

# Electricity Generating Speed Bumps

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## Situation

- Depletion of non-renewable resources and higher demand on them
- Energy lost from vehicles when they over pass a speed bump
- High cost of supplying electricity from power stations

## Mechanism

Converting, storing, and distributing energy using a shape that can harness the energy most efficiently

### Piezoelectric Generator

- Converting kinetic energy to electric power
- Storing energy in Lithium batteries

### Efficiency of the Shape

- Using a shape that harvests most of the energy when a car passes over the speed bump



Figure 1

Credits: <http://www.welovedc.com>

## Evaluation

- Producing high voltage with low current and lower maintenance requirement [1]
- Rechargeable and longer life time of the battery with lower replacement costs
- Causing no harm to the vehicle or any individuals in the vehicle

## Location

Finding the most suitable road to place the speed bump depending on several factors

### Criteria Considered for the Road

- A road that has the suitable optimum speed level to over pass the speed bump
- A road that attracts many vehicles throughout the day
- A road which is limited to vehicles with weights that the speed bump can withstand

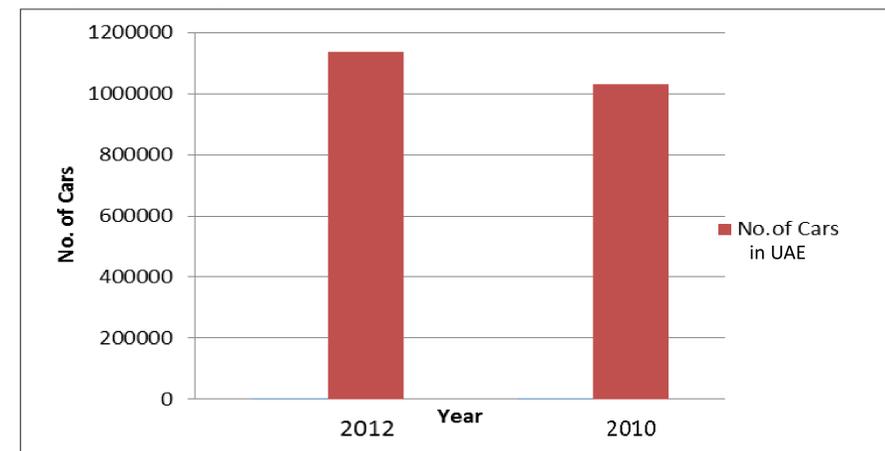


Figure 2

Credits: <http://www.gulfnews.com>

## Evaluation

- Obtaining a smoother flow of traffic due to the clearance level between the car and bump
- Supplying power for the traffic light will save electricity expenses
- Allowing vehicles to reduce speed near intersections and pedestrians

## Material Requirements

Choosing a recycled material that withstands the heat as well as the weight of the vehicles

### Recycled rubber from tires

- Dubai's desert climate
- Synthetic rubber can withstand high temperatures that can approximately reach 150°C [2]
- Rubber is an elastic material that would bend and go back to its original shape



Figure 3

Credits: <http://discardstudies.wordpress.com>

## Evaluation

- Reusing tires that are among the largest sources of waste
- Providing a cheaper source of rubber

### References

- [1]"Piezoelectric Generators: Applications" . [Online]. Available: <http://www.americanpiezo.com/piezo-theory/generators.html> [Accessed Nov. 16, 2013]
- [2]"TIS: Synthetic rubber " . [Online]. Available: [http://www.tis-gdv.de/tis\\_e/ware/kautschuk/synthesekautschuk/synthesekautschuk.html](http://www.tis-gdv.de/tis_e/ware/kautschuk/synthesekautschuk/synthesekautschuk.html) [Accessed Dec. 6, 2013]