

# Project Details

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**Theme:** Technology and toys

**Sub theme:** Transport and Innovation

**Title:** Modern Transportation

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## Introduction

Rationale behind the development of the model is to replace conventional energy sources [fossil fuels] by non-conventional energy sources like solar energy, wind energy and electromagnetic energy which are harmless to the environment unlike the fossil fuels. To save energy through motion sensing street lights which will in turn stop the wastage of electricity and the concept of auto-dippers which will reduce the rate of car accidents during night time.

The scientific principles used in the model are as follows:-

- Photovoltaic solar tracker: Tracks photovoltaic rays with the help of light dependent resistors.  
[PV Solar tracker]
- Ultra sonic sensor: Transmits a high-frequency sound wave at an object and measures the reflected echo off of the target.
- Wind turbine: Wind rotates the rotor blades, which converts mechanical energy into electrical energy.
- Auto-dipper: Specialized chips to be installed in vehicles which will detect each other so that it can dip [lower] the headlights automatically.
- Maglev train: Electrifying the propulsion which creates a magnetic field and levitates the train.

## Elements of the model

### ● Solar power generating station:

In this PV solar tracker is used for generating electricity. The PV [Photo Voltaic] solar tracker is a machine that changes the position of solar panel using a pair of LDR [Light Dependent Resistor] sensors with the position of sun which helps in receiving maximum solar energy. The electricity produced by it is used in multiple sectors.

### ● Wind turbine and solar panel:

When the vehicle move forward the wind coming towards wind turbines will make the flaps rotate and electricity is produced. This can also be used on buildings. Solar panel collect solar energy which can be used in vehicles and buildings. These can be used in many other sectors like solar furnace etc.

#### ●Vehicle charging station:

The electricity produced by solar panels in power generating stations can also be used in vehicle charging. This will benefit in decreasing the use of fossil fuels like diesel and petrol which are harmful to the atmosphere.

#### ●Street lights having ultra sonic motion sensors:

Street lights having ultra sonic motion sensors will help in saving electricity because When there is no movement of vehicles or any other object it will remain off and will start only when there is movement of vehicles, humans etc.

#### ●Vehicles with auto-dippers:

In this concept, vehicles are equipped with specialized chips that will detect other specialized chips fixed in the other vehicle coming on opposite side will automatically dip [lower] the headlights of both the vehicles having this circuit. This will reduce vehicle accidents during night because when the headlights will dip automatically it wouldn't trouble the eyes of the driver in the other vehicle.

#### ●Maglev train:

Use of maglev trains will benefit a lot because it is the fastest train in the world which will make travelling from one place to another faster and I save time, it will also decrease the wear and tear of the parts of the train as it floats about 10cm from the track by magnetic levitation which reduces the maintenance cost of the train. They are also way silent than normal trains.

## Materials used

Base: Ply wood

Grass: Artificial grass mat

Road: Printout

Vehicles with auto-dipper: paper vehicles, thermocol piece, wire, switch, 9 volt battery, battery Connector, Wind turbines, solar panels

Solar power generating station: PV solar tracker, box

Street lights: two ultra sonic motion sensors, four 1.5 volt LEDs, wires, jumper wires, arduino UNO, two Bread boards, two printer cables, six 220 ohms resistor

Building: two box, thermocol piece, five 4 volt LEDs, solar panel, turbines, switch, 4 volt Battery, transparent plastic sheet

Maglev train: thermocol piece, toy tracks, motor, magnetic tape, wires, battery

## Construction

The base of the model is a panel of ply wood on which artificial grass is attached and a printout of road is pasted. Handmade power generating station is on one side of the road and on top of it a PV solar tracker is attached. For the vehicle charging station I have used 4 volt battery, 4 volt LED [Light Emitting Diode], wire and a plastic platform and I placed it in front of power generating station. For the PV solar tracker I PCB [Printed Circuit Board], two 555 IC [Integrated Circuit] with base, L293D IC with base, two LDR sensor, two battery cap, 7085 voltage regulator, two 9 volt battery, 6 volt solar panel, 1K resistor, LED, switch, two 50k variable resistor, 104 capacitor [0.1 UF], 60 rpm motor is used. Street lights are made out of four used sketch pen bodies which are attached with four 1.5 volt LEDs and fixed on the either sides of the road with the help of themocol pieces. Materials used in ultra sonic motion sensors

are two bread boards, two arduino UNO R3 boards ,wires, jumper wires, four 220 ohms resistors and two printer cable. The ultra sonic sensors attached at the bottom of the sketch pen bodies. Building is made up of cardboard, box, white sheets, transparent plastic sheet and thermocol. On top of the building solar panel and wind turbines are attached, LEDs are fixed on the alternate floors. The building is placed on the other side of road. Maglev train and tracks made with magnetic tape, toy tracks, thermocol piece, battery, motor and wire. It is placed after the building.

## Conclusion

In this project i made an effort to save electricity, reduce the usage of fossil fuels, control the pollution and reduce the accidents during night. With my ideas and innovations I want to bring changes in future transport system and want to contribute to environmental conservation.

## References

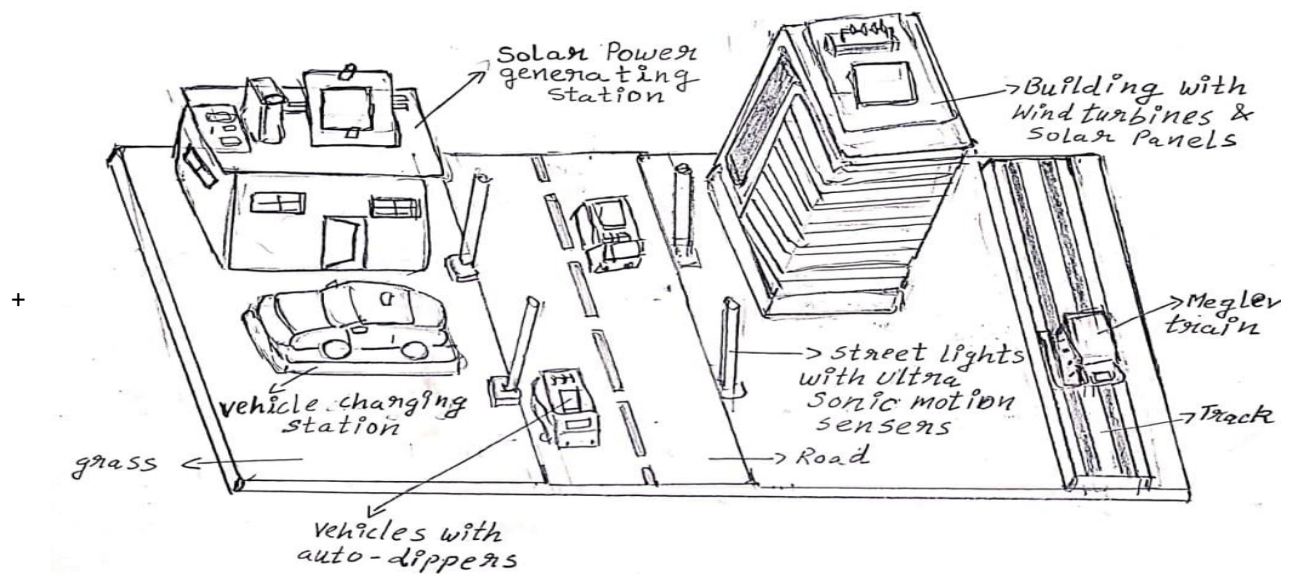
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## Illustrations



Labeled Diagram of the Exhibit