

Economic, Environmental, and Social Characteristics of E-Scooters on LSU Campus



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Louisiana State University

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Tran-SET

SPIN Inc.

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A third of all car trips in the US are under two miles, and almost half of all trips are under five miles. These trips are perfect for micromobility sustainable alternatives which have lower levels of harmful vehicular emissions. Although walking and bicycling are the most popular micromobility options, their share is still only a small percentage due to the physical demands and other limitations of the riders. Electric scooters (also known as e-scooters) have drawn significant attention recently as an efficient mode of transportation for short- and medium-distance trips. Unlike shared bikes, shared e-scooters allow for flexible pick-up and drop-off locations for the riders and have been widely used to achieve this goal.

Problem Statement

The number of e-scooter trips in the US increased from 40 million in 2018 to about 86 million in 2019. However, only a small number of studies have evaluated the social, environmental, and economic effects of this quickly developing technology. User feedback can also be used to assess potential infrastructure improvements that would maximize the positive effects of e-scooters, minimize its drawbacks, and ensure its successful implementation on college campuses.

Project Summary

E-scooters are zero-emission micromobility modes of transportation that can be used on-campus for enhancing safety, effectiveness, and sustainability of moving people. They are well-suited for college students because they enjoy recreational transport and can avoid delays associated with public modes of transportation. Despite these promising benefits, the promotion of e-scooters based on a single factor, such as reduced delays, does not provide a realistic and complete evaluation of this technology and may omit other critical factors. Challenges may also arise due to the lack of suitable physical infrastructure and weather conditions.

With the deployment of e-scooters on Louisiana State University (LSU) campus, the objective of this research is to evaluate the environmental,

economic, and social characteristics of implementing e-scooter technology on campus. The study will conduct a comprehensive Life Cycle Assessment (LCA) based on the collected data. LCA, also known as cradle-to-grave analysis, is a methodological framework for quantifying the impact of a product across its entire service life on the environment including climate change, fossil fuel depletion, human health, and acidification potential. LCA is used widely in construction, transportation, and product evaluation sectors. The benefits and barriers to using e-scooters and user safety perceptions will also be assessed.

Impact

The proposed research will evaluate the potential of using e-scooters on LSU campus as a means to promote transportation sustainability and reduce vehicle trips around campus, thereby improving the resiliency of the transportation infrastructure. If successful, the developed plan may be expanded to other campuses in Region 6.

Tran-SET

Tran-SET is Region 6's University Transportation Center. It is a collaborative partnership between 11 institutions across 5 states (AR, LA, NM, OK, and TX). Tran-SET is led by Louisiana State University. It was established in late November 2016 "to address the accelerated deterioration of transportation infrastructure through the development, evaluation, and implementation of cutting-edge technologies, novel materials, and innovative construction management processes".

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