



App-Based Collective Transport Service in Mexico City: A Start-Up Case Study

Discussion Paper

175

Roundtable

Onésimo Flores Dewey

Jetty,
Mexico City

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The International Transport Forum

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Transport in the Mexico City mega region

A whopping 66.5% of total week day vehicular passenger-trips in the Mexico City metropolitan region are completed with public transit. This large percentage is surprising, as coverage of Mexico City's centrally planned and publicly subsidised mass transit network is limited to its central boroughs, where less than half of its 21 million residents live¹. Only 75.25 of the 599.5 kilometres of the dedicated ways that comprise Mexico City's subway, commuter rail, light rail and bus rapid transit (BRT) networks are located beyond these central boroughs. And even *within* this central area there are many employment centers and population pockets lacking convenient mass transit connectivity. How can this encouraging mode share exist when the homes and offices of the majority of the population in Mexico City are not well served by mass transit?

The answer lays in the thousands of loosely regulated, privately operated and government permitted jitneys (locally known as peseros, colectivos or micros), which represent the true workhorse of this megacity's transit system. Statistics are telling: The BRT system is responsible for 1.1 million, and the subway for 4.5 million passenger-trips per day. In contrast, jitneys deliver a massive 11.5 million passenger-trips every day (INEGI, 2017a). Perhaps Mexico City is among the cities closest to achieving "on demand" transit (sans the tech hype): Jitney organisations nimbly match their seat supply to passenger demand, and expand or contract their service frequency and route coverage with amazing speed. Thanks to the jitney system, residents can hail a shared ride from most street corners in this vast metropolis to access employment, educational and cultural opportunities at a price they can afford.

But there is a catch. In contrast to the subway, BRT, commuter and light rail systems, jitneys receive no government subsidies, and cover the entirety of their costs with fare revenue. Fares are regulated and kept dramatically low (ranging from USD 0.25 to USD 0.50). As a result, jitney operators skimp on everything else to make ends meet. Their insurance policies are laughable, their vehicles are old and under maintained, and their labour practices are questionable. They also face intense competitive pressure, as barriers of entry to the market are low (if you know the right people). Jitneys are organised around route associations, which in turn coalesce into federations. Leaders of these organisations are instrumental for city authorities, as they help govern an otherwise chaotic system. But these leaders also benefit from expanding their organisation's membership base and territorial influence, and thus constantly expand their routes and add vehicle supply to an already flooded market.

This arrangement comes at significant social cost. According to official polling data, 90% of Mexico City residents feel unsafe using transit, and this percentage climbs to 92% for residents of the State of Mexico (INEGI, 2017b). Residents of this city feel more at risk while traveling in public transit than when using other public facilities, such as ATMs, banks, parks or markets (INEGI, 2017b). Onboard petty crime and sexual harassment incidents are frequent, especially on overcrowded buses, and many passengers buy safety with their time. They queue unnecessarily for long periods to wait for a vehicle with free seats. Others can't afford this luxury: 22.7% of women living in Mexico City report avoiding public transport to reduce risk (INEGI, 2017b).

These results have a lot to do with how drivers are hired and compensated. The take-home pay of drivers is whatever is left in the fare box after paying a fee ("cuenta") to vehicle owners, buying gas, and tipping policemen and others to idle unmolested in congested locations with high passenger demand. To make ends meet drivers work for long hours, drive recklessly, and mistreat passengers. They cram as many

passengers as possible into their vehicles, and either delay the start of their trips or aggressively overtake other jitneys. Many also replace regular seats with unsafe “horseshoe” benches (installed along the rim of the interior) to maximise standing room (and thus fit more passengers into each trip).

With each jitney association competing for territory, and each driver competing for passengers, over time routes have grown circuitous, overlapping and illegible. Many trips require several transfers, forcing users to pay a second or third time. The system is unwelcoming to new users, deepening the sense that transit is only for those who cannot afford an alternative.

In sum: Crashes involving pedestrian and passenger injuries are frequent. Trips are uncomfortable and dangerous. Vehicles are old and highly polluting. And perhaps most troublesome, there is little accountability built into the system.

This system is entrenched and unlikely to experience radical transformation. The subway, BRT, public bus, commuter and light rail systems are running mounting operational deficits and delaying maintenance and fleet renewal.

The following data points confirm this:

- 101 of the 384 trains in the subway fleet are currently decommissioned due to lack of maintenance funds (Ortega, 2018).
- In 2017, the subway system experienced 22 195 “system failures”, contributing to constant delays. 37% of the 300 electric trolleys, 33% of the light rail cars, and 27% of the busses owned by the city are also sitting on the sidelines (Sheinbaum, 2019).

The city has much to do with its already limited funds before turning to expanding its networks to the sprawling metropolitan area or creating a fare-integrated system with the jitneys, and new sources of funding are not forthcoming. Increasing fares has proven politically very difficult, vehicle registration taxes were recently nixed to appease motorists, and recently elected authorities have already discarded implementation of road pricing or tolling schemes. Without radical change in transportation finance policy, it is hard to envision centrally planned, capital intensive, publicly operated mass transit systems gaining significant market share.

In this context, the continued cooperation of the jitney industry is required to keep the city moving. Some jitney companies have been professionalising their operation, incorporating as companies, consolidating their ownership structure and modernising their fleets, but not at the pace needed to make meaningful impact, and many are struggling financially. Sadly, efficiencies achieved rarely offset costs they currently internalise (such as newer buses, better insurance policies and benefits for drivers). The government's ability to discipline the industry through mandated standards is limited. Most improvements need to be balanced with the unflinching commitment to unsubsidised low fares. The best residents can hope for are incremental, marginal improvements to the existing service.

The resulting quality of service explains why the population of Mexico City largely perceives public transit as an inferior good. The public transit offering is dangerous, uncomfortable, unreliable and slow. It takes someone traveling by public transit five hours and 21 minutes to cross the city from east to west. It only takes that person two hours and 42 minutes by private car. People opt out of transit as soon as they can afford a private vehicle, adding to the city's already epic traffic jams. The metropolitan area has 11.2 million motor vehicles (INEGI, 2017c), and this number is growing more rapidly than population growth. Vehicular congestion is already choking Mexico City, but the argument for modal shift is weak. Why would anyone who can afford a private car, a taxi or a ride-source service submit herself to transit? Despite the introduction of bus rapid transit, the construction of a new subway line, the addition of

elevated highways and the arrival of public bike share programs in the last decade, the current trend seems unstoppable. Travel times are increasing, and transit mode share is eroding.

The new mobility revolution and its opportunities in the Mexican context

Tech companies have forcefully entered the transportation space. A multitude of new companies and innovative business models are emerging, leveraging the smartphone, GPS, electronic payments, social networks and other innovations to create more transportation alternatives. In the case of the United States and other developed economies, these companies initially focused on “disrupting” over-regulated markets, where supply of service is scarce and fare prices are high (Flores Dewey and Rayle, 2018). “Ride-sourcing” companies like Uber and Lyft are incorporating additional supply of service to the taxi market by recruiting drivers and vehicles that do not meet the strict governmental requisites to offer taxi services. “Microtransit” services like Chariot, Via and Bridj, unburdened with the legacy costs, unfunded mandates, or bureaucratic planning processes that constrain government transit agencies, promise to supply shared trips more nimbly and cost effectively. These app-based transportation services have often fallen outside pre-existing “regulatory boxes,” and have frequently run foul of regulators. Yet they have clearly found an important niche, are thinking creatively, and are fighting to gain political legitimacy and market share.

App-based mobility became commonplace in Mexico City with the launch of Cabify in 2012 and Uber in 2013. These two companies started offering app-mediated, taxi-like services, initially without a permit. They became instantly popular, as vehicles in their fleets were of higher quality, and their drivers more courteous than taxi drivers. In addition, their apps set the price, eliminating unsavory haggling with drivers, who often tried to charge beyond the official meter. Both companies faced contentious opposition from the incumbent taxi industry, and a few violent episodes were recorded.

Mexico City and State of Mexico authorities soon created a permitting framework, allowing these companies to scale. In both jurisdictions, ride-sourcing companies were classified as enablers of purely private contracts between transport suppliers and passengers. This exempted their services from conditions that apply to taxi companies offering transit services *on behalf of* the government (through a concession). Both jurisdictions adopted the American “Transport Network Company” (TNC) regulatory model, in which the tech company obtains an umbrella permit to operate their platform, and is given freedom to add as many vehicles and drivers to their network as desired, to run service throughout the metropolitan area, and to charge whatever fare the market is willing to bear. Permitted companies must however register their vehicles and drivers, use vehicles of recent model, submit their drivers to a background check, and pay 1.5% of their gross fare revenues to a “mobility fund”.

While the apps are practically identical in Mexico and the United States, ride-sourcing companies fill a very different market need in each country. In contrast to cities in the United States, Mexico City faced no scarcity of mobility alternatives when ride-sourcing became available. It had approximately 140 000 taxis competing for customers, and meter prices were already very low. However, many perceive traditional street hail taxi service as unsafe and unaccountable. Ride-sourcing companies thus attracted

passenger demand and political goodwill in Mexico City by offering safer rides and by reducing friction in passenger-driver interactions, despite charging slightly higher prices. Passengers were surprised by drivers who would open doors, help carry luggage, or give water bottles to passengers. Their apps allowed passengers to track their rides and rate their trips, and customer service representatives immediately followed up on reports of bad experiences. As a result of the entry of ride-sourcing companies to the Mexico City market, taxi-like services have become more reliable, predictable, safe and accountable. However, ride-sourcing remains a niche service, largely used for occasional trips, and disproportionately patronised by relatively wealthier passenger demographics. Mexico City's 2017 origin-destination survey puts the ride-sourcing industry in perspective: They serve a meager 175 000 passenger-trips per day². The ubiquitous jitneys serve 12.5 million.

Mexico City and State of Mexico authorities embraced ride-sourcing, and crafted new regulation to allow their operation. This decision improved the transportation experience for the minority of the population that can afford taxi-like services. Unfortunately, government efforts to improve the transportation experience for the majority of the public, who rely on jitneys, have not yielded the same results. This policy contributes to expanding the quality of service gap between the haves and the have nots. Further, ride-sourcing is likely contributing to worsening congestion levels. Many ride-sourcing drivers concentrate around central areas to hunt for rides, and carry only one passenger in most trips. Shared-ride services offered by ride-sourcing companies like Uber Pool have not proven very popular in Mexico City. The price savings relative to individual rides are not very big, and a slight detour to drop off one passenger may result in significant time wasted in traffic. If you are a resident of Mexico City, you either suffer transit, or spend a large share of disposable income on unsustainable modes.

We need more and better transportation choices. As the International Transport Forum (ITF) has suggested, “people travel for different reasons, at different times and with more flexibility in their trip-making choices. They also value trips differently according to convenience, speed and willingness to pay for these and other features.” (International Transport Forum, 2017) We strongly believe a significant number of commuters in Mexico City would choose a transportation service that is simultaneously more affordable than ride-sourcing, and more comfortable, safe, reliable and accountable service than the jitneys. And this is the alternative we are building at Jetty.

The idea behind Jetty

Compared to ride-sourcing, jitneys enjoy two important advantages. First, the cost of a ride is distributed across a larger number of passengers, enabling lower-cost fares. And second, passengers travel to and from stops to reach the vehicle, instead of the vehicle detouring to pick up and drop off each passenger at their doorstep. This allows more direct routing, and increases the number of daily passenger-trips that are feasible. Ride-sourcing services have nonetheless proven more capable than leaders of jitney organisation in one critical arena: enforcing service standards on large networks of private suppliers of transportation services. Ride-sourcing companies are demonstrating that safety, security and comfort improvements can be achieved by focusing technological capabilities on customer care, real time information, frictionless payment and data-based route planning. They also suggest (at least so far) that these improvements can be sustained without subsidies from the government.

At Jetty, we are bringing these insights together to create a new mode of transport, capable of bringing the benefits of app-based mobility to a larger passenger demographic and of helping jitney operators improve their performance and bottom line. The value of this new option should be obvious. At one end of the spectrum, Mexico City commuters endure unsafe, uncomfortable and unreliable public transit conditions. Fares may be cheap, but passengers pay a high emotional cost and spend significant time moving around. At the other extreme, people who can afford an alternative choose private mobility, either by purchasing a motorcycle or car, or by relying on taxi or ride-sourcing services. The economic expense associated with this latter option is significant, especially for those who have to travel long distances from their homes to their jobs every day.

The following example may illustrate the quality/cost trade off facing commuters in Mexico City. A 23 kilometre jitney trip from Mundo E, in the north-west residential suburb of Satélite, to the employment center of Santa Fe, at peak hour (6:30 am) costs MXN 24 (roughly USD 1.25), takes 118-157 minutes and requires at least one transfer. The same trip, using a ride-sourcing app like Uber, costs MXN 185-245 (USD 9.75-USD 12.90), and takes 50 minutes. At Jetty, we aim to expand the transportation choice-set for commuters who feel mistreated by the existing public transit offering, but who can't afford the expense or stress associated with private mobility. The same trip, using Jetty, costs commuters MXN 69 (USD 3.60) and takes 60 to 70 minutes (after accounting for the last mile).

Figure1. Jetty Passenger van



Source: Jetty

While the majority of the population still relies on transit, the low quality of public transit is steadily “pushing” people towards less sustainable modes, clogging the city's roads. This in turn is increasing travel times for everyone, decreasing air quality, and diminishing the overall attractiveness of the city. Jetty is a small company with a grand goal: **Reducing vehicular congestion in Mexico City**. To do this, we aim to sustain the standard of comfort, safety and reliability in shared rides (shared taxis, vans and busses) needed to delay, and hopefully avoid, modal shift towards the private car.

Launching an app-based transit service in Mexico City

The founder of Jetty (author of this paper), completed his doctoral studies at Massachusetts Institute of Technology (MIT), writing his dissertation on the formalisation and professionalization of the jitney industry in Mexico City and Santiago, Chile (Flores Dewey, 2013). After graduation in 2013, he stayed in the United States as a researcher and studied the emergence of (and regulatory challenges facing) the ride-sourcing industry in the Bay Area (Flores Dewey and Rayle, 2017). In 2015, he briefly explored a partnership with Bridj, a company that at the time operated a micro transit service in Boston. The CEO of this company wanted to expand internationally, and negotiations to launch in Mexico City were serious. Ultimately, Bridj was unable to fund its share of the venture and unwilling to make adaptations to fit the local market, and the possibility of a partnership floundered. The idea did however spark investor interest in Mexico City. In mid-2016 we raised seed money and recruited a small team of three. On 31 October, 2016, we incorporated as a company, and Jetty was born.

Jetty faced three interrelated challenges prior to its launch in August 2017:

- a) Creating a minimally viable app.
- b) Obtaining a permit to operate.
- c) Recruiting transport operators to supply rides.

It took over a year to work through all three challenges.

The technological challenge was bridged by partnering with INNKU, a local and experienced software developer company. They assigned three developers to work full time on Jetty, and we launched our website (www.jetty.mx) and uploaded a beta version of our passenger and driver apps to the Google Play Store on 25 July, 2017. An iOS version was added soon after. All three developers eventually became full time employees at Jetty, where they continue to improve our platform.

The regulatory challenge was partly solved by the entry of Cabify, Uber and other ride-sourcing companies to the local market. These companies launched in 2012 and 2013, and operated illegally for more than a year. Eventually their lobbying efforts were successful, and both the State of Mexico and Mexico City reformed local regulation to allow the operation of technological platforms capable of linking “private transport” suppliers to interested customers. In July 2015, the Ministry of Transportation of Mexico City published rules to obtain “Registration as operator and administrator of an application or platform to enable individuals to hire private transportation services in Mexico City”. Similarly, in January 2017 the State of Mexico established “General rules regarding electronic contracts for private transportation of individuals”. While tailor-made for these companies, this permitting process opened the door for new companies like ours.

We met with the Transportation Ministers and their staffs from both jurisdictions on several occasions during 2016 and 2017 to discuss the characteristics of our intended service, and to further understand the permitting requirements. We even promoted a technical visit by State of Mexico Transport Ministry officials to MIT and Boston, where they experienced microtransit operation by Bridj. Reaction from authorities was a mix of mild encouragement and scepticism. The ride-sourcing rules they had put in place did not explicitly limit the size of the vehicles, the number of seats or the number of stops allowable along the way. They had certainly not intended those rules for microtransit, but our service

description fitted nicely into their own, very open, definitions. We fell into a grey area. While our service had important differences with taxi-like app-based services, there was no legal reason to deny our permit. Jetty obtained its license to operate in the State of Mexico on 17 March, 2017, and its registration as a platform in Mexico City on 18 May, 2017.

This does not mean that the process was all easy sailing, as illustrated by the following two examples. In the State of Mexico, the ride-sourcing permitting process is not managed by the Transportation Ministry, but by the Finance Ministry. We obtained our permit from the latter with minimal lobbying, and sustained communication with the Transport Minister and his staff throughout the process, but had to grapple with mid-level Transport Ministry regulators contending that we were abusing our permit. We received a lot of mixed signals in this period. In the case of Mexico City, we applied and received our registration as a platform, and this should have enabled us to register any vehicles or drivers that complied with the regulatory requisites. The electronic platform to complete this process was however unavailable for many months. We would upload our driver and vehicle files, but the system would not accept or deny them, and would not produce a receipt indicating their registration was under review. Officials would not accept paper copies submitted to the Ministry. These obstacles consumed time and resources, created significant stress, and certainly slowed down our growth.

The toughest challenge, however, was enlisting the support of the incumbent jitney industry. Authorities in both Mexico City and the State of Mexico clearly indicated that having a permit was not enough to launch service. We were told, in no uncertain terms, that the security of our drivers and vehicles would not be guaranteed unless our services were provided by incumbent jitney operators, or at the very least, secured the support of their leaders. Authorities feared, correctly, that incumbent operators would perceive our service as an invasion of their “property rights” and as unfair competition. Our maiden service intended to connect commuters living in the northwest suburbs with jobs located in Mexico City. This meant our vehicles would cross the state-city border, which is not allowed for public transit jitneys (but allowed for ride-sourcing). Further, our ride-sourcing permit allowed us to freely adjust our fares, activate new pick up points, fit the size of vehicle to demand, and redesign our routes. Jitney associations do all of this of course, but illegally. Fearing violent backlash, authorities in the State of Mexico helped broker meetings with jitney operators.

Figure 2. Fleet of Jetty vans



Source: Jetty

Over several months, as we developed our app and secured our permits, we contacted and met with the largest jitney association leaders in the metropolitan area. They are savvy businessmen, aware of the impact a platform like ours could have in their business. They had observed closely how Uber and similar

platforms had impacted the taxi industry in the months prior, and frowned on Uber's intention to offer pool services or accept cash as a not too covert strategy to directly compete with them for passengers. They understood Jetty's pitch to them, but they were not biting. We were a minuscule company, with an unproven technology, and a risky business model.

Perhaps we were asking jitney entrepreneurs to do too much, too soon through the following: 1) allocate a fleet of new vehicles to run exclusively for Jetty, 2) contract a more expensive insurance policy, 3) migrate their best drivers from commissions to a salary plus benefits scheme and 4) risk retaliation from others in the industry. All this without receiving any revenue guarantees from us. One jitney association leader offered to trade "protection" for shares in our company. A few threatened us not to launch in their areas of influence. Most listened attentively, did the numbers, and flatly declined. We simply did not have the track record necessary to make a credible business case.

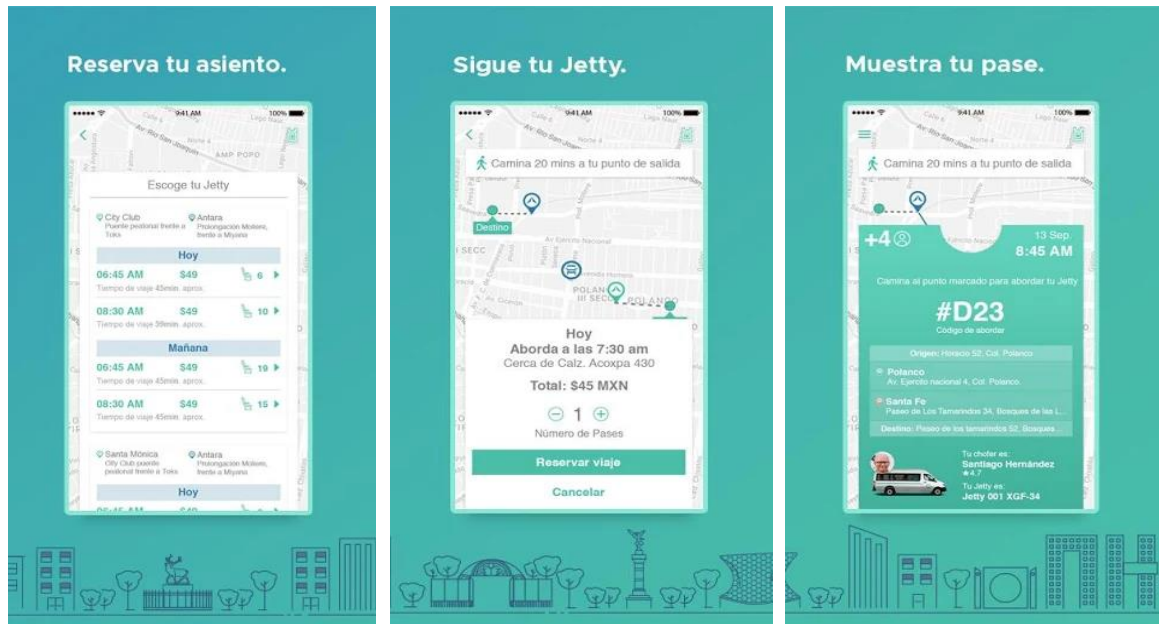
In June 2017, we struck a deal with a small transport company operating in the northern suburbs of Mexico City. This company was doing ok, but not growing, and its route network had no direct connections to Mexico City. Their owner agreed to commit four new 19-seat vans to our service, and to comply with our desired standards, during a one-year pilot. To hedge his risk, he asked one of our investors to invest in the new vans with him. They created a new company, purchased the vehicles and hired the drivers. We were ready to launch.

How does Jetty work?

Users download the Jetty app and create an account³. We collect their names, home and work addresses, email and credit or debit card information. They can start searching for trips as soon as they complete their registration. Users tell us where they are and where they would like to go, either by dropping a pin on a map or by typing the addresses into the app. We store this search information for future route planning purposes, and pair the request with pick-up and drop-off points located within walking distance of the user's origin and destination.

In the event a trip match is found, the app provides users with additional information such as walking time to the pickup point, the type, model and license plate of vehicle, departure times, the price of the ride, and the number of open seats available. If the user decides to reserve a seat, his account is charged, and a ticket displaying a confirmation code and additional details, such as the picture and name of the driver, is generated.

Figure 3. Screenshots from the Jetty app



Source: Jetty

Notes: Screenshots left to right: "Reserve your seat", "Follow your Jetty", "Show your ticket".

Money is deposited into Jetty's account. We withhold our fee, our contribution to the mobility fund in both jurisdictions, and the commission for our electronic payment broker, and finally disburse the rest to our transport suppliers. To drive for Jetty, drivers need to pass a strict background check and training program (currently, only 1/5 applicants pass). They have to be full time employees, with a salaried compensation scheme. We inspect and approve the vehicles they will use, and review their insurance policies to meet our standard. Vehicles must be outfitted with cameras.

Once the driver starts the trip, the user can follow the approaching vehicle in the screen, and receives timely in-app notifications in case of delays. We have live support available, and users can contact us using our in-app chat. This bi-directional communication channel also functions as a panic button. We ask passengers to arrive a few minutes ahead of the scheduled departure time, as drivers leave 60 seconds after the mark. Passengers running late can cancel or reschedule their trips from the app.

Our service is distinct from others like Uber Pool or Lyft Line. Jetty is not a door-to-door service. Passengers must arrive at a pre-determined pick up point, and make their way to their final destination from our drop off point. In contrast, Uber Pool and Lyft Line divert vehicles to pick up and drop off each individual passenger at their preferred locations, offering some convenience at the cost of frequent, time consuming detours. Our vehicles are also typically larger than those used by Uber Pool and Lyft Line. Jetty will try to fit the type of vehicle used to existing demand, usually launching a new service with a small van, and gradually increasing the size of the vehicle as the route matures. Finally, we are currently a peak hour-only service, and store our vehicles during the off peak. In contrast to ride-sourcing services, Jetty vehicles do not add to vehicle miles traveled (VMT) unless they are servicing a viable trip.

Upon arrival at the pick-up point, the driver checks-in all passengers. The confirmation code and the first name of all the passengers are listed in the driver's app. Each passenger is greeted by name. Since only passengers holding a reservation can board, everyone aboard is guaranteed a seat. In most services, onboard Wi-Fi and electric outlets are available. The driver follows Waze for most trips, and takes toll

roads when available. Once a passenger alights at the destination, a notification is sent to his app, asking to rate the trip (one to five stars) and to provide comments. Every passenger rating three or lower receives a follow up from our support team.

Figure 4. Jetty drivers and user



Source: Jetty

Every week, we review scheduling and routing adjustments and activate or relocate pick-up points. To make these decisions, we analyse the service requests collected through our website and social networks (at jetty.mx/solicitud), and study historical passenger data (both searches in the app, as well as passenger comments and ratings). We also provide daily feedback to our transportation suppliers, informing them of driver performance, conveying passenger feedback, and informing them of ridership and revenue trends.

Our app is permanently evolving, as well as our capacity to process and use increasing amounts of data. Our development, operations and customer support teams sit across from each other in our small co-working office space. It has been an exiting 15 months since launching, building a new kind of transit agency. Notably due to:

- Learning to negotiate and enforce standards on private suppliers, while also helping them increase their profits.
- Learning to engage with passengers directly, and to draw useful, actionable insights from their ratings and comments.
- Learning to make data driven decisions quickly, and to launch and adjust services nimbly.

Competitive resistance, regulatory capture and startup survival

Jetty was launched on 15 August, 2017. Despite our humble four-van operation, our launch was widely covered by the major local newspapers, such as Milenio and Reforma⁴. That morning, most of our team members assembled in Lomas Verdes, in the northern outskirts of Mexico City, and boarded our vehicles for our maiden trips. We planned to personally greet the passengers that had reserved a ride. At 5:50 am, roughly 200 metres before arriving at our first pick up point, two individuals signalled us to stop. Mistaking them for passengers, we stopped the vehicle, and were rapidly surrounded by a mob of twenty individuals. Our second vehicle, passing through a few minutes later, faced the same fate. The fact that a jitney operator they knew owned our vehicles likely prevented a more violent reaction, but the mob did puncture two tires. We were calmly but forcefully informed that we were encroaching on “their” territory, and that we faced a more violent retaliation if we attempted to pick up anyone. They made it clear we could not leave until someone from the State of Mexico Transportation Ministry clarified this point. As no one from the Ministry was available that early to pick up the phone, we were forced to stay on board for close to two hours⁵.

Figure 5. Newspaper headline



Source: Animal Político

Later that day, the author met at a restaurant located across the street from the Transportation Ministry with the leaders of the jitney associations that had hijacked our service. These are savvy businessmen, more approachable than you might imagine, but certainly moulded by the ways and means of an industry well prepared to defend its interests. As in the past, we tried to get them to join our platform as suppliers, and explained that our service could ultimately benefit them. We argued our platform would allow them to attract passengers already lost to ride-sourcing, to experiment with new routes and to charge a higher fare. One confided that they had been trying to develop their own taxi app for months, at great expense and with terrible results. They agreed to review our proposal in their assembly, and we decided to suspend service to await their response.

Three weeks later one of these leaders informed us that our proposal had been denied. Further, we later learned that our transport partner had been kicked out of its jitney federation, and that jitney associations in the area were raising funds to “police” their territory against “pirate” services like ours. It took us a month to go through the ranks, identify decision makers and get meetings, before we brokered a peace deal with the jitney associations in the State of Mexico. In the end, they allowed us to operate our four vans unharmed, in a different, less attractive area. In exchange, we committed to share information on our ridership and revenue. If results proved promising, their members would reconsider joining our platform.

We relaunched service on 11 September, only to suspend service days later due to a new regulation hastily adopted in Mexico City. On 18 September, the Transport Ministry in Mexico City published an addendum to the existing ride-sourcing rules, adding language prohibiting “private transport service generated via two or more requests and serviced with a single vehicle” (Gobierno de la Ciudad de México, 2017a). This rule went against the City Charter (Constitución de la Ciudad), which requires the government to “guarantee the mobility of people in conditions of maximum quality through an integrated system and multimodal transport, which considers social and environmental needs, under the principles of social equity, equality, accessibility, universal design, efficiency, security, affordability, permanence, predictability, continuity, comfort and hygiene” and also to “promote the use of intelligent systems and technologies that enable more fluid circulation of vehicular traffic” (Gobierno de la Ciudad de México, 2017b). The rule also challenged good sense. Why would it be against the public interest to use technology to coordinate people willing to share a ride with others, especially in one of the world's most congested cities? The timing of this new regulation, immediately following our newfound accommodation with incumbent operators in the State of Mexico and our announced relaunch, made us suspect our company was unfairly targeted.

Fortunately, this new obstacle did not force us to stop service. Mexico City does not prohibit cross-boundary ride-sourcing rides. Many Uber and Cabify drivers indeed live and have their vehicles registered in the more affordable suburbs of the metropolitan area, but naturally get many ride requests around the employment-rich downtown areas during the day. Thanks to this circumstance, Jetty was able to leverage its State of Mexico license to continue its nascent operation in Mexico City, but our scalability was severely constrained, and our operation was continuously at risk of suspension.

It was clear that jitney associations from Mexico City had successfully lobbied the local government to have our service stopped. In August, 2017, Peatónito, a masked, sustainable mobility activist, uploaded a petition on Change.org, demanding the reversal of the rule against app-enabled shared rides - 13 330 people signed. As he put it, “we are sick of the terrible service offered by colectivos and micros in the Mexico City Valley. The problems of insecurity and sexual harassment have reached our limit... help us tell authorities we are tired of the terrible state of public transit and of blockades to innovative alternatives like vanpooling”, (Peatónito, 2017).

Figure 6. Illustration of the petition on Change.org to: Allow app-based van pooling in Mexico City and in the State of Mexico



Source: Change.org

Jetty sued the city government to retract this rule. Our legal proceedings are ongoing as of this writing, but public pressure and the start of the trial did have the effect of opening a new dialogue with the Ministry. After studying our arguments, city authorities promised to review our service, and have allowed us to operate until new rules are put in place. Since then, we have not faced significant regulatory challenges. This new arrangement was perhaps aided by the fact that we were growing. In March 2018, emboldened by increasing ridership, our original transport operator increased the size of his Jetty fleet from 4 to 19 vans. And in May we convinced SVBUS, a large bus company, owned by a jitney association leader from Mexico City, to join our platform, enabling us to expand our service area significantly and to add 45 seat busses to our vehicle roster. Two additional jitney associations have since joined our platform, and several more may join soon.

Partnering with jitney companies to benefit users: a case study

Why do traditional jitney companies and associations partner with Jetty? And, how does this partnership benefit the public? To answer these pertinent questions, we share below a brief case study of our partnership with SVBUS, a transportation company owned by traditional jitney operators in Mexico City.

SVBUS was created in 2016, and obtained an exclusive permit to offer bus services from the southern tip of the city to the employment center of Santa Fe. The company was given a distinct, important advantage over its competition. It was the only bus service allowed to run on the city's elevated highway, which cut travel times by 55%. For this privilege, the company committed to purchasing brand new, large, natural gas buses. Their permit allowed them to run up to 40 buses along this route, but fixed a very low, unsubsidized fare of USD 0.50.

To make the economics of the project work, SVBUS was forced to do three interrelated things: Modify the original seating arrangement to maximise standing space, board no less than 70 passengers per trip, and limit its fleet size to 25 buses. While the company's services were a distinct improvement from the jitneys in the area, SVBUS was not delivering on its true potential. Every morning, in their terminal at Acoxta, users would form long queues to board. We estimate passengers arrived 30 minutes ahead of departure time to ensure a seat, effectively paying for comfort and safety with time.

Figure 7. SVBUS users queuing for a seat before the implementation of Jetty



Source: Jetty

We suggested using our platform to enable passengers to book a seat ahead of time. We launched a two week pilot with SVBUS, reserving ten seats on a few busses each morning, and selling them on our app at the fare price plus a service mark-up (Jetty, 2018). Passengers searching for trips on Jetty would find trip matches with a few services “operated by SVBUS”. Departure time for those trips was set five minutes earlier than SVBUS regular times, at a pick up point located 100 metres ahead of the SVBUS terminal. By boarding ahead of the rest of the passengers, users booking through our app would have guaranteed seats, and could arrive to the stop seconds before departure time. Once boarded, the bus would move on to the regular stop, and pick up the passengers paying the regular fare. We cancelled the pilot almost immediately. Tickets were selling out more than a day in advance, and passengers complained about their scarcity. Further, passengers with a Jetty reservation vividly complained about having to wait for passengers without a reservation to board. This process took over ten minutes, as each passenger paid the regular fare and had to wait for change before boarding. Finally, passengers suggested that despite traveling seated, their experience was affected by overcrowding of standing passengers. In lieu of the pilot, SVBUS decided to add new buses to its fleet, but this time serving Jetty exclusively. The new buses have more comfortable seats, and we do not accept standing passengers. We regularly sell-out.

Based on a growing number of trip requests, we were soon able to identify the true origin and destination of our users, and based on that information, we suggested improvements to SVBUS' operations. For example, we discovered that most Jetty passengers would alight at the SVBUS stop in Santa Fe, only to take a taxi to complete their last leg to their destination. But a one to two kilometre taxi ride in Santa Fe was often more expensive than the bus ticket! We made the case to SVBUS to modify the location of some of its stops, bringing passengers closer to their destinations, resulting on additional revenue and significant ridership gains.

Figure 8. Bus operated jointly between Jetty and Svbus



Source: Jetty

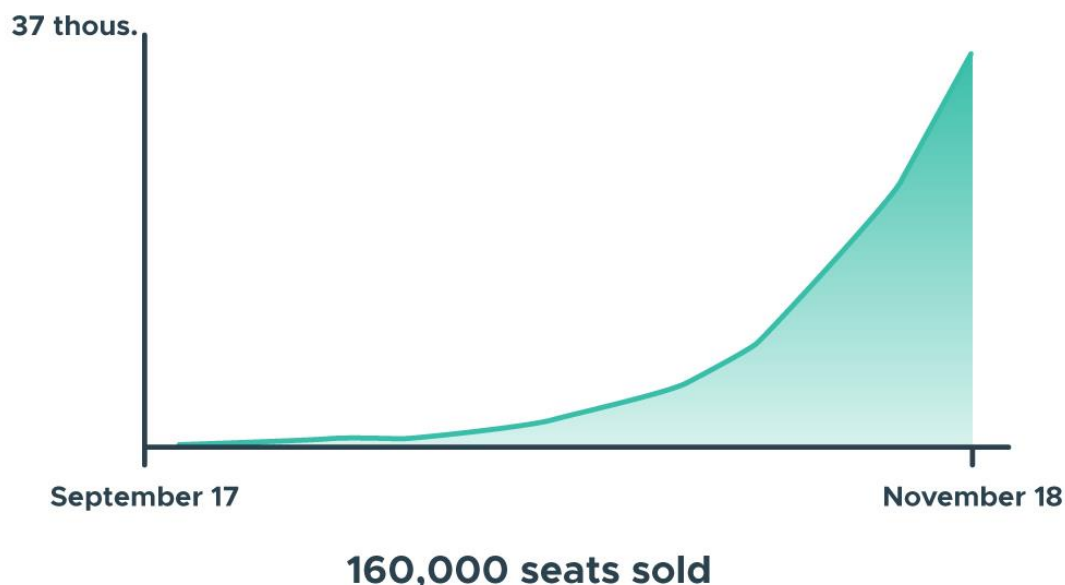
We are happy to stand by the results of this experiment. The supply of public transport seats in SVBUS services has expanded, and passengers can now choose to either pay for comfort and security with their time or with their money. Further, we can alert passengers of delays or service disruptions before they leave their homes or offices, recover forgotten items, and act immediately on their suggestions or complaints. In economic parlance, we have made our users better off, without making anyone worse off. Macario Schettino, an academic from Tec de Monterrey, summed up this position recently:

“A city like Mexico City, traversed everyday by over 10 million people from diverse socioeconomic backgrounds and with differing needs, must have a broad range of options available to ease the lives of commuters and expedites trip flows. Jetty’s contribution must not be disparaged. On the contrary, it could become a model for the arrival of more companies committed with service, quality and deliverance of an indispensable service.”

Jetty and its current contribution to Mexico City

Jetty still faces occasional skirmishes with jitney operators (mostly when we expand our coverage to new areas) and its regulatory position is under review in Mexico City, but our company is growing steadily and rapidly. As of this writing in November 2018, Jetty has sold over 160 000 seats (37 000 in the last month). We certainly have market fit, and are gaining traction. The number of sold seats through our platform has been growing at a 70% compounded monthly rate for the last 6 months. Despite our short history, we have an expanding user base, with many loyal customers. 27% of our users have already used our service more than 20 times, our passenger trip rating average is 4.92/5 stars and our retention rates are tremendously high: 80% of our users continue using our service 15 weeks after first trying it.

Figure 9. Jetty seats sold



Source: Jetty

We are very young and very small to have a meaningful impact on the general welfare of a megalopolis like Mexico City. However, our progress so far suggests three largely unproven assumptions may be right:

First, that the quality of service provided by the incumbent jitney industry can be dramatically improved by a) properly incentivising its drivers and owners, b) enforcing tight standards and c) responding to passenger feedback. We own no vehicles, but our fleet now includes 45-seat buses, 19, 14 and 12-seat vans, and a few electric taxis, all recent models. We employ no drivers, but all the drivers in the platform earn good salaries, have social security and work reasonable hours. Jetty has partnered so far with four different jitney associations, and is in negotiations to add several more to our network. All of these operators run regular jitney services, but the quality difference in service provided to Jetty customers is notable.

Dario Hidalgo, a researcher with long experience in the region working for the World Resource Institute (WRI), summed up this point during our one-year anniversary celebration:

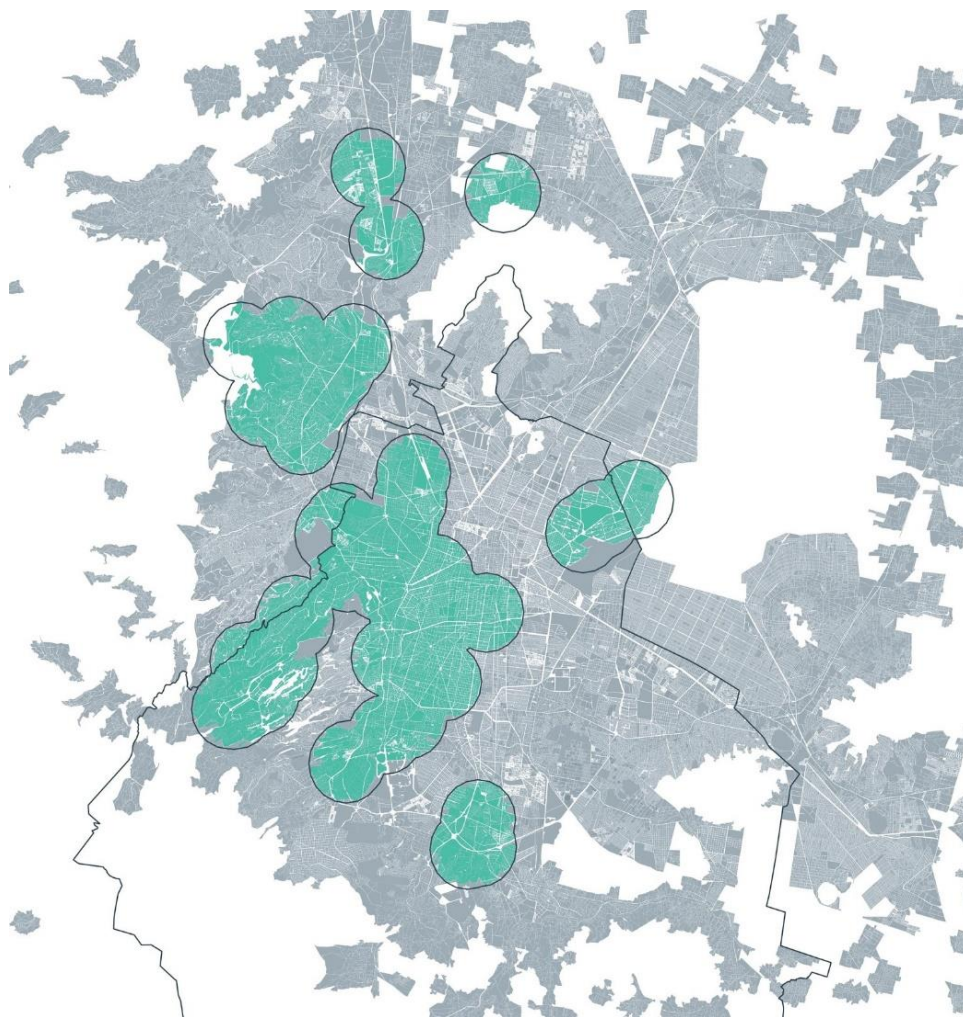
“Jetty found in the emerging technology a way to improve the traditional business model of the jitney operators, offering a superior experience for all involved: users, businessmen and public authorities... after many years of work trying to “formalize public transport” and of observing the problems that follow centralized planning, I’m beginning to understand it may be a better approach to leverage the semi-regulated jitney model, which are closer to the people, more flexible, more demand responsive and less stiff than the State, its bureaucracy and its eternal political infighting.”

Second, that it is possible to improve the quality and increase the coverage of public transit without making massive capital investments or committing to operational subsidies. This is especially important for cities facing fiscally challenging circumstances, like Mexico City. So far, the vehicles in our network

have run for over 945 000 kilometres across the metropolitan area. In our first year of operation, we registered zero major collisions and zero criminal incidents on our vehicles. We have done this by a) investing in driver training and paying drivers a fixed salary rather than a commission, b) equipping our vehicles with cameras and monitoring every trip, c) establishing bidirectional communication with passengers and immediately acting on reports of unsafe driver behavior or undesirable pick up or drop off locations.

Our coverage reaches suburban outposts that lack mass transit connectivity, but concentrate millions of homes or jobs. We currently have more than 100 active pick up and drop off points in our network, placing us less than two kilometres away from the homes of roughly 3 million people in the metropolitan area. We have done this by charging a fair price for rides, which are significantly lower than ride-sourcing, but high enough to entice operators to commit more vehicles to the network.

Figure 10. Jetty's coverage Map of Mexico City



Source: Jetty

Third, that a significant number of commuters are willing to forego less sustainable, individual transport modes, if a safe, comfortable, fast and reliable shared-ride alternative is available. We constantly poll our users via email and in-app notifications, and have high response rates. Last month, we asked, “what mode of transport would you have taken to complete your last trip, had Jetty not been available?” 58%

of respondents answered they would have traveled by private car, taxi or ride-sourcing services. These results are especially important, given mounting critiques about the negative impact that ride-sourcing may be having on vehicular congestion in core urban areas⁶. 90% of our survey respondents suggested that Jetty has improved the quality of their daily trips, over their preferred alternative. Also noteworthy: the majority (55%) of our users are female, a proportion that falls to 42.3% for the subway and 48.4% (INEGI, 2017d) for the BRT system. While not conclusive, these numbers could indicate that heightened perception of safety and increased levels of comfort in Jetty are increasing willingness to travel in shared rides.

It is difficult to predict the future, especially when it is changing so rapidly. However, our experience so far suggests it is possible to supply attractive transit alternatives to the private auto in Mexico City, with the support and participation of the incumbent jitney industry, and without significantly burdening our government's overstretched public finances.

Conclusion

We are humbled by the International Transport Forum's invitation to participate in this roundtable. We realise conditions in Mexico City are not representative of many cities of OECD countries, and that the competitive and regulatory challenges faced by Jetty so far may not exist everywhere. Yet there are many cities across the world where population, territorial and vehicular growth far outpaces the capacity of governments to establish, sustain and expand high quality transit alternatives. In those cities, transportation is yet another physical manifestation of inequality: The rich travel by car, the poor travel in low quality public transit. As both groups segregate by mode, society is left to grapple with the negative externalities of travel choices: pollution, crime, traffic accidents, depleted livability, and vehicular congestion. What is the potential of technology and innovation to transform such settings?

Some may argue it is preferable to make the necessary investments to have world class, publicly operated, centrally planned, city-wide mass transit. We wholeheartedly agree. Unfortunately, waiting for this to happen without also embracing other, more immediate alternatives to private mobility may be counterproductive. In the case of Mexico City, a few new subway or BRT lines will probably get built in the next few years, and if all goes well, the addition of new rolling stock may improve the level of service of existing lines. However, not even the most optimistic scenario considers a network build out at the scale required to expand public transit's mode share. Meanwhile, the flight to low occupancy vehicles continues to accelerate.

Autonomous and electric options may also become available in the near future. But in cities like Mexico City these improvements will likely first be embraced by wealthier elites, who will still travel by individual cars. So, even if these technological improvements became widely available, they would more likely lead to a transportation "hell" of gridlock and social segregation than a transportation "heaven" of livability and sustainable mobility⁷.

Our opportunity, attainable with the tools we have today, is making shared-rides attractive, not only to the poor that can't yet escape from transit, but for everyone. Unfortunately, the perception that app-based mobility contributes to congestion, inequality, gentrification and other evils is widespread and is

often accepted uncritically. Perhaps this is a consequence of observing the impacts of “new mobility” services in the more developed world, and of assuming their impact will be similar everywhere. Indeed, app based mobility companies in the United States have been known to weaken well established regulatory bodies, to harm the existing industry, to disregard labor rights, and to cream off customers from highly subsidised public services. But we are attacking a different problem in a very different context. At least in the case of Mexico City, public transport regulation is already weakly enforced, and compliance is already low. Labor rights of drivers in the incumbent jitney industry are not respected, and passengers are mistreated constantly. And protections to incumbent service suppliers from higher quality competition do little to benefit the public interest.



At the very least, companies like Jetty need a sandbox to develop new, bolder solutions. Companies like ours would benefit tremendously from an environment that rewards risk taking and experimentation. Our focus and limited resources are better employed improving passenger experience than on brokering peace treaties with incumbents, lobbying for new regulations and suing to defend our right to exist. But even in the face of adverse circumstances, and of tremendous technological, competitive and regulatory challenges, companies like Jetty will find a way to transform mobility in our cities. Not in the future; now.

Notes

1 The Mexico City Metropolitan Area is composed by Mexico City and 57 municipalities in the neighbouring State of Mexico. Mexico City proper is home to only 9 of the 21 million residents of the Metropolitan Area, but many State of Mexico residents commute every day to the central city to access employment, educational and cultural opportunities.

2 According to its own figures, Uber facilitates 15 million trips per day, worldwide. See: <https://www.uber.com/newsroom/campaign-sustainable-mobility/>

3 For a short video in English, showing how to use our app, please see <https://www.youtube.com/watch?v=JSHpjHpRJD0>

4 For example, see Zamarron (2017) <http://www.milenio.com/estados/camionetas-jetty-conectarán-lomas-verdes-polanco>

5 This event was also widely covered in local media. For a TV news clip (in Spanish) including footage from our in-vehicle camera, see here: <https://www.youtube.com/watch?v=UdMJKbllsEw>

6 For an example of this critique, see Schaller (2018): <http://www.schallerconsult.com/rideservices/automobility.htm>

7 Scholars are increasingly arguing that improving shared mobility is a precondition for autonomous and electric vehicles to deliver on their true potential. For a persuasive argument see: Sperling (2018) Three Revolutions. Washington, DC

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App-Based Collective Transport Service in Mexico City

This paper details the history of Jetty, an app-based collective transport platform operating in Mexico City since August 2017. It sets out the origins of the idea, recounts the strong competitive and regulatory pushback Jetty has faced, and evaluates Jetty's current growth and impact. In this context, the paper explores the potential contribution of new app-based mobility services in environments such as Mexico City - where transit alternatives are ubiquitous, fares are low and unsubsidised, but service is unsafe, insecure, uncomfortable, unreliable and unaccountable. It asks to what extent a technology company can complement government regulations, by establishing and enforcing stricter service standards on private suppliers of service whilst remaining responsive and accountable to passengers.

All resources from the Roundtable on Regulating App-Based Mobility Services are available at:
www.itf-oecd.org/regulating-app-based-mobility-services-roundtable