The UAE population has undergone a rapid increase, from 2.46 million to 9.27 million, since 1996 [1]. This led to an increase in the number of vehicles, especially in Dubai, which ultimately decreased the transportation system’s efficiency. Furthermore, congested traffic caused an economic setback of AED 2.9 billion in 2013 in Dubai, due to the loss of working hours and excess fuel consumption [2]. Speeding at intersections is another source of concern that limits the full efficiency and safety of Dubai’s transportation systems.

**Problem**

- **Problem 1: Congestion of Intersections in the UAE**
  - The efficiency of intersections is deteriorating from high congestion due to the growing number of vehicles
  - Regular solutions to reduce congestion are not applicable
  - Governments and municipalities are not taking enough action to resolve the issue

- **Problem 2: Speeding at Intersections**
  - Drivers speed up in order to cross the intersection in time
  - Speeding while turning at an intersection is considered hazardous to the driver’s safety

**Solution**

**Utilizing Piezoelectric Bumps**
- Utilizing composite material that consist of Piezoelectric quartz elements
- The process is described in Figure 2

**Reducing Traffic**
- The reduction of traffic is achieved by optimizing the green signal timing
- The sensors on the bump will detect the pressure from the cars
- The sensors will transfer the data to the traffic signal in order to extend the green timing in the next cycle

**Evaluation**

Utilizing Piezoelectric bumps will accomplish the following:
- A reduction in traffic congestion at intersections
- An increase in roads and transportation safety
- A construction of a self-sustaining system
- A cutback in the economic consequence of heavy traffic [2]
- Cost effective on the long run despite the high start up cost [6]

**References**