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BUILDING AMERICA'S FUTURE 2016 VISION

PREPARING FOR TOMORROW'S INFRASTRUCTURE TODAY

America's infrastructure is on the cusp of dramatic change. Our roads, rails, pipes, ports, electric grid and airways of tomorrow will look very different from those we use today. Imagine cars that drive themselves, carrying people and goods safely and reliably to their destinations; a smart grid that is dependable and resilient; a passenger rail network that safely connects major metropolitan areas at speeds so fast that drivers would rather travel by train; technology that can detect and repair leaks in our water infrastructure before a pipe bursts; air travel that is faster and more environmentally friendly; and roads free of congestion. All of this is possible due to significant advances in technology – much of it just in the past ten years.

The United States has always been a hub of innovation and many of the technological advances that make our infrastructure more efficient were developed here. This has not gone unnoticed as all across America states and cities are looking to the future and embracing these advancements in technology that can improve and modernize infrastructure for better performance, efficiency, safety and reliability. But in order to get prepared for the future, cities need to consider technology in their planning process. According to the National League of Cities only six percent of long-range plans in major U.S. cities are factoring in the impact of autonomous and self-driving cars.



PREPARING FOR SELF-DRIVING AND AUTONOMOUS VEHICLES

The advantages of autonomous and driverless cars include creating more efficient traffic flow (which means less congestion), better fuel efficiency, and increased productivity as 'drivers' can spend time in the car answering e-mails, texts and phone calls without worrying about distracted driving. The safety aspect is also key: cars that can 'talk' to each other will significantly reduce accidents.

It seems like every day a new app has been developed for smartphones, and they are transforming the way the average American navigates his or her daily commute. For example, there are apps that provide information about traffic conditions, the location of traffic accidents or work zones or the arrival of the next bus or train. Apps that let a driver reserve and pay for a parking space allow for greater convenience and also results in less congestion from drivers cruising around searching for a parking space. It is estimated that **30% of cars circling a city at any given time are doing so as they search for parking.** The City of Los Angeles recently installed low-power sensors and smart meters to track the occupancy of parking spaces throughout one of its most congested districts, allowing the City to change pricing on its parking spaces depending on demand. With other apps, the user can summon a ride with the touch of a finger from services like Uber and Lyft and pay for it without any cash changing hands.



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International Parking Institute (IPI) 2012 Emerging Trends in Parking Study.

\$ FINANCING TOMORROW'S ROADS AND TRANSIT

In many major metropolitan areas it no longer makes sense to build more roads to ease chronic and growing congestion. Instead, some regions are embracing technologies to alter driver behavior by pricing roads according to the level of congestion. Time is money. Many drivers are willing to pay to avoid a traffic jam and are rewarded with a more reliable trip. Taking these cars off of the so-called 'free' lanes eases up congestion for all drivers. Open road tolling allows for the continued flow of traffic and thereby eliminates delays and congestion at toll booths.

Technology will also play a larger role in funding and financing our transportation infrastructure. The federal gas tax of 18.4 cents per gallon pays for the vast majority of our roads and bridges. Since it has not been increased in 23 years nor indexed to inflation it has lost a large share of its purchasing power and can no longer keep pace with needs. Couple that with greater fuel efficiency in vehicles and it's no wonder that **America has a \$1.1 trillion investment gap.**

Some states like Oregon are implementing pilot programs that use advancements in technology to charge drivers by the mile instead of by how much gasoline their vehicle consumes. The Fixing America's Surface Transportation (FAST) Act recognized the value of this concept and included \$95 million in grants available to states seeking to implement a pilot program testing road user charges or other innovative funding options. Technologies exist to implement road user charges that also allow prices to vary depending on the weight of the vehicle (the heavier the vehicle the more damage it causes to roads), the time of day and current traffic conditions.

CAFE Standards: Combined Domestic and Import Passenger Car	
Model Year	MPG
1978	18
1988	26
1998	27.5
2008	27.5
2014	34.2
2025*	54.5

*New standards announced in 2012.

US Department of Transportation NHTSA, NVS-220, December 15, 2014 Summary of Fuel Economy Performance (Public Version)





STATES FILLING A FEDERAL VOID

As robust federal funding has become less reliable in recent years, some states have joined together to form infrastructure exchanges that seek to provide financing to bundles of varied infrastructure projects that standing on their own would not attract the financing needed to move forward. The West Coast Infrastructure Exchange formed by Oregon, Washington, California and British Columbia was the first such exchange. Others are currently under development and with \$12 million made available through the FAST Act, it can be expected that these and other exchanges will soon become operational.



PROTECTING OUR POWER GRIDS

The increasing reliance on technology to make our electric grid more reliable and efficient also exposes it to cyber mischief. Just as with autonomous vehicles and the need to safeguard them from cyber-attacks, we must ensure that our smart electric grids are protected. From protecting customer data collected from smart meters that could tell from usage patterns when the customer may not be home to the increasing prevalence of intelligent devices that manage the electric supply and demand – we must ensure the safety and integrity of this network. Imagine a scenario where a terrorist is able to attack the electric grid by shutting it down and depriving millions of citizens of power. Chaos would ensue, endangering lives and livelihoods and doing massive harm to the economy.



CONGESTION IN THE SKIES

When it comes to air travel our skies are fast approaching gridlock. **U.S. air travel will grow by 50 percent from 750 million passengers in 2014 to 1.14 billion in the next 20 years.** Much like using technology to curb congestion on our roads, modernizing the nation's air traffic control system from one that is radar-based to one that relies on satellites will also make our aviation network more efficient. According to a FAA/Nextor study, the costs and impacts of flight delays in the U.S. and estimated annual costs of delays is \$31 billion. Satellite-based technology known as NextGen is vital to meeting future demand and to avoiding gridlock in the skies and at our nation's airports. When fully implemented, NextGen will allow more aircraft to safely fly closer together on more direct routes thereby reducing delays and providing unprecedented benefits for the environment and the economy through reductions in emissions, fuel consumption and noise. However, NextGen has experienced unstable federal funding and as a result, the United States is still relying on World War II-era radar technology. Our global competitors are also working on modernizing their air traffic control navigation and it is important that the systems being developed are inter-operational.



2014



2034

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Federal Aviation Administration



NEGLECTED PASSENGER RAIL

We must also address the chronic neglect and under-funding of America's passenger rail network. Because our rail network is riddled with choke points, passenger trains in the U.S. run at slower speeds today than they did in the mid-20th century. **America's fastest train, the Acela Express running between Boston and Washington reaches a top speed of 150 mph – but most of the time it averages speeds closer to 70 or 80 mph.** To catch up with our international competitors, we must begin to strategically invest in high speed rail in corridors where it makes the most sense. The high speed rail project likely to have the greatest national impact is the Northeast corridor as it generates the highest GDP in the country and has an annual ridership of 13 million. However, only \$10 billion in federal funding has been made available for high speed rail since 2009.

Top operating train speed



*Average Acela operational speed is 70-80 mph

**Only half of Amtrak trains in operation can reach 100 mph

THE COST OF INACTION

It is clear, rapid advances in technology are bringing transformative changes to infrastructure. While America must continue to innovate and embrace these advancements, it is critical that we not lose focus on properly repairing and maintaining our existing infrastructure. **In the last 12 months, broken dams in South Carolina caused flooding and fatalities; a massive pipeline rupture in Porter Ranch, California, sickened and displaced thousands of families; and of course, residents in Flint, Michigan, found out that their fears about toxic water were not unfounded.**

Our nation's refusal to face facts and take care of our roads, rails, bridges and pipelines has very real consequences – both for public safety and for the economy. The cost of not fixing our infrastructure could lead to a \$3.9 trillion loss in GDP by 2025.

ASCE Failure to Act Economic Impact Summary Report			
Infrastructure System	Total Needs*	Expected funding*	Funding Gap*
Surface Transportation	\$2,042	\$941	\$1,101
Water/Wastewater	\$150	\$45	\$105
Electricity	\$934	\$757	\$177
Airports	\$157	\$115	\$42
Inland waterways and Marine Ports	\$37	\$22	\$15
Totals	\$3,320	\$1,880	\$1,440

*By 2025. Dollars in Billions.



A VISION FOR THE FUTURE

Twenty-first century challenges require 21st century solutions. It is time to think big. Rapid advancements in technology have already made significant improvements in our quality of life, and further transformation is inevitable. America is the world's leader in innovation and we must harness that creativity to modernize our nation's infrastructure. Our goal must be to have seamless fully integrated interoperability across all modes of transportation.

In order to get the country on the best path forward we need a strong vision and a long-term infrastructure strategy. Such a policy must have clear criteria for achieving economic objectives necessary for growth and prosperity, and rely on policy innovations rather than political considerations. We must create incentives for cities and regions to collaborate on the most efficient ways to leverage public investments with private sector dollars. We need to reward innovations by offering competitive grants to take ideas from pilot projects to widespread adoption. We need greater federal involvement when it comes to regulating autonomous and driverless vehicles as it would not make sense to have 50 separate laws governing this rapidly growing innovation.

What we do, or fail to do, now is not about the past — it is about our future. Building America's Future is optimistic about the possibilities, now and in the decades to come, and will continue to encourage visionary leadership that ensures America's place as the world's technological leader and preeminent global economic power.

Building America's Future is a bipartisan coalition of current and former elected officials from across the country.



Mayor Michael Bloomberg,
BAF Co-Chair



Former Secretary of
Transportation Ray LaHood,
BAF Co-Chair



Governor Ed Rendell,
BAF Co-Chair

