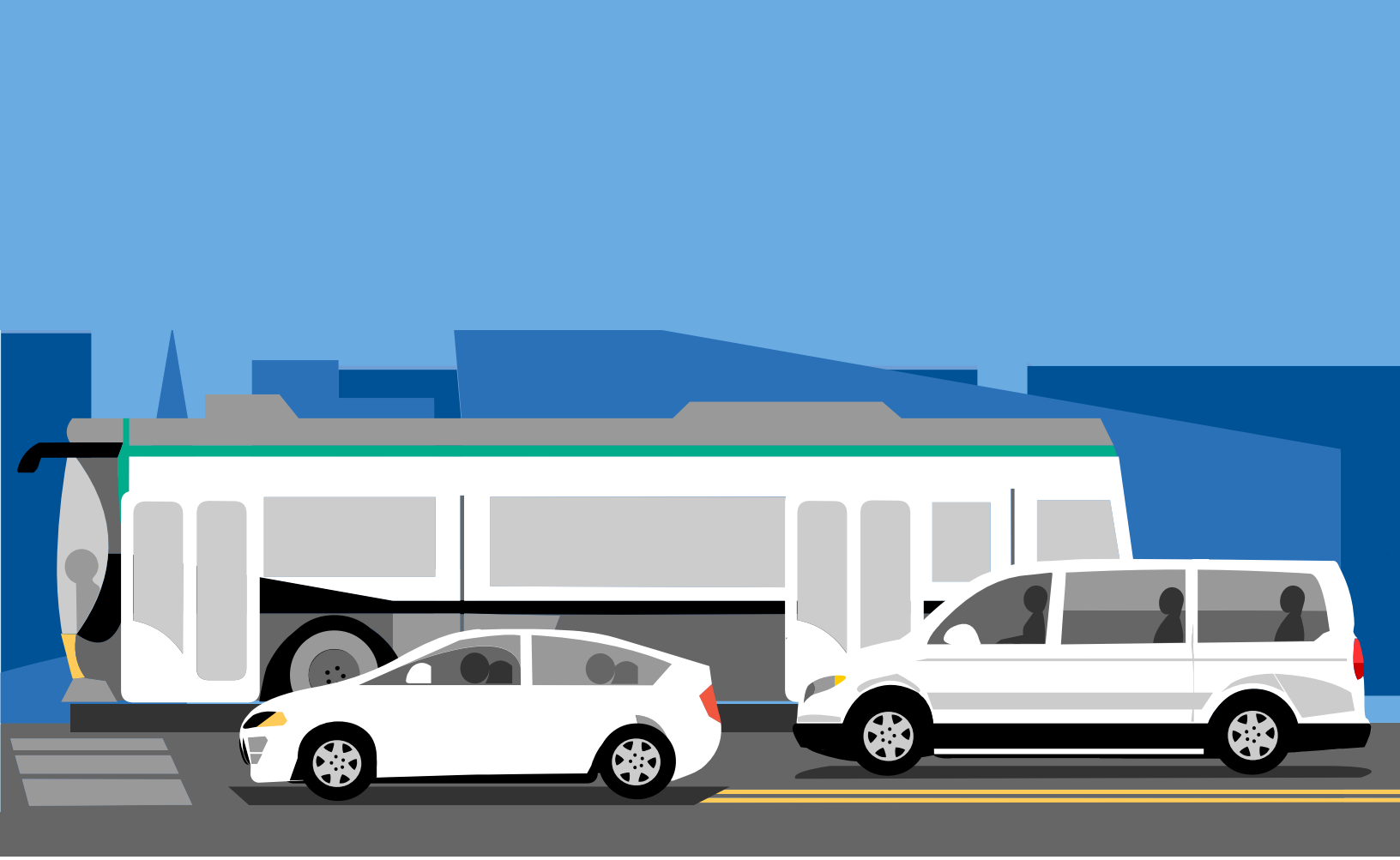

Transit Horizons

Towards a New Model of Public Transportation

How Uber is offering public transportation agencies new tools to operate more efficient, connected and equitable mobility networks

Uber | Routematch

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Part 1
Introduction

Public transportation is the vital backbone by which cities and towns move. Globally, more people rely on public transportation than they do on personal vehicles. Efficient public transportation enables cities and towns to flourish by providing mobility for essential workers, older adults, people with disabilities, those who forgo car ownership by choice or by circumstance, and is the only available option by which millions of people access economic opportunities. Without efficient public transportation, cities would grind to a halt.

And yet public transportation today is facing a very challenging environment. Consumers are demanding higher quality and more dynamic services together with integrated digital experiences. Agencies meanwhile are expected not to leave anyone behind. Adding to the challenges, the COVID-19 crisis has decimated ridership, funding sources have evaporated, and the recovery is progressing slowly. Against this backdrop, the need for public transportation agencies to evolve and innovate on their service delivery model has never been higher.

The good news is that agencies today have access to new tools, new technologies, new supply modes, **and new business models** to plan, deploy, and optimize a new type of public transportation system. This system has the potential to offer a more equitable service, at a lower cost for agencies, while delivering a better experience for riders.

The role of public transportation agencies is also changing as they shift their capabilities from operating transportation to increasingly managing mobility. Agencies will increasingly have to evaluate, contract, integrate, and then manage the right portfolio of products and partnerships - both physical and digital - to get to the right system solution for their specific needs. At the same time, network planning should take into account the new modes and technologies that agencies have at their disposal.

Our goal with this paper is to establish the strategic foundation for how we at Uber expect public transportation to evolve over the coming decade. While our perspectives and data analysis is based primarily on the US market, we believe many of the concepts we describe have the potential to be applied globally. We also share an overview of Uber Transit, a division of Uber exclusively focused on serving public transportation where we describe our strategy and product portfolio. We explain how Uber Transit offers public transportation agencies new tools to operate more efficient, connected, and equitable mobility networks. In subsequent papers and publications, we will share additional content on our case studies, policy positions, and implementation approaches in more detail. For readers looking for an executive summary of the content in this paper, we recommend you read the conclusion in part 6.

Uber Transit is committed to serving our communities and cities by making our technology, our app, our network, and our expertise available to public transportation agencies to use as their own. We hope this perspective will spur further discussions and we welcome your feedback.

“We look forward to strengthening our partnership with public transportation so that together we can bring safe, sustainable, and equitable movement and opportunity to as many people as we can, in communities across the world.”

- **Dara Khosrowshahi**, Chief Executive Officer, Uber

Part 2
Public Transportation 2030 Vision

We believe that public transportation is well into the early stages of a massive transformation that will play out over the course of the next decade. At the highest level, we see public transportation systems transforming from decentralized networks, where different modes can often operate in silos, toward a system that is truly integrated, connected, and optimized in a highly agile way.

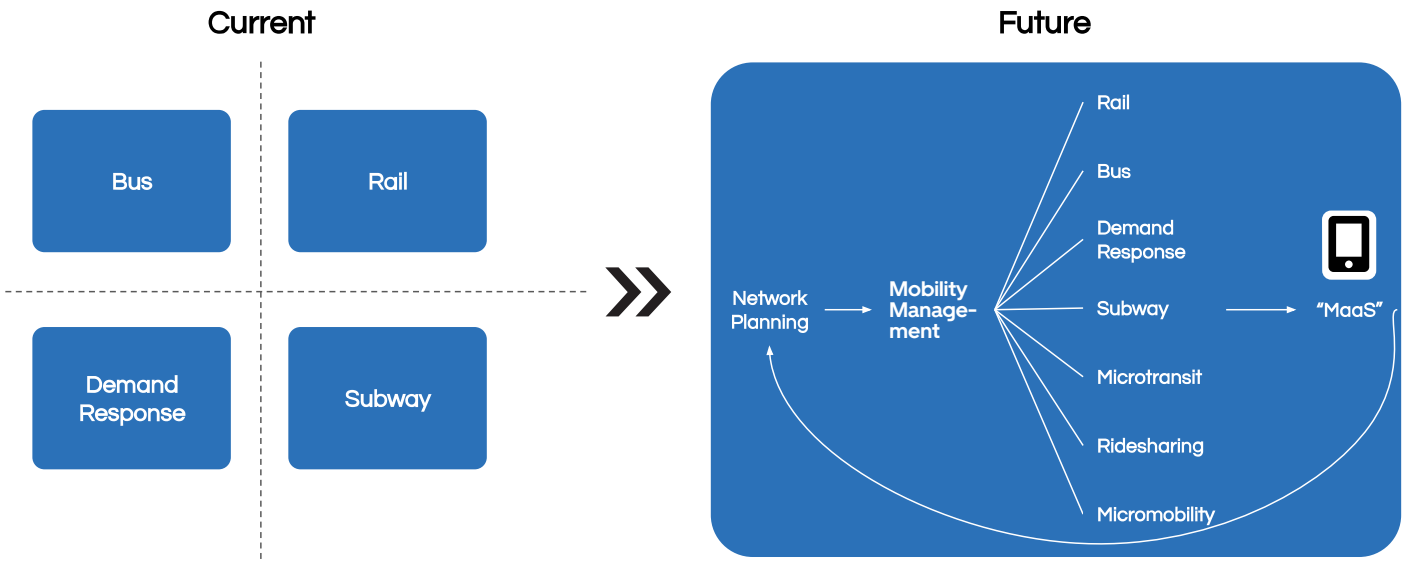
Today, leading agencies take a network view but many agencies still plan and manage public transportation operations in silos - often unable to consider the network holistically to optimize for the journey rather than the mode. Network planning, routing, and dispatching operations must become increasingly connected, centralized and optimized across modes of transportation. Network design will become more frequent and will leverage the latest analytical approaches to overlay new modes on top of the existing public transportation network. Agencies will have real-time visibility across the entire public transportation system, providing them the agility to make changes as disruptions arise, and eventually automating many parts of the planning process through integrated data that considers system-wide implications.

On the rider side, users will plan, book, pay for, and access their trips across any mode - both public and private - via Mobility-as-a-Service (MaaS) apps. Rewards, bundles, and mobility subscriptions will follow shortly thereafter.

Furthermore, the number of modes that form the fabric of public transportation will continue to increase. The mainstays of bus and rail will remain at the core of public transportation, moving large numbers of people along dense urban corridors. These modes will be complemented by the addition of microtransit, ridesharing, and micromobility modes which will gain an increasing share of the public transportation supply mix. The addition of new modes with a variable cost structure like ridesharing and the proliferation of on-demand services will unlock new optimums of efficiency and lower cost structures for public transportation agencies. This transformation will also offer agencies more opportunities to improve the equity, accessibility, resilience, and flexibility of their networks.

Figure 1

Public transportation systems will become increasingly integrated and connected with new modes in the mix



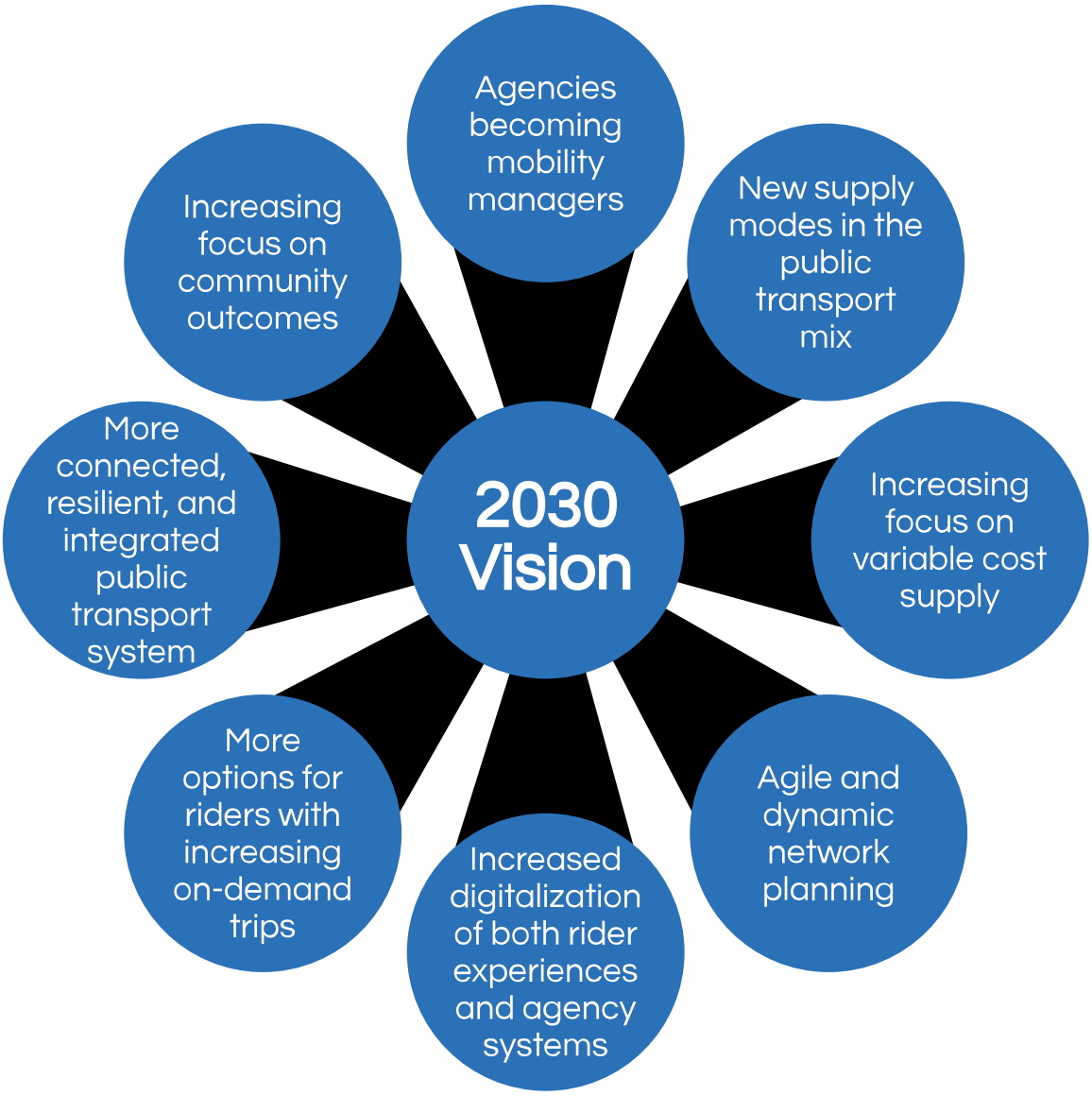
Siloed public transportation systems by mode.
Mostly fixed cost, fixed schedule.

Single highly integrated system with more modes.
Fixed and variable cost, fixed and on-demand schedules.

New technologies and new business models that are available to both consumers and agencies are enabling this transformation. Adoption is still in its early stages but will dramatically accelerate in the years to come. Not every innovation or solution will be applicable to every agency. The right mix of solutions will differ by location - what highly dense cities need will surely be different from what small towns require. Some pilot programs may fail while others succeed. However, agencies that adopt the right mix of solutions will experience an improvement in service quality and community outcomes while increasing equity, accessibility, efficiency, ridership, resilience, and lowering operating costs.

The future is bright and we expect public transportation to look significantly differently in the next 10 years than it does today. Below we describe the changes we are already seeing.

Figure 2
Major trends shaping public transportation in the next 10 years



equals

- **Improved equity and access**
- **Increased ridership**
- **Better customer experience**
- **Lower operating costs**
- **Higher resilience**
- **Improved flexibilty**

Agencies becoming mobility managers

Many public transportation agencies see their roles expanding well beyond just running traditional services such as bus and rail service. They increasingly view themselves not just as transport operators but as mobility managers; and with good reason.

The role of mobility managers is to orchestrate the overall mobility network to deliver a set of desired outcomes. As mobility managers, agencies pick and choose the optimal mix of modes, technologies, and providers - and decide what to do in-house and what to outsource. The capability set required to manage mobility is different from that required to operate transport. Managing mobility requires new skills across analytics, data science, technology integration, procurement, vendor management, and stakeholder engagement.

Under the mobility management approach, agencies have the mandate to introduce new innovations, improve services, and to lower costs in ways that pure transport operators cannot achieve.

New supply modes in the public transportation mix

Bus, rail, and subways have dominated public transport for the last 80+ years. Those modes are here to stay - simply put, there is no more efficient alternative than high-demand trunk lines on fixed routes to move a large number of people along dense corridors.

But public transportation agencies may also choose to serve areas where travel patterns do not allow them to efficiently provide vehicles with capacities of 40-80 passengers at frequencies that riders find useful. The result is that, in such areas, we see routes with headways of one hour or more or highly inefficient routes that require large subsidies.

The good news is that public transportation agencies have new modes and services at their disposal to integrate into their networks. In many cities around the world, on-demand microtransit, ride-sharing partnerships, and even bikes and scooters are already becoming a part of the fabric of public transportation.

Having an expanded range of vehicles with different capacities, accessibility options, and cost structures will allow mobility managers to match the right vehicle with the right passenger at the right time.

When integrated strategically, new modes can deliver an expanded public transportation network and a better mobility experience for riders. By thoughtfully distributing these modes across their networks, transportation agencies can improve equity, lower costs, increase resilience and provide more flexibility than conventional modes alone.

Increasing focus on variable cost supply

The cost structure of public transportation, similar to airlines, is largely fixed. Whether they operate at 90% or 5% capacity, agency-owned vehicles have a cost per supply hour that varies little, if at all.

In low-ridership environments, such a rigid cost structure may limit an agency's ability to provide high quality service. By supplementing variable cost supply to their mix, public transportation agencies can become more efficient as well as more resilient to sudden drops in demand.

One example of variable cost supply is ridesharing. Agencies are contracting with Uber for technology solutions to support various programs including first and last mile programs, guaranteed-rides-home, microtransit programs, late night programs, and paratransit service to name a few.

In these partnerships, agencies create mobility programs to pay only for completed ridesharing trips their customers take in a pay-for-perfor-

mance model. These programs are particularly well suited for low-demand areas where it is too costly to run a bus or a rail line.

Under such a model, agencies are building more resilience into their networks. When ridership drops, agencies experience a corresponding drop in spending, thereby reducing costs when they need it the most.

Agile and dynamic network planning

Comprehensive network planning and redesign is currently a labor-intensive and infrequent process. Data collection and analysis, together with long-term forecasting of travel demand, requires substantial time and resources to derive insights. Ongoing urban development coupled with changes in demographics and/or rider behavior may diverge materially from the assumptions underpinning the original design of a public transportation system. This can result in a transportation network that is not optimized for the community it serves.

We see a future where public transportation agencies regularly and proactively re-examine their networks. Network redesigns will become more frequent, integrating new modes, like microtransit and ridesharing, that have not traditionally been considered at scale. Agencies will start to assess the merits of all modes at their disposal across their full network to determine the optimal mix of services.

Network design will become even more deeply rooted in comprehensive travel data, advanced analytics, and real-world frequent experimentation with strong feedback loops. Rather than completing a network study once a decade or less, the leading agencies will make network optimization a core and continuous process. Getting to that optimal configuration will not happen in one go, it can only be achieved through ongoing iteration. Flexible and on-demand services together with mobility apps will lower the costs of experimenting quickly and affordably.

The longer-term trend is that public transportation agencies will be empowered to redeploy dedicated assets like buses, eventually even in real time, to where they will be best utilized. This is only possible with on-demand services at their disposal to fill gaps so no rider is left behind. Riders will merely have to plan and book their journey via an app or call center to be directed to a bus stop one day, while the next day a microtransit van may pick them up instead because that bus has been redeployed to a different route.

We think that a more frequent optimization and experimentation approach to network planning will result in a better mobility network for riders and agencies. This will ensure that the right vehicle is matched to each rider at the right time.

Detailed and timely ridership data, in conjunction with dynamic long-term forecasts, will inform the optimal network on a monthly, weekly, or even daily basis. By better matching the network to actual travel demand, we believe public transportation can reverse the trend of declining ridership and expand its mode share compared to private vehicles in the years ahead.

Increased digitalization of both rider experiences and agency systems

Today, public transportation spending on IT and technology is a fraction of what digitally native companies spend. Many processes remain analogue which sometimes results in an inefficient and sub-par user experience for both riders and agency staff.

For Riders, planning, booking and paying for trips across public and private modes is complicated and cumbersome. Navigating multiple apps, calling-in 24 hours in advance, locating kiosks, loading smartcards, paying with exact change, managing transfers - it can be an overwhelming experience.

Mobility-as-a-service (MaaS) will allow riders to plan, book, and pay for their complete multi-leg journey across both public and private modes,

all within a single app. From seamless multimodal trips with a single payment to booking paratransit trips on-demand, riders should be able to access all their services from within one app.

For agencies, operational systems and processes too will benefit from increased digitalization. From digital network planning to modern fare collection and ticketing systems to mobility apps, agencies will need to systematically evaluate where to invest in digital transformation. The good news is that many technology companies are building compelling products and services specifically for the public transportation market. Agencies can lower IT costs by going with off-the-shelf products rather than investing in custom or home-grown developments. And while the current fiscal environment makes incremental investments in technology difficult to fund, those agencies that invest in digital transformation today, will be the ones that will have among the most efficient, connected, and customer-centric public transportation networks in the near future.

More options for riders with an increasing share of on-demand trips

The convergence of new services like ridesharing (including pooled trips), and microtransit together with the shift towards MaaS will give consumers better choices for how to get from point A to point B at the touch of a button.

For example, most paratransit trips today require call-in booking 24 hours in advance. This allows dispatchers to plan complex route schedules in a nightly batch computation to match supply and demand given their fixed fleet size. With the seamless integration of microtransit and ride sharing service for paratransit trips, consumers can request their trips in real time. This would unlock new mobility and freedom for riders while also lowering costs for agencies.

As agencies implement larger fleet sizes and bigger service areas, on-demand microtransit can become a more useful service for more people as wait times decline while use cases increase. This should induce demand for the service which will boost ridership. Integrating ridesharing service with pooling (a variable cost structure for the agency) together with microtransit (fixed supply, fixed cost) will allow agencies to right-size their fleets to maximize utilization and cost recovery while using ridesharing service as flexible supply for "peak shaving"[1]. We believe this will create a virtuous cycle of increasing ridership while lowering the average cost per trip, which is still too high in many microtransit pilots today.

By adding ridesharing into the public transportation mode mix at the right times, agencies can deliver a better mobility experience for riders while also counterintuitively lowering average cost per trip.

More connected, resilient, and integrated public transportation system

The culmination of the trends described above - the integration of new services, new cost structures, new ways of agile network planning, and the development of MaaS and connected backend software systems presents a huge step-change improvement for how public transportation will be managed and delivered to consumers.

The result will be a better mobility network - better options for riders, better service delivery, more resilience to demand fluctuations, with higher efficiency and lower costs for agencies.

And while creating an integrated operating system for public transportation will take years, there are steps that agencies can take today to deliver on many of the benefits we describe above.

Agencies can start realizing many of the benefits of such an integrated mobility system using existing tools and technologies. And these tools and technologies will only get better over time following typical technology development iteration

[1] Peak shaving is the ability to offload trips to the Uber network when agency vehicles cannot meet the level of demand or the wait times for the rider are too long. See "Our approach to microtransit" below for a deeper explanation of how this works.

cycles, with early-adopting agencies more equipped to capitalize on these improvements. The time for agencies to start taking bold actions is now.

Increasing focus on community outcomes

Lastly, among all the talk about transformation and efficiency, we would be remiss if we don't remind ourselves of the true purpose of public transportation - to connect people with their communities and economic opportunity conveniently, safely, sustainably, and equitably.

Here too we see room for innovation. The tools we now have at our disposal allow us to deliver micro-targeted mobility solutions down to the individual level if we so chose. We are also not only constrained to moving people - we can now also move things to people such as prescription medicines, food, and packages, supporting local commerce in the process.

We think this will allow public transportation agencies to re-think their key performance indicators (KPIs) and metrics for how they chose to measure success. We could begin to measure public transportation's impact and performance in new and incremental ways - considering access to jobs or healthcare, measures of a network's equity, the economic output public transportation enables, and even social outcomes in select communities.

Because we can deploy hyper-targeted public transportation solutions and we can couple those offerings with better data tracking, we think agencies will have a new way of measuring impact and outcomes of that which matters most - people.

Part 3

The economic case for integrating ridesharing services as a new mode in public transit

Executive Summary:

- Most public transportation systems are subsidized and have a predominantly fixed cost structure for each mode or vehicle (similar to airlines). Ridesharing meanwhile, when integrated in public transportation, has a variable cost structure where agencies only pay for completed trips.

- For the vast majority of trips, conventional public transportation is very efficient at moving many people from A to B at low cost. However, when demand is low and during off-peak hours, conventional modes often face very high costs per trip while riders suffer from longer access times and reduced frequencies.

- Agency-subsidized ridesharing service can be a highly effective solution to complement public transportation (e.g., first/last mile programs) or to enable agencies to reallocate resources from inefficient bus routes and demand response services. This can help agencies reduce their costs while increasing the overall accessibility of the network.

- The cost-optimal mix of ridesharing services differs agency by agency and requires analysis to determine the optimal mix and cost reduction potential.

- Using a sampling of publicly available agency route performance reports from the United States, we estimate that ~1-6% of bus trips could be replaced by ridesharing at a cost reduction for agencies (based on Uber Pool pricing and pre-COVID ridership levels). These trips represent ~5% to 25% of all bus routes. Agencies can expect cost reductions per trip of ~15-30% on inefficient routes that are replaced with Uber Pool (assuming ridership remains constant).[2] Using UberX pricing, which is higher than Uber Pool, we estimate that only 0.1% to 1% of bus trips (at pre-COVID ridership levels) could be replaced by ridesharing at a cost reduction for the agency. These trips take place on between ~2% and 13% of the available bus routes.

- Using a sample of 10 agencies of different sizes from the National Transit Database, we estimate cost per trip reductions of between ~13% to 70% from leveraging ridesharing services like UberX for ambulatory demand response trips. In markets where Uber Pool is available, we have found the cost reductions per trip could be higher than 70% on average.

[2] These cost savings do not capture the costs associated with providing wheelchair accessible vehicles (WAV) for non-ambulatory trips.

- In the current COVID environment where ridership is significantly depressed, the cost-optimal mix of ridesharing has increased. At one large US agency, bus ridership had declined ~67% in the spring of 2020 compared to the same period last year. Based on pre-COVID ridership levels, UberX would have been cheaper on ~1% of trips and 13% of routes. In late spring 2020, that increased to 23% of trips and 73% of routes. The estimated cost reductions for the agency on affected routes were in the 26-30% range assuming ridership remains at the same levels.

- Adding ridesharing services to the public transportation mix not only has the potential to lower operating costs for agencies but also empowers agencies to increase access and equity throughout their service area, reaching areas previously underserved by the existing fixed-route system, and builds resilience in public transportation networks to handle fluctuations in ridership. The exact cost-optimal mix will vary by mode and by agency.

> “The biggest innovation of incorporating ridesharing in public transportation is not offering consumers an on-demand service, it’s about giving agencies a new supply mode with a variable cost structure that can serve the many low demand routes more affordably while also increasing equity and access.”

The state of public transportation subsidies in the United States by mode

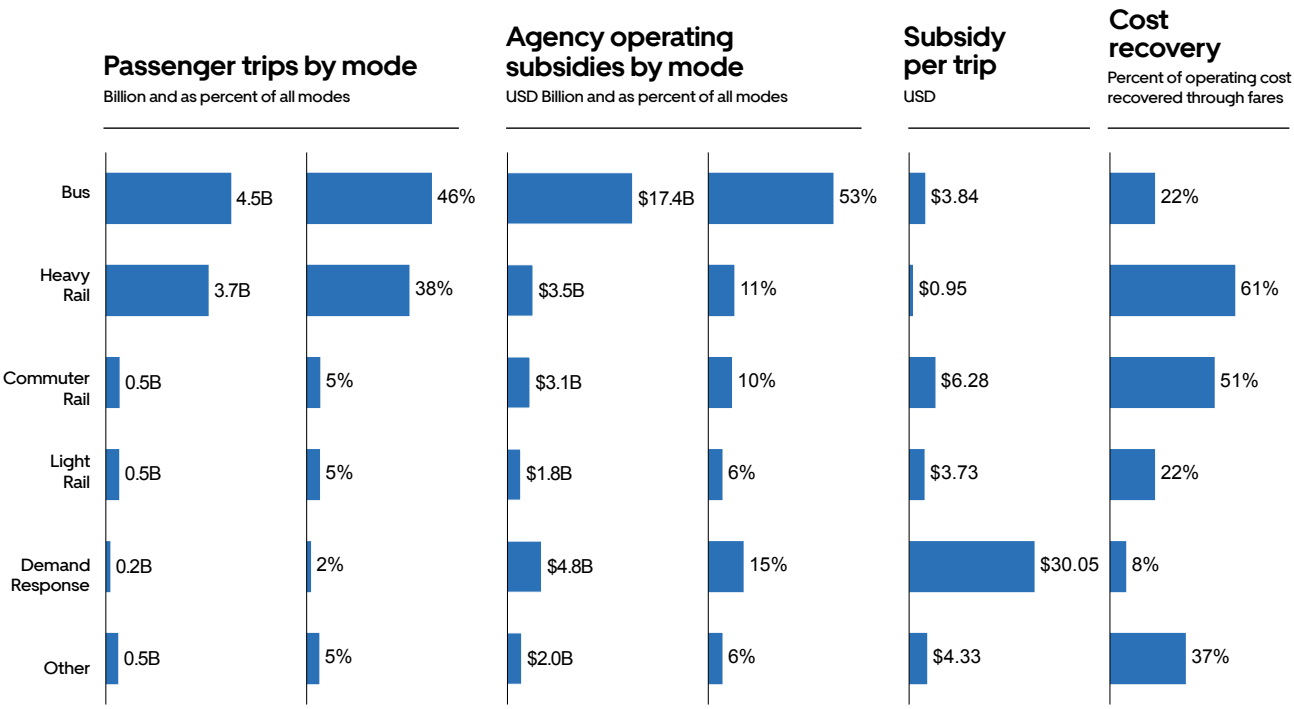
In many parts around the world, public transportation is highly subsidized by the government and for good reasons. According to the 2018 data from the National Transit Database, public transportation in the United States delivered ~10B passenger trips across all modes. Overall operating subsidies[3] amounted to ~$33B or ~$3.31 per passenger trip with an average cost recovery ratio[4] of ~33% across all modes.

By mode, bus accounted for the largest share of trips (4.5B or 48% of all trips) and had an average cost recovery ratio[4] of 22%. Heavy rail had the best economic performance with a cost recovery ratio of 61% while accounting for 40% of all trips. Demand response was the most expensive and subsidized mode with an average subsidy of ~$30 per trip. Demand response accounted for 2% of trips but 15% of the overall operating subsidies in the US.

[3] Defined as total operating expenses less total fare revenues

[4] Cost recovery ratio is the percentage of operating expenses that are paid for by fare revenues.

Figure 3
An overview of public transportation subsidies in the United States by mode



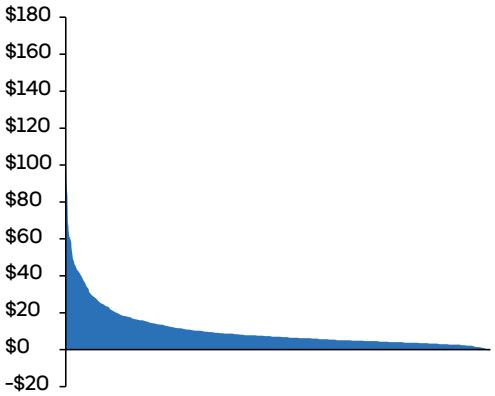
Source: National Transit Database - 2018 data

This data can be further dissected by agency, by route, and even by time of day. Looking at the subsidy per trip at the agency level, we see a large distribution in subsidy per trip across agencies.

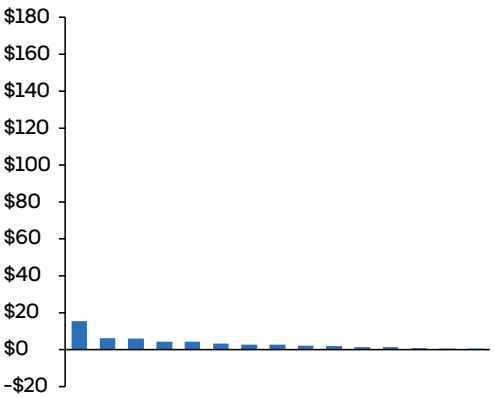
Figure 4

The distribution of public transport subsidies per trip across agencies in the US

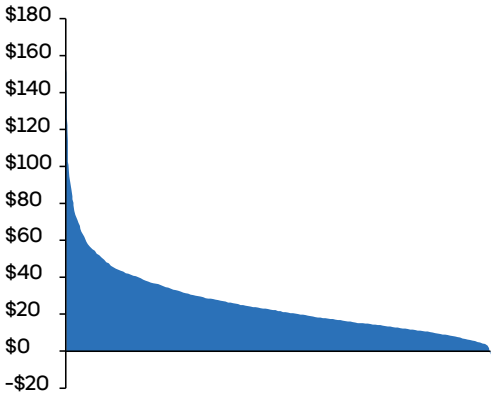
Subsidy per trip - Bus
USD
n = 1,242 agencies



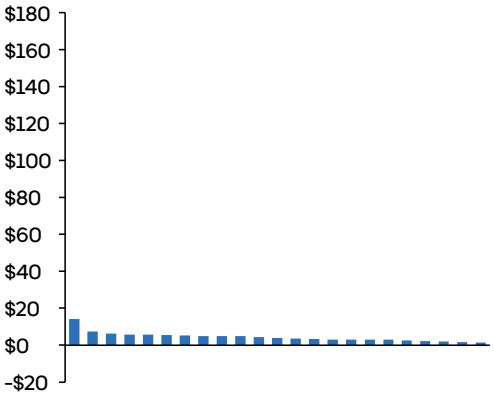
Subsidy per trip - Heavy Rail
USD
n = 15 agencies



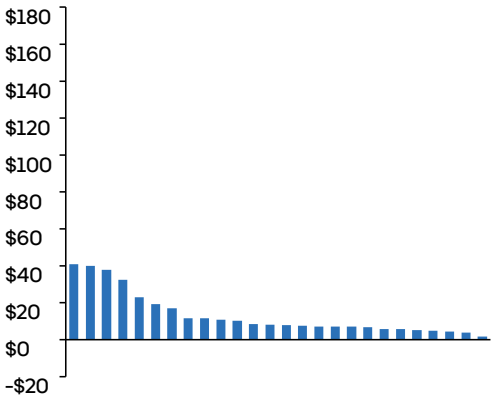
Subsidy per trip - Demand Response
USD
n = 1,998 agencies



Subsidy per trip - Light Rail
USD
n = 23 agencies



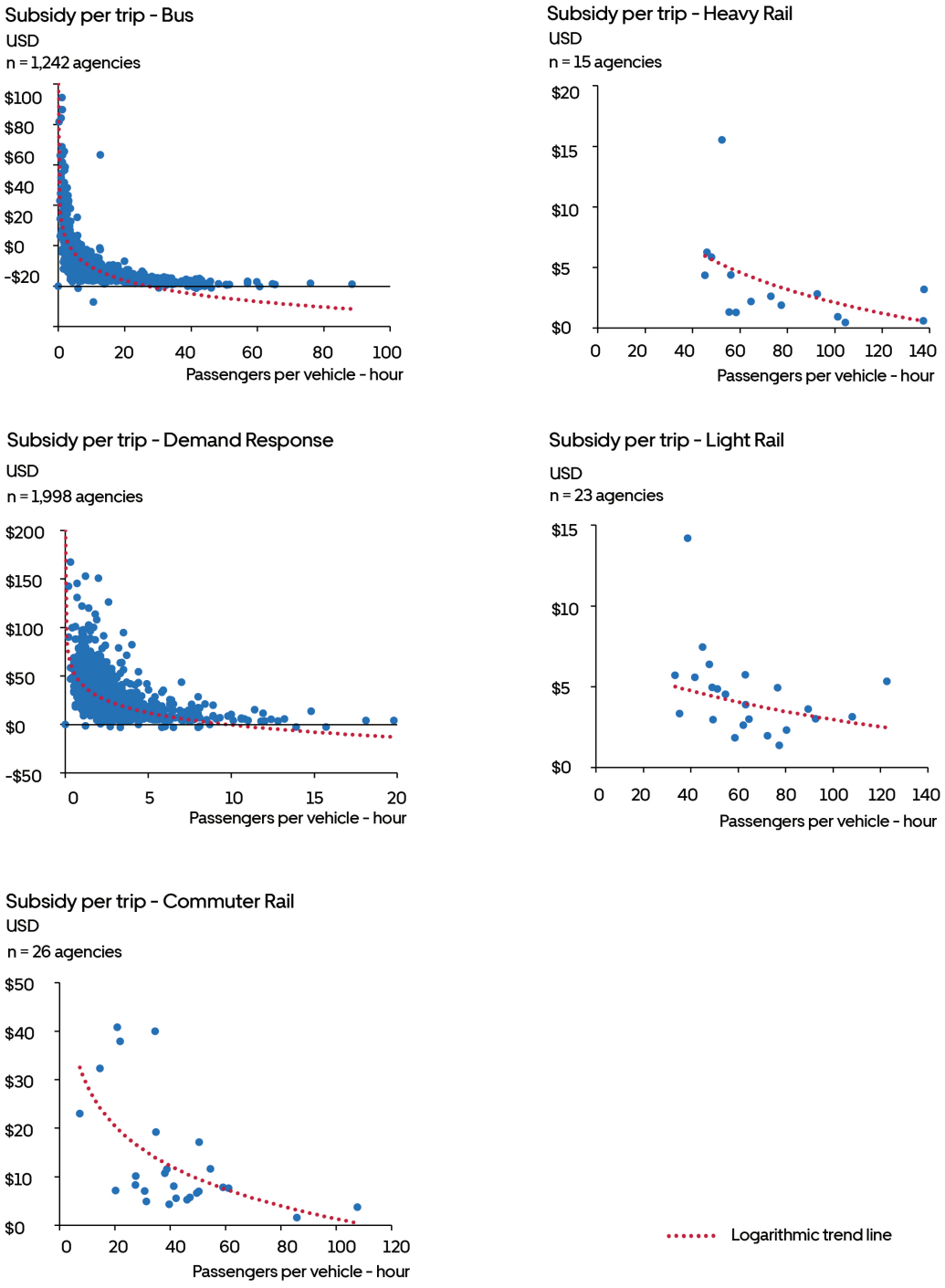
Subsidy per trip - Commuter Rail
USD
n = 26 agencies



Source: National Transit Database - 2018 results

We further see a strong correlation between average subsidy per trip and the overall level of ridership per vehicle hour. The higher the density on a given route, the better the performance. However many agencies also deliver service in areas that lack density - the result is high operating costs on a per trip basis. This can further compound the problem of low ridership as agencies are forced to offer less frequent or reliable service in those areas.

Figure 5
The relationship between ridership and subsidies per trip



Source: National Transit Database - 2018 results

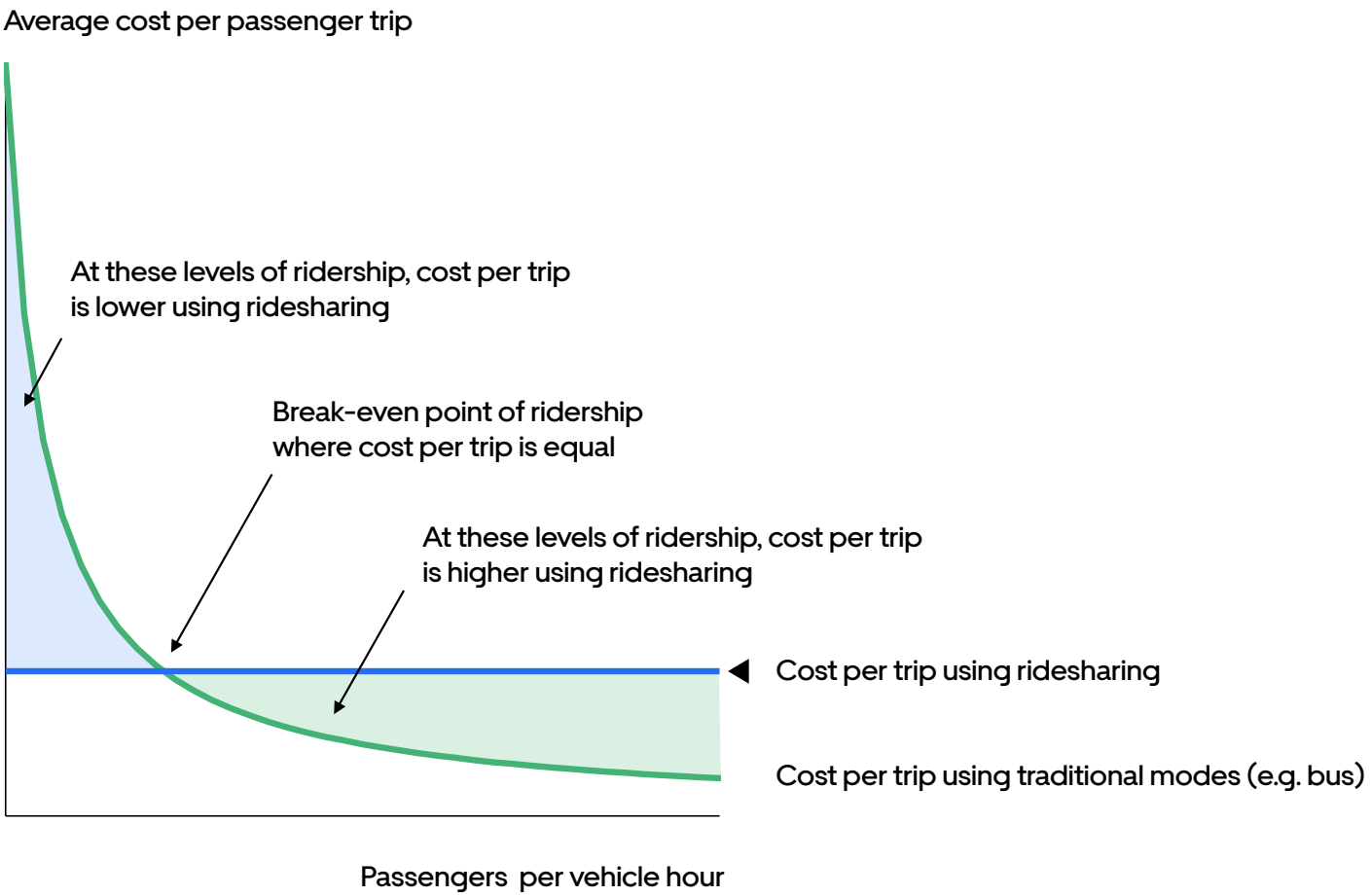
The economics of fixed versus variable cost supply

Public transportation today operates primarily using a fixed cost structure across all its modes. This fixed cost base for many agencies can represent ~80-85% of the total operating budget. As a result, during a drop in ridership, agencies bear the full impact of the reduced fare revenue on their bottom line - this is often coupled with a reduction in funding sources during economic downturns.

For agencies that partner with ridesharing companies, they only subsidize and pay for the trips actually taken. This makes ridesharing a variable cost supply for agencies. If ridership drops then the agency's operating budget declines accordingly while cost per trip remains the same.

As agencies seek to both lower costs and build a public transportation system that is more resilient to fluctuations in demand, they should consider increasing the share of variable cost supply in their overall mode mix. We illustrate the concept of fixed and variable cost structures below.

Figure 6
The economics of fixed and variable cost supply as a function of ridership



This visualization allows agencies to see how the average cost per trip changes as a function of passengers per hour for both fixed and variable cost supply.

For fixed cost supply modes, the lower the ridership the higher the average cost per trip. However, for subsidized ridesharing with its pay-per-trip model, the average cost per trip is flat regardless of demand because the agency pays only a fixed amount for a trip of a given distance.

Such a framework allows agencies to quickly compare their routes relative to the cost of ridesharing (using an average trip distance).

Estimating where ridesharing services can enable agencies to deliver equivalent or better transportation access at a lower cost per trip

This section focuses on quantifying the extent to which agencies can use ridesharing to supplement existing fixed route or paratransit networks - particularly in the most inefficient parts of the network. We focus on identifying routes where ridesharing can lower the cost per trip for agencies. While this analysis is framed around potential replacement of inefficient routes, we would like to point out that the majority of our public transportation programs to date are not in fact aimed at route replacement. The vast majority of our programs have been designed to complement and extend the reach of the public transportation network. Uber's public transportation programs typically address first and last mile connectivity to transit hubs, late night service, or microtransit service in areas previously underserved by public transportation. Nevertheless, we hope that you find this analysis useful in order to benchmark the economics of subsidized ridesharing service against other traditional modes and to quantify the cost reduction potential in select parts of the fixed route and demand response network.

A crude estimation at the aggregate agency level:

In Q3'2020, the average total cost per trip across Uber's public transportation programs was ~$14 per trip on UberX. For our public transportation programs that utilized shared or pooled rides, the average total cost was ~$11 per trip in Q4'2019. [5] These numbers are before taking into account any fares paid by the rider. Thereby the average agency subsidy per trip is considerably lower than these amounts. [6] Looking at the distribution of cost per trip from the 2018 National Transit Database (NTD), we could crudely infer that ridesharing could provide equivalent or better transportation access at a lower cost per trip for ~0.4% to 2% of all bus trips. [7]

Across all of Uber's demand response agency partnerships, the average total cost per trip during Q3'20 was ~$19 per trip. These numbers are before fare recovery that offset agency subsidies and are for ambulatory trips only (not wheelchair accessible vehicles). Looking at the per trip cost distribution for demand response service across agencies in the US suggests that agencies could reduce their costs if they shifted 50% (or potentially more) of all ambulatory demand response / paratransit trips to ridesharing. [8]

While this analysis, based on NTD data at the agency level, is a crude and directional approximation, a better methodology requires analysis at the route level which we calculate below albeit on a smaller sample set.

[5] Shared rides and rider matching has currently been suspended due to COVID-19. The last full quarter when rider matching was operational was Q4 2019 and the data is shown for that time period.

[6] Under our public transportation programs, agencies have a high degree of flexibility in setting the portion of the fare paid by the rider. The chosen fare structures vary from program to program.

[7] We implicitly assume that the average trip distances on Uber's existing programs are similar to those in the NTD data which may not be accurate. In the next analysis, we take into account the actual average trip distance at the route level to calculate a more precise estimate of the cost reduction per trip from shifting trips to the Uber network.

[8] We implicitly assume that the average trip distances on Uber's existing demand response programs are similar to those in the NTD data which may not be accurate. In the next section, we take into account the actual average trip distance at the agency level to calculate a more precise estimate of the cost reduction per trip from shifting ambulatory trips to the Uber network.

Figure 9

The distribution of average agency trip costs in the US for bus and demand response

Bus			
Average cost per trip in USD	# of trips Million	% of total trips	
<$3	252M	6%	
$3-5	2,452M	54%	
$5-8	1,592M	35%	
$8-10	151M	3.3%	
$10-15	74M	1.6%	Potentially cheaper with ride-sharing
More than $15	16M	0.4%	
Total	**4,537M**	**100%**	

Demand Response			
Average cost per trip in USD	# of trips Million	% of total trips	
<$5	1.6M	1%	
$5-15	24M	15%	
$15-20	17M	10%	
$20-30	37M	24%	Potentially cheaper with ride-sharing
$30-40	35M	22%	
More than $40	43M	27%	
Total	**158M**	**100%**	

Source: National Transit Database - 2018

Analysis at the route level taking actual trip distance into account:

Based on a sample of publicly available bus route performance reports, we were able to get route level data on ridership levels, cost per trip, and average trip length. We then estimated the cost of serving that same level of demand using UberX or Uber Pool based on actual Uber pricing[9] for each individual market. This allowed us to estimate which inefficient routes could be delivered by ridesharing at a cost reduction to the agency.

Our chosen sample was based on the availability of these agency-published route performance reports – we recognize that this is not a statistically representative sample of the US transit market. Nevertheless, we think the results are helpful to highlight the potential cost reductions some agencies may expect.

Below we show the expected cost reductions per trip per route across three agencies in the United States - a top 5 agency, a top 15 agency, and a small suburban agency. We ran this analysis based on pre-COVID ridership levels using both UberX and Uber Pool pricing in the local market. Please note that Uber Pool is only available in select markets and has been suspended everywhere during COVID.

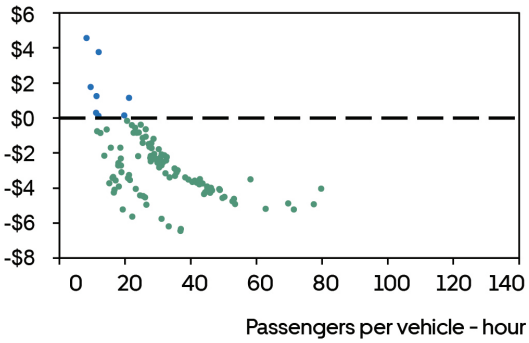
[9] Our Uber pricing estimates were based on actual Uber trips in the local market for trips of different distances. We also accounted for the impact of surge pricing to get accurate estimates of trip costs.

Figure 10

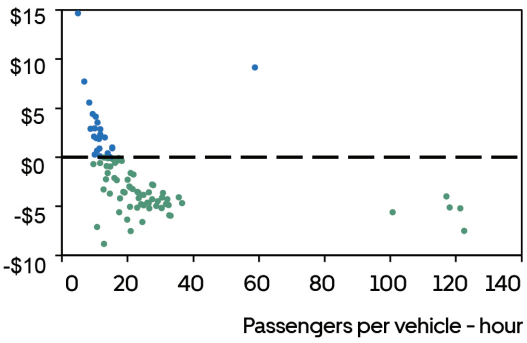
Identifying inefficient bus routes that could be supplemented by ridesharing across a sample of 3 agencies in the US

Estimated cost reductions using UberPool pricing

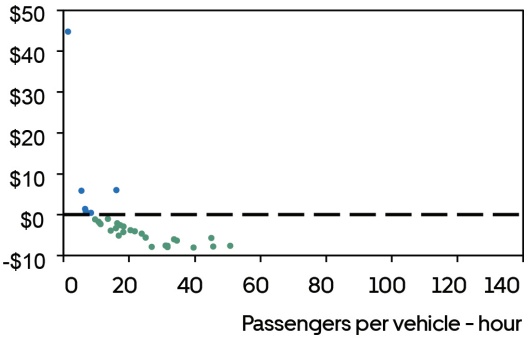
Large urban US agency (Top 5) - FY2019
Ave. cost reductions per trip by route
USD per trip (1 dot = 1 bus route, n=120)



Large urban US agency (Top 15) - FY2019
Ave. cost reductions per trip by route
USD per trip (1 dot = 1 bus route, n=90)

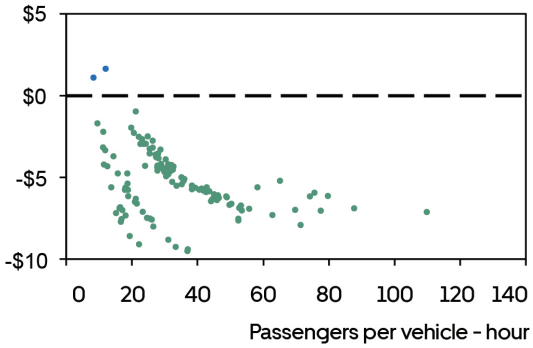


Suburban Agency - FY2016
Ave. cost reductions per trip by route
USD per trip (1 dot = 1 bus route, n=33)

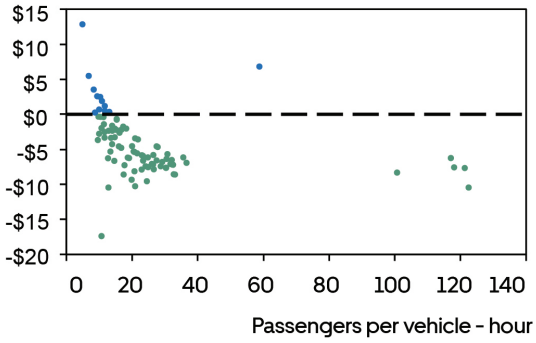


Estimated cost reductions using UberX pricing

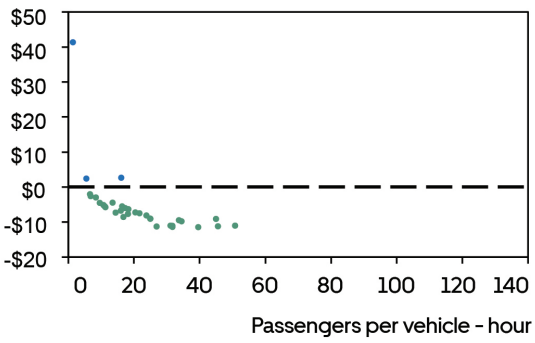
Large urban US agency (Top 5) - FY2019
Ave. cost reductions per trip by route
USD per trip (1 dot = 1 bus route, n=120)



Large urban US agency (Top 15) - FY2019
Ave. cost reductions per trip by route
USD per trip (1 dot = 1 bus route, n=90)



Suburban Agency - FY2016
Ave. cost reductions per trip by route
USD per trip (1 dot = 1 bus route, n=33)



Bus is cheaper UberPool or UberX is cheaper

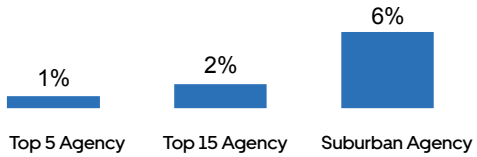
Source: Various publicly available agency route performance reports, Uber analysis

Figure 11

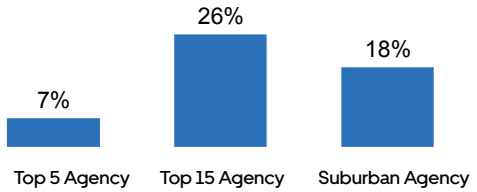
Summary of potential cost reductions on the fixed route network from switching to ridesharing across our sample agencies [10]

Estimates based on UberPool pricing

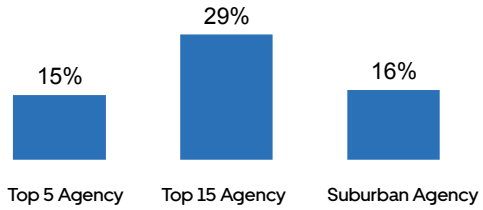
Trips where UberPool is cheaper
Percent of all bus trips



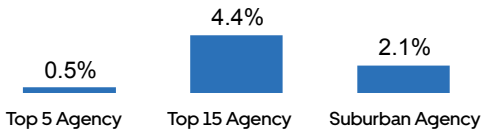
Routes where UberPool is cheaper
Percent of all bus routes



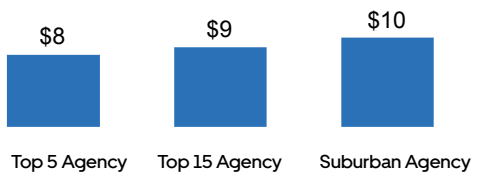
Potential agency cost reductions
On routes where Uber Pool is cheaper in percent



Potential agency cost reductions using Uber Pool
As percent of all route subsidies

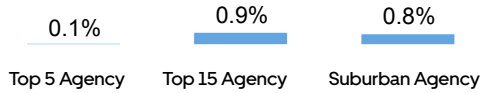


Average cost per trip - Uber Pool
USD per trip before fare recovery

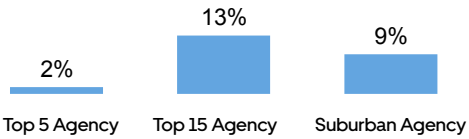


Estimates based on UberX pricing

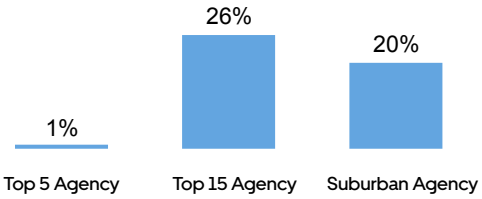
Trips where UberX is cheaper
Percent of all bus trips



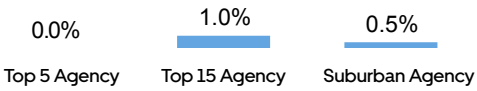
Routes where UberX is cheaper
Percent of all bus routes



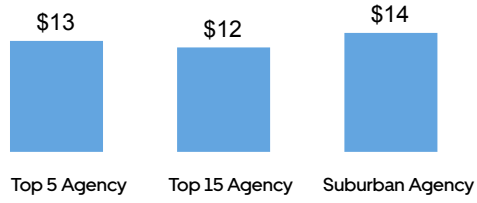
Potential agency cost reductions
On routes where UberX is cheaper in percent



Potential agency cost reductions using UberX
As percent of all route subsidies



Average cost per trip - UberX
USD per trip before fare recovery



[10] Excludes the incremental cost of offering on-demand wheelchair accessible vehicles (WAV) for wheelchair riders.

Source: Agency Route Performance Reports, Uber analysis

Based on route level data at these three agencies and pre-COVID ridership levels, we estimated that Uber Pool would only be a cheaper alternative for ~1-6% of trips.[11] However, these trips represent ~7-26% of the total bus routes from those agencies. Our analysis suggests that if these agencies shifted demand to Uber Pool, they could see cost reductions of ~15-30% on those routes assuming ridership remained constant. The average trip cost using Uber Pool was estimated at ~$8-10 based on the local Uber Pool pricing in that market and the average trip distances on those routes.

Given that Uber Pool is not available in all markets [12], performing the same analysis using UberX pricing, we estimate that only 0.1% to 1% of trips could be delivered at a cost reduction for the agency. That represents ~2% to 13% of routes. The average trip cost using UberX was estimated to be ~$12-14 based on the local UberX pricing in that market and the average trip distances on those routes.

This analysis shows that ridesharing service is not a good option and far too expensive for the vast majority of trips where buses are perfectly well suited. Example cases where ridesharing is not a good substitute include:

- On bus routes with high ridership (i.e., roughly more than 10 passengers per hour)
- In dense city centers where lower capacity passenger vehicles cause congestion
- For longer distance trips where the pricing of ridesharing would be prohibitive.

However, ridesharing (or microtransit) is well suited for low demand areas with relatively short trip distances where agency subsidies per trip are highest.

[11] Our calculations only consider agency operating costs as reported in agencies' route performance reports. These operating costs do not include the annualized costs of vehicle acquisition nor the costs of the infrastructure required to store and maintain fixed fleets. We expect that including those additional costs would make the relative value of ridesharing even more attractive for agencies, both in terms of the proportion of trips that can be served by ridesharing and the expected savings for public transportation agencies.

[12] Please note that Uber Pool has been suspended globally at the time of writing due to public safety concerns associated with the COVID-19 crisis.

Sidebar

Factoring in the incremental cost of on-demand wheelchair accessible vehicles on our fixed route cost analysis

Agencies that choose to replace inefficient bus routes with ridesharing service will also need to offer an equivalent on-demand service for their riders who use wheelchairs. Wheelchair accessible vehicles (WAV) typically have significantly higher cost per trip than UberX or Uber Pool - largely driven by sparse demand and a fixed cost model where agencies pay per supply hour. These added costs would offset some of the cost reductions from switching from fixed-route or demand response service to ridesharing.

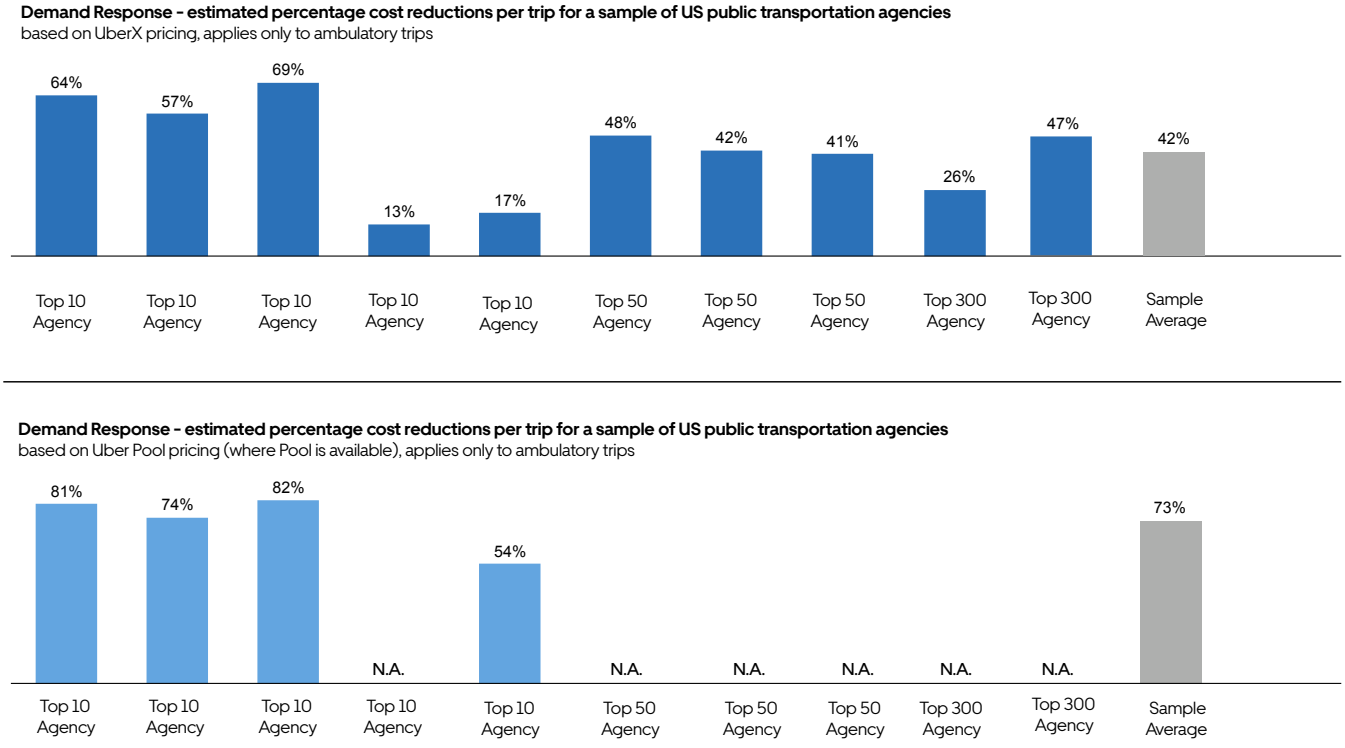
In our cost modeling, we were not able to reliably estimate the incremental cost of providing wheelchair accessible vehicles. To do this, we would need agencies to provide us with data on WAV demand at the route level which is not available in the reports we can currently access. Nevertheless, if we assume that 0.5% of trips require wheelchair accessible vehicles and that each of these trips costs ~$100, the cost reductions we estimated above would be reduced by between 10-40% among our sample of 3 agencies when on-demand WAV service is integrated. In other words, agencies are still likely to reduce their overall operating costs with ridesharing services that include integrated on-demand WAV service.

Agencies may also consider harnessing their demand response vehicles as part of their on-demand offering to fulfil these trips, rather than a third-party WAV provider, especially if there is existing capacity and a cost advantage.

We also conducted a similar analysis for demand-response service where we used the 2018 National Transit Database to calculate the cost per trip and average trip distance across a sample of 10 randomly selected public transportation agencies of different sizes. We then calculated the cost per trip assuming the agency switched those trips to UberX or Uber Pool (where Uber Pool was available). Please note that these savings only apply to ambulatory trips. We assumed that agencies will maintain a fleet of wheelchair accessible vans while only offloading select ambulatory trips to ridesharing providers[13].

[13] Uber can also onboard agency WAV vehicles or 3rd party WAV operators on the Uber platform to allow agencies to offer an equivalent on-demand wheelchair accessible service to riders.

Figure 12
Estimated per trip cost reductions for ambulatory paratransit trips from switching to ridesharing



Source: National Transit Database, Uber analysis

A simple average across our sample shows that agencies can expect, on average, a ~42% cost reduction for ambulatory trips from switching trips to UberX and ~73% cost reductions from switching to Uber Pool. However, Uber Pool was not available in more than half of the markets in our sample (and has been suspended globally at the time of writing due to the COVID-19 crisis).

The cost reductions from increasing the ridesharing mix in demand-response are substantial. However, our experience also shows that providing such a convenient on-demand service to riders tends to induce additional demand for travel. While this is wonderful, as it allows riders to move more freely and increases transportation access more evenly throughout communities, we think that the absolute cost-reductions for agencies could be at least partially offset by more trips. Agencies should take this induced demand effect into account if they are looking to purely lower operating costs from a ridesharing program.

Sidebar

Addressing labor concerns from integrating ridesharing services in public transportation.

In early drafts of our paper, industry stakeholders asked about our perspective on the labor challenges associated with shifting select services to ridesharing networks. We acknowledge that this is a complex issue that needs to be considered carefully and on a case by case basis.

As mobility managers, public transportation agencies are in direct control over how and when to integrate ridesharing services. Some agencies may choose to integrate ridesharing services primarily to expand their networks by offering first or last mile connectivity to public transportation hubs or offering ridesharing to areas that don't have existing coverage. Under such a scenario, there is no impact on jobs. In fact, the vast majority of Uber Transit's existing partnerships fall under this category.

Other agencies may choose to substitute inefficient bus routes with ridesharing or microtransit. Agencies may choose to redeploy those vehicle assets and operators to new routes or to existing routes to increase the frequency or capacity along dense trunk lines. Under this scenario, there should again be no impact to existing staffing levels.

For agencies that choose not to redeploy affected vehicle assets and operators, their pace of hiring to fill natural attrition and retirements may be temporarily slowed down. If an agency decides that ridesharing services are to be a beneficial part of their overall network, these services can also be phased in over several years.

As mobility managers, agencies should first engage in a network planning exercise with all modes, including ridesharing in mind. This will provide insights into the optimal mix of ridesharing services and allow agencies to first quantify the estimated impact on jobs which will differ from agency to agency. It is helpful to remember that our estimates suggest that only about 1-6% of bus trips could be provided at a lower cost with ridesharing - a relatively modest share of overall trips (see figure 11). Based on such an analysis, agency leaders will have a clearer sense of their operational staffing needs for the years ahead.

“Under most scenarios, we believe ridesharing will likely play an increasingly important role within the public transportation mix in the next 3-5 years.”

Part 4

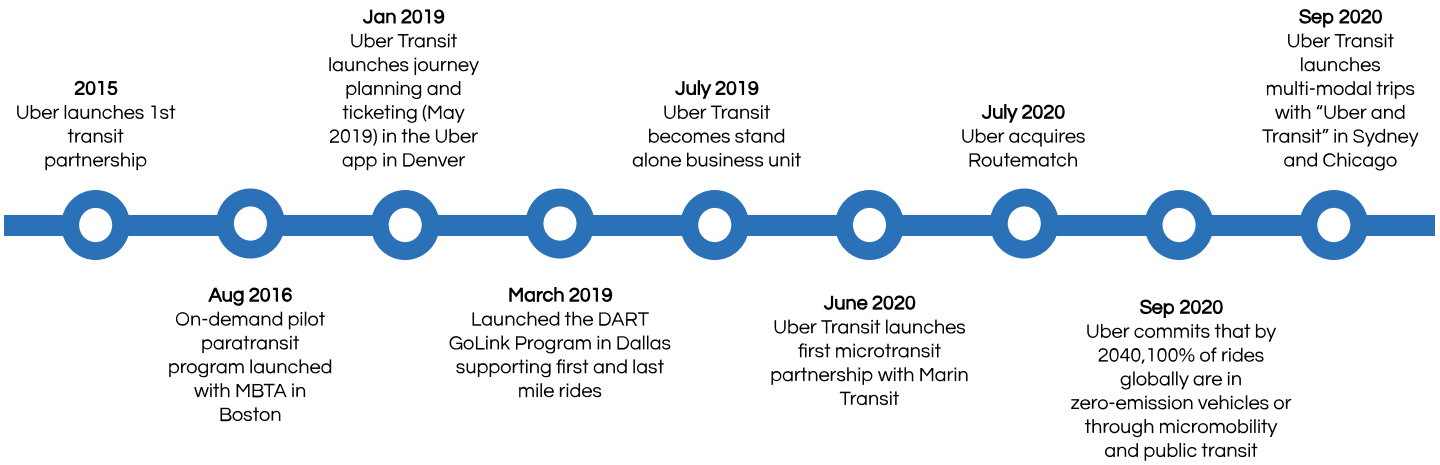
How Uber offers agencies new tools to operate more efficient, connected, and equitable mobility networks

About Uber Transit

Uber launched its first public transportation agency partnership in early 2015. That partnership helped senior citizens in Gainesville, Florida maintain their independence through free UberX rides to select destinations. Since then, our team and our impact in the communities we serve has grown substantially.

Today, Uber Transit is a dedicated business unit that is exclusively focused on supporting public transportation agencies and riders. In early 2019, we launched public transportation in the Uber app for the first time - offering riders journey planning and in-app ticketing in Denver. In July 2020, we launched our first microtransit SaaS (Software-as-a-Service) partnership with Marin Transit in Marin County, California, marking the first time Uber has made its software available to power a public transportation agency's microtransit service using their fleets and agency operators. That month we also acquired Routematch, one of the leading software providers to public transportation agencies. Then in September 2020, we launched "Uber and Transit", an integrated multimodal experience within the Uber app that allows riders to plan and book a complete journey on Uber and public transportation, using Uber for the first mile trip to connect with public transportation. This product is live in Sydney and Chicago with plans to scale further in 2021. Uber also made a bold sustainability commitment to become a zero-emission mobility platform in Canada, Europe, and the US by 2030 while by 2040, 100% of rides globally will be in zero-emission vehicles or completed through micromobility and public transportation.

Figure 13
A brief history of Uber Transit



Uber Transit and Routematch empower agencies to become mobility managers by leveraging Uber's network and software to build the most efficient, equitable, and accessible mobility networks. We help agencies lower costs through access to the Uber network with its variable cost structure. Agencies can use UberX or Uber Pool to quickly launch and easily manage highly configurable and innovative programs to any segment of their community. We promote public transportation directly in our app to millions of users through our journey planner, in-app ticketing, and multimodal products. Our software solutions power agency fleets to offer both pre-planned and on-demand trips with the ability to seamlessly allocate certain trips to the Uber network if and when desired by our partners.

As mobility managers, agencies have the opportunity to partner with Uber and Routematch to create the backbone for a mobility ecosystem. That may look different at each agency, but all with the common theme of how to use resources as optimally as possible while improving rider satisfaction. Through our collective technology, resources, and experience, we can help public transportation agencies build out their current and long-term software infrastructure for mobility management based on their changing community needs.

As of October 2020, the Uber Transit Team has more than 220 employees with thousands more engineers developing Uber's core technologies that power our products. With more than 550 public transportation partners around the world, we serve agencies of all sizes from small rural agencies to some of the largest agencies in the world.

Sidebar

What equitable and accessible public transportation means to Uber

Access to transportation is a fundamental part of life. With it, people are able to harness the economic and social opportunities, among others, available to them within their community to lead the lives they wish to pursue. When transportation options are limited, financial, health, and other hardships are likely to follow.[14]

Given its importance, one of the most common reasons communities choose to provide public transportation is to provide access to those who do not have access to a private vehicle or choose not to use one. This enables communities to reap many benefits, including increasing the social welfare of its residents while reducing the negative externalities of the private automobile.

Different members of a community, however, may have different transportation needs, and this is the key if an agency is seeking to provide transportation service that is more equitable. For example, while fixed-route transportation may be able to serve the vast majority of public transportation trips, for a significant number of people, this service may be inaccessible due to physical barriers, economic barriers, total travel time, or need for travel outside of service hours or areas, among other reasons.

With a shift towards mobility management, and by incorporating a variable cost supply as appropriate, public transportation agencies can have access to cost effective, tailored service models that can meet these kinds of specific needs. For example, for people with disabilities who are unable to use the fixed-route network, transit agencies can now provide a more responsive and lower cost per trip service by tapping into a ridesharing network that includes wheelchair accessible vehicles.[15]

For areas where trip density may not cost effectively support a fixed-route bus or a dedicated fleet dial-a-ride service, transit agencies can utilize the ridesharing network to provide high levels of access at lower costs per ride to areas of their community that would otherwise be underserved by public transportation, all while redeploying saved resources elsewhere in their system.[16]

These new modes must themselves not raise new barriers of access either, including to people who may be unbanked or without access to a smartphone. Uber is proud to be able to offer solutions including call centers and cash funded cards to reduce these potential barriers.

While it is the choice of each public transportation agency to determine how to best serve their constituents, we believe that the concepts of mobility management, variable cost supply, and the other aspects of this paper can help empower agencies to offer more equitable transportation service in their communities.

[14] For a specific overview of how the lack of public transportation is a major hurdle for many Americans, see here.

[15] See how the MBTA in Boston offers on-demand paratransit service here.

[16] DART in Dallas is using the ridesharing network to offer service to customers, see here.

Our value proposition to public transportation agencies

Uber's global platform brings unique capabilities to our public transportation partners.

With over 110M monthly active users,[17] **Uber is a demand generator** for public transportation - allowing users to plan, book, and pay for their journeys without having to download a new app.

By offering access to our network of close to 5M17 drivers, we are a technology service provider to public transportation agencies. We do this by adding access to a new type of service, ridesharing, to the public transportation mix that is highly flexible and has a variable (pay-per-trip) cost structure. Agencies can customize fare structures for riders and implement cost controls to not exceed their set budgets.

Our market leading technology is now available to public transportation partners for the first time. From July 2020, agencies have access to Uber's proprietary demand prediction, dispatching, matching, pricing, routing, and payments technologies to power their own vehicles and drivers. This allows them to deliver a highly efficient pre-planned and on-demand service for paratransit or microtransit.

Uber's presence in 69 countries and 10,000+ cities means that almost any agency around the world can access our products and services. Regional on-the-ground operations teams support agency partners and accelerate program launches.

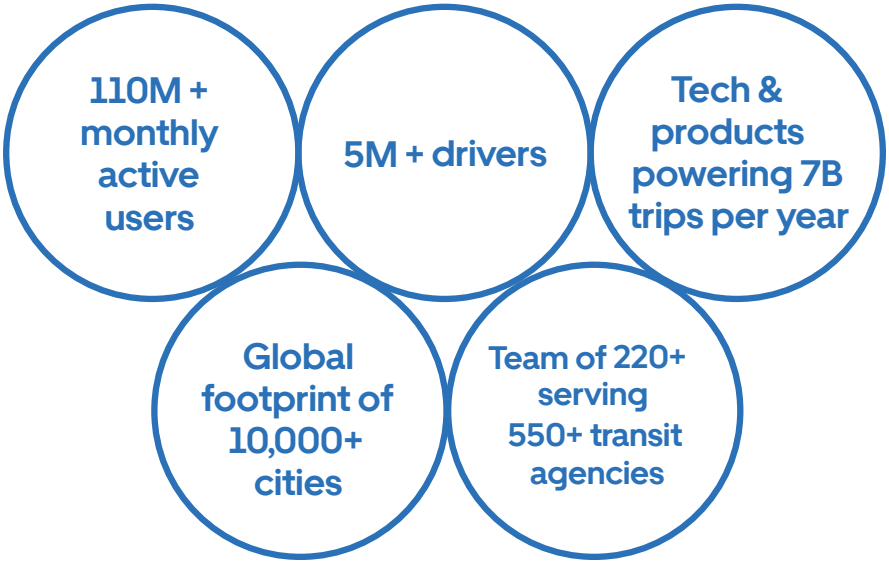
Our global scale provides significant operational cost and efficiency advantages. Uber knows how to power movement at the touch of a button. We bring our product and marketing experience to provide users with a safe, intuitive, and continuously improving experience.

Our dedicated Uber Transit team of over 220 (and growing) employees are solely focused on serving public transportation. We are building products and services that allow agencies to operate the most efficient, connected, equitable, and accessible mobility networks.

Our customers chose us because of our distinctive capabilities that provide multiple concurrent benefits to their operations - increased ridership, lower cost, and market leading technology all while extending the reach of the public transportation network and improving the customer experience.

[17] Monthly active platform consumers (MAPCs) as at Q4 2019.

Figure 14
What the Uber platform offers public transportation agencies



Our customers chose us because of our distinctive capabilities that provide multiple concurrent benefits to their operations - increased ridership, lower cost, and market leading technology all while extending the reach of the public transportation network and improving the customer experience.

Figure 15
Why public transportation agencies use Uber products

Sidebar

Driving a green recovery through our sustainability commitments

Investing in public transportation is a key part of our sustainability commitment to become a 100% zero emission platform globally by 2040 and drive a green recovery from the global pandemic. We're doing so to decarbonize our platform via public transportation, micromobility, along with electric vehicles, and do our part to expedite the global transition to clean energy.

As communities recover from COVID-19 and people start moving again, Uber will continue to partner with public transport to avoid the return to traffic gridlock and pollution, as well as help hundreds of thousands of drivers on the platform transition to electric vehicles.

As the world continues to change, many public transportation agencies share our perspective and are seeking out innovative solutions so that they can come out of Covid better and greener than before.

That's why we've expanded Journey Planning - which lets riders choose their destination and see pricing options, real-time schedules, and walking directions to and from public transportation stations - to 40+ total cities around the world, and brought in-app ticketing to 10+ cities as well.

Most recently, we expanded multimodal trip options offering integrated journeys across Uber and Transit to Mexico City and London beyond Sydney and Chicago. Riders can tap this option and plan their entire journey, combining UberX with walking directions and city bus, subway, or train connections. Powered through real-time transit information and Uber's on-demand mobility network, it's the latest way we're partnering with public transportation to create solutions to congestion and reduce everyday use of personal cars.

The world is at a critical juncture, and we all have a role to play. Uber is aiming high, and our goal is to build the most efficient, decarbonized, and multimodal platform in the world for mobility.

Our product ecosystem

Our products fall under under three broad categories:

"Uber Rides for Transit" provides agencies with the tools they need to use Uber's ride-sharing platform as one of their core modes. Agencies can create highly-customized programs leveraging UberX, Uber Pool, or any other Uber product. Agencies can define pricing structures, subsidy levels, service areas, hours of operation, budget controls, and set population-specific parameters for each program to target only specific communities. Agencies pay per trip taken using Uber's regular pricing in each local market - the agency sets the subsidy level, which is highly flexible based on each agency's preference. Typical use-cases include first and last mile programs, paratransit, off-peak, microtransit, and bus route supplement programs. Agencies can use the Uber network to extend the reach of public transportation, particularly in low-demand areas where typical bus route service is cost-prohibitive to run.

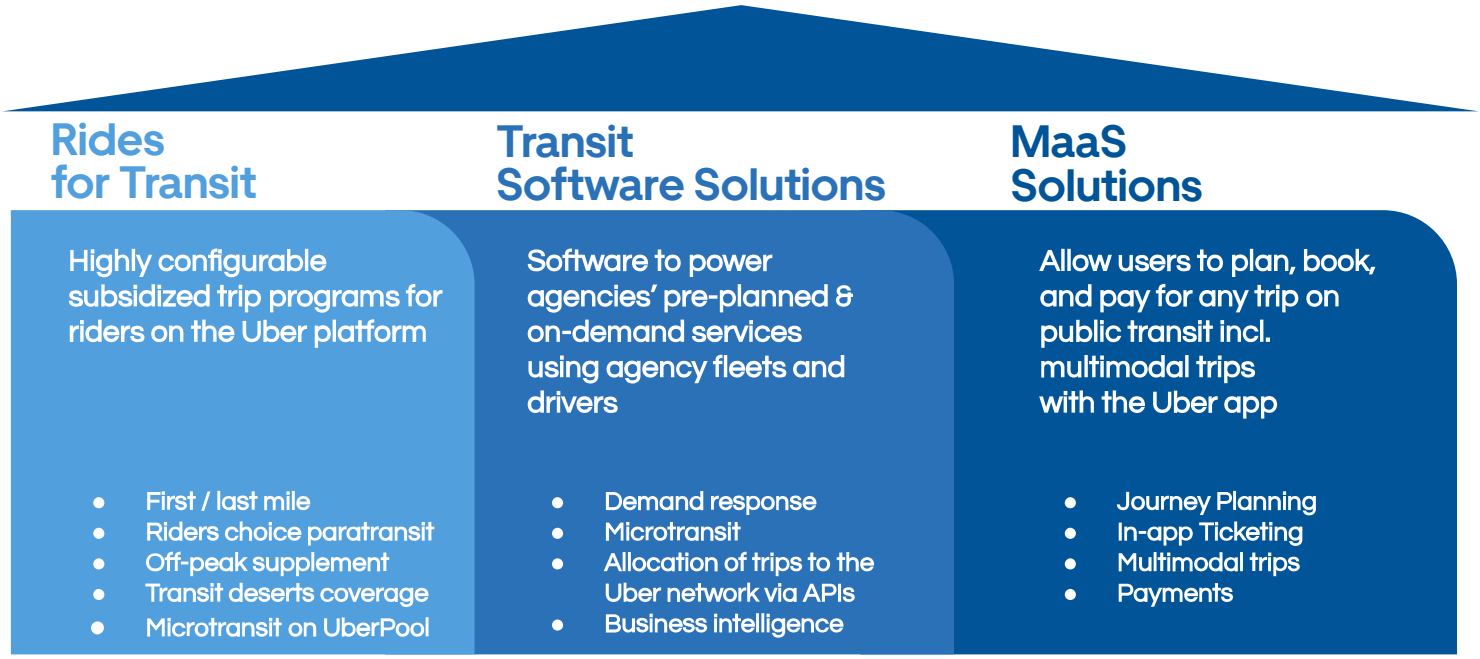
Uber's Transit Software Solutions power agency fleets, particularly for paratransit and microtransit applications. This software enables both pre-planned and on-demand provision of trips. Our on-demand service is built on top of Uber Pool technology with market leading matching, routing, pricing, and payment technology, delivered via Uber's driver app, rider app and agency dashboards. Riders can book their trips through the Uber app or a call center, which speeds market adoption as many users already have the Uber app downloaded on their phones.

Our pre-planned service is powered by Routematch's leading scheduling, routing, fleet management and rider eligibility management technology. Over the last 20+ years, Routematch has built functionality to meet the many agency-specific requirements for paratransit programs. Both pre-planned and on-demand services are designed to work in parallel, it is not one or the other. One of the main differentiators for our software is the ability to seamlessly allocate certain trips to Uber's variable-cost and highly-flexible network. This allows agencies to lower cost, reduce wait times, flex capacity during periods of high demand and also to size their fleets for optimal efficiency by relying on the Uber network for "peak shaving" [18].

Uber's MaaS (Mobility-as-a-Service) Solutions allow users to plan, book, pay for, and navigate any trip on public transportation directly from their phone. Our journey planner promotes public transportation in the Uber app. Using real time transit data, our app recommends itineraries to get from A to B on public transport including multi-modal trips that use Uber for the first and/or last mile to or from a public transportation station. In select markets, riders can also purchase and redeem tickets without needing to buy tickets at vending machines or top up their smartcard. As we scale our MaaS offerings globally, our goal is to offer riders the full suite of travel options, including public transportation, to get to their destinations.

[18] Peak shaving is the ability to offload trips to the Uber network when agency vehicles cannot meet the level of demand or the wait times for the rider are too long.

Figure 16
Uber Transit product ecosystem



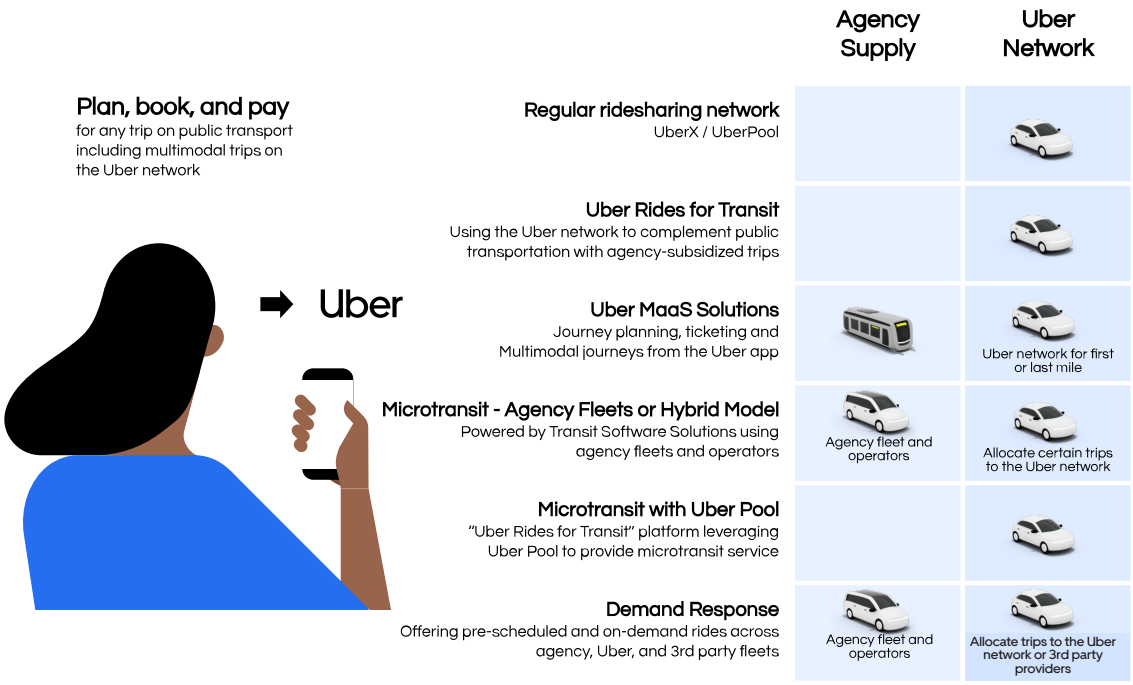
While our products can be deployed individually, they work best as a holistic and integrated offering. For example, agencies can use our "Uber Rides for Transit" product to offer subsidized first/last mile connections to public transportation stations which are directly integrated with our multimodal product in our Uber MaaS Solutions - this way riders can take the "complete journey" all via a single app. Consumers will also be able to see, book, and pay for their demand-response or microtransit trips directly from within the Uber app via our MaaS offering. If the rider needs to go outside the microtransit geofence, they will be presented with other options so they don't need to switch apps. Riders will be able to request both pre-scheduled and on-demand trips - and they can do this through our app or by calling into a call center. We are working to bring these types of advanced integrations and product experiences to market in 2021 and are very excited about the opportunities they will unlock for both riders and agencies.

Agencies also get access to trip level and aggregate data as well as dashboards for their subsidized Uber programs. This data helps agencies fulfill reporting requirements, audit trip level data against invoices received, as well gain insights into how the program is performing. These insights enable agencies to measure the program's performance against their goals while informing future service planning efforts. The level of data shared with agencies is carefully reviewed to protect rider and driver privacy.

By combining Uber's unique capabilities, we offer agencies a holistic, differentiated, and integrated mobility ecosystem. Riders get access to all modes of public transportation to plan, book, and pay for their journeys. Agencies, meanwhile, get an integrated mobility ecosystem for their paratransit, microtransit, and ridesharing programs. This highly integrated system offers routing and dispatching of both pre-planned and on-demand trips across agency owned and operated fleets, 3rd party fleets, as well as vehicles available through the Uber Platform.

Figure 17

Our integrated offering is merging all public transportation options in one seamless experience for both riders and agencies



Riders ♥

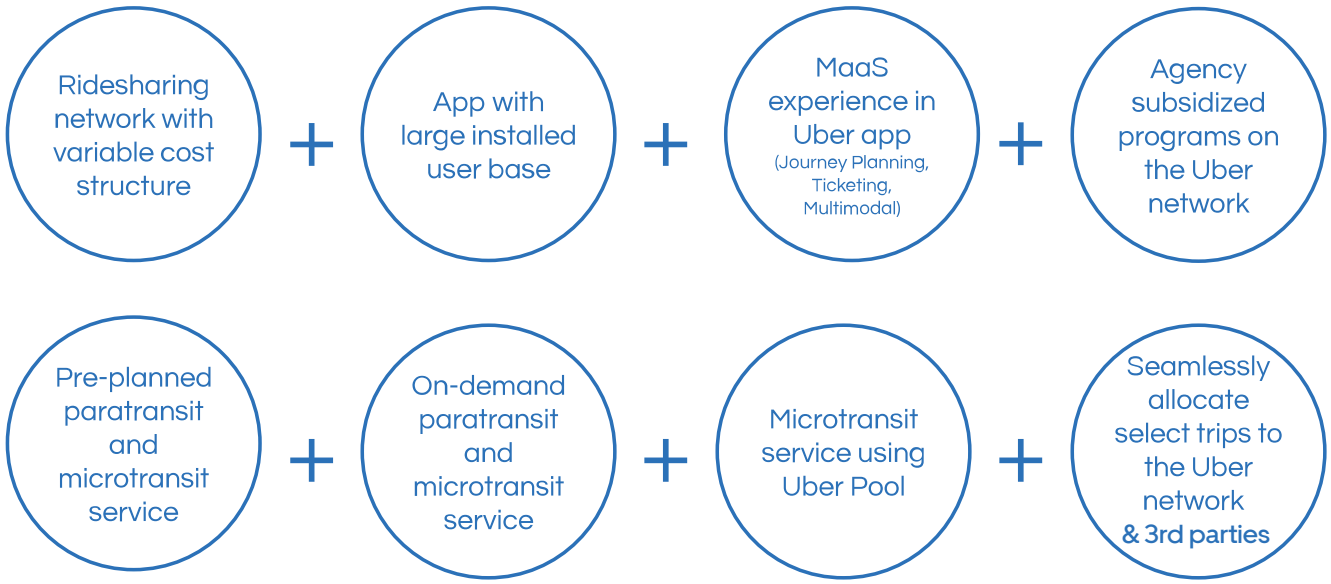
- Seamless user experience
- Improved options

Agencies ♥

- Increased ridership
- Decreased costs
- Improved equity and access
- Higher resilience
- Improved flexibility

Uber Transit can offer public transportation agencies a unique set of strategically important capabilities all within a rapidly unifying product suite. By offering a holistic integrated offering, public transportation agencies can operate more connected, efficient, equitable, and resilient mobility networks. In the next section, we expand on how Uber's unique capabilities unlock differentiated programs to complement public transportation networks and power paratransit and microtransit applications - all from the same product suite and delivered to users through the Uber app.

Figure18
Uber Transit's holistic integrated offering for public transportation agencies



Part 5
How Uber Transit's products and services work

Our approach to complementing public transportation

Applying conventional fixed-route service to areas with low density is challenging. While bus service is highly efficient on major corridors, in low-density areas buses struggle and incur a high cost per trip. The result is that agencies are forced to reduce the frequency of buses to keep costs in check. This low frequency compounds the low ridership problem even further by making the service less convenient for riders. Those that can afford personal vehicles will use them instead of waiting for a bus that might come in 30 or 60 minutes. Those that can't afford cars are left with a suboptimal service that limits their mobility and access to economic opportunities.

"Uber Rides for Transit" gives agencies the tools to maintain public transportation access by extending ridesharing service in low density areas, thereby providing first/last mile connections to more efficient fixed route transit service, opening new mobility zones that were previously out of reach for agency budgets, or even replacing inefficient bus routes. Under this model, agencies tap into a more affordable service mode while increasing the equity and accessibility of their public transportation networks. Agencies set fare structures for riders and can implement cost control measures to ensure they stay within their budgets. Agencies can reduce their cost per trip relative to fixed route service, avoid capital investment in new buses, reduce wait times, and increase ridership at stations through first/last mile connections. Resilience of the network improves as agencies only pay for trips taken, which buffers their budgets from sudden drops in ridership as we have experienced during COVID. Flexibility rises as Uber's supply can easily flex to meet peaks or valleys in demand. As ridership in a given program grows, agencies can easily replace the variable cost Uber Rides for Transit service with a microtransit service utilizing agency vehicles and operators if and when it makes sense.

Uber MaaS Solutions promote riding public transportation directly in the Uber app, driving increased demand. Consumers access real-time public transportation data and plan their complete journeys including transfers all within the Uber app. Riders can purchase tickets in-app in an increasing number of markets. They can also plan and pay for multimodal journeys, which may include Uber service for the first or last mile connection. This full digital MaaS experience is finding a strong product-market-fit as consumers opt for the convenience of a single app that can meet all of their transportation needs.

Meanwhile, agencies get the benefits of having all their modes in the Uber app, which drives increased ridership and a positive product experience. Agencies can even use the Uber app instead of investing in their own white-label apps if they so choose. This removes the common struggle for agency apps to scale consumer adoption and the funding required to maintain and support their own white label apps.

Agencies can combine Uber Rides for Transit with our MaaS Solutions to deliver a more complete and seamless public transportation experience. This could take the form of subsidized Uber trips (UberX or Uber Pool) for first/last mile connections to public transportation stations. Such a seamless experience can spur some riders to leave their private vehicles at home, or downsize from two cars in their household to one. Agencies can further elect to use Uber Green vehicles where available, our electric and hybrid fleet, that have the added benefit of reducing emissions. As we will describe below, paratransit and microtransit services can also be integrated into the Uber app, offering customers the ability to access all modes available on public transportation. In the future, we expect more use cases and programs that we will co-develop with agencies. These new programs will be possible by combining our modular products and experiences in new and innovative ways.

Sidebar

Uber Transit's different offerings in terms of agency outcomes (directional)

To make it easier for readers to understand how our products work, we have created a series of visual representations that each provide:

Use case: a brief description of how each implementation works;
Product: the name of the Uber product family that powers each service;
- **UR4T:** Uber Rides for Transit
- **MaaS:** Uber Mobility as a Service (MaaS) Solutions
- **UTSS:** Uber Transit Software Solutions

Supply: aims to distinguish between the type of vehicle that is providing the actual trip to the rider - be that through agency fleets, 3rd party fleets, taxis, or the Uber network;

Distribution: refers to how riders access the service - such as through an agency app, a call center, or through the Uber app.

We use a qualitative 1 to 5 rating scale that attempts to illustrate the relative agency outcomes as we compare one product approach to another. We specifically focus on 9 agency outcomes:

↑ **Ridership:** quantifies whether the product can be expected to increase demand for the service.

↓ **Cost /trip:** quantifies the potential reduction in cost per trip relative to other modes currently in common use (e.g., ridesharing cost per trip relative to bus cost per trip).

↓ **Capex:** quantifies the potential reduction in capital assets (e.g., vehicles) that agencies need to fund in order to deliver an equivalent number of trips.

↑ **Equity / accessibility:** quantifies the ability of the servic
e to expand on the equity or accessibility of public transportation. In this instance, we correlate a strong equity and accessibility score with a lower cost per trip which allows agencies to extend or improve service that has traditionally been cost prohibitive to deliver using traditional modes.

↓ **Wait time:** quantifies the potential reduction in rider wait times.

↑ **Experience:** quantifies the potential improvement in customer experience, with a strong emphasis on digitization.

↑ **Resilience:** defined as a cost structure that decreases when demand drops, thereby buffering agency budgets for the particular service.

↑ **Flexibility:** defined as having flexible supply that can increase or decrease to meet peaks and throughs throughout the day as well as the ability to easily and quickly alter service areas (i.e., change microtransit service design, expand the geofence, etc).

High scores ratings highlight the primary reasons public transportation agencies should pursue one implementation approach over others.

Our objective with these illustrations is not to make absolute value judgements whether one type of service is good or bad. We merely attempt to illustrate the relative differences in outcomes that agencies can expect by choosing to implement one type of product configuration or service over the other. We defer to each agency to determine which type of service or configuration is optimal for them based on their own needs and requirements which may vary from agency to agency.

Figure 19

Uber Rides for Transit and MaaS Solutions - Our approach to complement public transportation

Basic Use Case

Fixed Route Service in Low Demand Areas - the "conventional" model

Agencies mostly rely on fixed route service using buses of different capacities to operate service in low demand areas.

Primary Agency Outcomes:

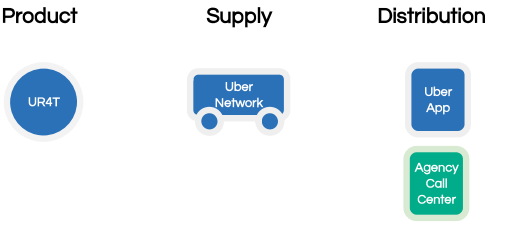
- ↑ Ridership
- ↓ Cost /trip
- ↓ Capex
- ↑ Equity
- ↑ Accessibility
- ↓ Wait time
- ↑ Experience
- ↑ Resilience
- ↑ Flexibility

Basic Use Case

Uber Rides for Transit - Using ride-hailing to extend the reach of public transit

Uber

Agencies can create highly configurable programs using the Uber network. Agencies only pay for the trips taken using regular Uber pricing which is offset by the fare structures agencies set for riders. Typical use cases incl. first/last mile, off-peak service late night service etc.



Primary Agency Outcomes:

- ↑ Ridership
- ↓ Cost / trip
- ↓ Capex
- ↑ Equity
- ↑ Accessibility
- ↓ Wait time
- ↑ Experience
- ↑ Resilience
- ↑ Flexibility

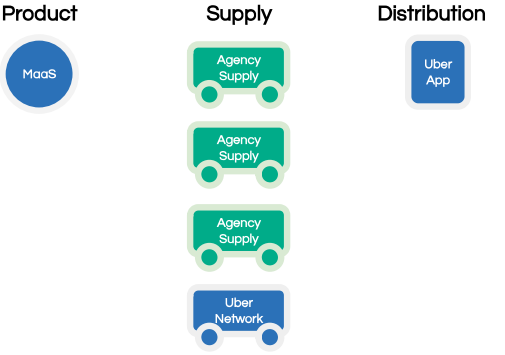
Basic Use Case

Uber MaaS Solutions - journey planning, ticketing, multimodal and rewards

Uber

Uber shows riders public transportation options directly in the Uber app, allowing users to plan, book, and pay for any trip. Specific functionality includes:

- Journey planning
- In-app ticketing
- Multimodal trips



Primary Agency Outcomes:

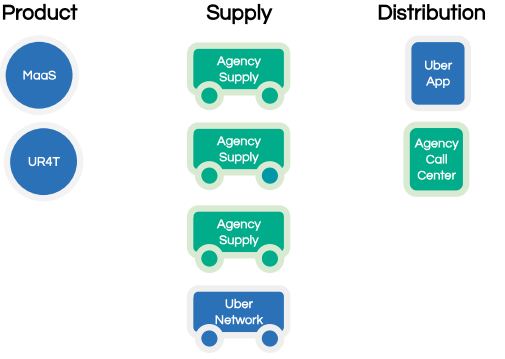
- ↑ Ridership
- ↓ Cost / trip
- ↓ Capex
- ↑ Equity
- ↑ Accessibility
- ↓ Wait time
- ↑ Experience
- ↑ Resilience
- ↑ Flexibility

Advanced Use Case

Uber MaaS Solutions + Uber Rides for Transit - the "complete journey"

Uber

By combining Uber Rides for Transit programs with Uber's MaaS offering, agencies can offer subsidized first/last mile connections to public transportation stations extending the reach of public transport and creating a more compelling alternative to the personal vehicle.



Primary Agency Outcomes:

- ↑ Ridership
- ↓ Cost / trip
- ↓ Capex
- ↑ Equity
- ↑ Accessibility
- ↓ Wait time
- ↑ Experience
- ↑ Resilience
- ↑ Flexibility

Our approach to paratransit

For people with disabilities unable to use a fixed-route public transportation system, public transportation agencies are required by federal law to provide Americans with Disabilities Act (ADA) complementary paratransit service that is governed by specific requirements. These requirements, along with funding constraints that have limited the ability of most public transportation agencies to invest in significant improvements, have led to a paratransit system that has left riders wanting a more dynamic service, and agencies grappling with soaring costs.

Riders must typically request a trip 24 hours or more in advance via a call center or web portal. Scheduled pick-up or drop-off windows can be as wide as 30 minutes. These parameters allow for complex scheduling software to run a nightly batch allocation model to match riders with vehicles in the most efficient manner. The result is a relatively rigid system that limits the usefulness for riders, while for agencies often require dispatchers to intervene manually should riders cancel trips or if operational issues arise. Perhaps the biggest pain point for agencies though is the high cost of service which, according to the National Transit Database, on average accounts for 2% of trips but 15% of the overall operating subsidies. The median agency's subsidy is $30 per trip - though this is often much higher in major cities.

Routematch's core Demand Response software powers more than 500 demand-response fleets - from small rural agencies all the way up to some of the largest agencies in the US with fleets of over 600 vehicles. Routematch is one of the largest players in paratransit scheduling and dispatching with its leading scheduling, routing, fleet management and rider eligibility management technology. Its latest software releases are powering some of the most advanced paratransit deployments with a highly efficient scheduling engine.

Under a "Riders' Choice" model, Uber is helping some of the largest agencies lower the cost of their paratransit programs. The "Riders Choice" model allows eligible riders to use ridesharing services or taxis in addition to the conventional ADA paratransit service. This model leverages our "Uber Rides for Transit" platform and offers riders both on-demand and pre-scheduled trips on the Uber network (instead of with agency vehicles). Uber is also able to onboard 3rd party transport operators with dedicated wheel-chair accessible vehicles (UberWAV) where available. Riders book trips in real-time or in advance directly via the Uber app or through a call center. Agencies and riders have seen numerous benefits from this model, most notably significant per trip cost reductions while improving mobility for riders. Given the increasing demand for paratransit in the years ahead as more baby boomers retire, it is hard to imagine that ridesharing will not play an increasingly important role in paratransit to help agencies reduce per trip costs while improving the mobility experience for riders.

The latest iteration of the Routematch software is an integrated mobility platform that can combine both pre-scheduled and on-demand trips from multiple providers. This open platform can onboard multiple ridesharing platforms and transportation providers including agency fleets, 3rd party operators, and taxis. Agencies are able to set parameters that determine which trips to allocate to which providers, at which times, and in which quantities or percentages. Having multiple providers including fixed cost and variable cost supply will make for the most efficient, flexible, and resilient paratransit network while offering even greater equity and accessibility to our communities at the lowest cost. This next generation paratransit operating system is currently live at select customers and will be developed even further in 2021 and beyond.

Figure 20
Our approach to help agencies reduce costs and improve service in paratransit

Basic Use Case

Paratransit - Software Solutions - the "conventional" model

Routematch

Traditional ADA / Call-a-Ride service where 3rd party paratransit software powers agency fleets. Users typically call 24 hours in advance to book a trip. This model applies to small rural systems as well as to the largest fleets in the world.

Primary Agency Outcomes:

↑ Ridership	● ○ ○ ○ ○
↓ Cost / trip	● ○ ○ ○ ○
↑ Equity	● ● ● ● ●
↑ Accessibility	● ● ● ● ●
↓ Wait time	● ○ ○ ○ ○
↑ Experience	● ○ ○ ○ ○
↑ Resilience	● ○ ○ ○ ○
↑ Flexibility	● ○ ○ ○ ○

Basic Use Case

Paratransit - "Riders Choice" model using the ride-hailing network

Uber

The Riders Choice model offers both on-demand or pre-scheduled trips to paratransit riders using the Uber network (instead of agency vehicles). Offers cost per trip savings for the agency while also enabling on-demand dispatching.

Primary Agency Outcomes:

↑ Ridership	● ● ○ ○ ○
↓ Cost / trip	● ● ● ● ●
↑ Equity	● ● ● ● ●
↑ Accessibility	● ● ● ● ●
↓ Wait time	● ● ● ● ●
↑ Experience	● ● ● ● ○
↑ Resilience	● ● ● ● ●
↑ Flexibility	● ● ● ● ●

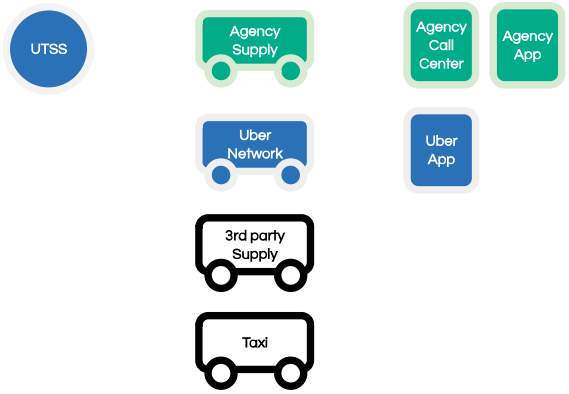
* WAV refers to wheelchair accessible vehicles for non-ambulatory riders.

Advanced Use Case

Paratransit - Software Solutions - "integrated mobility platform"

Routematch

Paratransit software platform that combines both pre-scheduled and on-demand trips which can be seamlessly dispatched to multiple providers incl. agency ADA vehicles, the Uber network or to other 3rd party supply (e.g., taxi).



Primary Agency Outcomes:

↑ Ridership	● ● ○ ○ ○
↓ Cost / trip	● ● ● ● ●
↑ Equity	● ● ● ● ●
↑ Accessibility	● ● ● ● ●
↓ Wait time	● ● ● ● ●
↑ Experience	● ● ● ● ●
↑ Resilience	● ● ● ● ●
↑ Flexibility	● ● ● ● ●

Our approach to microtransit

Microtransit is a form of on-demand service, similar to ridesharing, that offers flexible routing and scheduling of vehicles. Microtransit vehicles range from large SUVs to shuttle buses with a typical capacity of 10-15 passengers. Microtransit typically operates on a small scale within a geofenced area. The fleet size is often fixed, typically with around 10-15 vehicles (but this can be higher or lower). To date, most microtransit programs have launched as temporary pilots, and have experienced varying levels of success. This new mode is gaining popularity and growing rapidly.

Under the conventional model of microtransit, agencies purchase agency-branded vans and pay to use 3rd party software to power the service. This software typically comprises a Rider App, Driver app and Agency dashboard. While drivers are often agency-employed, agencies can also outsource the full microtransit service to an integrated 3rd party operator to provide the software and operate the service. Under this conventional model, riders either book trips with a white label app that they have to download, or through a call center. Agencies typically pay a monthly licensing fee for the software in addition to a fixed rate per vehicle supply hour. This model offers riders convenience, with a user experience closer to ridesharing than to fixed-route service. The flexible and on-demand routing and scheduling of vehicles makes it a compelling alternative to fixed route service in low ridership areas.

While microtransit is becoming increasingly popular and exhibiting high growth, it has not yet reached a critical mass of broad agency deployments, large service areas, nor large fleet sizes for the majority of deployments to date. Though there are signs we are heading toward greater scale and adoption of microtransit, our internal research suggests there are several structural challenges that may persist with the conventional microtransit model.

Rider adoption takes a long time - getting consumers to download and use a new app is often challenging. Small service areas further compound low ridership on microtransit. They narrowly restrict its usefulness to few origins and destinations while small fleets push-up wait times or reduce overall vehicle availability during peak times. Having low ridership under a fixed-cost model means that the agency bears the full financial risk of low utilization, leading to high costs for microtransit trips. Subsidies of $10 to $30 per trip are not uncommon in many US microtransit pilot programs, limiting the scalability of this new service mode.

However, we believe that microtransit has the potential to capture a much larger share of the public transportation supply if the conventional model can be adapted and tweaked.

Uber is now offering its Microtransit software platform to power public transportation service with agency vehicles and drivers. Agencies get access to Uber's proprietary demand prediction, dispatching, matching, pricing, routing, and payments technologies. Riders book trips through the Uber app. By accessing microtransit service directly through the Uber app, riders don't need to download a new app. This increases microtransit's discoverability and usage, which may translate into higher ridership and a lower cost per trip. While this alone is compelling to agencies, we believe that Uber can offer far more benefits to agencies that are open to alternative microtransit approaches.

An affordable alternative approach for experimenting with microtransit is to simply launch a microtransit program using the Uber network. Agencies create highly-configurable microtransit programs using Uber Pool [19], setting similar service areas and parameters to conventional microtransit programs. Instead of dedicated agency-branded vans, they use vehicles on

[19] At the time of writing this report, Uber Pool has been suspended due to public safety concerns associated with COVID-19. This model would only apply when Uber Pool is running again and public health guidelines allow for shared trips to resume.

the Uber network which most commonly have a capacity of 4-seats. The 4-passenger capacity is not a significant disadvantage; many microtransit deployments to date rarely operate efficiently when configured beyond 4-person matching in a point-to-point or even block-to-block service. In other words, the excess capacity in a 10-15 passenger van typical of microtransit programs may remain unutilized most of the time.

Although this model does not include agency-branded vans, it comes with several advantages. For starters, these programs can be ramped up faster, with very short lead times of weeks instead of months. As agencies bravely fought to keep their communities moving through COVID, many worked with Uber to launch programs in as little as 48 hours. With these programs, agencies don't need to invest in branded vehicles nor hire and manage new drivers. A big advantage of using the Uber network for microtransit is that agencies only pay for trips taken, which is especially helpful during a program's initial ramp-up. Agencies can smartly mitigate the financial risk of low ridership while validating and understanding the level of ridership. Using the trip-level data that Uber shares with agencies for transit programs, agencies can build models and run simulations that more accurately size the fleet they will need to launch a successful microtransit program when consistent ridership justifies the investment.

Using the Uber platform for microtransit provides more flexibility to the peaks and valleys of demand than a conventional fixed-size fleet. This offers riders greater certainty around wait times and availability - a commonly cited problem in microtransit deployments. Over time, as agencies become comfortable with the viability of microtransit, they can seamlessly invest in and operate their own fleets in parallel with the Uber network, which brings us to the third and most efficient model of microtransit.

The "hybrid" model seamlessly combines agency fleets with ridesharing vehicles to offer the most efficient microtransit service possible. The hybrid model offers the best of both worlds - the accessibility and recognition of agency-branded vans with the efficiency and flexibility of ridesharing with its variable cost model. With a solid understanding of underlying demand patterns and ridership, agencies can right-size their fleets to find the right balance of availability and efficiency (see figure 22).

For example, one approach is to deliberately undersize the agency-owned fleet. Agencies can deploy a smaller fleet to maximize utilization, resulting in the lowest cost per trip. This approach is only viable if agencies can integrate ridesharing services when demand exceeds supply or wait times are too long - also known as "peak shaving". This hybrid model lowers cost per trip, reduces the capital investment required for the fleet, offers greater resilience, and improves flexibility to deal with fluctuations in ridership.

We strongly believe that this model has the potential to accelerate the transition toward convenient and sustainable microtransit in more communities and at greater scale.

Figure 21
How Uber can provide a new and differentiated microtransit service

Basic Use Case

Microtransit - the "conventional" model

Agencies purchase and brand vehicles and use 3rd party software to power the service. Drivers are agency drivers or outsourced to a 3rd party operator.

Trips are booked via a white label app that consumers have to download or via a call center.

Primary Agency Outcomes:

↑ Ridership	●
↓ Cost / trip	●
↓ Capex	●
↑ Equity	● ● ●
↑ Accessibility	● ● ●
↓ Wait time	● ● ●
↑ Experience	● ● ● ●
↑ Resilience	●
↑ Flexibility	●

Basic Use Case

Microtransit - the "conventional" model via the Uber app

Uber

Agencies pay SaaS fees to use Uber's technology to power their fleets while the Agency employs the drivers.

Trips are booked with the Uber app which is downloaded and **used by 110M+ monthly active users**

Primary Agency Outcomes:

↑ Ridership	● ● ●
↓ Cost / trip	● ●
↓ Capex	●
↑ Equity	● ● ●
↑ Accessibility	● ● ●
↓ Wait time	● ● ●
↑ Experience	● ● ● ● ●
↑ Resilience	●
↑ Flexibility	●

Basic Use Case

Microtransit - the "UberPool" model

Uber

Agencies create highly configurable microtransit programs using the UberPool product on the Uber network (typically 4 person matching).

Agencies don't need to invest in their own branded vehicles and don't need to employ / manage drivers.

Agencies pay per trip taken (not per hour).

Primary Agency Outcomes:

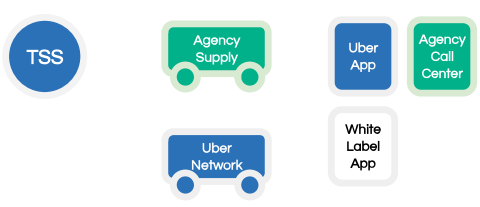
↑ Ridership	● ● ●
↓ Cost / trip	● ● ● ● ●
↓ Capex	● ● ● ● ●
↑ Equity	● ● ●
↑ Accessibility	● ● ●
↓ Wait time	● ● ● ● ●
↑ Experience	● ● ●
↑ Resilience	● ● ● ● ●
↑ Flexibility	● ● ● ● ●

Advanced Use Case

Microtransit - the hybrid model - "integrated mobility platform"

Uber | Routematch

Integrated mobility platform that can be configured to maximize the efficiency for agency vehicles while using the Uber network when demand is higher than available capacity (i.e., "peak shaving") or when wait times are outside SLA limits. Rides can pre-scheduled or on-demand trips.



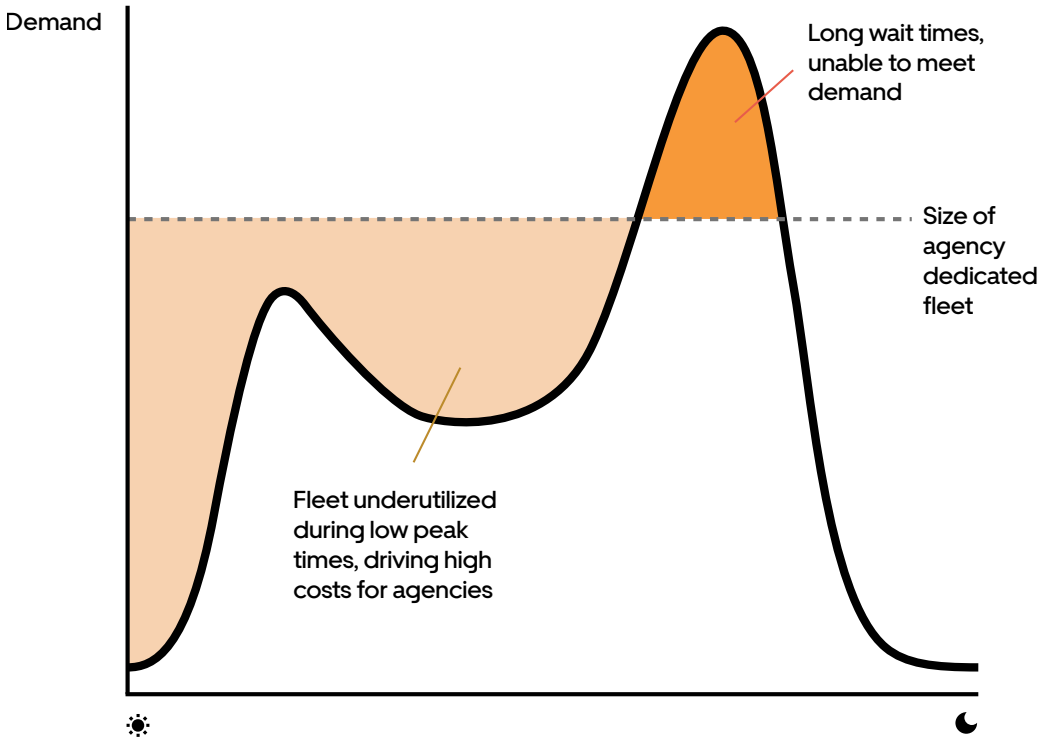
Primary Agency Outcomes:

↑ Ridership	● ● ●
↓ Cost / trip	● ● ● ● ●
↓ Capex	● ● ●
↑ Equity	● ● ● ● ●
↑ Accessibility	● ● ● ● ●
↓ Wait time	● ● ● ● ●
↑ Experience	● ● ● ● ●
↑ Resilience	● ● ●
↑ Flexibility	● ● ● ● ●

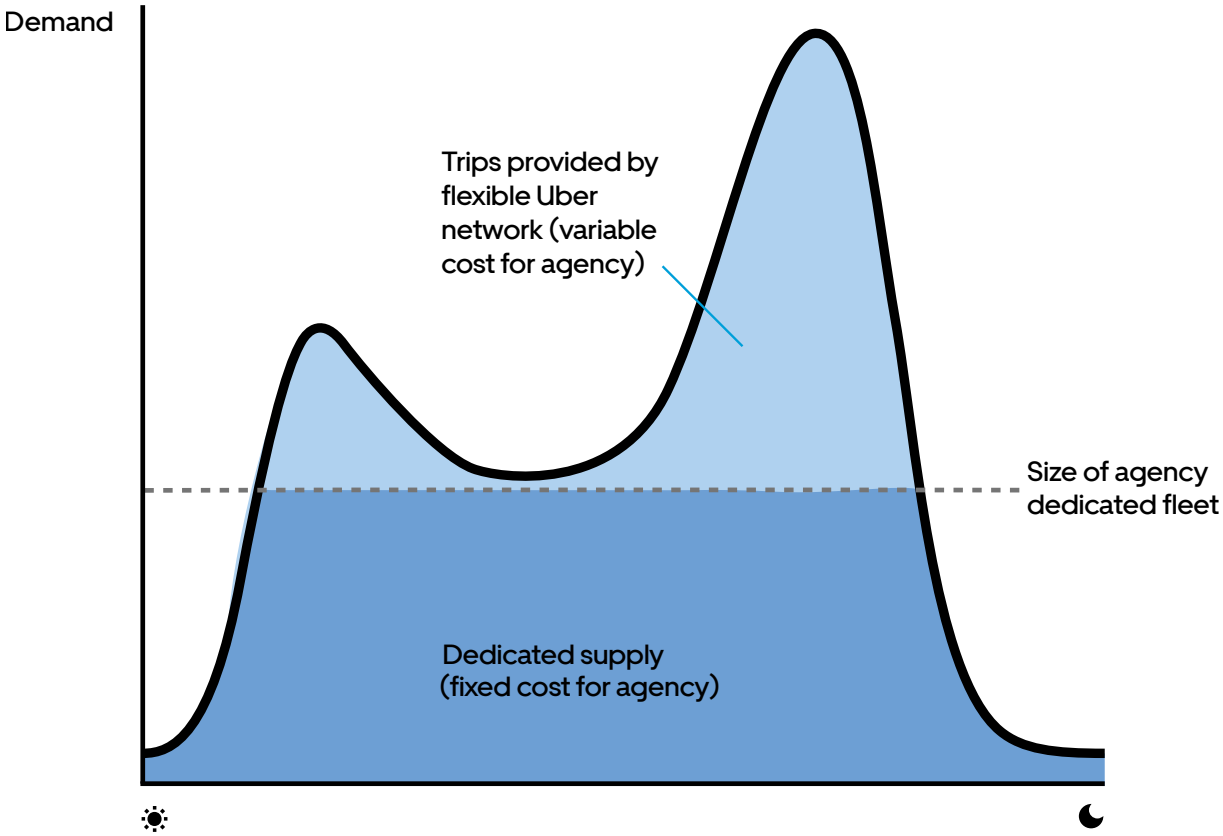
Figure 22

Why the hybrid microtransit model is a game changer for efficiency and flexibility

Conventional microtransit approach to fleet-sizing



Hybrid microtransit approach to fleet-sizing



Part 6
Conclusion: Towards a new model of public transportation

The public transportation industry is facing one of its most challenging periods in recent history. There is enormous pressure to maintain service, equity, and access without additional funding in this low-ridership environment. And while COVID has made the current environment more challenging to operate in, it has merely accelerated the pre-COVID need that public transportation, like every other sector in our economy, must innovate on its service delivery model in order to take advantage of new technologies.

Overall, integrating ridesharing with public transportation is about complementing and connecting a city's mobility network. When integrated strategically, in the right mode mix to the right parts of the network, ridesharing is a vital component of the mobility manager's toolbox to improve equity and access, lower costs, increase resilience, and expand flexibility than conventional modes can achieve on their own.

As mobility managers, agencies are in charge of deploying new technologies and services. Agencies determine the optimal mix of on-demand services across their different services, whether fixed route, paratransit, microtransit or others. An iterative and analytical approach is required as the optimal mix undoubtedly varies between cities and service types. Our economic analysis, based on pre-COVID ridership, suggests that ridesharing could deliver around 1-6% of bus trips at a cost reduction for agencies - a relatively low share of trips**.** For paratransit, the optimal mix of ridesharing is much higher given that most paratransit trips are ambulatory and the per-trip cost reduction is substantial. For microtransit services, the optimal mix of agency and ridesharing vehicles is yet to be determined, however we believe it will be closer to paratransit than to fixed route levels. Over time, as microtransit ridership increases and agencies operational expertise at demand prediction, and fleet sizing improves, microtransit's efficiency will improve. We expect this efficiency to reduce the optimal share of ridesharing trips in microtransit programs over time.

Uber and Routematch have built the tools, technologies, and services that can help agencies today. Our product families - Uber Rides for Transit, Uber Transit Software Solutions, and Uber MaaS Solutions - bring together a unified product suite that can help cities operate more connected, efficient, equitable, and accessible public transportation networks. As mobility managers, agencies will experiment with, pilot, and scale new technologies within their networks. Some will be bolder and move faster than others, and we stand ready to assist agencies across this

range - from small pilots to broad redesigns of entire public transportation systems.

While the concept of an equitable, efficient, and connected public transportation system is relatively clear, getting there is not going to be easy. Regional agencies will need to collaborate on an unprecedented scale to jointly plan, connect, and fund their respective public transportation services to meet the holistic mobility needs of their riders which are not bound by mode. Digitizing their operations and rider experiences in a customer centric way is another hugely important area of focus to make public transportation more convenient and accessible. The policy environment too needs to adapt to ease this transition - for example, measuring the success of specialized programs such as paratransit through the lens of increased mobility and accessibility, rather than minimizing costs to meet a regulatory requirement, will put riders at the center and spur the adoption of on-demand options. Agencies will have to manage complicated labor issues and upskill or re-skill some parts of their workforce. This will inevitably require a carefully crafted people strategy developed in close collaboration with the labor force and unions. Lastly, this transformation needs to be funded at a time of huge fiscal constraints. New funding sources from the state and federal level will be needed to give agencies more flexibility to experiment with and then rapidly scale up successful innovations. Agencies will need to find creative ways to secure funds with strong support from their respective constituents.

Agency leaders need a clear vision and a strong communications plan if they are to overcome these challenges. Agencies need this to energize their workforce, communities, and other stakeholders as well as to build their case for additional funding sources with voters. Having a strong vision coupled with a clearly defined strategy and tactical plan for how to get there will be essential to sustain what will be a multi-year transformation effort.

At Uber, we are unwaveringly optimistic about the future for public transportation. Ridership will return, albeit slowly. While it may not recover to pre-COVID levels for several years, the long term need for public transportation is certain. Cities will bounce back and public transportation will remain the vital backbone to move our communities. We are at a crossroads today where public transportation desperately needs innovative new ideas, technologies, cost structures, and supply modes to make the mobility system more financially sustainable and better for all. Uber and Routematch stand ready to use our technology, resources, and experience to support cities and agencies on this joint journey towards a new model of public transportation.

Appendix

How COVID-19 is impacting the cost-optimal mix of ridesharing

We know that public transportation ridership is down considerably due to COVID-19. This is putting tremendous strain on agencies' operating budgets. Comparing National Transit Database ridership data from August 2020 to the same time period last year shows that ridership on fixed route and demand response service is down 53% and 54% respectively on average. The result of this decline is considerably higher subsidies per trip today than a year ago for most agencies.

At one large agency in the US, ridership on their bus network was down 67% in the spring of 2020 compared to 2019. As a result, the average cost per trip increased from $3.88 to $10.27, an almost 3X increase. For many bus routes on their network, the average cost per trip was even higher as shown below.

Using agency-published performance data at the route level, we calculated the equivalent trip cost using UberX and estimated the potential cost reductions per trip to the agency.[20] We made sure to adjust the pricing based on the average trip distance per route and UberX's actual pricing in the local market.

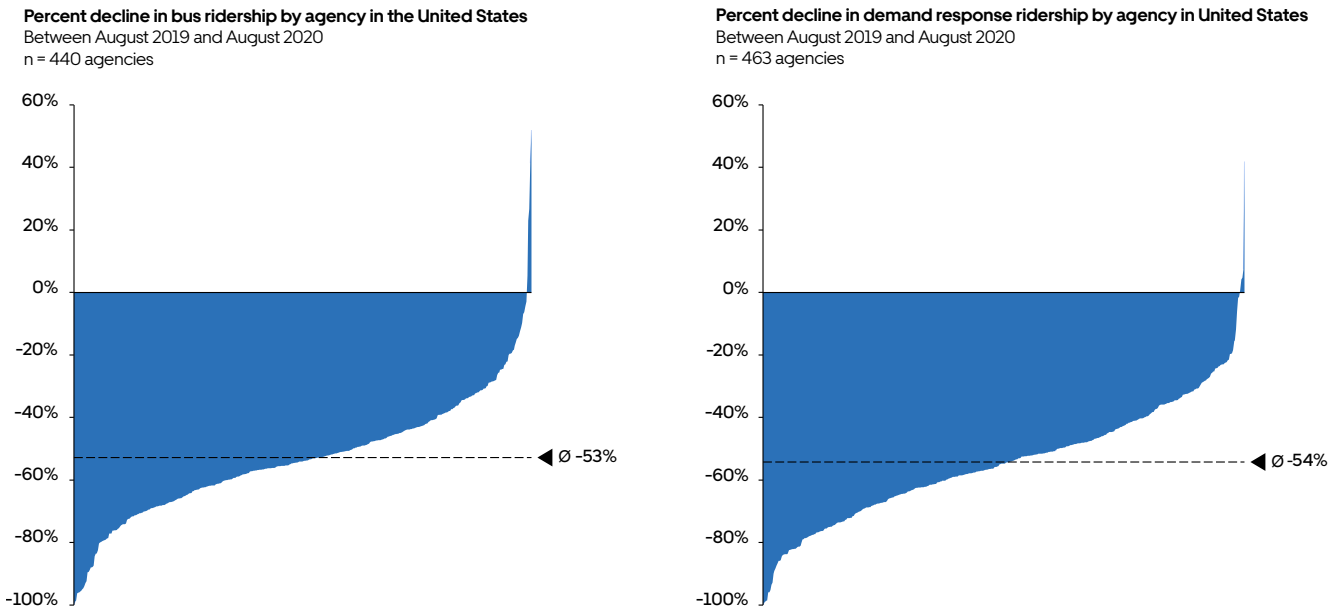
Pre-COVID, we estimated that UberX would be cheaper than running the bus on ~13% of routes representing ~1% of all bus trips. During COVID, facing a ~67% reduction in ridership, we estimate that 73% of routes and 23% of trips could be performed by UberX at a cost reduction for the agency. The estimated cost reductions for the agency were in the 25-30% range on those routes.[21]

To be clear, we are not advocating for a drastic redesign of the bus network in favor of ridesharing. Ridership levels are gradually increasing and will continue to increase as our economies recover and a vaccine for COVID-19 becomes widely available. But the post-COVID new normal ridership could be at 80-90% of pre-COVID levels due to structural changes in unemployment, passenger preferences, and continuing work-from-home arrangements. This means that agencies need to re-evaluate their cost structures, capacity planning, and network design. They have the flexibility to temporarily substitute under-performing routes with ridesharing partnerships. Then, when demand recovers, agencies can switch those back to fixed-route or microtransit service using agency vehicles and operators. Under most scenarios, we believe ridesharing will likely play an increasingly important role within the public transportation mix in the next 3-5 years.

[20] Please note that we are not showing the results on Uber Pool as Uber Pool was suspended for public health reasons during the COVID crisis and at the time of writing.

[21] This analysis does not factor in the incremental cost of providing on-demand wheel-chair accessible service. However, if we assume that 0.5% of trips require wheelchair accessible vehicles (WAV) and that each WAV trip costs ~$100, we estimated that this would reduce the cost savings for the agency by only 10-15%.

Figure 23 How COVID-19 has reduced bus and paratransit ridership across agencies in the US



Source: National Transit Database - Aug 2020 ridership report

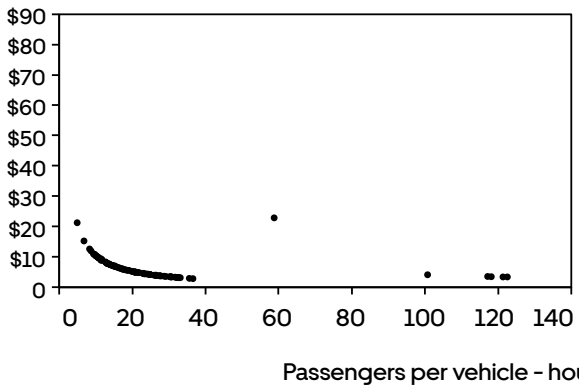
Figure 24

How COVID-19 has impacted cost per trip and the potential cost reductions from shifting to ridesharing

Spring 2019 (pre-COVID)

Average cost per bus trip by route

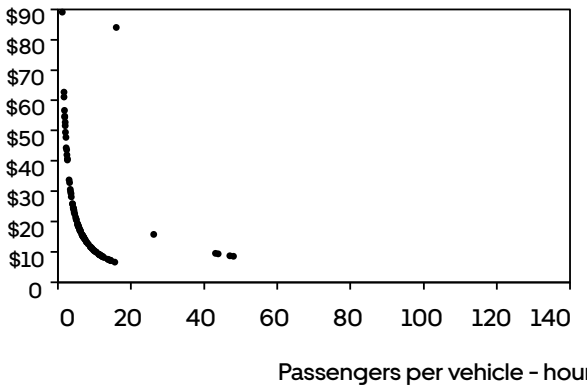
USD per trip (1 dot = 1 bus route, n=90)



Late Spring 2020 (during COVID)

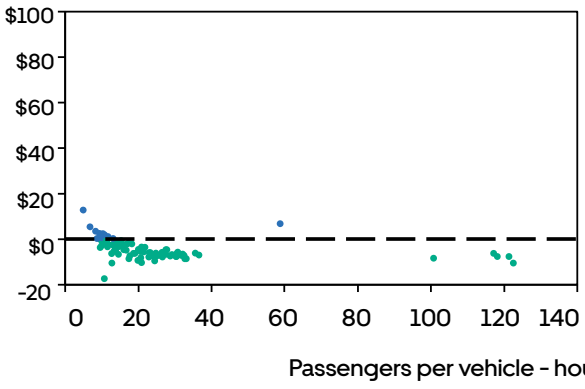
Average cost per bus trip by route

USD per trip (1 dot = 1 bus route, n=90)



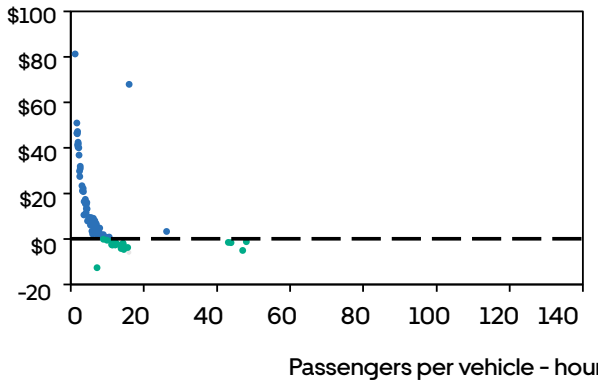
Average cost reductions per trip with UberX by route

USD per trip (1 dot = 1 bus route, n=90)



Average cost reductions per trip with UberX by route

USD per trip (1 dot = 1 bus route, n=90)



Source:
Publicly available public transportation agency route performance report (Spring 2020), Uber analysis

Figure 25

Summary of potential cost reductions for agencies before and during COVID

Estimates based on UberX Pricing

Trips where UberX is cheaper
Percent of bus trips

Routes where UberX is cheaper
Percent of all bus routes (n=90)

Potential agency cost reductions
on routes where UberX is cheaper in percent

Potential agency cost reductions
As percent for routes subsidies

Average cost per trip - UberX
USD per trip before fare recovery

Source: Public transportation agency's route performance report (Spring 2020), Uber analysis

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