App-Based Ride Services – and the Future of Urban Transportation

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Rapid TNC growth – U.S.

# Uber Drivers Making at Least 1 Trip/month

Source: Uber
Rapid TNC growth – NYC

Growth in TNC vehicles 2014-2017

Growth in NYC auto reg. 1915-1929
What’s Happening?

What’s It Mean?
Work In Progress
First the Hype

Autonomous vehicles will be “new modality for urban travel” offering “the same on-demand, door-to-door convenience of traditional taxis, but at far lower prices.” (RAND Corporation report, 2016)

Uber: “goal is take 1 million cars off the road in NYC”

Lyft: “helping reduce carbon footprint”

John Zimmer: Autonomous vehicle fleets will account for the majority of Lyft rides within 5 years.
A “Revolution in Transportation?”

Yes –
But Not What’s Being Talked About
The Origins of “Ride Sharing”

Exclusive Ride → Density → Shared Ride Services

- Fill empty seats
- Take cars off the road
- Reduce carbon footprint
- Set up transition to fleets of shared autonomous vehicles
The Origins of “Ride Sharing”

- Exclusive Ride → Density → Shared Ride Services
  - Set up transition to fleets of shared autonomous vehicles
  - Fill empty seats
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  - Reduce carbon footprint

Set up transition to fleets of shared autonomous vehicles
**More VMT**

2013 to 2016

**Citywide**
600 million miles
3.5% of VMT

**Congested core:**
353 million miles
7% of VMT
TNC increase net of decline in yellow cab trips, per hour per sq. mile

Weekdays, 4-7 pm

Large increases in trips during PM peak
TNCs fill gaps in transportation services

Combined Taxi & TNC trips Change from 2013 to 2016

37% of overall TNC/taxi trip growth

23%
TNCs fill gaps in transportation services

Growth in average weekday trips, Manhattan 2013 to 2016

PM taxi shift change

Evening trips
Shift from High-Capacity Transit

PASSENGER MILES OF TRAVEL PER VEHICLE MILE

AUTO

TAXI

TNC

NYC BUS

NYC SUBWAY
Imagine for a minute, what our world could look like if we found a way to take most of these cars off the road. It would be a world with less traffic and less pollution. A world where we need less parking—where streets can be narrowed and sidewalks widened. It’s a world where we can construct new housing and small businesses on parking lots across the country—or turn them into green spaces and parks. That’s a world built around people, not cars.

All of this is possible. In fact, as we continue into our new century, I believe we’re on the cusp of nothing short of a transportation revolution—one that will shape the future of our communities. And it is within our collective responsibility to ensure this is done in a way that improves quality of life for everyone. The coming revolution will be defined by three key shifts:

1. Autonomous vehicle fleets will quickly become widespread and will account for the majority of Lyft rides within 5 years.

Last January, Lyft announced a partnership with General Motors to launch an on-demand network of autonomous vehicles. If you live in San Francisco or Phoenix, you may have seen these cars on the road, and within five years a fully autonomous fleet of cars will provide the majority of Lyft rides across the country.

Tesla CEO Elon Musk believes the transition to autonomous vehicles will happen through a network of autonomous car owners renting their vehicles to others. Elon is right that a network of vehicles is critical, but the transition to an autonomous future will not occur primarily through individually owned cars. It will be both more practical and appealing to access autonomous vehicles when they are part of Lyft’s networked fleet.

Why? For starters, our fleet will provide significantly more consistency and availability than a patchwork of privately owned cars. That kind of program will have a hard time scaling because individual car owners won’t want to rent their cars to strangers. And most importantly, passengers expect clean and well-maintained vehicles, which can be best achieved through Lyft’s fleet operations.

Today, our business is dependent on being experts at maximizing utilization and managing peak hours, which allow us to provide the most affordable rides. This core competency translates when we move to an autonomous network. In other words, Lyft will provide a better value and a superior experience to customers.

I’ll have more to say on how the autonomous network will work a bit later in this piece.

2. By 2025, private car ownership will all-but end in major U.S. cities.

As a country, we’ve long celebrated cars as symbols of freedom and identity. But for many people—especially millennials—this doesn’t ring true. We see car ownership as a burden that is costing the average American $9,000 every year. The car has actually become more like a $9,000 ball and chain that gets dragged through our daily life. Owning a car means monthly car payments, searching for parking, buying fuel, and dealing with repairs.

Ridesharing has already begun to empower many people to live without owning a car. The age of young people with driver’s licenses has been steadily decreasing ever since right around when I was born. In 1983, 92% of 20 to 24-year-olds had driver’s licenses. In 2014 it was just 77%. In 1983, 46% of 16-year-olds had licenses. Today it’s just 24%. All told, a millennial today is 30% less likely to buy a car than someone from the previous generation.

Even more and more people are concluding that it is simpler and more affordable to live without a car. And when networked autonomous vehicles come onto the scene, below the cost of car ownership, most city-dwellers will stop using a personal car altogether.

3. As a result, cities’ physical environment will change more than we’ve ever experienced in our lifetimes.

So why should you care about changes in transportation? Even if you don’t care about cars themselves, the transition to autonomous vehicles will change the way we think about where and how we live.

Imagine for a minute, what our world could look like if we took most of these cars off the roads and cities. Let’s do it in a way that puts people, not cars, at the center of our future. It’s a world where streets can be narrowed and sidewalks widened. It’s a world where we can construct new housing and small businesses on parking lots across the country—or turn them into green spaces and parks. That’s a world built around people, not cars.

A full shift to “Transportation as a Service” is finally possible, because for the first time in human history, we have the tools to create a perfectly efficient transportation network. We saw this potential in 2012 when Lyft became the first company to establish peer-to-peer, on-demand ridesharing, which is now what the world knows simply as ridesharing. What began as a way to unlock unused cars, create economic opportunities and reduce the cost of transportation, has today become the way millions of Americans get around.

Ridesharing is just the first phase of the movement to end car ownership and reclaim our cities. As I mentioned before, the shift to autonomous cars will expand dramatically over the next ten years, transforming transportation into the ultimate subscription service.

This service will be more flexible than owning a car, giving you access to all the transportation you need. Don’t drive very often? Use a pay-as-you-go plan for a few cents every mile you ride. Take a road trip every weekend? Buy the unlimited mileage plan. Going out every Saturday? Get the premium package with upgraded vehicles. The point is, you won’t be stuck with one car and limited options. Through a fleet of autonomous cars, you’ll have better transportation choices than ever before with a plan that works for you.

Using the Lyft network will also save you money. Here’s why. We don’t often think about it, but owning a car and making monthly payments also means paying retail prices for every aspect of getting where you need to go—fuel, maintenance, parking, and insurance. In a future subscription model, the network will cover all of these costs across a large network of cars, passing the savings onto you. We cut the hassle and you get the one thing you really want: the true freedom to ride.

Once this happens—once autonomous networks provide better service at a lower cost—our country will pass a tipping point. And by 2025, owning a car will go the way of the DVD. Until then, over the next five to 10 years there will be both driver and driverless cars on the road, which we call a hybrid network.

We are currently in the first of three phases, and will be until vehicles can be operated without any human intervention. That said, we don’t have to wait until autonomous cars are capable of handling all kinds of rides without human intervention. The second, or hybrid, period will be defined by a mix of limited capability autonomous vehicles operating alongside human-driven ones. At first, fully autonomous cars will have a long list of restrictions. They will only travel at low speeds, they will avoid certain weather conditions, and there will be specific intersections and roads that they will need to navigate around. As technology improves, these cars will be able to drive themselves in more and more situations. Hypothetically, Lyft could initially have a fleet of autonomous cars that completes rides under 25 miles per hour on flat, dry roads. Then, we could upgrade the fleet to handle rides under those same conditions, but at 35 miles per hour. And so on and so on, until every kind of trip can be completed by an autonomous car.

As people trust that the introduction of autonomous vehicles will mean human drivers are no longer needed. We believe that in the first five or more years following the introduction of autonomous vehicles, the need for human drivers will actually increase, not decrease. How is that possible? Rides in autonomous vehicles will be less expensive than any options today and will lead to more people using Lyft for more of their transportation needs. As people rely on Lyft for more of their transportation, they are more likely to live car-free. And as more people trade their keys for Lyft, the overall market will grow dramatically. When autonomous cars can only solve a portion of those trips, more Lyft drivers will be needed to provide service to the growing market of former car owners.

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All of this is possible. In fact, as we continue into our new century. I believe we’re on the cusp of nothing short of a transportation revolution—one that will shape the future of our communities. And it is within our collective responsibility to ensure this is done in a way that improves quality of life for everyone. The coming revolution will be defined by three key shifts:

1. Autonomous vehicle fleets will quickly become widespread and will account for the majority of Lyft rides within 5 years. Once this happens—once autonomous networks provide better service at a lower cost—our cities will be able to grow exponentially. Cities of the future must be built around people, not cars. Streets can be narrowed and sidewalks widened. It’s a world where we can construct new housing and small businesses on parking lots across the country—or turn them into green spaces and parks. That’s a world built around people, not cars.

2. Private car ownership will all but end in major U.S. cities.

As a country, we’ve long celebrated cars as symbols of freedom and identity. But for many people—especially millennials—this doesn’t ring true. We see car ownership as a burden that is costing the average American $9,000 every year. The car has actually become more like a $9,000 ball and chain that gets dragged through our daily life. Owning a car means monthly car payments, searching for parking, buying fuel, and dealing with repairs.

Ridesharing has already begun to empower many people to live without owning a car. The age of young people with driver’s licenses has been steadily decreasing ever since right around when I was born. In 1986, 59% of 16-year-olds had driver’s licenses. In 2014 it was just 77%. In 1983, 46% of 16-year-olds had licenses. Today it’s just 24%. All told, a millennial today is 30% less likely to buy a car than someone from the previous generation.

Every year, more and more people are concluding that it is simpler and more affordable to live without a car. And when networked autonomous vehicles come onto the scene, the cost of car ownership, most city-dwellers will stop using a personal car altogether.

3. As a result, cities’ physical environment will change more than we’ve ever experienced in our lifetimes.

So why should you care about changes in transportation? Even if you don’t care about cars—even if you never step into a Lyft or an autonomous vehicle—these changes are going to transform your life. Because transportation doesn’t just impact how we get from place to place. It shapes what those places look like, and the lives of the people who live there.

The end of private car ownership means we’ll have far fewer cars sitting parked and empty. And that means we’ll have the chance to redesign our entire urban fabric. Cities of the future must be built around people, not cars. They should be defined by communities and connections, not pavement and parking spots. They need common spaces where culture can thrive—and where new ideas can be shared in the very places where cars previously stood parked and empty.

Tangible change will begin to happen almost immediately. The American Society of Civil Engineers recently gave U.S. infrastructure a D+, estimating that our country requires $3.6 trillion in infrastructure investment by 2020. If we have to rebuild and revitalize our roads and cities, let’s do it in a way that puts people, not cars, at the center of our future.

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Using the Lyft network will also save you money. Here’s why: We don’t often think about it, but owning a car and making monthly payments also means paying retail prices for every aspect of getting where you need to go—fuel, maintenance, parking, and insurance. In a future subscription model, the network will cover all of these costs across a large network of cars, passing the savings onto you. We cut the hassle and you get the one thing you really want: the true freedom to ride.

Once this happens—once autonomous networks provide better service at a lower cost—our country will pass a tipping point. And by 2025, owning a car will go the way of the DVD. Until then, over the next five to 10 years there will be both driver and driverless cars on the road, which we call a hybrid network.

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1. Autonomous vehicle fleets will quickly become widespread and will account for the majority of Lyft rides within 5 years.

2. A demand network of autonomous vehicles will provide the majority of Lyft rides across the country.

3. The end of private car ownership means we’ll have far fewer cars sitting parked and empty. And that means we’ll have the chance to redesign our entire urban fabric. Cities of the future must be built around people, not vehicles. They should be defined by communities and connections, not pavement and parking spots. They need common spaces where culture can thrive—and where new ideas can be shared in the very places where cars previously stood parked and empty.

Taken together, this urban re-imagined has the opportunity to deliver one of the most significant infrastructure shifts we have ever undertaken on a nation. And the good news is that we have to make these investments anyway. The American Society of Civil Engineers recently gave U.S. infrastructure a D+, estimating that our country requires $3.6 trillion in infrastructure investment by 2020. If we have to rebuid and revitalize our roads and cities anyway, let’s do it in a way that puts people, not cars, at the center of our future.

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Transit absorbed trip growth

Growth in non-auto travel in NYC

2012 to 2013

Change in Ridership (Annual, millions)

-20 -10 0 10 20 30 40 50 60

Subway
Bus
Ride services
Bike
Ferry
Ride services & bikes account for trip growth

Growth in non-auto travel in NYC

2015 to 2016

- Taxi/for-hire
- Bike
- Ferry
- Subway
- Bus

Change in Ridership (Annual, millions)
Gaps & Deficiencies ➔ Shift to TNCs

- Taxis
  - Readily available
  - Reliable
  - Transparent
  - Comfort
  - Ease of payment

- Transit
  - Readily available
  - Reliable
  - Transparent
  - Comfort
  - Ease of payment

- Personal auto
  - Parking cost
  - Avoid drinking and driving

- TNCs
Customer is saying

Save time
Reduce stress

+ Save money
+ Be safe
Pool not the solution

Uber Trip Density
By trip origin

May-June 2016
Pooled Trips
As percent of total trips, by origin

May-June 2016
Pooled Trips
As percent of total trips, by time of day

May-June 2016
Pooled Trips
As percent of total trips
8 am – 6 pm, weekdays
May-June 2016
Use of UberPool and LyftLine
(U.S. TNC users)

• 90% never used
• 10% have used
• Most only occasionally
• Estimate that <5% of TNC trips are pooled

The Origins of “Ride Sharing”

- What route?
- How long?
- With whom?

To promote pooled services:
- Offer shuttle on fixed routes (Lyft)
- Walk to designated stop (Lyft and Uber)
- “Dynamic drop-offs” (Uber)
The New is Also Old (but Better)

Taxi
- Point-to-point
- Exclusive Ride (mostly)
- On-Demand

Transit
- Fixed route
- Shared ride
- Scheduled (mostly)
**The New is Also Old (but Better)**

**Better Taxi**
- Match supply and demand
- Ease and transparency (app)
- Price/quality choice

**Better Transit**
- Demand response
- App shows where to wait
- Price/quality choice
Customer is saying

+ Save time
+ Reduce stress
+ Save money
+ Be safe
What’s Happening?
Growth in Non-auto Travel in NYC

2015 to 2016

- Taxi/for-hire
- Bike
- Ferry
- Subway
- Bus

Change in Ridership (Annual, millions)
Opportunity

Better taxi
- Point-to-point
- Exclusive Ride (mostly)
- On-Demand

Better Transit
- Fixed route
- Shared ride
- Scheduled (mostly)
What's Happening?

What's It Mean?
Problem: Individual and societal interests are out of alignment.

Gaps and deficiencies in transportation system → proliferation of vehicles

Need: Meet the revolution in expectations ... within capacity of the streets.
Robust Toolkit: PUSH FACTORS

Street use
- Bus Lanes
- Queue jumps
- Transit signal priority
- Bus lane enforcement cameras
- Franchise authority

Data/planning
- Ridership & traffic counts
- Mode choice modeling
- Best Practice Model

Transit operations
- Bus Lanes
- Change fleet mix
- Blend fixed route and on-demand service

Road Pricing
- Parking pricing
- Congestion pricing
- Open road tolling
- HOT lanes

Fleet management
- Passenger occupancy
- Pick-up/drop-off locations
- Unnecessary driving
- Delivery dwell time
- Off-hours delivery

Technology
- GPS
- E-Z Pass
- Cameras
Robust Toolkit: PULL FACTORS

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Start with....

• Street management
• Road Pricing
• Fleet management
Work In Progress
Street management

**Start with....**

Street use: Dedicate multiple lanes/gateway to efficient users
- Double bus/HOV lanes
- Bus/HOV streets
- Bus/HOV-only gateways

**Combine with....**

- Fleet mgmnt: Vehicle occupancy (TNCs/taxis etc)
- Fleet mgmnt: Pick-up/drop-off locations
- Street use: Dedicated curb space for efficient deliveries
- Street use: Queue jumps & signal priority
- Transit: Blend fixed route and on-demand services
- Pricing: HOT lane fees for personal vehicles
- Technology: Open road tolling and camera enforcement
Fleet management

Start with....

Franchise authority: Modernized franchising process for commercial use of crowded streets (e.g. taxi/TNC & freight)
- Open to all qualified operators
- Minimize unnecessary driving (consistent with good pick-up times)
- Vehicle occupancy (consistent with free flow)
- Minimize delivery dwell time

Combine with....

- Fleet mgmnt: Pick-up/drop-off locations
- Street use: Dedicated curb space for efficient deliveries
- Street use: Queue jumps & signal priority
- Transit: Blend fixed route and on-demand services
- Pricing: Commercial parking
Pricing

Start with....

Congestion pricing: Charge to enter Manhattan CBD
- MoveNY proposal or similar
- Might include toll reductions on non-Manhattan crossings
- Use open road tolling and camera enforcement

Combine with....

- Fleet mgmnt: Vehicle occupancy (TNCs/taxis etc)
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- Street use: Dedicated curb space for efficient deliveries
- Street use: Queue jumps & signal priority
- Transit: Blend fixed route and on-demand services
- Pricing: Commercial parking
- Technology: Open road tolling and camera enforcement
At stake:

Unsustainable path

User-driven & market-driven process

Adaptations → Prosper