

# Principles and Applications in Speed Sensing and Energy Harvesting for Smart Roads

Part of the Advances in Civil and Industrial Engineering Book Series

Luay Taha (The Pennsylvania State University, Altoona College, USA)  
and Sohail Anwar (The Pennsylvania State University, Altoona College, USA)

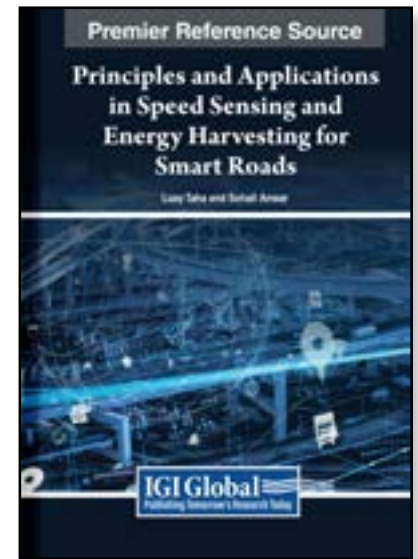
## Description:

In the industry of transportation, the demand for sustainable energy solutions and intelligent traffic management has reached a critical juncture. One of the key challenges faced is the efficient utilization of roadways to generate power and support the infrastructure of smart highways. Road piezoelectric energy harvesting (RPEH) is a concept that has sparked widespread interest in both industry and academia.

The book, titled **Principles and Applications in Speed Sensing and Energy Harvesting for Smart Roads**, unravels the intricacies of RPEH and presents a visionary solution to power traffic ancillary facilities and wireless sensor devices on highways. Within its pages lies a transformative proposal – harnessing energy from piezoelectric stacks to not only address the power needs of these critical components but also to enable intelligent vehicle speed sensing.

This book is for academic scholars and practitioners alike, navigating the intricate landscape of smart highways. Focused on the latest energy harvesting technologies and vehicle speed sensing, it extends an invitation to delve into communication with smart road displays. Tailored for diverse engineering disciplines—electrical, computer, mechanical, and civil—the book contains cutting-edge research in the domain. Aspiring to be a one-stop source for up-to-date information, it guides researchers, students, and industry professionals through state-of-the-art technologies, fostering a deeper understanding of smart highway systems.

**Principles and Applications in Speed Sensing and Energy Harvesting for Smart Roads** is a versatile reference for researchers, university students, and industry professionals eager to explore the forefront of smart highway technologies. Its value transcends disciplines, making it an essential resource for graduate and undergraduate energy engineering programs worldwide. With a principal contribution as an up-to-date reference source, the book is set to empower practitioners, researchers, academic faculty, and students in their pursuit of excellence in smart highway development.



**ISBN:** 9781668492147

**Pages:** 300

**Copyright:** 2024

**Release Date:** March, 2024

**Hardcover:** \$315.00

**E-Book:** \$315.00

**Hardcover +  
E-Book:** \$380.00

## Topics Covered:

- Electromagnetic Energy Harvesting
- Electrostatic Transducer
- Energy Management in Road Energy Harvesting
- Nanotechnology for Smart Highway Development
- Piezoelectric Transducer
- Prospects and Challenges
- Radar Systems in Smart Highways
- Road Energy Harvesting Technologies
- Smart Highways
- Solar Pavements
- Speed Sensing in Smart Highways
- Thermoelectric Generators as Road Energy Harvesters
- Use of Nanotechnology for Smart Highway Development
- Wireless Sensor Nodes in Smart Highways

**Subject:** Computer Science & Information Technology

**Classification:** Edited Reference

**Readership Level:** Advanced-Academic Level  
(Research Recommended)

**Research Suitable for:** Advanced Undergraduate Students; Graduate Students; Researchers; Academicians; Professionals; Practitioners

### Order Information

Phone: 717-533-8845 x100

Toll Free: 1-866-342-6657

Fax: 717-533-8661 or 717-533-7115

Online Bookstore: [www.igi-global.com](http://www.igi-global.com)

Mailing Address: 701 East Chocolate Avenue, Hershey, PA 17033, USA