REMAPPING DEBATE
Asking "Why" and "Why Not"

Public transit 101: read a "how to start a business" book

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May 22, 2013 — Visitors to the United States are often shocked by the paucity of robust public transportation systems in most of its cities. In many places, there is no public transportation system at all. In others, automobile travel remains a superior way to get around for many, if not most, types of trips.

Could a "jumpstart" of much more substantial and convenient public transit service convince car owners to give transit a chance?

Taking a bus to travel between two different dense and walkable neighborhoods in Pittsburgh, Pennsylvania's booming East End, for example, may require waiting 25 minutes or more (if, indeed, there is a bus route that connects a rider's planned origin and destination.)

Transit planners and advocates in the U. S. see such waiting times and other structural barriers to convenient service — hardly atypical — as a principal reason that, in most cities in the U. S. where public transit exists, it has not been more widely adopted either by potential riders (many cities, of course, have no public transit to speak of). In turn, evidence of low ridership tends to reinforce negative attitudes towards public transit.

Jeff Wood is the chief cartographer at Reconnecting America, an organization that advocates for improved public transit services and transit-oriented development in the United States. Wood told Remapping Debate that critics of transit investment argue, "Well, nobody uses transit, so why should we fund it?"

What doesn't seem to have been done very much by those thinking about the building and maintaining of public transit systems is to take account of a key characteristic in the birth and subsequent life of an array of other goods and services. It is costly to make an offering (like a restaurant meal or a mobile-phone app) sufficiently appealing to attract increasing market share, but the failure to invest enough toward presenting a desirable dining experience or an accurate mapping service to consumers guarantees that they *won't* adopt it. As such, companies understand that there is an initial period during which the hope of *future* consumer adoption means significant *pre-adoption* losses.

Could such a "jumpstart" of much more substantial and convenient public transit service (with an initial operating and capital "super-subsidy") convince car owners to give transit a chance, and result in greater adoption of public transit after an initial startup period (and thereafter return to a lower operating subsidy)?

How do you make it attractive enough in the first instance?

"A real truth is that all the transit agencies are incrementalists," Graham Currie, professor and chair of public transport at Monash University in Melbourne, Australia, told Remapping Debate. "They have no choice…They are hamstrung by lack of funding [and], politically, have very little power."

The result of such an approach is that "when tinkering around the edges of an existing system, [it] doesn't really raise you to the point…of beginning to form a [real] network, so you [have spent] extra money and nothing appears to happen [to ridership]," said Paul Mees, an associate professor of transport planning at Royal Melbourne Institute of Technology (RMIT University) in Australia. Critics of transit funding, Mees added, will look at such a result and say, "We told you so. We put an extra service at 3 o'clock on Saturday afternoon on [bus] route 274…and still nobody is using it!'"

In contrast, one way to build a public transit system that could result in substantial adoption would be to create significantly improved networks at the outset as "new products" that would then show people that public transit systems can function well.

> "You can't expect transformational change without sort of setting up the conditions so that people really see [public transit] as an alternative," said David Van Hattum of Transit for Livable Communities.

Venture capital firms and investors in startups know this intuitively. When a new product is being developed, depending on the industry, it may take years before a company sees a return on its investment. "You have to invest before you are going to get to a point where you are going to make money, and where you get to break even," said Ari Ginsberg, professor of entrepreneurship and management at New York University's Stern School of Business.

Companies and analysts call the rate at which a business launching a new product or service consumes cash a "burn rate." Yoav Farbey, the editor of the U.K.-based website, The Startup Magazine, told Remapping Debate, "In the beginning [of a company's existence], obviously your burn rate is really high because you are trying to get something ready for market, and then when it is launched your burn rate is still relatively high because now you are spending a lot to make sure that it fits the market." It is crucial, he added, for companies to understand the "minimum investment" that is needed to "make things work."

Dave Neal, the managing director of the Triangle Startup Factory, a supporter of early stage startup technology firms based in Durham, N.C., works with companies that are still refining their ideas and building products, and agreed that having adequate investment was crucial for long-run success. "The cases in which you have a business that is cash flow positive immediately are quite rare." Even after developing a product, he said, "You would expect to have some period of time where you would have to expend more money, perhaps a lot more money than you are taking in each month in order to get to your desired state of the business."

Businesses know, Neal added, that "it would take some time" to reach a "self sustaining point."

In an Internet company, much of the "burn" will go towards developing the new product; in other kinds of enterprises, the money may be spent heavily once the business is "open," as with a restaurant.

Regardless of how many people come to that restaurant on its first day, the business needs to have invested in all of things that are necessary to make it operate — produce, stoves, chefs, and waiters — and have a "minimal viable service" available.

A real risk for many smaller businesses, Dave Neal noted, is undercapitalization. "People start a restaurant," he said, but "they don't have enough cushion money in order to make it through the first 'x' months…one of the areas that they would be shorting would be investing in making their service as good as possible." Under such conditions it is possible that they will either fail or never reach their desired customer base.

> "We won't get radical change in the population until we can give people a competitive alternative" to using their cars, said Graham Currie.

David Van Hattum, the policy and advocacy program manager at Transit for Livable Communities, an organization that advocates for improved transit options in Minneapolis and St. Paul, Minnesota, told Remapping Debate, "How much are you going to invest in your restaurant to build a loyal, committed growing clientele?"

"You can't expect transformational change without sort of setting up the conditions so that people really see [public transit] as an alternative," he said.

"The old adage, 'you can't make money without spending money,'" Ginsberg added, could apply to expanding public transit, where such an investment wouldn't result in profits to a venture capital firm, the way a tech startup does, but "is acceptable in terms of social impact terms…because the government isn't making money on this, but the state will be and the country will be, and the focus of government is to enrich the society, of its people."

Applying the lessons to public transit

If a cardinal rule of seeking consumer share is to make the product attractive in the first instance, public transit decision-making appears to have violated that rule almost everywhere in the U.S.

The principles that make a transportation option attractive to use are precisely the features absent in many cities in the U.S. where public transit operates, and, perhaps more importantly, absent from many attempts to adopt new systems.

"The three key things" for keeping and attracting ridership, said Graham Currie of Monash University, are, "No.1: service frequency. No. 2: service frequency. And you will never guess what no. 3 is."

In many places low frequency "is a hindrance," said Jeff Wood, because if a local bus "doesn't come that often" — say, every 15 minutes, at least — "then you are not going to take it, you are going to buy a car and hop in and go whenever you want to go."

A related problem in American cities is that public transit networks don't go to a sufficient number or variety of destinations, so taking some trips by public transit would be impossible, not simply impractical. Historically, public transit systems have been oriented in a "spoke" arrangement emanating from a city's central business district, but as commercial centers have grown on the peripheries of cities, such service doesn't always meet people's needs. "If you have a region where people live near transit, but they don't work near transit," Stephanie Pollack, associate director of research at Northeastern University's Dukakis Center for Urban and Regional Policy, told Remapping Debate, public transit "is not going to provide a high percentage of trips."

Reducing "burn rate" and thinking about other subsidized transportation options

None of the planners or advocates Remapping Debate spoke with for this story believed that the gains in ridership that could be catalyzed by more substantial "jumpstarting" of public transit service would *eliminate* the need to publicly subsidize those systems. But, several people said, a dense and robust network that was more broadly adopted by the public could, over time, *reduce* a system's "burn rate" from its initial level.

Paul Mees, of RMIT University, said that as a dense network attracted many more riders, the fare box recovery rate (a measure of the amount of operational costs paid for by a customer's fare) would also rise closer to the levels achieved in some well-run European systems because the initial increase in service, though dramatic, would be smaller than the subsequent increase in the number of trips taken on the system.

Currently, the most dense public transit networks in the country are correlated with relatively high fare box recovery rates. For example, approximately 57.7 percent of New York City Transit and 36.4 percent of Southeastern Pennsylvania Transportation Authority's (SEPTA) Philadelphia buses, trolleys, and subway costs are paid for by rider fares. By contrast, the very high rates of public transit usage in Zurich, Switzerland yields a recovery rate that approaches 65 percent.

Less complete public transit systems have recovery rates that are substantially lower. The Port Authority of Allegheny County, which runs public transit service in Pittsburgh, Pennsylvania, for example, has a recovery rate of just 25.1 percent despite charging the same fare as New York City Transit.

(Such recovery rates are also dependent, of course, on the size of the fare. Los Angeles' Metro charges $1 less per trip than does New York City Transit, and has a fare box recovery rate of only 27.6 percent.)

Public transit is not the only mode of transportation, though, that is subsidized: automobile infrastructure is also subsidized, though the subsidy "is more obvious for transit," said Stephanie Pollack of Northeastern University.

Part of the reason why public transit's subsidy is more visible and why public transit appears expensive is that the "cost of running…a bus system, includes the vehicles, the fuel, the stops, the stations, and everything. It is the total system," Todd Litman of the Victoria Transport Policy Institute told Remapping Debate.

In contrast, Litman said, since users pay for cars and fuel; businesses build and maintain parking lots; and governments construct and rehabilitate roads, only the last infrastructure element is considered subsidized. "When you do a total cost accounting…[including] roads, parking facilities, and vehicles, public transit is often far cheaper" than automobile usage.

And that is "not even paying attention to the environmental benefits [of public transit]," Litman added.

Even if a system is set up to allow movement to many non-central business district locations, "It is amazing how close you can get to city centers in the states and have systems where transferring is still a nightmare," said Paul Mees of RMIT University.

Tallahassee, Florida, for example, recently redesigned its transit network to serve suburban destinations more easily, but, because the change was required to be "budget neutral," the system still suffers from "infrequent service [and] you have long wait times at transfer locations," a situation that has "hampered" its success, according to Jeffrey Brown, an associate professor in the department of urban and regional planning at Florida State University.

Ultimately, public transit in the United States "is not very good," said Graham Currie. "So why should people use it?…We won't get radical change in the population until we can give people a competitive alternative."

The network effect

The approach to transit advocated by Mees, Currie, and others — not thinking simply in terms of individual lines but upgrading the public transit network as a whole, to the point where people can transfer easily — relies on the idea that the value of a technology increases substantially as more people and places are in the network. "When you have a critical mass," Currie said, "behaviors change." (The revolutionary potential of the telephone, for example, was only realized after a certain number of telephones existed.)

If the "network effect" is applicable to public transit, that means that until a dense web of routes with frequent service of routes is present, behaviors will not change, and widespread adoption will not occur. "A car will go everywhere, and a transit system has to compete with that," said Currie. In order to get widespread adoption of transit, he explained, "We have to create a product: *a network*…and that means it has to go everywhere."

> "A car will go everywhere, and a transit system has to compete with that," said Graham Currie of Monash University.

"Where public transit is relatively convenient and fast and comfortable and affordable, you do see pretty high ridership," Todd Litman, founder and executive director at the Victoria Transport Policy Institute, an independent transportation research organization, told Remapping Debate, "and you do see growth in ridership."

Not every place need look like New York City — which currently accounts for almost a third of the 10.2 billion public transit trips taken annually in the United States — for a system to be competitive with automobiles. Zurich, Switzerland alone, with just a metropolitan area of 1.9 million (about the same population as the Columbus, Ohio metropolitan area, if somewhat denser) — clocked some 542 million passenger trips in 2007 on its network. Within the city proper (population: 380,000), some two-thirds of all workers commute by public transit.

The Zurich model relies on a system that combines very high frequency service in the city that is "time-table-free" for riders — meaning that it is unnecessary for riders to consult a schedule, as the next bus or tram is understood to be on its way soon — and a "pulse" schedule for suburban and rural routes. In the latter areas, where timetable-free service is not offered, there are easy-to-remember departure times (every twenty minutes, at seven, 27, and 47, minutes after the hour, for example) and near seamless transfers to other services in the network.

Isn't that expensive?

"We require strong government subsidies to get to [the] appalling service levels we have now," said Graham Currie of Monash University, but it turns out "that you actually get higher patronage per kilometer when you provide more kilometers." The largest systems in the United States, for example, tend also to have the highest "fare box" recovery rates, a number dependent on the actual fare, but which suggests that systems become more sustainable when they provide better service in the long run.

With a high quality system in place, at least initially, it will have a high "burn rate." "For the first couple of years you will need some temporary subsidies to pay for the fact that it will take a while for the fare revenues to grow, yes, that is true," said Paul Mees of RMIT University. The payoff, however, will be a system that people actually *want* to use, providing "something equivalent to the convenience of the car."

"I think a truth is we have a pretty good ideas about how we could increase ridership, but increasing it cost effectively within our existing political environment is a huge problem," said Currie. "We get the outcomes" — low transit usage and high car ridership — "that result from that."

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