ATLANTA REIMAGINED

Creating Community, Collaboration and Access through Transportation Innovation in Atlanta

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Introduction from the Honorable Kasim Reed, Mayor of Atlanta

We are pleased to submit our proposal to the U.S. Department of Transportation to win the "Beyond Traffic: The Smart City Challenge" award.

We have worked diligently to create a new vision for Atlanta to become the transportation city of the future. The Challenge has mobilized us to work together—internally within city government and with civic, private sector, nonprofit and university organizations across our region.

Atlanta is a community of collaborators. In fact, we are renowned as a city of partners—one that is well positioned to bring our entire innovation ecosystem together to be a global leader in transportation technologies. In addition, you will see throughout our proposal the strategies to build from our existing infrastructure assets and to develop a more connected urban mobility framework. We are mindful of the opportunity to reshape our future, to build a safer, more resilient, sustainable city.

As we move along the journey of innovation, we will break out a new map—not the old map that shows where we have been, but the new one that shows where we are going. We are headed in a new direction that increases economic opportunity and social mobility; creating a transportation network that reconnects neighborhoods, inspires new forms of civic engagement, embraces "smart" technology and fosters investment decisions and dollars that are aligned to create a better quality of life for all who live, work and play in Atlanta.

With sincere appreciation,

Kasim Reed

Mayor of Atlanta

1 – Vision

Atlanta's Challenge

Atlanta's beginnings, dating back to 1836, are rooted in transportation. When Georgia first designated the "Terminus" for a rail line from the South to the Midwest, our city's destiny was forged to grow as a rail hub, a distribution center, and today, a vibrant communications, technology and transportation mecca.

We believe that Atlanta truly deserves to win this Challenge. In fact, we know of no other city that can leverage its history of transportation challenges and turn its problems into competitive advantages that build a smarter, more inclusive, more vital community.

Our challenges run the gamut…

- Divisive highway systems that have segregated our city and contributed to the forcing of growth out to the suburbs, away from ready public transportation options.
- Neighborhood clusters with high unemployment rates and residents who lack access to transportation and workforce services.
- A historical lack of an overall regional ability to connect many underserved communities to major transportation systems, jobs, education, healthcare and affordable housing.
- Continuous outward development has created an automobile commuter culture, resulting in daily roadway congestion that negatively impacts residents, commuters, commerce and our environment.
- The need for improved public transit and multi-modal options that span the city and foster new density and development to spur economic growth in town.

All coming together to contribute to our core challenge—**the need for social inclusion and mobility, the need to create economic opportunity for all of our citizens, the need to hear all of the voices in our community and ensure better access to jobs, education, healthcare, housing and other critical city services**. We acknowledge the current state of affairs:

- A study by the Brookings institution found that a child born at the 25th percentile of income in Atlanta saw an 8% decrease in earnings relative to the national average by age 26.
- In a 2012 study conducted by The American Business Journal, the Gini Index, a measure of income equality, ranked Atlanta 78th out of 102 metro areas
- According to analysis completed in 2012 by the American Association of State Highway and Transportation Officials, as of FY2010, Georgia ranked 49th out of 50 states in per capita state transit funding levels ($0.22/person).

These challenges have led us to explore a fresh, bold approach. We see the mandate to create a safer, more mobile, more resilient city. As you will see throughout this proposal, we plan to leverage our community, our partners, and our technology to turn our challenges into solutions.

Atlanta's Vision

We embrace a bold commitment to social mobility and economic opportunity for all Atlantans. We are "Reimagining Atlanta" to strengthen our legacy transportation networks, to create new, innovative modes of transport and urban mobility and to leverage advanced technologies across our region.

Our vision is crafted by our collaborations. It is designed to ensure the flow of commerce and to better connect people, providing access to jobs, education and housing to improve the quality of their lives. Our vision is also shaped by our challenges. In fact, we have reimagined a future that sets Atlanta apart and shows the spirit of our community and the strength of our commitment to be a model for our nation as the "transportation city of the future."

Most importantly, our vision is rooted in the fundamentals of the dream of Dr. Martin Luther King Jr., a legendary hero from the city of Atlanta, where we close the social, economic, and digital divides.

We imagine Atlanta as…

- ✓ **a beacon of urban mobility**, connecting people with the transportation options they need
- ✓ **a socially inclusive city**, enabling low-income communities to use new modes of transportation to achieve upward economic mobility
- ✓ **a smarter city**, where data and technology are leveraged to reduce the number of vehicles on the road, smooth the peak commute periods, and increase the use of public, low-carbon emission alternatives
- ✓ **a more innovative city**, engaging private sector, civic and university leaders to implement urban automation, connected vehicles, sensors and analytics
- ✓ **a city with smooth flowing traffic** for commuters in and out of the city, for riders of our public transit systems, and for everyone who uses our roads
- ✓ **an urban logistics leader that has world class movement of goods and freight**, with efficient, sustainable and secure systems connecting the region
- ✓ **a safer city, welcoming and connecting all modes of transportation** in the sharing economy—for cars, bicycles and pedestrians
- ✓ **an engaged and connected city**, embracing our culture, our diversity and skill as collaborator and partners—a model for the world

We believe that Atlanta is optimally positioned to shine a light on transportation transformation—to be the "North Star," leading our entire community and the nation to a better, more sustainable environment.

While complex, accomplishing this vision is realistic and attainable. To get us there, we have developed a framework that leads from the vision statement to a set of executable projects. This framework consists of **Vision – Objectives – Solution – Projects**. As you will see in this response, our solution and projects will leverage innovative practices, technology, public-private partnerships, Atlanta's renowned higher educational institutions, and policy changes to

create seamless, pleasant, productive transportation experiences that enable citizens to navigate across the city and affords them pathways to prosperity.

Atlanta's Objectives

To guide the vision of *Atlanta Reimagined*, we have translated the vision into five distinct objectives**.** These objectives ensure that the key elements of our vision transform into specific plans and actions. They will also drive our solution and numerous ongoing and planned complementary projects that will bring *Atlanta Reimagined* to life.

Atlanta's objectives are as follows:

1. Expand mobility options and enable economic opportunities for the underserved
2. Make travel – both public and private – faster, easier and safer for all citizens across all modes of transportation
3. Improve commerce and attract employers, building new collaborations to grow our economic strength as a city
4. Move and deploy efficiently the goods needed by citizens and businesses
5. Reduce the environmental impacts of transportation and logistics

Atlanta's Proposed Solution

Atlanta's proposed solution to achieve our objectives and vision contains **3 key components:**

1. A network of ***Connected Transportation Centers*** **(CTCs)**, used for both people and freight, that will link into and build upon our existing public transportation system. These CTCs include both new access nodes that link into Atlanta's existing network and the augmentation of key hubs within the existing system.
2. A ***Smart City Command Center*** **(SCCC**), powered by big data and analytics, that will monitor and analyze data from sources across the city, including the CTC network, to maximize the efficiency of the network. The SCCC will be a new addition to our information technology capability, enabled through a valuable collaboration with Georgia Tech
3. An improved ***Technology Infrastructure Backbone*** to support our network and analytics capabilities. This backbone will strengthen physical technology infrastructure, including many planned and in-progress projects across the city. It will also be a test bed for the implementation of key transportation and logistics technology standards.

Together, these components will deliver a solution that incorporates all twelve of the U.S. DOT's Smart City Vision Elements to reach our overall vision: To increase social mobility and economic opportunity for the citizens of Atlanta, and ultimately, the entire Atlanta region.

One important note - As you will see in the ensuing sections of this document, our proposed solution design minimizes the need for new public transportation built infrastructure, including bridges, roads and rail. Instead, it focuses on improving the use of existing infrastructure to achieve the goals of this proposal. Because of this, we believe this program is feasibly scalable to a regional, and even national, level.

Solution Component 1 – The CTC Network

The Connected Transportation Center network is the core of Atlanta's overall solution. It will consist of both new locations and the augmentation of existing transportation points. The CTC network provides both physical and virtual elements. It enables multi-modal transit for pedestrians, cars, bikes and freight. It leverages physical infrastructure and builds out capabilities for new transportation modes, while overlaying a myriad of technical applications that enable safer, faster and more efficient routing, navigation and access.

Connected Transportation Center nodes will be strategically located in specific areas of the city based on their core access goals (e.g. – access for disadvantaged populations, access to jobs and other resources, commuter access, freight and logistics access). Each CTC will serve as a connecting point both into and out of Atlanta's transportation network, while also delivering services at the physical location. In many cases, these centers will host community activities and be a beacon of activity: smart lockers, education, training, new technology, etc. They will also be a hub for advanced automotive technologies: autonomous vehicles, electric vehicle fleets (shuttles), connected vehicles and infrastructure, sensor network, etc.

For CTCs specifically designed to provide access to disadvantaged communities, community zones will be identified based on the following criteria:

- Locations outside of Atlanta's existing inner urban core that contain a substantial population of residents but are currently underserved by mass transit.
- Populations with critical unmet needs, such as access to jobs, food, and medical care.
- Locations that have existing or planned significant development efforts that can be leveraged to drive more housing for lower income families, create new landmarks to increase traffic into areas, or promote business ingress into the area. Examples of such locations include the Turner Field neighborhoods, Google Fiber neighborhoods, anchor public schools, The Beltline's Southwest Spur Trail and the Fulton Industrial business corridor.

In addition to the new CTC nodes, key connection points within Atlanta's existing public transportation system will be augmented by CTC technology. These points include Hartsfield-Jackson Atlanta International Airport and its connected Aerotropolis business development, MARTA's Five Points hub station, MARTA's Lenox Square station and the Atlanta Beltline.

While new CTC nodes will be located outside of existing transportation hotspots, these CTCs will connect both with each other and with existing transportation hubs identified above. There are multiple benefits to this approach:

- The CTC network builds on Atlanta's existing transportation infrastructure, leveraging past investments and current initiatives.
- The CTC network creates more access points into Atlanta's existing transportation network, bringing transit to a much larger segment of the population and business community.
- The CTC network creates opportunities for more efficient connections between any points in the City, making it faster and easier for citizens to access jobs, groceries, healthcare and other core services and amenities, and for goods to reach households and businesses.

- CTCs can serve as development anchor points around which communities can be revitalized through increases in inbound and outbound traffic, as well as through associated development policies and projects that ensure inclusion and access for disadvantaged populations such as youth, low income citizens, disabled, and the elderly.

The functionality of each CTC location will be adaptive, based on the specific transportation and logistics needs of the community in which it exists. While each CTC will serve as a multimodal connecting point into and out of Atlanta's existing transportation systems, the mix of transportation modes, and the physical footprint of the CTC, will vary based on its location, users and goals. Certain CTCs will place a focus on connecting into regional transit and reducing regional commuter congestion. Others may focus more specifically on in-town modalities such as walking and biking. CTCs located next to key business hubs will also put more focus on freight transport and distribution.

The CTC network solution provides five overarching benefits – each of which will be brought to life through a different combination of Smart City vision elements:

1. ***People Mobility:*** Moving quickly, seamlessly and safely throughout Atlanta.
2. ***Commercial Agility:*** Achieving greater delivery efficiency, improving asset utilization, bringing logistics and distribution closer to urban areas, and mobilizing the private sector to generate innovation in the domain.
3. ***First/Last Mile Access:*** Creating easy connections into and out of the CTC network to locations such as home, work, the grocery store or the doctor.

4. ***Connected People:*** Using smarter tools to connect people to their transportation, to their communities and to Atlanta.
5. ***Vibrant Communities:*** Rejuvenating neighborhoods by creating a vibrant, inviting community anchor point and reconnecting those neighborhoods to the broader city.

Solution Component 2 – The Smart City Command Center

Supporting the operations of the CTC network will be a Smart City Command Center (SCCC), which will aggregate all of the data coming in from the CTC network, and other sources, and use it to make network operations as efficient as possible, generate new solutions and services, and enable integration of new modalities.

In partnership with Georgia Tech, and leveraging Georgia Tech's new High Performance Computing Center (HPCC), the SCCC will manage real-time data acquisition and analysis. The information that is gathered by the SCCC will be digested, analyzed, and translated to deliver real-time, reliable and meaningful information to all stakeholders, who in-turn can make more-informed decisions. In a sensing environment, the SCCC can work to make infrastructure assets become more self-aware and direct their own maintenance, leading to condition-based maintenance, reduced down time and greater operational efficiency of the infrastructure overall. In addition, the SCCC will serve as an innovation lab for the CTC network, gathering input on network user behavior and conducting live and virtual input and simulation sessions with citizens and other partners.

The HPCC provides the perfect opportunity to bring this solution to life. Already under active development in Midtown Atlanta, the HPCC will be an urban data center and a hub for establishing partnerships among the industry, academia, and the public sector centered around big data analytics. Included in the HPCC's existing development roadmap is a plan to create a cluster dedicated to Smart Cities, which will become the Smart City Command Center referenced above. The HPCC will allow us to:

- Store the big data that will be collected in the implementation phase of this project.
- Provide data security & protect the data.
- Provide direct, high-power computational access to the city much faster than any other cloud-based technology providers.
- Analyze the data, build predictive, optimization and simulation models, and create control tools for smart urban traffic and logistics management systems.
- Document the outcomes of research & disseminate results to the public domain.
- Give access to the sanitized version of the dataset to anybody who is interested in the research to help grow the adoption of smart hyper-connected transportation.
- Provide a unique collaboration platform to attract and host the industry partners to the city's smart transportation and logistics initiatives.
- Identify appropriate standards for all components – data, infrastructure, applications, devices – and ensure adherence

Solution Component 3 – The Technology Infrastructure Backbone

Supporting both of the above solution components will be the deployment of tens of thousands of sensors, controls, displays, and other devices across the city. This robust and well-designed network will enable the connectivity needed to support data gathering, analytics and communications, bringing the entire network to life. To underpin this proposal, Atlanta is already deploying a city-scale, carrier-grade municipal fiber network. Through this network, Atlanta will be able to layer multiple technologies and devices at critical points throughout the city. Our current vision includes 1 Gigabit fiber connections at most controlled intersections throughout the city. This will allow the city to deploy the following technical equipment at every controlled intersection in the city:

- Advanced traffic control systems
- Advanced traffic monitoring systems
- High resolution video cameras for security and operational purposes
- Local video analytics for multiple purposes
- Wi-Fi connectivity for operational, commercial, and public needs
- Environmental and other wide-ranging sensors for monitoring, communications and feedback

Our Stories

As you will see, our solution leverages the technology capabilities of our region. Between the government, university and corporate expertise in our city, Atlanta can lay claim as a world-class technology leader in logistics and transportation. Yet the real value of our solution will be measured by its impact on the lives of our people. As we have worked to "Reimagine Atlanta," we have continually thought of the individuals who live, work, and play in our city—the people who we serve and who, every day, deal with challenges sometimes complicated by transportation systems that do not meet their needs.

The stories below are the inspiration for the transportation city of the future. While these six stories clearly communicate the benefits of a Reimagined Atlanta, there are many more stories like these that we could tell about people—from students struggling to get to campus, to elderly citizens with limited mobility, to CEOs considering a move to Atlanta—whose lives and livelihoods would be improved through these efforts.

- **Tom Maggin – A struggling worker living in an underserved community.**
  - **Current:** Every morning, Tom has to walk to catch the bus in order to take 3 separate buses to get to his job in another part of city. Despite this arduous trek, a lack of mobility options prevents him from finding higher-quality employment.
  - **Future:** Tom rides his bike to the CTC, where it can be stored securely. He is able to move quickly through the CTC smart corridors on a connected bus to the Beltline. Once he arrives, he takes an autonomous cart to the Northeast side of city, where his job is located. Tom gets a subsidized ride share ride to his office from his endpoint on the Beltline. On his way home from work, Tom picks up a package containing his new work uniform at smart locker in the CTC.

- **Benefits:** Tom's commute time was cut in half, using safer travel modes. Tom is able travel to more parts of the city in order to find a higher wage job better suited to his professional certification, and has greater access to urban resources.

- **Vanessa Hudgins – A young student, disconnected from affordable and safe transportation options, who struggles to get to school on time**
  - **Current:** Vanessa is not served by school buses because she lives less than a mile from school. As a result, Vanessa has to get up early to walk ¾ mile in the dark, early morning on a road without sidewalks to get to school. Both of Vanessa's parents work early shifts and are unable to take her to school. To return home after school, Vanessa must go through the same process.
  - **Future:** Vanessa is able to use a low-cost smart phone to find out when the next neighborhood automated shuttle pickup will be. The shuttle takes Vanessa and other students to the CTC, which is located near her high school. Now, Vanessa only walks one block to get to school. At school, she is part of group project that uses CTC data to think of new ways of smartly getting students from their home to school.
  - **Benefits:** Vanessa has a much safer commute. She can sleep longer, which helps to improve her academics. The CTC network itself augments learning for students and allows for applied research at school.

- **George Silva – A disabled senior citizen dealing every day with inadequate access to transport for food and medicines.**
  - **Current:** George lives five miles from the nearest grocery store. To get there, he must call MARTA's disability-friendly shuttle, which can take a long time. George's only other choice is to go to the convenience store on the corner, where he will pay more for his groceries with less selection.
  - **Future:** George calls the nearest CTC and requests a ride. Depending on the volume of requests in his neighborhood, he can wait for an automated shuttle or take a subsidized ride share ride to the CTC. He moves via connected transit through a smart corridor to the CTC located near the grocery store. George receives a ride in an electrics car from the CTC to the grocery store. He shops for his groceries and returns back to the CTC close to the grocery store, where he leaves his groceries. He then moves back through the corridor to his "home" CTC, where his prescription pills have been delivered and are waiting in the secure pharmacy pickup area. George picks up his pills and goes across street to his local urban farm, where he is able to select more fresh produce. An autonomous shuttle drops him off back home. 15 minutes later, his groceries, which were transported with other goods through the CTC network, show up at his door.
  - **Benefits:** George has increased mobility to and from home, as well as more affordable access to better quality food. He is also able to conveniently and securely pickup goods, such as his prescription pills, at the CTC. He can transport goods through the CTC, allowing him to shop without worrying about having to carry heavy items a long way.

- **Tonya Morris – A regional commuter who lives in a suburb, 15 miles out of the city. Every day she must endure a long, stressful commute.**

- **Current:** Tonya wakes up at 6:00 am and leaves home without seeing her kids. She drives and sits in traffic for 90 minutes to get to her downtown office. She tries taking the express bus, but it is not feasible because the drop-off point is too far from her office to walk in her work clothes or in bad weather.
- **Future:** Tonya leaves home later, allowing her valuable time with her kids. She drives to the regional commuter CTC, which is located near the city limits. Upon arrival, Tonya is automatically directed to an open parking spot where license plate recognition technology registers her license plate and charges her credit card. She takes a quick ride on the CTC express corridor bus to the Five Points CTC downtown. Her phone app recommends transportation modes from the final CTC to her office, based on weather and traffic. Today, Tonya uses a bike share bike and arrives at her office in five minutes.
- **Benefits:** Tonya significantly reduced her commute time. The removal of her car from in-town roads reduces overall rush hour congestion, impact on infrastructure and the environment. Tonya is able to spend more time with her family.

- **Jamel Huff – Food services inventory manager at the Georgia Aquarium, whose top priority is running smooth operations at one of Atlanta's premier attractions.**
  - **Current:** Jamel has an incoming order from one of the regional delivery companies. On-time delivery is critical to make sure the various on-site food service operations remain fully stocked. As a result of bad traffic, the delivery is delayed, leading to bad experiences for the Aquarium guests and creating headaches for Jamel.
  - **Future:** To get the delivery to the Georgia Aquarium, the truck driver drives to a CTC near the perimeter of the city that specializes in freight distribution. While inbound to Atlanta, the truck automatically notifies the CTC of its location and projected arrival time. Immediately upon arrival, specialized robots, operated by UPS, automatically offload a modular container from the truck. On-demand transport vehicles receive data from in-town sensors and are automatically routed in the most efficient way to the Aquarium, allowing them to arrive at the exact time specified for delivery and keeping Jamel's operation running smoothly.
  - **Benefits:** The Aquarium's costs are reduced by being able to plan more accurately for tighter delivery windows, and Jamel's customers are more satisfied. Additionally, Atlanta's roadways are less damaged by heavy truck wear and tear. Congestion and pollution are reduced, improving the quality of life in urban spaces.

- **Samuel Wright – A CEO who is weighing the assets and liabilities of relocating his global technology business to Atlanta.**
  - **Current:** Sam's company is relocating from a large, northeastern city due to high costs of operation. Sam and his team consider Atlanta. The existing business core of the city proves too expensive, and tax incentives are not large enough to make a difference. The company rules out relocating to other parts of the city because they lack transportation options for employees and the areas are perceived as dangerous. The company decides to relocate to a different city.
  - **Future:** Sam's company examines relocating to the west end of Atlanta, near a CTC. It offers ready access to the employment base and goods supply of the entire city. By relocating near a CTC, the company will also be able to take advantage of networked public safety cameras, improved street lighting and a mini-police precinct located near

the CTC. In addition, the cost of land and other operations remain significantly lower than in the urban core. The company decides to relocate to the west side, bringing 500 new jobs into the city and further increasing the momentum of residents and job seekers relocating to the west side of city.

- **Benefits:** New employment is attracted to Atlanta. The cost of doing business within Atlanta in decreased, and business development is less reliant on tax-based incentives. Relocating residents are encouraged to fill in the areas outside of Atlanta's existing inner urban core.

Implementation and Program Management Approach

Atlanta will follow best practices and incorporate key learnings from its $250M Renew Atlanta infrastructure bond program to employ a best practice program management approach.

Prior to implementation, the City will select and hire a Program Management Team (PMT) with project management expertise in both construction and technology implementation. This PMT shall report through the governance structure outlined in a below section. The PMT will be responsible for day-to-day program management, including project management, resource allocation, budget management and partner coordination.

In tandem with our proposed governance process, the PMT approach will ensure that projects are completed on time, within budget and to standard.

2 – Atlanta's Key Characteristics

The city of Atlanta had a 2010 Census population of 420,003 people (The 2014 Census estimated a population of 456,002 people, or over 8% growth). Atlanta has a land area of 133.15 square miles, which translates to a population density of 3,154.3 persons per square mile as of 2010.

The 2010 Population of Atlanta's Urbanized Area was 4,515,419 people. Atlanta's UZA Land Area is 2681.0 square miles, which translates to a UZA population density of 1684.2 persons per square mile. Also as of 2010, the city of Atlanta's population as a percentage of its UZA was 9.3%. The city's land area as a percentage of its UZA was 5.0%.

Atlanta's population increases significantly during the daytime, in terms of absolute numbers, density, and as a percentage of the UZA. The 2010 Census estimated that the city's population increases by 66% (~273,000 people) during the daytime, the second largest increase of any city in the US with over 250,000 residents. In other words, during the daytime, Atlanta's population as a percentage of its UZA jumps to ~15%.

This massive daily influx of commuters into the city poses many challenges relevant to this proposal: The city's infrastructure is supported by a tax base significantly smaller than the daily user base; commute times are some of the longest in the country; congestion clogs roads, harms the environment, reduces quality of life, and increases costs for people and businesses.

In the context of this challenge, we believe these characteristics to be an advantage for Atlanta. Atlanta is uniquely positioned as both a relatively dense city that has the critical mass to test

and scale smart transportation solutions, while also still having the potential to reap the benefits of significantly increased resident density. Most cities can only claim one or the other.

We believe that our proposal will enable Atlanta to generate and handle greater round-the-clock density—thus alleviating the challenges described above—by providing connectivity to disconnected communities, driving development, and generating the influx of visitors and residents needed to create smart, dense urban environments that will help the city to thrive in the years to come. We also believe that this can be done while minimizing the need to build significant costly new public physical infrastructure to achieve it.

3 – Other characteristics of Atlanta

While Atlanta, and the state of Georgia, has historically ranked extremely low in per capita state transit funding, recent efforts have significantly boosted overall transportation funding at the state and municipal levels, making Atlanta a location ripe for new, bold strategies.

In 2015, Atlanta voters approved a referendum allowing Atlanta to issue a $250M bond with the purpose of upgrading infrastructure across the city. This program is known as Renew Atlanta. Also in 2015, the Georgia Legislature passed HB 170, the Transportation Funding Act of 2015. This bill is expected to generate $900 million in annual, dedicated transportation funding.

Atlanta's public transportation is currently managed by the Metro Atlanta Rapid Transit Authority, known as MARTA. Within city limits, MARTA operates a rail system containing 2 main lines (North to South, East to West) that include 2 minor branch lines. The system has 24 train stations within the city. MARTA also operates 407 bus routes that contain a total of 4,308 stops.

MARTA, a key partner in implementing Atlanta's proposed solution, has demonstrated its ability to manage a fiscally and operationally sound organization. According to their data, MARTA has posted three back-to-back years of budget surpluses and has $200 million in reserves. Year over year ridership increased from 129 million to 136 million passenger rides last fiscal year. On-time performance for buses and trains in 2015 was 96 percent. In addition, this year MARTA is asking the state General Assembly to allow a referendum on a half-percent sales tax in Fulton and DeKalb counties to fund an estimated $4B of an $8B planned expansion to MARTA's train network in metro Atlanta.

Atlanta and Georgia have demonstrated commitments to integrate with the sharing economy. In 2015, GA Governor Nathan Deal signed into law HB 225, which set uniform statewide operational requirements for for-hire vehicles, including ride share companies. The bill, which filled existing gaps in state law regarding insurance coverage and passenger safety in the for-hire industry, was supported by prominent ride share companies such as Uber and Lyft. The City of Atlanta complied soon after by updating its charter to accommodate the regulatory changes, ensuring smooth operation of ride share companies within the city. In addition, Hartsfield-Jackson Atlanta International Airport is currently developing a policy framework that will allow ride share companies to operate at the world's busiest airport.

Led by the efforts of Mayor Kasim Reed, the City of Atlanta has also made significant progress in making its data open, machine-readable and accessible, discoverable and usable by the public.

In 2015, the Mayor's Office of Innovation Delivery and Performance (MOIDP) launched DataAtlanta, a portal allowing access to all of the city's publically-accessible performance data. MOIDP also launched Atlanta's first ever public-facing performance website, delivering on the Mayor's commitment to make the City's performance more transparent.

Because of these and other efforts, Atlanta is currently ranked 17 out of 109 cities in the amount of open data that it delivers. This ranking is compiled by the Open Data Census, a joint effort by the non-profits Code For America and The Sunlight Foundation.

These efforts by our leaders are clear demonstrations of Atlanta's commitment and capacity to carry out our demonstration projects throughout the period of performance.

In addition to all of the characteristics listed above, Atlanta has many more advantages that make it conducive to being a Smart City, including:

- **Managed Lanes:** The number of average daily trips using the I-85 HOT lanes increased from 18,960 in April of 2013 to 20,141 in April of 2014.
- **World Class Air Travel:** Atlanta is home to Hartsfield-Jackson Atlanta International airport, the world's busiest airport for passengers. In 2015, passenger traffic at HJAIA topped 100,000,000 passengers, a first for any airport in the world.
- **Roadway Safety:** From 2008 to 2012, the 18-County region experienced a decrease of fatalities on the public roadways, from 528 in 2008 to 452 in 2012.
- **Georgia is the #4 state in the nation for jobs attributed to the app economy**, numbering 24,000 in 2012 according to CTIA. TechNet places Atlanta in the top 10 metro areas for the highest percentage of app economy jobs.
- **Approximately 70% of all credit and debit transactions that occur in the US are handled by companies based in Georgia**, predominantly in metro Atlanta (Source: Global Payments)
- **Four of America's top FinTech companies are headquartered in Georgia**: NCR, First Data, TSYS, Equifax (American Banker)
- **Atlanta ranks third in the nation among cities with the most FORTUNE 500 Headquarters, according to the 2013 FORTUNE list.** These companies include Coca-Cola, Delta Air Lines, The Home Depot, UPS, First Data Corporation, NCR and The Southern Company.
- **Key Universities** include Georgia Tech, Georgia State, Historically Black Colleges and Universities, and Emory University. This includes Georgia Tech's Advanced Technology Development Center and High Performance Computing Center.

4 – Site Map

Please see the final page of this document, prior to letters of support, for a full-sized map.

5 – Smart City elements

Atlanta's 3-tiered Smart City solution includes projects related to all 12 of U.S. DOT's vision elements, bringing them together in a cohesive fashion. Below, we have listed each element and the projects that come underneath it. The site map at the end of the document serves as a

companion to this section, demonstrating how projects will come together under a unified structure.

As stated in the solution overview in section 1, these projects will deliver benefits related to People Mobility, Commercial Agility, First/Last Mile Access, Connected People and Vibrant Communities.

Vision Element #1: Urban Automation

- **People Mobility**
  - In partnership with the Georgia Road and Tollway Authority (GRTA), driver-assisted autonomous regional express transit buses can deliver commuters from regional transportation points into commuter-focused CTCs. Automation is feasible because of the relatively fixed routes and mostly freeway driving done by these buses.
  - Transportation around the Beltline CTC in slow moving autonomous carts, allowing users to hop on and off.
- **First/Late Mile Access**
  - Driver-assisted autonomous delivery trucks, powered by companies such as UPS and Mercedes, can complete last-mile delivery of residential packages.
  - Automated, wheelchair-accessible shuttle buses can serve neighborhoods within each CTC's defined collection areas. Because routes are fixed, automation of these shuttles is feasible within a reasonable timeframe.
  - A pilot autonomous drone project can be used to facilitate last-mile delivery of residential packages from a CTC in areas where airspace is unrestricted.
- **Commercial Agility**
  - At logistically-specialized CTCs, advanced robotics can be used for unloading large freight deliveries and staging for outbound transportation.
  - Autonomous freight movement vehicles can be used to move freight within a CTC from offloading area and into a staging area for departure.
  - Driver-assisted movement of freight can be automated within the smart corridor from the Aerotropolis to the airport. The closeness of these facilities provides a realistic proving ground for automation.

Vision Element #2: Connected Vehicles

- **People Mobility**
  - On-demand transportation modalities, such as connected buses, cars, bikes and carts will be alerted to come to CTC nodes when a critical mass of arriving or departing people is reached for transportation.
  - Smart corridor mass transit vehicles will be enabled with Dedicated Short Range Communications. This will enable these vehicles to improve breaking, increase accident avoidance, deliver greater fuel efficiency, and eventually move as a platoon.
  - Signal priority technology will communicate with connected buses to create a continuously-moving travel path.
- **Commercial Agility**

  - Connected package distribution vehicles will be alerted to come to CTC nodes when critical mass of packages is reached for delivery.
  - Connected freight trucks will communicate arrival times to freight CTC nodes, allowing for efficient use of delivery space and preparation of automated robotics for offloading and staging. The trucks can be routed to arrive at a freight CTC at a pre-specified time.
- **Connected People**
  - Connected modes of transportation to the CTC from a starting point will be able to adjust routes based on amount of people waiting to be picked up. They will then be able to communicate projected pickup times back to users.

Vision Element #3: Intelligent, Sensor-Based Infrastructure

- **People Mobility**
  - For CTCs serving heavy regional commuter bases, free flow parking applications powered by smart parking sensors at the CTC will get cars off the streets and into a spot faster, reducing pollution and improving the experience of CTC utilization
  - Sensors and traffic management software along smart corridors will route buses and other transit modalities in the most effective way between points
  - Sensors will also support traffic light synchronization within smart corridors. This signalization, supported by lane-level traffic flow sensing, will allow vehicles to achieve the fastest feasible travel times within corridors.
- **Commercial Agility**
  - Sensors at freight-specialized CTCs will allow for automatic data collection related to freight size and weight, as well as arrival, unloading, loading and departure times. This will allow for improved planning of freight staging and delivery clustering.
  - Sensors along the smart corridors will allow for tracking of freight logistics vehicles and their transported modular containers, allowing ubiquitous tracking and visibility of logistics flows across the urban network.
- **First/Last Mile Access**
  - Sensors in key collection areas around CTC nodes will gather data that can recommend an appropriate last mile connectivity mode based on traffic, weather, and numerous other factors.
- **Connected People**
  - Sensors placed at key points within CTC collection zones will allow for real-time monitoring of conditions coming into CTC. Citizens will be alerted to updated arrival times at the CTC, or routed to another CTC in case of accident, incident or congestion.
  - A variety of already-available sensor technologies can deliver accurate travel time calculations, along with updated arrival and departure information.
- **Vibrant Communities**
  - In and around CTCs, sensor-embedded surveillance cameras and lights will improve monitoring and safety, adjusting coverage based on current locations of people and vehicles in and around the vicinity. Cameras will be linked into the Atlanta Police Department's existing Video Integration Center, allowing for easy communication should a public safety issue arise.

Vision Element #4: Urban Analytics

- **People Mobility**
  - The Smart City Command Center can use real-time data on travel patterns to test the effectiveness of different routing options within smart corridors, allowing buses to adjust travel schedules and routes while also enabling improved traffic signalization.
  - The SCCC will also use existing platforms to expose sanitized open data to the public, allowing for the crowd-sourced development of additional travel apps and technology.
  - SCCC open data will enable improved real-time alerts and rerouting of commuters during peak congestion times.
- **Commercial agility**
  - The SCCC can analyze freight data from routings along the network and deliveries at the CTC, identifying sources of freight congestion. This analysis will feed predictive modeling of future deliveries, enabling more efficient transportation management and shipping consolidation.
  - Efficient freight-specific routes can be identified in real-time and transmitted to delivery trucks' navigation systems

Vision Element #5: User-Focused Mobility Services and Choices

- **Connected People**
  - The concept of Mobility As A Service (MAAS) can be used within CTC collection zones to collect people via different modes of transportation depending on their travel needs. Automated shuttles can run at preset times, while more nimble on-demand transportation modes can be dispatched for more urgent or resource-intensive travel needs (e.g. – disabled citizens).
  - A suite of apps, or possibly a single integrated app, will assist users with full journey planning, vehicle (or other modality) reservations, real-time location, duration and ETA information, and, if necessary, payment.
  - Users will be able to input travel preferences via both app and phone, allowing for mobility regardless of technical capability.
- **Commercial Agility**
  - At CTC nodes handling freight, logistics software can foster adoption of digital methods for exchanging shipping documentation and payment
  - Residential packages can be either stored at smart lockers within CTCs or delivered directly to a residence, depending on user preference
- **First/Last Mile Access**
  - Residential packages can be either stored at smart lockers within CTCs or delivered directly to a residence, depending on user preference.
  - Last mile transportation from CTCs can vary based on current weather, traffic and other input data collected from sensor network.

Vision Element #6: Urban Delivery and Logistics

- **Commercial agility**

  - The CTC network can be exploited to place goods in modular containers at an initial CTC, and then ship goods iteratively to CTCs until reaching a final CTC near their destination.
  - The sensor-based, connected vehicle and urban analytics solutions described above can come together to allow for a decreased number of urban delivery vehicles to deliver more packages in a faster time than is possible today.
- **First/Last Mile Access**
  - Smart lockers at CTC nodes will store packages securely for residential pick up.
  - These shared community distribution points will catalyze even more innovative services to facilitate last mile delivery.
  - CTCs with more intensive freight capabilities will be located based on key retail and commercial delivery hubs within Atlanta.
  - On-demand, crowd-sourced delivery services can be used to ship goods from the CTCs to their final destination, be it a household, a smart locker or a business.

Vision Element #7: Strategic Business Models and Partnering Opportunities

To implement the proposal described within this document, we will explore taking advantage of a wide array of partnerships and financing opportunities in addition to the actual Smart City Challenge award money. These include:

- **Implementation and Operation**
  - Partnering with Georgia Tech to form the Smart City Command Center at GT's High Performance Computing Center. It should be noted that Georgia Tech is a sub-grantee of the National UTC lead by UC Davis.
  - Leveraging nascent software developed to enlarge the market for Public-Private Partnerships (PPP).
  - Partnering with MARTA to operate mass transit vehicles within CTC corridors.
  - Partnering with GRTA to incorporate regional commuter buses into the CTC network.
  - Partnering with Georgia Power to deliver roadway electrification and electric vehicle charging stations at select CTC nodes and in select smart corridors.
  - Partnering with many of Atlanta's Fortune 500, midsized and startup companies to bring to life the service and technology solutions laid out within this proposal.
  - Working with neighboring municipalities and regional governments, in tandem with our Regional Planning Commission (the Atlanta Regional Commission) to expand the CTC infrastructure outside of Atlanta and into the greater Atlanta region.
  - Partnering with Google Fiber (currently laying fiber in Atlanta) to link LED street lights and sensors into its fiber network.
- **Financing**
  - Building on existing PPPs within the vicinity of the Beltline CTC, allowing for significant private investment of technology related to that CTC.
  - Leveraging existing federal dollars awarded through a Choice Neighborhood grant to build out select CTC nodes.
  - Leveraging our existing $250M Renew Atlanta infrastructure bond program to help lay down the physical technology backbone needed to bring these solutions to life.

- Leveraging State Bill HB 170, the Transportation Funding Act of 2015, to finance any infrastructure improvements required to implement these solutions.
- Using the Tax Allocation District (TAD) model to finance development of CTC nodes.
- Using funding from Atlanta's Community Improvement Districts and Regional Planning Commission to finance development of both CTC nodes and smart corridors.

Vision Element #8: Smart Grid, Roadway Electrification, and Electric Vehicles

- **People Mobility**
  - Commuter-specialized CTCs will contain charging stations for electric vehicles parked therein. Depending on feasibility, they can also contain wirelessly charging parking spaces. Electricity will be drawn from street or most convenient source.
  - Non-manual transportation at all points (pickup, in-network, distribution) can be electrified. This includes shuttles, buses, cars and slow-moving carts.
- **Commercial Agility**
  - The short corridor between the Aerotropolis and airport can become a fully-electrified roadway via wireless inductive charging, allowing for autonomous, electric and constant movement of freight between the two points.
- **Vibrant Communities**
  - LED street lights near CTCs and along smart corridors will connect directly into Georgia Power's smart grid network, allowing for efficient use of energy.

Vision Element #9: Connected, Involved Citizens

- **Connected People**
  - Mobility As A Service will enable citizens to reduce overall travel times to and from destinations. It will also enable citizens of all degrees of technological capability to access the CTC network.
  - The Smart City Command Center, in addition to serving as the analytic nerve center of this proposal, will conduct regular transportation ideation sessions with citizens. These sessions will build upon a citizen ideation session model already in place at the Airport, gathering qualitative citizen input and using it to augment learnings from data analysis.
  - In partnership with Atlanta Public Schools and Georgia Tech, we will expand Georgia Tech's existing *City as Lab* project, which brings real city-focused data and issues into the classroom. Students will be challenged to analyze and solve existing issues that city's face, providing a win-win for both the students and the city.
  - The Smart City Command Center will expose its open transportation data to the public, allowing for exponential development of currently unknown transportation solutions.

Vision Element #10: Architecture and Standards

- In order to deliver maximum usage of this infrastructure, Atlanta will make the new system environment completely compatible with current and future ITS architecture standards and all other applicable technical and security standards, including CVRIA. Given that the network will comprise of a large number of heterogeneous devices, standards applicability will be required at the following levels:

  - Device level
  - Group level (groups of homogeneous and spatially similar devices)
  - Departmental level (all devices controlled by one department within an entity)
  - Corporate/Agency level (all devices controlled by one company or agency)
  - Regional level (all devices of a singular type irrespective of controlling company/agency)
  - Global level (interaction with the municipal network irrespective of type or ownership)
- As devices, functions, and configurations are identified, we will work with the appropriate stakeholders to ensure that all applicable federal, state, and local standards are maintained.
- We will also seek to employ a federated network model that recognizes most devices on the network will be privately owned or owned by specific government agencies with little or no relationship with other participants in the network.

Vision Element #11: Low-Cost, Efficient, Secure, and Resilient Information and Communications Technology

- The Smart City Command Center will allow for development and testing of best-in-class security protocols related to storing and managing transportation data
- We will also support implementation of U.S. DOT's SCMS wherever possible
- Existing LED streetlight retrofitting efforts, municipal fiber network, and newly-developed Google Fiber network, can be leveraged to connect and network physical infrastructure backbone of the proposal at a relatively low cost
- We will employ a minimum 4 tier security model for all network devices (control and data) to allow for information to be shared: (1) Only within the controlling department; (2) Throughout the controlling agency/company/institution; (3) Across agencies and companies within the municipal cloud; (4) Publicly available to all parties irrespective of affiliation.
- Device level security monitoring and audit functions to reflect current state and previous state changes logged for analysis.

Vision Element #12: Smart Land Use

- **Vibrant Communities**
  - New CTC nodes will be developed around existing physical infrastructure, eliminating the need to fully construct any new physical buildings to serve as a CTC.
  - CTC nodes will promote urban agriculture in select areas, allowing for easy access to fresh produce for those who live in food deserts.
  - Building on Atlanta's existing Better Buildings Challenge program and solar panel rollout, CTC buildings will be LEED certified and at least partially powered via solar technology.
  - Overall, the CTC network minimizes the need for new built transportation infrastructure, including bridges, roads and rail. Instead, the network focuses on improving the use of existing infrastructure to achieve the goals of this proposal. Because of this, the program is feasibly scalable to a regional, and even national, level.
  - Housing policies will encourage development of affordable housing, reducing risk of "gentrification" in CTC areas that further push out underserved communities.
  - Zoning policies around CTCs will be updated to encourage mixed-use development and walkable spaces.

6- Key technical, policy, and institutional risks and mitigation plans

Technical

Technology implementation (High)

As with most large-scale technology implementation projects, the complexity of implementation poses a significant risk to overruns of time and budget, and a failure to achieve results. We understand the need to engage in a risk mitigation strategy to prevent project delays and/or funding misallocations. We will identify, quantify and prioritize the most important risks as well as returns on a systematic basis, using a combination of quantitative and qualitative methods.

To mitigate, we will set up a risk governance structure to maintain command over the program's risk profile and operational needs. Some methods we plan to employ include: risk measurement scoping, analytic modeling and stress testing, portfolio adjustments, and risk-based pricing. More routine processes we also plan to utilize are: daily management reporting, weekly planning, and capital allocation and daily frontline transactions, such as contract structuring and pricing. Ultimately, we will ensure that with our validated approaches, we will have better clarity and insights to the projects portfolio of risks and how to use these insights to improve strategic, financial, and operational decision making for Beyond Traffic: Atlanta.

Technology development/feasibility (High)

It is possible that some of the technologies proposed in our solution may not become commercially available within currently-expected timeframes. It is also possible that one or more of these technologies will not be as feasible to implement as expected when detailed implementation planning is undertaken. Either way, the result is that a technology listed in our proposal will not be able to be implemented.

The risk governance structure above will allow us to identify and address technology development risks as soon as possible. Additionally, our close partnership with Georgia Tech will provide us with better insight into advanced technology development pipelines, allowing us to adjust the program roadmap before a critical point is reached.

Security (High)

Our proposal entails connectedness and data gathering at a scope and scale not currently seen in many cities, if any at all. The integration of large amounts of data from so many sources will pose myriad security challenges, particularly around autonomous and connected vehicles.

We recognize that specialized expertise will be required to implement a security framework that protects the safety and the privacy of our stakeholders. In this respect, our partnership with Georgia Tech will again be critical. Georgia Tech and their Georgia Tech Research Institute have Department of Defense-level experience in securing these types of networks. No other city could provide the Security First elements that Atlanta can to advanced Smart City networks.

Policy

Lack of coherent autonomous vehicle policy (Medium)

Perhaps the greatest policy risk of this proposal is the lack of a unified national regulatory framework around autonomous vehicles. This framework must be in place before we can implement autonomous vehicle projects at scale. This risk is mitigated by the fact that autonomous vehicles within our proposal can be replaced by smart, connected, driver-assisted vehicles. While our proposal will significantly benefit from autonomous vehicle technology and policy, its success is not solely reliant on these factors.

Privacy (Medium)

Big data collection may trigger concerns about the privacy of personal data. As we implement this solution, we will endeavor to use data privacy best practices and consult with industry experts to develop privacy policies that balance the need for privacy with the need for data to operate effectively. We will ensure that this development process contains extensive citizen feedback, and we will work to sign MOUs with relevant partners to ensure compliance with these policies.

Supporting land use and zoning policies (Low)

Development in and around CTCs will require changes to city zoning, land use and affordable housing policies. Enacting these policy changes will be a critical success factor of the proposal. Because these changes can be enacted at a City level, we are confident in our ability to work with the Atlanta City Council and Department of Planning and Community Development to enact required zoning, housing and land use policy changes.

Institutional

Support of partners through implementation (Low)

Implementation of this plan will depend on the support of many key partners, both public and private. Two critical partners in this venture will be MARTA and Georgia Tech. While both have indicated support for this proposal, it is always possible that the implementation details of the solution and changing macroeconomic factors could change that level of support.

To address this, we plan to work closely with both of these partners during planning, making them both part of the core team as we develop implementation plans. In this way, we will be able to address and mitigate and critical disagreements as early as possible.

The fiscal health of both of these organizations should mitigate any risk of shifting priorities based on macroeconomic conditions. Georgia Tech has also already demonstrated its commitment to partner with Atlanta by joining the city in a MetroLab partnership.

Changes in leadership (Low)

Mayor Kasim Reed will leave office in January 2018. By law, he cannot run for another term. It is possible that a new Mayor will decide to halt implementation of this proposal.

We believe this risk to be low. The amount of economic and social benefit generated by the solutions proposed herein will be large enough that it will be counter-productive to halt implementation halfway through. In addition, the Atlanta City Council has demonstrated its commitment to this plan, voting unanimously to support our proposal prior to this submission.

7- Partners, Key Stakeholders, and Demonstration Governance Processes

Partners

This proposal will enlist the support of myriad partners, both public and private. As outlined before, key partners will include Georgia Tech, to help bring to life the Smart City Command Center, and MARTA, to help operate transit through the CTC corridors and augment existing transit hubs with CTC technology.

Georgia Tech, through its Supply Chain and Logistics Interdisciplinary Research Center and its Physical Internet Center, is a leader in smart hyper-connected city logistics and urban mobility. It is also a leader in autonomous vehicle research as well as in transportation analytics and policy research. They will be a key partner in the development and implementation of many of the projects described above.

Other key public partners will include:

- The Atlanta Beltline, to help augment the Beltline with CTC technology
- Invest Atlanta, Atlanta's development authority, to encourage business development at and around CTCs.
- Atlanta Public Schools, to provide input into CTC locations and design programming for the proposed *City As Lab* project expansion.
- The Atlanta Regional Commission, to provide planning, research and policy support.
- Atlanta's Community Improvement Districts, to help plan and implement CTC technology.
- The GA Department of Transportation, to help plan and implement multiple facets of this solution.

In addition to providing much of the technology underlying this proposal, private partners will also be critical in the planning and implementation of each solution. Key private partners will include:

- UPS, to help design freight-specialized CTCs and logistics delivery networks.
- Georgia Power, to plan for roadway electrification and additional vehicle charging stations.
- AT&T, a strategic partner with Atlanta, to help design our network of connected sensors.
- Multiple large and small technology-focused companies to provide enabling technologies that support this proposal.

It should be noted that most all of the stakeholders above have indicated their support for this proposal, as evidenced by the letters of support attached to this document.

Stakeholders

Atlanta's biggest stakeholders are its people, and we have not succeeded if we do not deliver our proposed outcomes for them. Other stakeholders include:

- Governments and citizens of municipalities surrounding Atlanta. Some of them (i.e. – commuters) will be directly impacted by this work, while others will serve as interested parties, possibly helping to expand this solution across the region should it prove successful.
- Multiple Federal Departments and Agencies, whose policy and regulatory guidance will be critical in achieving these goals. Atlanta commits to stay connected with these agencies and serve as a testing ground for framework design where necessary.
- Technology companies interested in testing new technology in Atlanta's cutting edge CTC network. Atlanta is open for business and welcomes all companies that wish to make us their base of operations.

Demonstration Governance Processes

Atlanta has multiple options for governance of solution demonstration. A recommended structure will be specified as more detailed implementation approaches are developed in Phase II of this challenge. At a high level, potential governance options include:

1. Placing governance responsibility underneath an Executive Director of Smart City Implementation, reporting directly to the Mayor of Atlanta. This approach has been successful with the implementation of projects under the aegis of the $250M Renew Atlanta Infrastructure Bond, which report into a Renew Atlanta Executive Director. This approach will allow for tighter control of project timelines and costs, but may make coordination across entities more difficult.
2. Establishing a separate 501(c)(3) responsible for governance. This method was employed to manage a variety of Atlanta initiatives to address homelessness and poverty. This approach will facilitate easier cross-organizational participation, but may make it more difficult for the city to directly control project timelines and costs.

Regardless of the selected process, the City will work to establish an overall demonstration governance board, consisting of members from all key partners. This board will meet at least monthly, and more frequently if necessary, to review progress, make key implementation decisions and address any unforeseen challenges that may arise.

8- Existing Transportation Infrastructure and System Features

Roadways

Atlanta contains 459.8 arterial road miles and 513.1 arterial lane miles. Atlanta also contains 459.8 freeway miles and 1,256.7 freeway lane miles.

Transit Services

In addition to MARTA, described in detail in an above section, Atlanta is also serviced by the following transit services.

Hartsfield-Jackson Atlanta International Airport ("HJAIA")

Hartsfield-Jackson Atlanta International Airport (ATL/Airport) is the world's busiest airport, handling over 100,000,000 million incoming and outgoing passengers aboard more than 880,000 aircraft operations. It is the principle air carrier airport servicing both Georgia and the Southeastern United States. The Airport occupies a 4,750-acre site in Clayton and Fulton counties, approximately ten miles south of downtown Atlanta. Two major airlines use ATL as a key airport in their operations, Delta Air Lines and Southwest Airlines. The direct regional economic impact of the Airport in total business revenue estimated to be more than $34.8 billion annually, with an indirect and induced impact of $29.5 billion annually.

Atlanta Streetcar

Phase I of the Atlanta streetcar opened for use in December 2014. Phase I consists of an initial 2.7 miles. In the coming years, additional lines are planned, and project developers intend to expand service to additional neighborhoods and other popular destinations around the city.

Georgia Regional Transportation Authority ("GRTA")

GRTA is a transit provider for all of metro Atlanta with its Xpress bus and vanpool services. GRTA also administers the Atlanta region's vanpool program, which provides an additional transportation option for commuters in approximately 33 counties, who use the daily vanpool service to travel to major employment centers throughout the region.

Cobb County Transit ("CCT")

CCT services a population of about 730,981 in Cobb County, GA, providing regional connectivity to MARTA. CCT's buses in 2015 provided service for a reported 2,487,129 passenger trips. CCT operates 89 Full size buses on 16 bus routes covering approximately 10,734 miles per day. CCT has over 751 bus stops including 293 bus shelters. CCT's Paratransit service operates 25 lift-equipped vans and 5 Flex service vans with 58,916 passenger trips in 2015.

Shared-use mobility services

A number of shared-use mobility services have significant operations within Atlanta, including Uber, Lyft, Zip Car, the Clean Air Campaign shared rides, and vRide.

Information and communication technology (ICT)

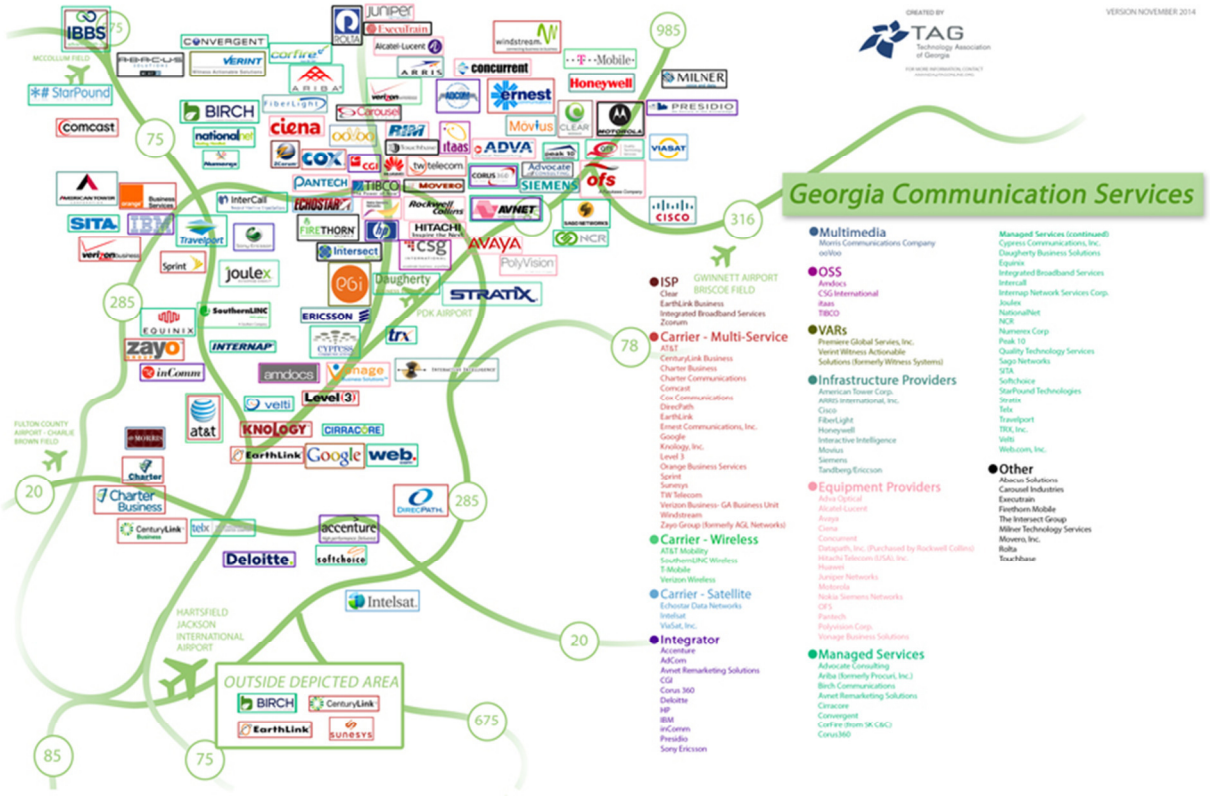
Atlanta is well positioned technically to realize a challenge of this magnitude. The City already has the following in place:

- A state-of-the-art Video Integration Center that integrates and uses smart analytics technology to provide 24/7 monitoring of over 6,000 (and growing) public and private sector cameras from across the city.
- Over 9,000 laptops, desktops, and computing devices.
- Multi county radio network supporting 9,200 users.
- Server capacity of 600+ physical and virtualized computer servers and nearly 200 applications in the municipal portfolio
- 112 miles of owned and shared fiber available for municipal usage.

In addition to the existing technical portfolio, the City has plans already underway to modernize and interconnect nearly 1,000 intersections, corridors, and key facilities with nearly 150 additional miles of a carrier-grade municipal fiber network. This investment will give the city over 250 miles of Gigabit+ speeds, spare capacity, and Wi-Fi for multiple operational and commercial needs, and the communications capabilities necessary to deploy a city-scale level of smart technology enabling the enhanced transportation solutions outlined in this proposal.

Atlanta consistently ranks at the top of Forbes' "Most Wired Cities in the US" list (last ranked at #2), enjoying 74% broadband adoption, 18 broadband providers, and 11, 342 WiFi hotspots.

According to the Technology Association of Georgia, Atlanta's telecom infrastructure is ranked among the top five U.S. markets for total bandwidth and fiber access, in part because two of the country's largest fiber routes cross in metro Atlanta. Because of this and many other reasons, metro Atlanta has a thriving ecosystem of communications service providers.



Intelligent Transportation Systems (ITS)

The table below from the Georgia Department of Transportation provides ITS data for the Atlanta MPO Area, as of 2010:

ATMS Components	Year 2010
Miles of freeway surveillance (fiberoptic cable)	456
Miles of arterial surveillance (fiberoptic cable)	180
Miles of surveillance system fiberoptic cable	636
Number of surveillance cameras on freeway (pan, tilt, zoom)	510

Number of surveillance cameras on arterial (pan, tilt, zoom)	220
Number of video traffic detection cameras (fixed)	1750
Number of changeable message signs on freeway	141
Number of changeable message signs on arterial	9
Number of changeable message signs dedicated to express lanes	18
Number of ramp meters	165
Advanced Traveller Information Systems	
Number of Advanced Traveller Information Systems kiosks	5
Real-time traffic information	YES
Other ITS	
Number of accident investigation sites	75

Smart Grid Infrastructure including electric vehicle charging infrastructure

Georgia Power (a division of Southern Company) has invested heavily in Smart Grid and Automated Metering Infrastructure (AMI) in Atlanta. The Smart Grid's intelligent devices, communications network, and advanced applications enable several advantages such as increasing grid reliability, improving safety capabilities and enhancing customer communication and interaction. Georgia Power has completed an investment in and deployment of AMI enabling automation of service connections and disconnects, meter tampering identification and service quality issues. Additionally the infrastructure provides a platform for enhanced services including the customer monitoring and managing their residential energy usage.

There are 149 charging stations throughout Atlanta. In 2010, Southern Company accepted $165M as part of the Smart Grid Investment Grant with U.S. Department of Energy.

9 – Data currently collected

Currently, the following data is collected relating to traffic in and around Atlanta:

- The City regularly collects 24 hour traffic volume counts from high trafficked areas. Over the past 24 months, the city collected traffic counts at 154 distinct locations.
- The Atlanta Regional commission collects traffic data at 98 distinct bottleneck locations in and around the Atlanta metro area.
- The Georgia Department of Transportation collects and provides real-time data online so Atlanta drivers can plan their commute.

The City also collects operational data from multiple other sources, including:

- Data on each call placed to the City's 311 customer service center, including call time, length, call type, Department affected, and Service Request type (if applicable).
- Record-level data from the City's work order management systems, including detailed information on work completion progress for 200+ metrics across multiple departments.
- Record-level data on crime and emergency response incidents.
- Record-level data on all calls placed to the City's e911 call center.
- Individual case data from the City's Municipal Court.
- Building permit application and issuance data from the City's Office of Buildings.

- Public safety camera data at the Atlanta Police Department's video integration center.
- Park and Recreation Center attendance data.
- Airport passenger and cargo volumes.

Data collected and aggregated through the Smart City Command Center can be combined with existing city data to improve upon a variety of services. Some core examples include:

- Scheduling of trash collection trucks during off-peak hours to reduce road congestion.
- Improved routing of emergency response vehicles to reduce arrival times.
- Use of sensor data to predict potential accident and crime hot spots based on weather conditions, population movement and time of day.
- Use of sensor data to detect critical water main leaks and breaks.
- Use of sensor data to detect road abnormalities such as potholes.
- Optimal scheduling of preventative maintenance to roads, lights and other traffic infrastructure.
- Location, mode and frequency of future public transport investments.
- Coordinated mitigation and remediation of weather events.

All data collected by the SCCC will be aggregated on to an existing open data platform, where it will be shared with both partners and the public. Additionally, if selected, the City is committed to aggregating the data listed above on to this platform as well. To do this, the City will work to implement an open data policy modeled after the best practice 31 point framework put forth by the Sunlight Foundation.

Terms of Use would include disclaimers of warranty and limitations of liability as needed, but will also include: no cost or registration requirement, no restriction on use, and no license restrictions. All open data will be available as public domain information. No attribution will be required, but citation will be recommended as a best practice. The City will endeavor to sign MOU's with all relevant stakeholders to ensure that this policy framework will guide the overall data integration process.

10 – Approach for using existing standards, architectures and certification processes

To ensure maximum usage of systems and infrastructure, Atlanta will make the new system environment completely compatible with current and future ITS Architecture standards and all other applicable technical and security standards.

As devices, functions, and configurations are identified, Atlanta will work with the appropriate stakeholders to ensure that all applicable federal, state, and local standards are maintained.

Atlanta will cooperate with standards developers by exposing all data collected through the Smart City Command Center for analysis and testing, as well as by providing any additional input requested by standards developers. In this way, Atlanta can truly become a living lab for the testing of new Smart City standards and technology.

11 – Goals and objectives

Vision goals

Progress against achieving our overall vision will be measured by the following metrics:

- Overall income equality (GINI index)
- Median income
- Employment rate
- Youth reading levels and graduation rates
- Poverty rates
- The % of lowest quartile income residents who are able to move out of the lowest quartile

These longer-term objectives all have existing measurement methodologies and baselines established. We will continue to track their progress, and would expect to see improvement in each over the demonstration period.

Outcome Goals

More immediately, we will measure progress against the vision by tracking outcome-focused metrics in four key areas:

Safety

- Reduction in pedestrian and vehicle accidents along smart corridors
- Reduction in crime in defined areas around CTC nodes

Mobility

- Decreased average commute times
- Increased traffic flow at key bottleneck areas
- Increased ridership of public transit
- Increased % of public transit run on time

Economic Vitality

- Growth in commercial activity in defined areas around CTC nodes
- Number of startups leveraging CTC and Smart City Data Center resources
- Increase in businesses founded in or relocating to Atlanta

Sustainability:

- Decreased number of vehicles on road during 24 hour vehicle counts
- Decreased emissions, as measured by PPM of industrial contaminants
- Increased use of alternative fuel vehicles
- Decreased number of trucks on in-town highways
- Increase in overall citizen satisfaction

For the above outcomes that do not have existing measurement systems, the City will conduct a baseline assessment prior to program implementation. This may involve activities such as

manual vehicle counts and time studies. The same methodologies will be employed to measure progress throughout the demonstration period.

12 – Capacity to take on project

Some of the best evidence for Atlanta's capacity to take on this project is the current Renew Atlanta infrastructure bond program. This program involves managing $250M worth of upgrades and enhancements to the City's infrastructure. The City's ongoing successful management of a program with a budget much larger than this award should demonstrate its ability to effectively manage this proposed program.

Other large, capital intensive projects the City has recently successfully managed include the construction of a new international terminal at Hartsfield-Jackson Airport and the Watershed Management Department's substantial upgrades to Atlanta's underground water systems.

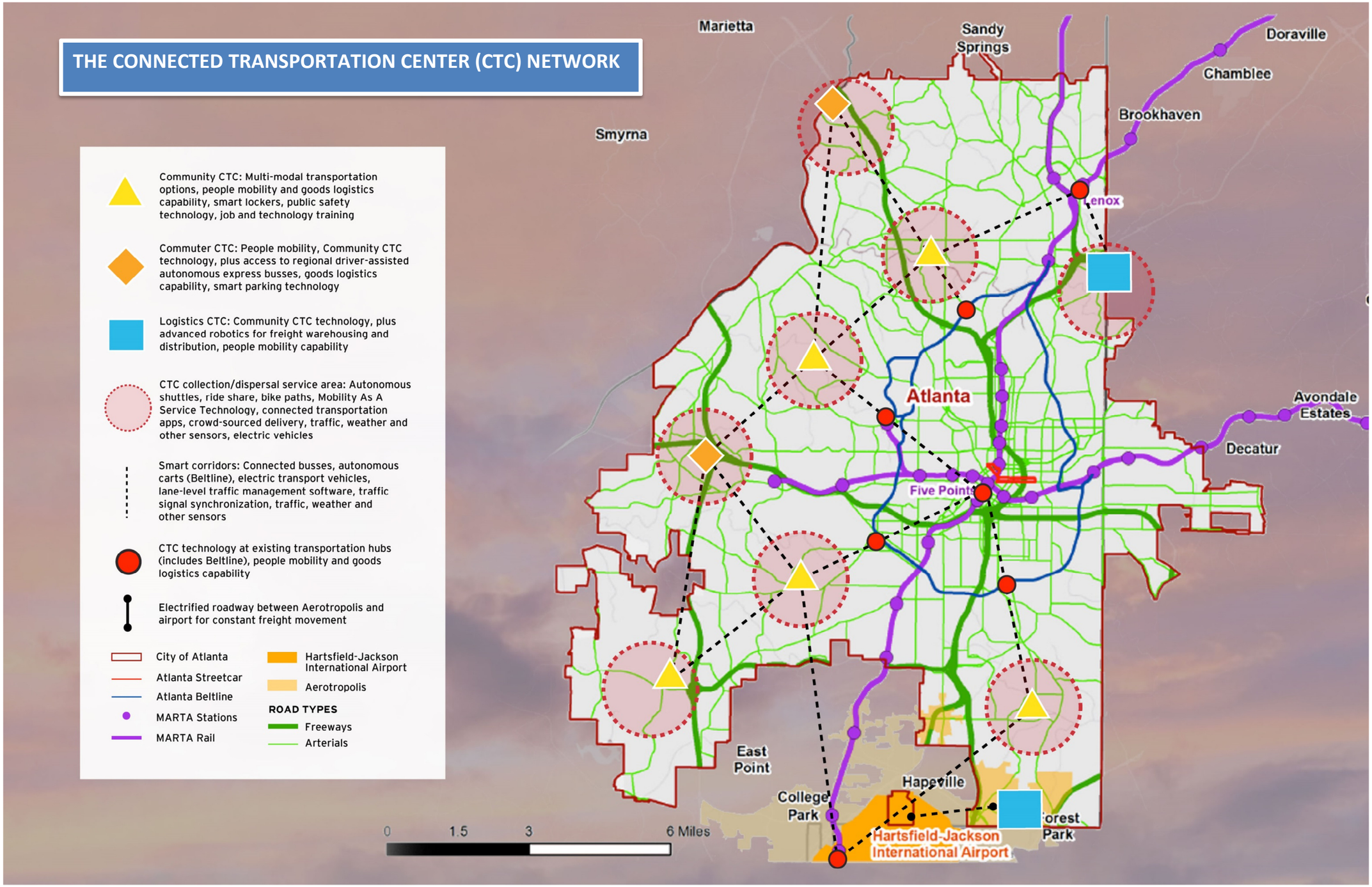
The above projects not only demonstrate the city's capacity to manage this implementation, but also speak to the city's infrastructure readiness. Atlanta is experiencing a period of unprecedented growth in infrastructure spending at the municipal and state levels. The current modernization efforts around Atlanta's infrastructure represent the perfect window of opportunity to implement Smart City solutions.

Atlanta has a growing workforce with the specialized knowledge and skills needed to implement such a bold plan. According to the Bureau of Labor Statistics, total nonfarm employment for the Atlanta-Sandy Springs-Roswell, Ga. Metropolitan Statistical Area stood at 2,646,000 in November 2015, up 86,500, or 3.4% over the year. Trade, transportation, and utilities, a super-sector critical to the success of this plan, had the second largest increase in jobs locally, increasing by 18,000 from November 2014. Employment in this super-sector grew 3.1% in Atlanta compared to 1.7% for the nation. Employment in the Construction super-sector grew 4.3%, slightly higher than the national average.

Highlights throughout the document have demonstrated Atlanta's executive leadership commitment to improving infrastructure, mobility and technology. Atlanta also is also seen nationally as a leading city in performance management. Mayor Kasim Reed's *Focus on Results Atlanta* (FOR Atlanta) performance management team has been cited by the National League of Cities, among other organizations, as a best practice in performance management. FOR Atlanta regularly collects and analyzes data on hundreds of operational performance metrics, using these metrics to not only assess but also improve performance. FOR Atlanta also recently launched Atlanta's first ever public-facing performance website and DataAtlanta portal.

13 – Opportunities to leverage additional Federal resources

The City plans to work as hard as possible to leverage additional federal funding to augment the implementation of this program. Key examples include leveraging dollars from City's Choice Neighborhood award as well as future potential TIGER grants and Promise Zone grants to augment the CTC network solution.


THE CONNECTED TRANSPORTATION CENTER (CTC) NETWORK
Community CTC: Multi-modal transportation options, people mobility and goods logistics capability, smart lockers, public safety technology, job and technology training
Commuter CTC: People mobility, Community CTC technology, plus access to regional driver-assisted autonomous express busses, goods logistics capability, smart parking technology
Logistics CTC: Community CTC technology, plus advanced robotics for freight warehousing and distribution, people mobility capability
CTC collection/dispersal service area: Autonomous shuttles, ride share, bike paths, Mobility As A Service Technology, connected transportation apps, crowd-sourced delivery, traffic, weather and other sensors, electric vehicles
Smart corridors: Connected busses, autonomous carts (Beltline), electric transport vehicles, lane-level traffic management software, traffic signal synchronization, traffic, weather and other sensors
CTC technology at existing transportation hubs (includes Beltline), people mobility and goods logistics capability
Electrified roadway between Aerotropolis and airport for constant freight movement
City of Atlanta
Atlanta Streetcar
Atlanta Beltline
MARTA Stations
MARTA Rail
Hartsfield-Jackson International Airport
Aerotropolis
ROAD TYPES
Freeways
Arterials
Marietta
Sandy Springs
Doraville
Chamblee
Brookhaven
Smyrna
Atlanta
Five Points
Avondale Estates
Decatur
East Point
College Park
Hapeville
Hartsfield-Jackson International Airport
0
1.5
3
6 Miles