

A Smart, Sustainable Technology Vision for a Smart, Sustainable Charlotte

An ongoing partnership between Siemens and Charlotte NC, proves that sustainability doesn't have to mean sacrifice.

Over the past 10 years, Siemens has partnered with the City of Charlotte to help craft and implement the City's vision of a smart, sustainable Charlotte. Expansions of the Charlotte Area Transit System, energy efficiency programs in Downtown buildings, and the opening of a Siemens gas turbine manufacturing plant have had widespread economic benefits. Regional connectivity and workforce development have catapulted Charlotte to be not only one of the fastest growing cities in the nation, but also a great place to live and do business.



Average Number of Miles Traveled per Person, per Day

VATIONALLY

79miles

Romieso **Greenhouse Gas Emissions from Buildings vs. Transportation**

Mode of Transportation

Today

Population of Charlotte,

+22%

2025

Now and in the Future

810K



Greenhouse Gas Emissions Per Capita 95% **AUTOMOBILE**

+2

2050



Green Impacts of Smart Technologies

A recent study by Siemens and the City of Charlotte's Sustainability Office looks at the potential impacts of investing in technologies that could contribute to a smart, sustainable future in Charlotte. The study estimates that by implementing 16 "smart" buildings and transportation technologies, Charlotte could reduce greenhouse gas emissions by 5% and improve air quality by 8%, all while generating more than 8,000 jobs by 2025. By 2050, benefits could increase to 20% reduction in greenhouse gas emissions, 21% improvement in air quality, and close to 100,000 jobs.





METRO / STREET CAR

Automated Train Operations (ATO) ATO controls the engine throttle to optimize speed and enable coasting.

PERSONAL TRANSPORTATION **Electric Car Sharing** A short-term, self-service rental system provides a zero-emission alternative to public transportation.

2

METRO / STREET CAR Regenerative Braking Energy captured while braking is used to power the train.



TRAFFIC FLOW Intelligent Traffic Lights Adaptive control traffic lights managed by a control center optimize traffic flow.

> **PERSONAL TRANSPORTATION Electric and Hybrid Electric Cars** Low- or zero-emissions vehicles

PUBLIC SPACES

Smart Street Lighting LED lighting with motion sensors and wireless communication turn lights on/off based on movement.

improve local air quality.

NON-RESIDENTIAL BUILDINGS

Building Automation

Real-time management and integration of technologies including HVAC, lighting, security, fire/life safety are coupled with energy management and comprehensive reporting.

METRO / STREET CAR Reduced Headway Communications-based train control (CBTC) reduces time between trains by introducing a "moving block" scheme.

NON-RESIDENTIAL BUILDINGS Building Performance PUBLIC TRANSPORTATION Optimization Building data analytics allow for **E-Ticketing** facility improvement measures. Electronic tickets enabling passengers to transfer seamlessly between modes and pay at the end of a multi-modal trip. RESIDENTIAL **Home Automation** Sensors regulate heating, cooling, ventilation and lighting depending on climate and occupancy.

As urban expert Peter Kageyama said at the opening of Envision America's first workshop,

"People don't care about sustaining something they don't love." With all that's happening to make Charlotte smart and sustainable, it's clear: People love Charlotte.

Follow @SiemensUSA and visit www.siemens.com/cypt to learn more about how Siemens is helping to make cities fit for the future.

between today and 2025 or 2050), and include direct, indirect, and induced employment.



Source: City of Charlotte, Charlotte Area Transit System, Energy Information Administration, Environmental Protection Agency, US Census Bureau, US Dept. of Energy, US Dept. of Transportation, Siemens City Performance Tool Model results. Siemens City Performance Tool, the model behind this analysis, defines "jobs" as full-time equivalent positions, e.g., 2,080 person-hours of work per year. Estimates are cumulative (e.g., accrue