

# SMART MOBILITY & TRANSPORTATION

## Charge on Foot

Presented by :-

AISHWARYA H R (23CSE004)

NAVYA N (23CSE086)

Aishwarya J (23CSE005)

Harshitha S (23CSE051)







# Problem Statement

Urban centers face increasing energy demands and pollution due to rapid population growth and transportation needs.

## Challenges:

- \*\*High dependence on non-renewable energy sources.
- \*Limited EV charging infrastructure for widespread adoption of EV.
- \*Insufficiency in utilizing human and vehicular Kinetic energy.

# SOLUTIONS

## energy harvesting walkways

install piezoelectric  
files on sidewalks in  
high-footfall areas(ex:-  
used in streetlight,wifi)

## EV charging roads

this reduces "range  
anxiety" and  
eliminates the need  
for frequent stops to  
charge vehicles.

## carbon capture resource

the system can help  
reduce CO2 level in  
high footfall areas, &  
capturing CO2  
contributes to reduces  
the greenhouse effect.

## Batteries

Batteries are ability to  
charge rapidly,  
withstand more cycles  
and operate effectively  
with smaller energy  
input.



# Kinetic Energy Harvesting Technologies



## Piezoelectric Sensors

These sensors convert mechanical energy from footsteps into electrical energy using piezoelectric materials.



## Electromagnetic Induction

This technology uses electromagnetic induction to generate electricity from the movement of pedestrians.



## Triboelectric Nanogenerators

These devices utilize the triboelectric effect to produce electricity from friction between materials.



# How it Works: Key Steps in Implementing Charging Roads

1

## Road Installation

Embedded coils are placed beneath the asphalt to create a magnetic field.

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2

## Vehicle Adaption

Electric vehicles need special receivers to pick up energy from the coils.

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3

## Power Supply

Electricity is sent through the coils, generating a magnetic field that charges the vehicles.



# The Potential of Pedestrian-Generated Energy

## **Sustainable Energy Source**

Pedestrian footsteps represent a vast and untapped source of renewable energy, offering a sustainable alternative to traditional power sources.

## **Reduced Carbon Footprint**

By utilizing kinetic energy from pedestrians, we can significantly reduce carbon emissions and contribute to a greener environment.

## **Cost-Effective Solution**

Harvesting kinetic energy can be a cost-effective way to power smart city infrastructure, as the technology matures and scales.





# Integrating with Electric Vehicle Charging

1

Pedestrian energy harvested from sidewalks can be stored and used to power EV charging stations.

2

Wireless charging pads embedded in parking spots can provide seamless charging for electric vehicles.

3

Smart road infrastructure with integrated energy harvesting technology can provide charging as vehicles drive.

# Emerging Battery Technologies

## Sodium-ion Batteries

Sodium-ion batteries are a promising alternative to lithium-ion batteries, as they are cheaper to produce and use more abundant resources. They are expected to be used in large-scale energy storage applications.

## Solid-state Batteries

Solid-state batteries have a solid electrolyte instead of a liquid one, making them safer, more energy-dense, and have a longer lifespan. This type of battery is expected to be used in electric vehicles.



# Integrated Payment System & Green Credits

## Smart Charging

Our system streamlines EV charging payments by integrating them into a user-friendly interface. Drivers can easily track their charging costs and manage their payments through a convenient app.

## Green Credits

Pedestrians contribute to the grid by generating electricity through their movement. Our Green Credits system rewards pedestrians for their efforts, offering incentives for sustainable living. This creates a collaborative ecosystem where everyone benefits.



**THANK YOU**