Passport

TRANSIT IN
motion

*Exclusive insight into transit technology; where it's been,
where it's going, & the innovations to come.*

CONTENTS

A MOBILE TIMELINE

THE OMNIBUS
Don't be fooled by the name – this is not your typical bus (or at least the way you'd think of it now). The "omnibus" marks the very beginning of public transportation in the U.S. This horsecar could transport up to 42 passengers, many times in a double decker carriage powered by three horses. The "omnibus" starts to bring public transportation into everyday life.
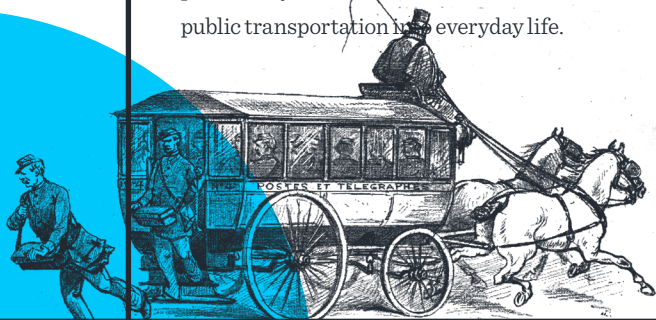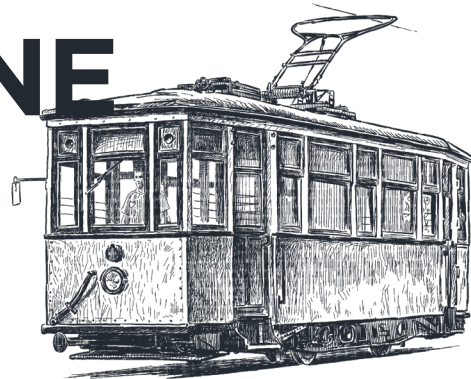
THE CABLE CAR
The cable car, also known as the trolley, streetcar, or tram, becomes common in most U.S. cities around this time, with the City of Cincinnati pioneering this new technology. This dramatically affects how city goers travel, giving suburban residents a convenient way to commute into the city for work. Without this invention, cities may have turned out quite a bit differently today.

MONORAIL
This futuristic-looking way of travel is introduced in the City of Houston, TX. However, it doesn't gain as much momentum across the U.S. as many had hoped. When you picture monorails, you most likely picture the Disney theme parks. Besides Disney, cities like Seattle have developed sophisticated monorail systems.
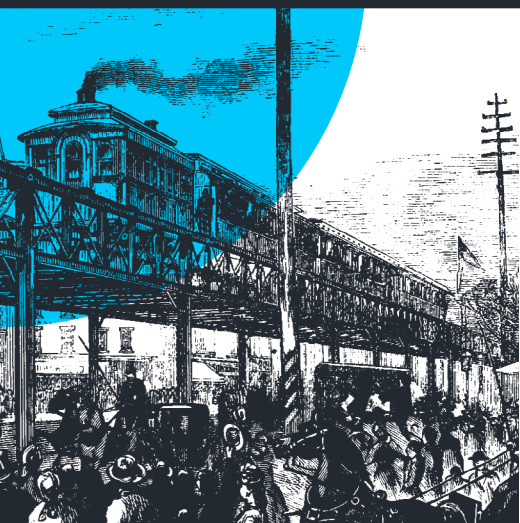
SMART CARDS
More sophisticated "smart" cards begin to make their way into the transit space. These cards allow for more storage, and as technology becomes more advanced in the coming years, allows riders to pay without inserting or swiping their card at all. This reduces transaction time and keeps passengers moving quickly onto transit.

Early 1800s   **1880**   **1890**   **1956**   **1970**   **1990s**   **Late 2000s**
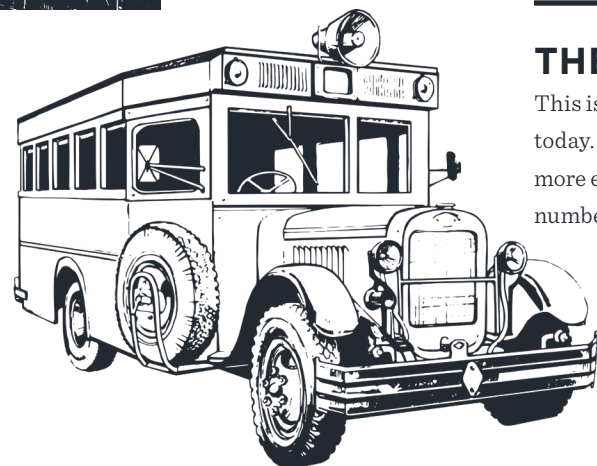
ELEVATED TRAINS/ UNDERGROUND RAILWAYS
The development of elevated trains and underground railways introduces new forms of public transportation. In an effort to reduce congestion on the streets, large cities like Boston and Chicago are among the first to implement these methods of transportation.

MAGNETIC STRIPE CARD
Another method of payment besides the typical cash and token is introduced. Magnetic stripe cards allow riders to add a balance to their account and either feed or swipe their card onto a reader. This makes fare payments more convenient, especially for frequent riders.

MOBILE TICKETING
With the advent of the cellphone and eventually the smartphone, transit agencies begin to offer mobile payment as a fare purchase option. As mobile technology becomes more advanced, apps start providing real-time tracking and trip planning options. Agencies look to further improve the rider experience by connecting to other transportation apps within their cities.

THE MOTORBUS
This is closer to your typical idea of a bus today. The motorbus brings a quicker and more efficient option for transporting large numbers of people on the streets.

WHAT IS MOBILE TICKETING?

Transit technology has come quite a ways since the first form of public transportation was introduced back in the early 1800s (three horses pulling 42 people on an "omnibus" wasn't exactly the most efficient way to move around). However, in the past few decades, we've probably seen the biggest changes happen right before our eyes with how we pay for transit fares and plan trips.

As riders, we used to only have the option to pay in cash, change, or with tokens when we boarded transit. But around 1970, this all changed with the introduction of the magnetic stripe card, kiosks for credit card payments, then the smart card, and now in the age of the smartphone - mobile ticketing.

Mobile ticketing is one of the latest and greatest improvements to how we can ride public transportation. It's been gaining significant traction over the past couple of years, especially as mobile payment technology continues to grow in popularity throughout the U.S. By the end of 2016, EMarketer predicts that mobile payment transactions in the U.S. will triple.

So, what is mobile ticketing, exactly?

Mobile ticketing is mobile payment technology that allows riders to purchase transit fares from their phones. App users can securely store their credit card and easily make payments with a few taps of their smartphone. This provides a new convenience that doesn't involve walking up to a kiosk or a transit station's front desk to pay. Most times, users just show the transit driver their app screen to board.

But there's much more to it than that.

As smartphone technology has rapidly progressed, mobile ticketing apps have also made major strides. Riders can now view transit routes in real-time, coordinate with other ridesharing apps, and ultimately view the quickest route to their end destination.

Not only does mobile ticketing create a solution for payments, but it creates a solution for planning trips.

According to Pew Research Center, as of 2016, **72% of adults in the U.S. report owning a smartphone.** This doesn't even include other mobile devices! As these numbers continue to grow each year and technology makes us more interconnected, this is reflected in how we move around our cities.

Take apps like Uber and Lyft, for example. These ridesharing apps have flipped the taxi industry upside down and as their popularity continues to skyrocket, they're teaming up with public transportation agencies to further improve the rider experience. Agencies that utilize mobile ticketing technology can now incorporate these ridesharing options within their own apps to give additional transportation options to users.

This improved interconnectivity makes the definition of mobile ticketing a little broader. Mobile ticketing has already become more than just a new method of fare payments.

It's becoming the new way to connect your city. ■

Mobile Ticketing: STEP BY STEP

1. Download the app and register.
2. Put in your location and destination. You will be able to view routes.
3. Choose your route.
4. Purchase your fare using a credit card.
5. To board your transit option-of-choice, you will either show the transit operator your mobile ticket or scan it on a reader.

WHY MOBILE MATTERS

Mobile ticketing technology has become more relevant now than ever. In a recent survey conducted by Passport, **nearly 73% chose a smartphone as the preferred method to pay for transit fare.** While still fairly new to the marketplace, this technology is proving to be an important factor in increasing rider adoption and improving efficiency in transit operations.

The number of public transportation agencies utilizing this technology is still growing, but the results these agencies are already seeing is impressive. While the numbers vary, according to the Federal Reserve Bank of Boston, certain transit agencies are already seeing **close to 30 percent of rail ticket purchases via mobile.** Mobile ticketing is allowing public transportation to appeal to an entirely new audience that doesn't utilize public transit, as well as their current riders that are willing to ride more frequently.

Increased Ridership

Technology is most effective when it solves a real problem, therefore appealing to human emotion. Consider some of the most popular apps or even one of your personal favorites - most likely it relieves a pain point for you. The problem that mobile ticketing is solving? It eliminates the anxiety and uncertainty of riding public transit.

According to a recent survey conducted by Passport, the top reason preventing people from riding public transportation is the uncertainty around whether their transit will arrive on time.

When choosing your mode of transportation, you naturally feel more comfortable selecting a method you have knowledge of and control over. If all riders could take advantage of real-time tracking for transit, there is no longer uncertainty around when their transit will arrive. Reduce this uncertainty and you create a solution.

Reduced Costs

Mobile ticketing is a low cost alternative for agencies to accept fare payments. According to the Federal Reserve Bank of Boston, the New York Metropolitan Transportation Authority (MTA) prints and encodes 160 million cards a year at an average annual cost of about $9.5 million. One ticket machine costs approximately $50,000 and carries with it additional maintenance and repair costs.

These costs really start to add up. According to a recent interview with three major U.S. transit agencies conducted by Trapeze, costs associated with hardware purchases and maintenance for large agencies can be upwards of $1 to $4.3 million respectively, depending on the size of operations.

Mobile ticketing means lower fare collection costs since users are purchasing and maintaining the fare collection equipment themselves (the smartphone).

If you can reduce the expenses related to revenue, you can drive up profits and potentially mitigate reductions in federal funding.

Future-Proof

Technology continues to evolve, there's certainly no doubt about that. Just in the past ten years, we've seen technology dramatically change how we communicate, receive our information, make payments, and even carry about our lives.

By implementing a mobile ticketing solution, public transportation agencies not only secure their relevance in today's smartphone generation, but secure their ability to remain flexible with future technological advancements. ■

INDUSTRY PERSPECTIVE

Transit leader provides insight into new technology

Meet Robyn Chiarelli. Robyn is Executive Director at the Downtown Fort Lauderdale Transportation Management Association (TMA), which operates a charming trolley system located in Fort Lauderdale, FL, locally known as the Sun Trolley and Riverwalk Water Trolley. The Trolley system provides convenient transportation to endless entertainment and dining options in the heart of the city. Riders have the ability to track the Trolleys in real-time with the free Sun Trolley Tracker app, which utilizes a GPS system that shows you exactly where the Trolleys are located. Get Chiarelli's insight into how mobile ticketing benefits transit agencies, the impact it's making to the industry, and where transit will be in the future:

Q: Can you give me a little background into how you got into the industry? Tell me a little about your role at the TMA?
Robyn: I'm the Executive Director at the TMA and have been in that position since July 2014. I've been involved with the board of directors since 2007. First as a volunteer working on route planning and marketing and then in 2009 I was invited onto the Executive Board of Directors as a representative of the Florida Department of Transportation.

I got into the transportation industry on accident. I actually have a biology and an environmental science degree and I studied at the Marine Biological Laboratory in Woods Hole, Massachusetts.

First, I wanted to be a doctor and then I wanted to be an environmental scientist. For 5 years, I was a biological science technician for the U.S. Department of Agriculture. We were studying an invasive plant species in South Florida with a 5 year grant and once the grant was over, I was unemployed. I went to a conference for air quality and I came across people there that had commuter services information, and they encourage employees and commuters to take alternative routes to get to and from work. We talked for a bit and really hit it off and at the end of the conversation they told me I should apply for a job at their organization. I didn't have any experience in the industry and I didn't take it seriously until they introduced me to the director of the program. Within the next 3 days, I had a job. From there I was Outreach Coordinator for South Florida Commuter Services, a program of FDOT, and after that I was recruited to oversee the entire program as FDOT staff. During my five year tenure at FDOT, I took on additional projects as my expertise expanded, which included spearheading the fare interoperability program for the state.

Q: How has the transportation industry changed since you've been in it?
R: The first thing that comes to mind is Uber and the fact that everyone has a smartphone. Now everybody has a computer at their fingertips, which is great because no matter what financial background you are, many get smartphones before anything else.

If you look at Maslow's Hierarchy of Needs, I think the triangle really needs to add communication to its list. Communication is key and without it the world would be turned upside down. Everything from the Baby Boomers to now the Millennials play a huge part in the workforce and in turn, greatly impact the transportation industry.

Q: What are some of the biggest challenges you're facing?

R: Since we all utilize our smartphones to communicate, mobile technology is rapidly progressing. No matter what demographic you are, pretty much everyone has the Internet at their fingertips. I think mobile ridesharing apps like Uber and Lyft have really turned the industry on its back. I recently called a bunch of local hotels as a secret shopper to see if they'd recommend the Sun Trolley to their guests. The first thing out of most their mouths was Uber-this, Uber-that because it's considered extremely convenient for vacationers. I think there's a huge opportunity for our industry to sell to these individuals, however, this poses as a huge challenge for us. We're really seeing a hit in our ridership numbers due to these apps and I think that we need to continue to focus on what makes the Sun Trolley and Water Trolley stand apart from the crowd. We need to continue promoting the trolley as a charming experience that will create lasting memories, well past when they return home from vacation.

There's really a holistic approach to the transportation industry – it's great when an industry can help both public and non-profit organizations be better at what they do. I think that's what Uber has been doing and now they are starting Uber Pool, which allows people to carpool. Now they're really entering the multimodal landscape. I think the Department of Transportation and mobile transit agencies need to take a look at these entities and identify ways to develop strategic partnerships. The bottom line is moving people to the places that they need to get to. Ultimately, this improves economic development and makes the world a better place by allowing people to access education and employment opportunities.

Q: How do things like mobile ticketing impact the transportation industry?

R: I think mobile ticketing, real-time tracking apps, on-demand transportation services, driverless

> *"Mobile ticketing allows people to have the power in their own hands.*

vehicles, and all the newly emerging technologies are a very positive thing for the transportation industry. Well beyond the transportation industry, these technologies advance society as a whole, as they create safer and quicker ways to get from place to place. I just recently watched the movie "Castaway" with Tom Hanks. The juxtaposition of him traveling on an airplane, to him traveling on a handmade raft (that took months to craft), and then going back onto an airplane after he was found is noteworthy. As a transportation professional, I can't help watch a movie like that and marvel at where society is at in terms of transportation advancement and what the future holds.

**Q: Why do you think mobile ticketing is important?**

R: I think mobile ticketing is really a game changer. Not only from a customer's standpoint, but an operations standpoint. As a transit agency, when you're not handling cash it allows you to free up staff time to do other tasks. Having to count cash and having a back room where there's cash requires high levels of security and security cameras, and it really becomes more of a hassle. And from an end-user standpoint, it's really a game changer to be able to utilize mobile tickets rather than ticket stubs.

**Q: What type of innovations to the transportation industry do you see happening in the next 5 years?**

R: I ask myself this question a lot. On a larger scale globally, I think that innovation needs to focus on reducing the cost of manufacturing buses or rail. The one major factor that prevents society from moving forward is the high capital costs involved in deploying high-occupancy opportunities. ■

STATISTICS

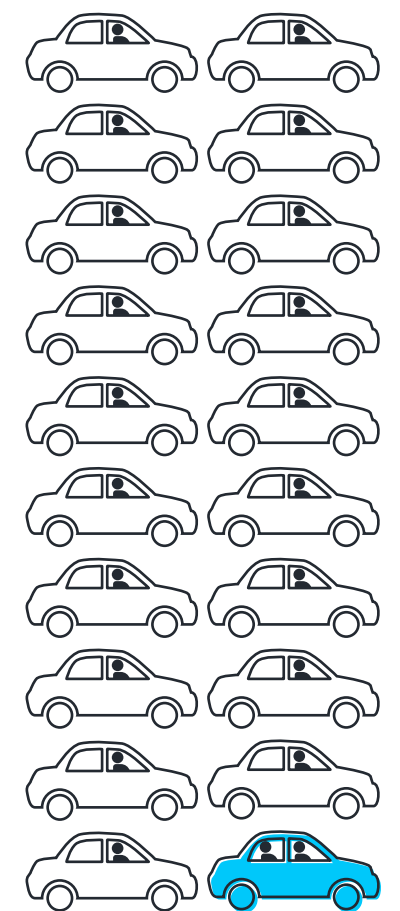**37%** the increase in public transit over the last two decades

20 Years Ago   Today
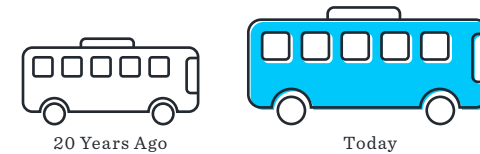
20% the increase in population over the last two decades

20 Years Ago   Today
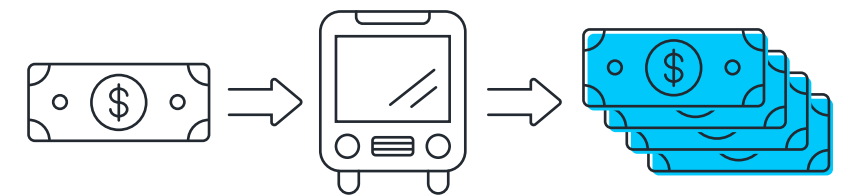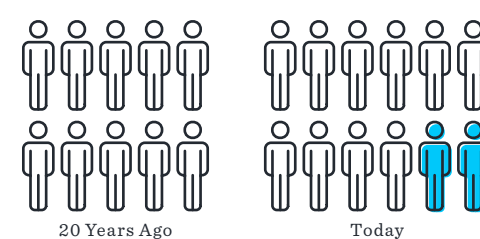
Every $1 communities invest in public transportation approximately $4 is generated in economic returns.
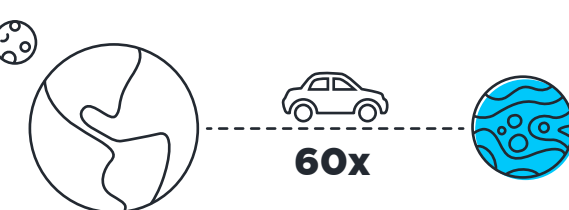
Americans living in areas served by public transportation save
850 million HOURS
in travel time – the number of man hours it took to build the Great Pyramid of Giza

Americans living in areas served by public transportation save
450 million GALLONS OF FUEL
annually in congestion reduction alone. That's enough fuel to drive to Mars 60 times.

60x

Without public transportation, congestion costs would have been an additional
$21.0 BILLION

	Public Transportation	IBM	amazon	Microsoft	Google
400k					
300k					
200k					
100k					
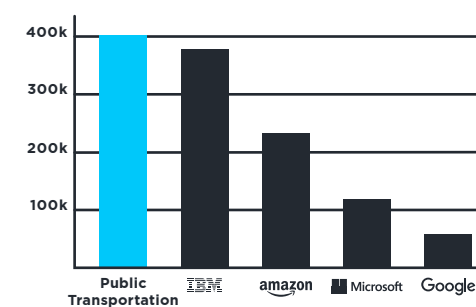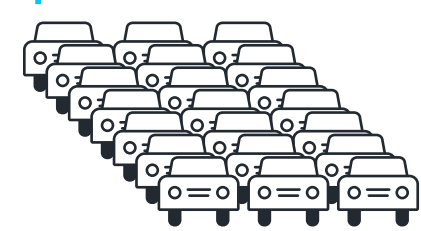
Public transportation has over **400,000** employees and is a **$58 billion industry**

In the U.S., only **10%** of commuters **carpool**

more than
7,100
organizations provide public transportation in the United States

In 2013, Americans took
10,700,000,000
public transportation trips. To date, that is still the highest number in the last 57 years.

A household can save over $10,100 a year by utilizing public transportation and opting to have only one car.

= $10,100

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