people needed to get across town, or go from one suburb to another, they didn't want to have to go through downtown to do it, especially if that meant transferring from one infrequent bus route to another.

The Columbus transit agency spent four years and $9.4 million studying its bus network, gathering public feedback and designing alternative routes. All of that work came to a head this May, when COTA switched to a completely new system. It doubled the number of bus lines with frequent service (every 15 minutes or less), deploying many of them along major roads far from downtown. The new routes added or increased service to the airport, shopping malls, a casino and many other job centers. By COTA's estimate, the number of jobs within a quarter mile (a five-minute walk) of a frequent bus line jumped from 155,000 to 265,000. The number of people who lived within a quarter mile of those lines increased from 116,000 to 219,000. Plus, the agency beefed up service on Saturdays and Sundays. And Columbus did all of it without an increase in funding.

The problems that beset the Columbus bus system before its relaunch are all too common among this country's transit agencies. In most places, as in Columbus, they go unaddressed for decades. But just in the last few years, transit agencies in more than half a dozen major cities have totally revamped their bus routes to focus on frequent, reliable service to job centers and dense neighborhoods. As in Columbus, transit advocates hope the recent redesigns in Indianapolis; Jacksonville, Fla.; Omaha, Neb.; Portland, Ore.; and, most of all, Houston, will lead to major changes in how cities think of and offer bus service. But the same advocates acknowledge that there is nothing easy about making these changes, even if the need for them seems obvious.

The biggest reason for the sudden attention to bus networks is that bus ridership is dropping across the country, both in absolute terms and as a percentage of total transit trips. As recently as 1990, buses accounted for nearly two-thirds of all transit trips in the country. But in 2014, for the first time, bus rides made up less than half of all transit trips, according to the American Public Transportation Association. Part of that is because more people are taking subways, light rail and commuter rail. But a good many bus riders have left the transit system altogether. "Bus network redesigns are a reaction to that decline," says Kirk Hovenkotter, the national network coordinator at TransitCenter, a New York foundation that recently hosted a conference on bus system overhauls. Even leaders from cities that have not committed to major changes are enthusiastic about the idea, he says. "Network redesigns are the hottest trend in transit right now."

Redesigns can help reduce inefficiency in bus systems, but that doesn't always translate into higher ridership numbers. External factors such as gas prices and the state of the economy can affect ridership. Plus, a well-designed bus network can lead to fewer trips because riders have to transfer less to get to their destinations.

But declining ridership isn't the only reason transit agencies are reconfiguring their bus routes. Demographic shifts in urban areas are also forcing them to reexamine their services. Jarrett Walker, a transit consultant who has helped several cities with their bus network redesigns, says many cities are developing dense neighborhoods that cannot function if they don't have a good transit system. Single-occupancy vehicles -- even taxis or UberX compacts -- simply take up too much room on the streets. And residents in those areas want better transit options. "There is justifiably pressure on transit to work more effectively and meet the expectations of those residents," Walker says.

Inefficiencies in bus systems have also gotten easier to measure, as real-time bus arrival data and online trip planning tools make gaps in a system painfully obvious. While riders a few years ago might have waited at a stop in hopes that the bus would come soon, now they know for sure when it's coming, and they don't want to wait long. They can tell from a map how far out of their way they have to go in order to get to their destination. "You're seeing the problems you couldn't see before," Walker says. "That makes it easier to diagnose and to build political consensus to solve those problems."

That political will is important, because political pressure is a big reason bus routes follow meandering paths and are hard to change. Interest groups urge politicians to add new stops, often in places that wouldn't warrant them based on ridership. The added stops make the routes longer, and the longer routes mean the bus doesn't come as often. "The cumulative effect of elected officials doing that over 20 to 30 years is a network that looks like spaghetti, where frequencies aren't very high," Walker says. When transit planners try to make a network more efficient, they inevitably have to cut service to low-performing areas, and riders there will complain to the transit agency. Without political cover, Walker says, transit planners often just try to do their job without getting yelled at, which means no major changes happen.

One Sunday morning in August 2015, Houston woke up with a brand-new bus system. It was a big deal, not just for Houstonians who rode the bus, but for the transit community nationwide. Houston wasn't the first to successfully complete a network overhaul: Portland, Ore., Jacksonville and a few other places had gone before. But Houston's "reimagining" of its system was an especially ambitious project in America's fourth-biggest city. Officials in other cities seemed to figure that if Houston could reconfigure a system with 1,200 buses and 10,000 stops, they could figure out how to do it in their cities too.

The impetus for Houston Metro's route overhaul came from its board, and from one new member in particular. Christof Spieler came to the board in 2010 after earning a name for himself in Houston as a transit blogger. He is an engineer by trade, with a focus on urban planning, and was a regular rider of Metro's local No. 9 route. That latter fact set him apart from his fellow board members, who he says weren't regular bus riders before they joined the board. His message to the others was that frequent service -- not just having a big coverage area -- was the key to a good bus network.

It was clear that Houston Metro had to do something to address ridership. Between 1999 and 2012, the number of riders dropped by 20 percent, even after Metro extended its service hours and even while the city's population and economy were booming. And unlike other cities, Houston didn't see its bus ridership bounce back after the Great Recession.

Metro also had to revisit its network because it was in the process of completing three new light rail lines. Metro needed to adjust its bus schedules to better connect to the light rail and to eliminate duplicative service.

And, of course, Metro's antiquated bus routes faced the same issues as the ones in Columbus. In Houston's case, some of the the routes could be traced back to the early 1900s, when they were streetcar routes between downtown and outlying neighborhoods. Over the years, tinkering had made those short, straight routes long and twisty. Many of the areas they served were no longer big population centers. And downtown was no longer the dominant job magnet. Instead, much of the workforce commuted to universities and hospitals south of downtown in the city's medical center, while big shopping areas sprouted up around the Galleria mall and office towers emerged in once-sleepy suburban territory. Houston had become a city with a complex and "multinodal" employment base.

Metro, in other words, faced big problems that needed big fixes. "The [problems] couldn't be solved by adding another bus to this line or extending this route here," says Kurt Luhrsen, the agency's vice president of service planning. "It was systematic. The system was not serving those folks well anymore."

Once Metro decided it needed to overhaul its bus network, the agency's leaders combined their own data analyses with suggestions from the public. They wanted Houstonians to realize that this was not an arcane, bureaucratic process, but a chance to make big changes to improve people's lives. So Metro urged residents to reimagine the bus network.

The agency also described its existing operations in blunt terms, recalled Spieler, speaking at a 2015 transit conference. "We started this [process] by saying, 'We have a really crappy bus system,' which is a real odd thing for an agency to do. In fact, we had considerable internal fights over that idea. … I said, we're not going to fix the system if we don't own up to the fact that our current system isn't working. Why in the world would we go to the public and say, 'We have a great system. We'd like to blow it up and start all over?'"

A man pays his fare on an Atlanta bus.

There is a tension in designing any bus system between maximizing ridership and maximizing coverage. The easiest way to bump up the number of riders would be to run more routes frequently through dense areas. But then the outlying areas would get little or no service, residents of poorer neighborhoods would have trouble getting to work and older people would be stranded without a connection to out-of-the-way senior centers. Before the redesign, Metro split its resources evenly between ridership and coverage. Based on the feedback it received, the board decided that the agency was spending too much to operate largely empty buses. So it shifted resources: 80 percent went to building ridership, while 20 percent went to maintaining coverage.

Originally, the plan was supposed to be cost-neutral. Metro thought it could achieve that goal by using its existing resources more effectively. But residents who stood to lose service under the agency's initial proposal came to board meetings and public hearings to protest the changes. Politicians took up their causes. It took a year for the agency to iron out all of the wrinkles. Most of the changes the agency made to its initial plan were to lower-service routes. The high-volume lines remained largely the same. One way the board smoothed the passage was by adding $12 million to the annual operating budget for buses, which was about a 4 percent increase.

The switch came after months of publicity, as well as training for Metro staff. The transition itself had no major problems, although the agency did have to make adjustments after the rollout. Still, the easy transition made the process look simpler than it was. "We just barely pulled it off," Spieler says, "with the right staff, the best consultants, a gutsy board and a policy geek mayor with lots of spine." (Mayor Annise Parker's term expired in 2016.)

Metro, though, will fall short of its goal of increasing overall transit ridership by 20 percent in the new system's first two years. Ridership did climb by 6.8 percent in the first year, but most of that came from increased light rail boardings. Bus trips increased by 1.2 percent in that initial year, much of that from weekend service. Weekday trips decreased.

Things got worse the second year, when lower gas prices led to a more sluggish economy in energy-dependent Houston. Although final data was not available by press time, Luhrsen, the Metro vice president, says ridership for the second year will likely be flat. [*This story was reported and written prior to when Hurricane Harvey hit Houston in August.*] But he points out that other Texas cities are seeing decreases of 5 to 6 percent because of the drop in gas prices and the oil-related downturn in the local economy. "If we would have done nothing, we would have been down 5 to 6 percent, too," he says. "But [after two years] we're up 7 percent."

Houston's size makes it the obvious template for other cities that want to launch a bus network redesign. But the growing number of transit agencies that are going through with similar plans will offer slightly different models to follow.

While Houston and Columbus tried to keep their expenses relatively flat, Indianapolis is embarking on an expensive redesign, aiming for fast, frequent service even as it expands its network by about 70 percent. Indianapolis will fund the expansion through a new 0.25 percent income tax voters approved in 2016, which is expected to bring in an additional $54 million a year for IndyGo, the city's bus service. A major component of the new design will be adding three bus rapid transit lines that are designed to "basically be light rail on tires," says Bryan Luellen, an IndyGo spokesman. (The Indiana Legislature prohibited Indianapolis from using the money on actual light rail, but transit experts say the city isn't dense enough for rail anyway.) The new tax money will also help upgrade existing buses and bus stops, increase service on nights and weekends, and reduce customer waiting times on a more simplified grid network.

The transit system serving the Albany, N.Y., region stands out because it has increased bus ridership by 25 percent since 2009, while most other agencies have struggled with declining ridership. The Capital District Transportation Authority covers four counties, but it concentrates its efforts on fast, frequent service in its four major cities: Albany, Saratoga Springs, Schenectady and Troy. The emphasis on frequency, says authority CEO Carm Basile, is a "game changer," because when buses come every eight to 15 minutes, the service "starts to feel a lot more like a rail system. The No. 1 thing people want from you when they get on your bus is to get off your bus. They want the bus to come really frequently, and they want to get to their destination really quick, just like a rail system."

But another key to Albany's success has been its decision to reach out to local colleges and businesses to enroll in its "universal access" arrangements. In those deals, the institutions pay a discounted rate up front so their students or employees can ride without paying a fare. More than a dozen colleges and a dozen local businesses participate in the program, and their riders make up nearly a quarter of the passengers the agency handles and a quarter of the fare revenues it collects. The program makes route planning easier, Basile says, because it's easy for the agency to predict where students or workers will want to travel. Plus, he adds, it helps keep ridership up. "Wholesaling service has taken the spikes out of the ridership," he says, that are caused by external factors like the price of fuel. "We've been isolated from that. The people we are talking about are going to use the service regardless, because they can and it's free to them."

The number of transit agencies contemplating a bus system redesign continues to grow. This summer, Philadelphia officials announced they would soon undertake one, in part to respond to what they see as competition from private ride-sharing services. Anchorage, Alaska; Austin; Dallas; Richmond, Va.; and even Los Angeles and Staten Island in New York City are working on overhauls as well.

Jon Orcutt, the director of communications and advocacy for the TransitCenter, says many of those cities may need an infusion of new money, along with a new system design, to make a truly effective bus system. But some, like Los Angeles, which has the country's second-largest bus system after New York, will mainly need to show that they can spend existing tax money more effectively. L.A. voters approved major transportation funding measures in 2008 and 2016, which have resulted in a rapidly growing light rail system. At the same time, though, bus ridership has fallen sharply, decreasing by 20 percent in just the last three years.

Redrawing bus routes and overhauling schedules forces transit agencies to take a hard look at whether they're doing everything they can to serve their riders, Orcutt says. "It's a reflexive thing in the transit industry. If ridership goes down, the explanation tends to be that it's some sort of exogenous force: Gas is cheap, Uber came to town, whatever. But they don't look at whether their service is attractive to people. They don't look at what they can do, regardless of external forces," he says. "But now you're seeing the best of the transit industry looking at doing what they do better and trying to use the resources they have better."

Houston's new system increases high-frequency bus routes (shown in red), which brings more than 1 million Houstonians into within a half-mile of a route that runs every 10-15 minutes. (Metro.com)