Sustainable Urban Public Mobility

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Abstract

The public transportation system is vital in major cities where mobility via personal automobile is limited. The current system in major cities provides numerous citizens with a viable means to travel not only for leisure but for professional purposes as well. In this day and age the technologies available for a more sustainable system are plentiful. The purpose of this project is to research and analyze the current taxi, bus and subway systems in major cities and propose both short and long term changes that benefit the system as a whole. Members of the group will research both the current system and new technologies and propose both simple and complex improvements. Flywheels, super capacitors, and compressed air are some of the potential technologies that are available and could improve the efficiency and reduce the environmental impact of the public transportation system. A few cities will be studied in particular, including New York City, Boston, and Oklahoma City; however the new technologies can be implemented in every city across the country.

Background

Millions of people use public transportation everyday to commute and travel around cities. New York utilizes their public transportation the most, with 60% of people traveling by it. We decided to research the three most used types of public transit in cities: taxis, buses, and the subway.

Project Goals & Objectives

Propose solutions for improving the energy efficiency and usage of public transit, specifically taxis, buses, and subways, in order to create more sustainable public transportation.

Subways

Current Facts:
- 75% coal powered grid

Proposed Ideas:
- Regenerative Braking

Long Term:
- Magnetic Levitation
- Renewable energy grid

Buses

Current Facts:
- 5 miles per gallon
- Low average ridership

Proposed Ideas:
- Hydrogen & Hybrid Buses
- Optimized bus routes & sizes

Long Term:
- Super-capacitor buses

Taxis

Current Facts:
- Normal taxicabs are only achieve low gas mileage
- There are over 13,000 Taxicabs in New York and 10,000 Black Cabs

Proposed Ideas:
- Hybrid Taxicabs are now being implemented in and New York

Long Term:
- Compressed air and fully electric taxicabs that draw from a clean energy grid

Impact

Short Term:
- Reduce America’s dependence on fossil fuels
- Reduce carbon emissions
- Reduce street congestion

Long Term:
- Achieve zero carbon emissions
- Use 100% sustainable energy
- Eliminate dependence on fossil fuels
- Reduce street congestion

Summary

- There are many options to improve the quality of the buses, subways, and taxis
- Many of these options are already being implemented
- These new technologies increase energy efficiency and thus promote sustainability

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References