

Routematch

## THE 12 PRINCIPLES

# **A Guide to Understanding the Possibilities of Public-Sponsored Mobility On-Demand**

## EXECUTIVE SUMMARY

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# ABOUT THE WHITEPAPER

The “12 Principles” whitepaper originated two years ago as an internal document at Routematch Software to facilitate public-transit technology ideas and innovation throughout the company. The goal was to create a sort of manifesto reflecting the values and aims of an emerging mobility-on-demand world in transit. And with that common road map laid out, aspirational in nature, everyone on the team would be empowered to contribute their own ideas about how technology can best embody the principles. Routematch used it as a guide as the company began investing in a new division to develop a first-of-its-kind mobility platform for the modern transit agency.

The idea to turn the internal credo into a public-facing whitepaper gained steam as two things happened: agencies worldwide began experimenting with mobility innovations at a much faster pace in 2018; and the dialogue around what public transit’s role should be in tomorrow’s world became more intense and, in some ways, uncertain. Not only could many of the lessons learned from both the successes and the failures of early pilots be better understood through the lens of the 12 principles, but also the document as it then existed already gave an emphatic, impassioned response to the swirling uncertainty of public transit’s future.

The full whitepaper is a multi-page booklet that explains each principle in more detail, relates experience where possible, and discusses newly developed tools in conceptual and practical ways related to each principle. While it immodestly claims to be a guide to understanding all things mobility-on-demand, it still maintains its aspirational character. The most ambitious intent is to facilitate the growth of new ideas, contributions, and innovations more so than to simply explain those already conceived.

## Public Transit is...

- A bridge connecting individuals & communities with opportunities
- A commitment to inclusivity
- A chance to create new & meaningful connections
- A choice towards social and environmental responsibility

“ You can’t manage what you can’t measure.

– Peter Drucker

Thinking in terms of an individual’s abilities rather than disabilities lends itself not just to accessibility but to equity in order for that individual to reach her full potential.

## THE CONTEXT FOR MOBILITY

There are significant changes taking place in the world today that are relevant to understanding the full possibility of mobility-on-demand for public transit. We have fully transitioned through the digital revolution, whose impact has been as consequential and far-reaching as the industrial revolution. Yet the pace of technology innovation and change has only increased, so much so that some acknowledge we are on the precipice of another great revolution – dubbed the “Industrial Internet” or Internet of Things. The innovation is changing our relationship to material things, where value is now derived more from access than ownership – dubbed the “sharing economy.”

Lost in much of that change is a subtler consequence – it has facilitated large scale movement toward higher economic value propositions. Just as the industrial revolution brought about product and service-oriented economies, today’s technological innovation is ushering in an experience-oriented economy. This

is true in nearly every industry, be it retail, hospitality, healthcare, etc. Industries and companies that have previously manufactured products or merely delivered services are reimagining their businesses to stage experiences for customers. It isn’t merely coincidence that every conference you attend in any industry will be talking this language – the guest experience, the patient experience, and in transit – the rider experience.

But there is a higher value proposition than an experience, and it’s no secret what that is. The highest proposition on the economic value chain is a transformation. A plastic surgeon’s practice is an obvious example of a transformative business model, in which the patient is actually the product. However, people want to change in more ways than physically. And customers more and more will look to engage with companies and products that help them become the best versions of themselves.

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## WHAT IS MOBILITY-ON-DEMAND?

If public transit is to be successful in broadly standing up and maturing this new service mode, it must be conceptualized within that broader understanding. Mobility-on-demand is not merely on-demand service. In fact, it will be defined more by its rider centricity than by its operational dynamics. And even on-demand service innovations deployed in the traditional mindset of a service company are likely destined for stagnation, if not failure.

What many people call micro transit has occasionally fallen into this trap. The fact that it is “on demand” is the only changed characteristic in what is essentially delivering the same as all others – simply a service offered up indiscriminately to a faceless public.

It turns out, true mobility-on-demand for public transit is somewhat complex. To be sure, dynamic on-demand services are components. And rider experience and personalization play a major role. But there are also opportunities to more fully deliver on the promise of transit and to renew our interpretations of public values. As flexible and as undefined as it may be, these 12 broad principles should be manifested in your service vision.

# THE 12 PRINCIPLES

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## Rider Transformation:

The modern transit agency will not view its services as its product. Instead, it will view its riders and community as the product. This follows the general economic value chain explained above, with public transit being uniquely positioned to transcend an “experience” business model and reimagine itself as a leader in the “transformation” economy.

Some might argue transit has always been a transformational proposition, and this mindset is no different than before. But that argument likely mistakes the foundational values of public transit, which are compatible with transformation and with how the industry has typically measured success, which has undoubtedly been a service-oriented approach. And viewing this principle as anything short of a radical change leads to otherwise avoidable shortfalls.

There’s an old adage that “you can’t manage what you don’t measure.” One of the areas most open to innovation – where transit agencies can push the limits of possibility, is how to measure success in this new world. Developing measurement tools such as a dignity index, spontaneity scorecards, or methodologies to directly measure healthcare outcomes, socio-economic outcomes, or other community outcomes will allow agencies to respond with more purpose-driven mobility options.

2

## Accessibility First:

Public transit has become proficient at retrofitting accessibility. But as the industry sits at the dawn of a new service paradigm, there are still opportunities to get things right from the very beginning. Mobility-on-demand services

## ECONOMIC VALUE CHANGE

Public transit didn’t come into existence until after the service economy was born, but it’s important to understand the progression of the economic value chain and where public transit is headed with rider transformation.

### COMMODITY

An ingredient, a natural state of something.  
*extract*

### PRODUCT

Commercialized, usable, something that is now tangible.  
*make*

### SERVICE

A deliverable, it can be customizable, involves a client  
*deliver*

### EXPERIENCE

Personalization, a memorable encounter  
*stage*

### TRANSFORMATION

Influencing behavior, personalized.  
*guide*

and technologies should be “accessibility first.”

The entire design of technology and on-demand fleets should be done around accessibility, and only layered or retrofitted for conventional complexities afterward if necessary. On the other hand, service planning and innovations should focus first on the most challenging trips to deliver.

### 3 Journey Personalization:

The principle of journey personalization seems self-evident, but is perhaps the easiest to misunderstand. As the mobility world generally has seen an explosion of innovation over the last 5 years, the private sector, as well as the public sector, has focused on aggregating those mobility options to maximize rider choice. In that sense, journey personalization is thought to be synonymous with MaaS concepts, or visualizing all mobility options to the rider such as transit, TNC, bikeshare, e-scooter, etc. It is simply about choice.

While there is no doubt a need for transit to participate

in these emerging mobility-ecosystem aggregator models, the essential concept of journey personalization in the new mobility space refers to something more nuanced. This concept is about the need to offer differentiated mobility journeys based on each rider’s ability. Where today’s models often seek to identify whether or not a rider has a disability before enrolling them in a broad, indiscriminate service based on that designation, tomorrow’s models seek to designate and personalize journeys based on each rider’s abilities. Building services around abilities rather than disabilities facilitates lower service delivery costs and fosters broader independence and dignity among riders.

### 4 Dynamic Scheduling:

Broad scheduling or trip matching capabilities are required to maintain a dynamic mobility ecosystem. A trip matching engine must incorporate real time factors and conditions such as traffic, but also rider attributes and/or attributes of the physical infrastructure to personalize intermodal or multimodal journeys. It must also be able to consume different potential SLAs

at the individual trip level.

The technical requirements are merely a reflection of business rules governing trip allocation and personalization. And as a principle, mobility-on-demand service rules and operations should be as granular as technology allows. All the business logic of which trips go where and why, including third-party fleets and partners, must be consumed by a dynamic scheduling model.

### 5 Predictive Demand:

Mobility on Demand in the public sector carries with it a different set of challenges than the private sector. Perhaps the biggest challenge operationally is managing equilibrium between supply and demand with such significant constraints on the supply side. This is a challenge unique to public sponsored on-demand service, since TNC models effectively deal with unlimited supply.

Agencies must have solid tools and methodologies to predict the demand for new service innovations prior to launch. They also need the ability to predict specific trips-request locations

and times in order to efficiently distribute its constrained supply of vehicles once services are operational. This principle is likely the most technical in nature, as it cannot effectively be addressed without specific machine learning technology. But any scalable mobility services need to incorporate it in some fashion in order to deliver a smooth rider experience.

## 6 Collaborative Service Delivery:

Focusing on riders and communities as the product divorces agencies from the need to actually deliver service, as it is the outcomes that should most define the agency. With so many emerging mobility companies, public transit should pursue innovative partnerships to maximize efficiency while bringing about its goals.

Simply put, mobility on-demand is limited when it is not integrated into a broader community ecosystem. Partnerships with a TNC like Lyft are desirable so long as visibility into the rider is not lost. And, there is no reason why such partnerships cannot be bi-

directional. As an example, why couldn't a trip booked through Lyft's WAV service be delivered by a public transit agency?

## 7 Micro-targeted Service Creation:

This principle is the polar opposite of offering up one standard service indiscriminately to the public. As technology allows, public agencies should be able to create service innovations for very particular purposes, geographies, or people. There is no better way to improve the community as a product than to deliver the most impactful trips toward that aim.

Efficiency in this new world isn't necessarily achieved by delivering the greatest number of trips given budgetary constraints. Rather, it is delivering the right trips given budgetary constraints. And public transit must seek out tools, processes, and best practices to measure and improve that efficiency.

## 8 Orphan Market Identification:

Before agencies can plan services with an extensive set of granular service-creation tools,

they must have methodologies, processes, and/or tools to help identify orphan mobility markets within the service area. An orphan mobility market, or mobility desert, is simply a set of trips defined by a unique characteristic such as type, geography, rider group, time, etc. that is not being served or is being underserved within the mobility ecosystem of the community. They are trips there is demand for, but no sponsor.

The explosion of mobility innovation in the private sector has been phenomenal in offering choice and legitimate coverage for a community's needs. But there are still many rides and many people that slip through the cracks of that innovation – for one reason or another it isn't accessible. The promise and opportunity of public transit is to effectively build and manage mobility ecosystems that leave no rider behind.

## 9 Integrated Payments:

Having integrated payment mechanisms that span service modes and third-party partners is an important aspect of

mobility on-demand for several reasons. First, it provides a smooth overall rider experience. Second, payments may be the best opportunity to drive engagement with riders – and engagement is the key to transformation. Third, maintaining control of the rider payment throughout a journey allows the agency to separate collections from service delivery costs and effectively create subsidies.

## 10 Shared Use Resources

Once agencies adopt mobility on-demand and effectively create a dedicated fleet, the service should look beyond that dedicated fleet to make use of all other agency resources in the service area on a trip-by-trip basis. An easy example is to integrate into fixed route fleets when possible, creating first/last mile segments only for on-demand. But another option is to integrate the paratransit fleet into mobility service when possible.

Breaking down the silos within the various modes agencies

offer, and in a sense “co-mingling” fleet resources, can significantly reduce service delivery costs per trip. And it has another important impact. One of the unintended consequences of building out service modes within silos is that the respective rider groups those modes serve end up in silos. But viewing all resources (i.e. paratransit, BRT, rail, bus, MOD) as one family of services integrates riders in meaningful ways.

## 11 Real Time Visibility

Because much of mobility on-demand business logic must be automated through technology, the focus of mobility program managers shifts to visibility. Visibility of the mobility ecosystem extends well beyond typical operations metrics, or real time visualization of vehicles. The essential component of the ecosystem is people, and better ways to visualize movements, intended or predicted movements, spontaneity, etc. should be contemplated.

Also, because of the collaborative nature of service

delivery, third party fleets performing trips such as a taxi or a Lyft must also be integrated into the ecosystem views.

## 12 Real Time Analytics

Similar to visibility, analytics must be in real time and extend to the mobility ecosystem as a whole, rather than narrowed only to fleet operations. Public transit should seek data relevant and useful for not only decision making, but also policy making.

Foreseeing a future with dozens of distinct services delivered on demand, how does an agency evaluate equity among them? This is a challenging example of the new questions the industry will likely face. And with tools that allow instantaneous access to new service creations, real time data can drive dynamic, real-time decision making that can be executed on demand.

## CONCLUSION

There is a clear need for public transit to commit fully to mobility-on-demand. But that concept must have its own identity rather than a “me too” response to private mobility innovations. Both have a place in the future. And they require coordination and integration.

The single biggest deficiency in public transit now is not the foreign elements of operations in this new model. The biggest deficiency is big data – and public transit will need to develop those proficiencies in order to be successful moving forward. ■

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### About the Author

*A diehard Cardinals fan, Pepper hails from Phoenix and is a devoted father to his kids. Currently, the Vice President of Transit Solutions at Routematch, he has spent the last six years identifying trends in transit, the challenges they present to the market and the potential technology solutions that will help move the industry forward. When he's not leading the technical and product strategy for conventional transit, mobility and integrated payment markets, Pepper loves to engage in a good debate. He is motivated by civil rights, equality and social progress, and considers himself a "recovering lawyer" who loves learning American history through Constitutional law. Prior to his work in Transit, Pepper held similar strategic roles in the healthcare and hospitality technology markets. He received a degree in Economics from the University of Utah and a law degree from Georgetown University.*