Connecting the Dots

Linking bike share with transit — while considering equity issues — requires a big-picture approach.

Healthy Ride, Pittsburgh's nonprofit bike-share program, offers three pricing tiers: pay as you go and two different monthly memberships. According to research by the National Association of City Transportation Officials, offering short-term payment options promotes bike-share accessibility, especially for low-income users. Here, a woman checks in at a Healthy Ride station in downtown Pittsburgh. Photo by Bob Donaldson, courtesy *Post-Gazette*.

By Greg Griffin, AICP

Since Capital Bikeshare, the first bike share system in the U.S., launched (with a different name) in August 2008 in Washington, D.C., the concept has caught on like wildfire. More than 80 systems were operating as of December 2016.

This rapid growth has been enabled by communications technology and digital payment systems, which provide a quick check-out experience and funding for operations. And bike share's presence as a street-visible travel option has helped it grow — cities want what others have. Chicago's former Mayor Richard M. Daley famously fell in love with bike share after seeing Velib on Paris streets in 2007. (Chicago's Divvy program launched in 2013, two years after Daley left office.)

Bike share is also on the rise because it's an attractive option for cities looking to meet health and sustainability goals. A paper from the Sustainable Cities Institute of the National League of

Cities highlighted bike share programs in four cities, including Denver, which launched B-Cycle in 2010. "For Denver, bike sharing is a cost-effective means to reduce obesity and greenhouse gas emissions through affordable, alternative transportation, supporting goals outlined in the city's Strategic Transportation Plan and Climate Action Plan," the paper reads.

The environmental sustainability credibility of bike sharing is seldom challenged, but the expansion of the mode has raised questions about equity. Systems need to be financially stable to survive. But that financial sustainability is often best achieved by installing systems in areas where there are already riders who can afford it.

A recent study by University of Vermont researchers Julia Ursaki and Lisa Aultman-Hall examined differences in bike-share access by race and income in Arlington, Virginia; Boston; Chicago; Denver; New York City; and Seattle, and found that high-income areas are more often included in bikeshare service areas. Ursaki and Aultman-Hall recommended public subsidies for stations in low-income areas and education resources as a start to mitigate the problem.

New York's Citi Bike is one system that has worked through significant financial challenges while achieving a more equitable system. Citi Bike expanded in 2016 to go deeper into Brooklyn and Jersey City, New Jersey, with western Queens stations coming this year. "It's imperative that we continue to make these types of investments to meet the needs of those communities with limited transportation options," noted Rep. Joe Crowley (D-Queens, the Bronx) in a city Department of Transportation press release from 2015.

On the West Coast, San Francisco's Ford Go- Bike system will offer \$5 memberships and cash transactions for low-income residents. Meanwhile, GoBike is expanding its 700-bike system to serve more areas of the city, totaling 7,000 bikes by 2018. Clarissa Cabansagan, a senior community planner with a local non-profit called Transform, says that the investment in equity outreach for GoBike includes "the multilingual education crucial for increasing access to people of all incomes and backgrounds."

As planners develop new approaches to using bike share to address urban transportation needs, achieving a balance between equity and economic sustainability is crucial. Better planning for connectivity between bike sharing and transit modes offers at least one way forward.

A system-wide approach

But first, let's back up a bit by looking at bike share as it relates to other parts of the transportation ecosystem — namely, cars. City and regional transportation planners are increasingly being asked to develop ways of managing auto travel, whether it is to mitigate congestion, reduce household travel costs, or cut greenhouse gas emissions.

Bike sharing can replace short trips for any surface transportation mode, of course, but member surveys from Washington, D.C.'s Capital Bikeshare and Austin B-cycle in Texas suggest six percent and 25 percent of bike-share trips replace a car trip, respectively. A 2016 report from the Shared-Use Mobility Center, a public-interest organization based in Chicago, notes that "people who use transit and shared modes [such as bike share] reported lower car ownership and less driving, as well as increased physical activity and decreased transportation spending," which leads to a variety of benefits for individuals and communities.

Despite bike share's impact on driving's mode share, many transportation plans do not directly address the role of bike share. Instead, most systems are implemented by partnerships of

nonprofit and for-profit companies, often without a strategic vision to serve the community's long-term goals. Just over half of the systems reviewed in the Alliance for Bicycling and Walking's 2016 *Benchmarking Report* are supported with city funding. Smaller systems may need to rely on agency partners, coupled with solid long-range planning and significant political support to attract funding.

A more strategic approach requires reenvisioning bike-share systems as an integral part of a transit system — not just a mobility bonus. Coordinating bike share with other planned infrastructure, like transit stations, can better seize bumps in demand and visibility.

The financial piece is often a risk, especially for small or new systems that rely on grants and scant (and sometimes difficult to navigate) federal transportation funding streams.

Bike-share systems can partner with local governments, metropolitan planning organizations, and state departments of transportation to cooperatively develop a program, but this requires planning leadership and foresight. Other funding sources provided by states or transit agencies provide financial stability during a system's build-out phase, when they can be vulnerable to minor problems that turn into bigger challenges.

Integrating bike share as a transit service may turn out to be a supportive trend. Metro Bike, launched last July in Los Angeles, was implemented in partnership with transit agency, creating a system where users can use the same pass for transit and bike share, getting users one step closer to a seamless service. This makes it easier (and perhaps more fun) to reach transit stations. In LA and elsewhere, transportation officials see bike share as a way to help solve first- and last-mile transit gaps.

Bikeless in Seattle

In a surprise to many, Seattle's Pronto bike-share system was shelved, with operations set to close on March 31, 2017. Plagued by financial and other difficulties, the city's requirement for cyclists to wear helmets may also have inhibited use, many say.

Seattle Mayor Ed Murray announced in early January that the city would be redirecting expected local funding to bike- and pedestrian-safety projects, effectively ending the system as a city-supported partnership.

Growing to meet demand, but for whom?

Like many planning issues, when and where are critical questions for bike share. A bike-share program typically starts out serving a central business district with a large density of destinations — and, often, bike-friendly roads and trails. Expansion plans work outward from there, frequently considering connections with transit as a next step.

In the Washington, D.C., area, 64 percent of respondents to a member survey reported that at least one of the trips made in the last month started or ended at a Metrorail station. Almost a third took bike share to connect to Metrorail three or more times a month. But bus riders and heavy rail riders on the Virginia Railway Express or Maryland Area Regional Commuter use it less: 13 percent connected to bus, and six percent to commuter rail at that three-plus times a month frequency. That makes sense, since most bike-sharing systems serve only the downtown areas of commuter rail destinations, although expansions into suburban areas may change this trend.

Planners should consider bike share opportunities in more suburban areas, potentially replacing car trips and effectively increasing the catchment area of transit stations.

Researchers in this field are helping pinpoint where bike sharing and transit modes tend to work together and where they compete. Susan Shaheen, PhD, and Elliot Martin, PhD, of the Transportation Sustainability Research Center at the University of California-Berkeley, have done more work on this than perhaps anyone else. (See "Resources" to access Shaheen's PAS report on shared mobility.) They have found that bike sharing often replaces walking and transit trips in large, dense cities, essentially adding capacity to congested transit systems during peak hours. In suburbs and small to medium-sized cities, bike sharing can reduce the time needed for commuters to reach transit stations, which can lead to a complementary increase in both modes.

Expanding bike-share networks beyond commercial districts and affluent neighborhoods can also help with the equity question. According to speakers at a November 2016 panel at New York University's Rudin Center, siting stations at urban edges and in neighborhoods that lack transit service can provide increased mobility to low-income residents and communities of color. Panelists also mentioned some complementary efforts that help: namely, reducing the cost of enrollment for people in need and offering support for community efforts to promote bike sharing and cycling overall.

Participants at last summer's Better Bike Share Conference in Philadelphia discussed using these same ideas to improve bike share equity in Los Angeles, New York, Philadelphia, Washington, D.C., and other cities. One of the conference speakers, Tracey Capers, works with Bedford-Stuyvesant community members to support expansion of bike sharing into areas of New York City she calls "transportation deserts." She sees these as sites of opportunity, where people can save time and money by replacing two subway rides with a single bike trip, "connecting a whole community to jobs and services that they otherwise would not have been connected to." For many, it could be life changing.

Subsidized memberships for low-income users helps, too. Several systems do that, including Capital Bikeshare in Washington, D.C., and Chicago's Divvy. New Orleans's Low-Income Pass is only \$1.67 per month, or \$20 for a whole year. Atlanta's Relay bike-share system is hiring an inclusion program manager, tasked with developing a cash payment system and working with partners to reduce barriers and increase awareness for low-income people, communities of color, and others. In Boston, Hubway launched a subsidized membership program costing \$5 per year for qualified users, which accounted for 18 percent of their membership in 2014. Austin's B-cycle For All program also offers a \$5 per year membership to qualified low-income users, funded through the Better Bike Share Partnership and the Downtown Austin Alliance.

Since its launch in 2015, Philadelphia's bikeshare program Indego has grown to more than 1,000 bikes, 100 stations, and — as of November — over one million rides. Photo by Lora Reehling, courtesy Indego.

While there has been a burst of efforts to support equitable bike sharing, many of these programs are grant-funded. Planners are well-suited to look at the sustainability of these programs, such as through cooperative agreements with transportation agencies.

Monthly passes (rather than just annual memberships, which have a high upfront cost), cash payments, and per-trip rates can support bike-share growth among low-income users as well, according to a paper from the National Association of Transportation Officials. Such payment strategies "are intended to make bike share more convenient and attractive by making the pricing more flexible and highlighting bike share's inherent affordability."

Outreach matters, too. In Boston, a simple enrollment process, dedicated outreach staffing with community organizations, and marketing in multiple languages contribute to Hubway's success. Like-wise, focus group research done by Temple University ahead of Philadelphia's 2015 roll-out of its bike-share program, Indego, emphasized engaging diverse audiences. Images and messages should reflect the makeup of the community and appeal to local mobility needs.

Bike Share and Equity: What Operators Are Doing Right Now

In 2016, researchers affiliated with the Transportation Research and Education Center at Portland State University surveyed bike-share operators to find out whether (and how) equity is considered when making decisions about their systems. (Percentages below that do not total 100 percent are due to "Don't Know/NA" responses.)

N = Number of Systems

WHICH SYSTEMS HAVE SPECIFIC EQUITY STATEMENTS?

HOW IS EQUITY CONSIDERED IN THESE AREAS?

OBSTACLES AND SOLUTIONS

Over 80 percent of responding systems shared what they think are the key obstacles to bike-share participation for underserved communities in their cities, and TREC suggested remedies. Here is a selection.

Data source: Based on research published as: Howland, S., McNeil, N., Broach, J., Rankins, K., MacArthur, J., & Dill, J. (forthcoming). "Current Efforts to Make Bike Share More Equitable: A Survey of System Owners and Operators." *Transportation Research Record: Journal of the Transportation Research Board*.

This is the case in LA as well. Tamika Butler, executive director of the Los Angeles County Bicycle Coalition, reports that they are developing a "street team" to ensure their outreach is "culturally appropriate, linguistically appropriate, and really reaching people where they are."

Planners' role

So what can planners do to foster the advantages of bike sharing and transit? My own research with Ipek Sener at the Texas A&M Transportation Institute found that siting bike-share kiosks near transit stations may not be enough to encourage intermodal travel patterns in a population. An even bigger picture view is needed.

Bike sharing systems should be planned in conjunction with other modes in the region. In other words, a strategic approach is better than an opportunistic one. Simply relying on initiatives led by — and funded by — external sponsors means communities might lose the competitive advantage when seeking traditional transportation funding. Planners should leverage opportunities to insert goals that make bike sharing more accessible in communities' metropolitan transportation plans, transit plan updates, and urban transportation plans.

Consider other reasons for siting stations, too. Bike sharing serves many needs, providing quick access for shopping, dining, or exploring parks.

"Planners should look beyond the first mile ride and understand existing or needed bicycle facilities when deciding where to place [a docking station]," says Adrian Lipscombe, who worked on the Austin, Texas, system and is the principal of the design and planning firm Urbanlocity.

A Portland State University research team surveyed bike-share system owners and operators about their own approaches to improving equity, and found most consider equity across their programs: 68 percent include equity issues in siting stations, 72 percent consider equity in their fee structure and pricing, and 57 percent incorporate equity in their promotion, marketing, and outreach. Respondents mentioned cost to the users, accessibility to low-income communities, and outreach to be their most challenging barriers, with system funding and staffing levels also playing a role.

The Bike Share Station Siting Guide, developed by NACTO, can help planners work through a logical approach. Factors to consider, says Lipscombe, include the location of bicycle facilities, proximity to other stations, lighting, rider safety and comfort, crash statistics, and terrain. When working through siting options, she also emphasizes that stations need to interact with the real places and people impacted by system plans.

Data Connection

Open data systems make it easier for riders to plan and make connections between modes, like transit or ride sourcing through transportation network companies.

The North American Bike Share Association has developed a standard data format called General Bikeshare Feed Specification, which allows integration of bike-share data with online platforms to simplify multimodal trips. The format also simplifies analysis of the data for planning, and is being used to enable mobile payment and unlocking of bikes in some systems.

As of this writing, at least 49 systems were using the standard, including BIKETOWN in Portland, Oregon, Juice in Orlando, and even international locations such as Velonet in Prague.

What's next?

The more we understand about bike-sharing systems, the more we can do — including enhanced collaboration with local communities, better use of performance data, and more holistic planning with local and regional transportation agencies. There's much more to explore in terms of paying for it all, too, since traditional transportation funding sources have been relatively untapped for bike sharing. To this end, I propose the following planning framework for integrated bike share planning:

Assess Local Conditions and Publicly Identified Needs.

Public involvement, market assessment, and station location analysis can be done simultaneously. Citizen data, such as map-based surveys, can be combined with other intel, including GIS data.

Planners must first develop and conduct public outreach systems that take equity issues into account, by offering in-person engagement opportunities and online tools to meet a wide range of residents' preferences and digital access, for instance.

Draft Goals for Integration With Transit and Other Modes.

Transit agencies, city transportation departments, and state agencies may have different ideas about the role bike sharing can play, but collaborative goal development creates a shared understanding that could support funding and in-kind support for projects later down the road. For example, one straightforward, shared goal might be: "Bike sharing is accessible at [X number] of regional transit stations by [date]."

Some transportation agencies require a project to be included in their plans to be eligible for funding, so bike-share goals may need to be a part of multiple plans within a single region.

Develop Strategies With Partners.

Describe what needs to be done, by whom, and when. Transit agency strategies might focus on getting bike-share stations at a certain number of rail stations, while a city's strategies might center on offering access to an equitable distribution of the population. The planning process is the right time to work through potential conflicts.

Measure Performance and Keep the Public Engaged.

Bike sharing systems provide a wealth of data. Use that as a great foundation for public reporting of performance and to improve systems by identifying low-performing stations and changing needs of the city. Planners can ably translate the data results into meaningful stories that resonate with residents. The [APA Communications Guide](#) can help planners develop key messages.

Recognizing that solutions and good ideas don't just come from the professionals, Adrian Lipscombe stresses the importance of working with communities that might be experiencing difficult issues firsthand. "As planners, we must be willing to address to ... pedal what we

preach," she says. "Get out from behind our computers, talk with communities of color, ride our bikes, and see what it takes for people to get around their neighborhoods."

Greg Griffin is a researcher with the Texas A&M Transportation Institute and PhD student at the University of Texas at Austin. Discuss ideas about collaborative planning and active transportation with him on Twitter @gregpgriffin.

RESOURCES

The Bike-Share Boom: Part of CityLab's City Makers: Connections series, this website shows how quickly a great idea can spread when combined with the right technology. citylab.com/city-makersconnections/bikeshare

How to Build a Thriving, Equitable Bike Share System: Streetfilms, a nonprofit resource for films about sustainable transportation, teamed up with NACTO to ask 12 experts how to improve bike-share accessibility. tinyurl.com/znq3klx

Planning for Shared Mobility (PAS 583): www.planning.org/publications/report/9107556

"Shared Mobility and the Transformation of Public Transit": tinyurl.com/z3xsxao

"Planning for Bike Share Connectivity to Rail Transit" in the *Journal of Public Transportation*: scholarcommons.usf.edu/jpt/vol19/iss2/1

Live Global Bike Share Map: tinyurl.com/h2s7yny