

Testimony of

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Committee on Small Business  
U.S. House of Representatives

Building on the Wireless Revolution:  
Opportunities and Barriers for Small Firms

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Chairman Graves, Ranking Member Velázquez, and Committee Members, I am excited to have this opportunity to share with you how BigBelly Solar uses wireless technology to help curb the usage of our natural resources and help improve our environment.

My name is Michael Feldman and I am the Vice President of Engineering at BigBelly Solar. BigBelly Solar was founded in Newton, MA with the mission of reducing CO2 emissions from gas hungry garbage collection vehicles by eliminating unnecessary miles driven. A standard garbage truck gets 3 miles per gallon and travels an average of 25,000 miles per year. Each truck emits an estimated 100 tons of CO2 per year. In the United States alone, with an estimated 180,000 garbage trucks traveling the roads, they collectively consume over 1 Billion gallons of oil contributing 18 Million Tons of CO2 into the atmosphere each year. That is the equivalent usage of an Exxon Valdez oil spill every 4 days. And this does not include the congestion and nuisance they cause amongst our city streets and roadways. By reducing, or even eliminating, unnecessary driving miles we can significantly cut into the emissions emitted. And this paradigm works even if the vehicles use alternative fuel technologies. As we like to remind people, the cheapest and cleanest mile is the one never driven.

Manufactured in Lexington Kentucky, The BigBelly Waste and Recycling System provides a unique combination of information technology software and on-site compaction at public space locations where citizens deposit their trash and recyclables. By compacting the waste, which increases storage capacity, we are left with a trash can that does not require emptying as often. In fact, the BigBelly compacts at a ratio of up to 5 to 1 which is equivalent to storing five 30 gallon bags of trash into one bag. The BigBelly is capable of holding 5 times more waste and is more intelligent than traditional trash cans. This has been shown to reduce collections on average from twice a day to approximately once every other day. Furthermore, utilizing solar energy to power the compaction mechanics allows a BigBelly to be placed virtually anywhere without the need to connect to the electric grid.

BigBelly has been an early champion and recognized leader in the growing Machine to Machine (M2M) marketplace. This industry is aimed at connecting devices together all around us, and providing useful data for humans to make intelligent decisions. A significant part of the BigBelly solution incorporates wireless technology to transmit data from the trash receptacles to a central database for processing. Users of the system access this data from a simple and easy to use WEB Application that provides important information including which cans need to be emptied, historical reports and analytical reports. There is even a mobile application for smartphones and tablet devices that allow users, such as supervisors and collection personnel, to get up to the minute information about the BigBelly's on their streets. The technology used is very similar to that found in modern cell phones today, only instead of calling another person, the BigBelly calls another machine.

Today, you can find a BigBelly in every state in the US, and over 40 countries around the world. Our product can be seen in cities and towns both large and small, colleges and universities, military bases, national parks and government agencies. Each BigBelly trash compactor is equipped with a series of electronic sensors, solar panel, a battery, and an internal computer. The solar panel is used to keep the battery charged which drives the compaction mechanisms. A compaction is triggered when the trash level inside the bin crosses a sensor beam. As more waste is deposited, this process continues until the internal computer determines the bin is full. The computer will then use the wireless network to

transmit the fullness data to a central computer system, where users can see that the bin requires service. The central system can even be configured to send an e-mail to users for real time updates. We are pioneers in the notion of Smarter Cities – leveraging technologies and information to better manage resources. Trash cans have never been smarter. Example images of our WEB Management Console can be seen on the last pages of this testimony.

Typically, early in the morning, the Waste Operations department will get a report from the central WEB application system that identifies which BigBelly's need to be emptied. These reports are then provided to the truck drivers. In this scenario the trucks only visit those locations that require a collection as opposed to driving up and down every city street, stopping at each waste receptacle. For some of our customers, such as the National Parks, no one needs to be sent to remote areas until it is necessary. The results are measurable and tangible savings in time, fuel and resources.

Efficiency in collection operations vary by customer and usage. After the first year the City of Philadelphia deployed the BigBelly System, they estimated a savings of \$850,000.00 and moved 11 employees to service a new public space recycling program. The program has been a revenue source to the city by diverting trash from costly landfills. Instead, the recyclables are sent to processing centers where the city is paid per ton of material. This fundamental shift has transpired with many of our customers.

Like all small businesses, we are not without our share of challenges. As a member of a unique club of American businesses that are “market makers”, those who venture into uncharted territory, we need help and assistance to overcome some of these challenges. As a small privately funded company of 40 employees, our available financial resources are stretched thin placing this technology on the streets and pushing its adoption. For any business wishing to connect wireless devices, there are specific rules and regulations in place by the telecommunications industry requiring costly certification, upwards of \$30,000, before they will allow new devices to connect to their network. While we certainly are in full agreement and have no issue with the intent and protection the carriers require, in many instances, these rules and standards are mostly aimed at cell phones, smartphones and tablet style devices. Not for M2M devices such as the BigBelly. After all, you cannot hold a BigBelly up to your ear!

Similarly, federal assistance for Energy Efficiency Community Block Grants, or EECB grants, has run out. This is most unfortunate as it enabled municipalities to participate in new green products such as BigBelly that have proven rewards not only to the town's balance sheets and budgets, but to the environment as well. Past recipients of EECB grant money used to subsidize the purchase of a BigBelly system include Philadelphia, Albany NY and Jersey City. Your sponsorship, endorsement and legislation assisting environmental and technology products like BigBelly, and creating new or similar programs such as the EECB, will benefit all Americans.

There are of course other barriers to adoption. For example, cash strapped cities and towns are unable to apply for and receive Solar Energy credits for the deployment of a BigBelly System. As explained earlier, our use of wireless technology allows the BigBelly product to operate out of the prevue of the electric grid. However Solar Energy grants only apply to products that connect to this grid. Given the positive dollar savings, environmental and

economic impact this class of product has, we ask the committee to research and investigate how these solar credits are disbursed and to implement changes that could incorporate new solar technologies like BigBelly that would enable your cities and towns to receive these credits.

And we know firsthand these programs work. For example, the Federal Transit Authority has the ability to assist local Transit Authorities by issuing Formula Grants, or 5307 Grants. Under this program, a BigBelly qualifies as an “amenity” which enables local transit systems to deploy BigBelly's at bus stops or rail stations. Without EECB assistance, the City of Philadelphia would not have the deployment and budget impact they see today. These programs are of significant value to the local communities as well as small businesses like BigBelly. We ask for your assistance in helping to legislate funding for a cleaner environment.

In closing, I would again like to thank the members of the Small Business committee for allowing me this opportunity to present the BigBelly Solar story, and provide insight into how we are using wireless technology to save real budget dollars, resources and most importantly make a tangible impact on the environment.

Respectfully submitted,

Michael Feldman.



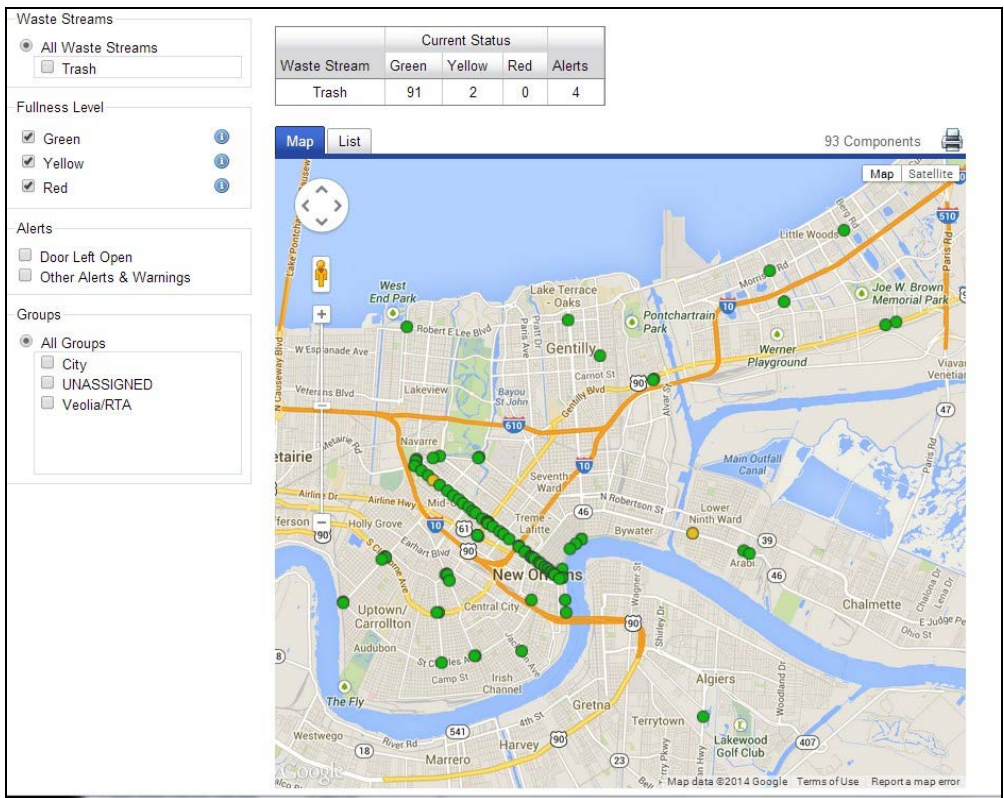
The Times Square area has 88 BigBelly stations.



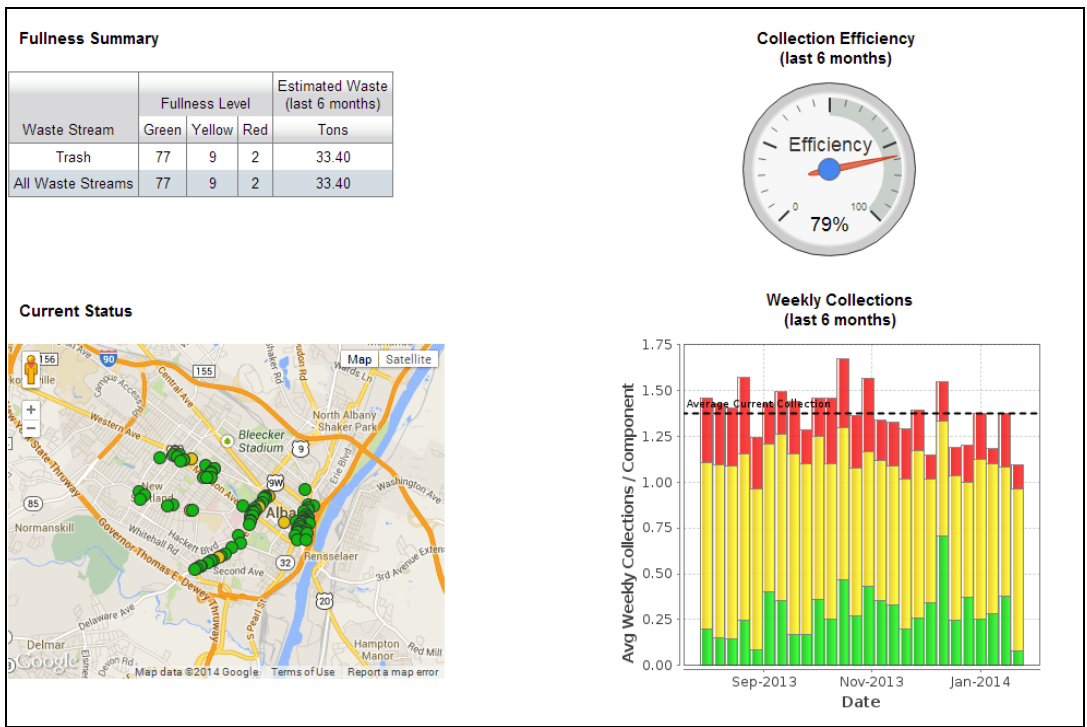
You can find BigBelly's anywhere!



Colleges and Universities promote recycling



Out of all the stations, only the 2 yellow ones need to be collected. (GREEN is okay, YELLOW is full)



A Dashboard using wireless connectivity to show efficiency and collection history