

SITUATION

Jumeirah road became one of the most well-known roads in Dubai due to the tourist attraction and commercial use. However the road has become very congested with traffic because of its excessive use of traffic signals and poor traffic system organization. This congestion in Jumeirah road results in huge amounts of wasted money and time due to the fact that cars should stop repeatedly at several traffic signals before reaching the desired destination.



Figure 1: Jumeirah road

PROBLEMS

- Generating Power:**
 - * Finding the most efficient way to generate electricity for the system
- Using Sensors:**
 - * Choosing the right sensors and system to control the traffic signals
 - * Installing and uninstalling of the sensors should be easy such that regular maintenance is performed with ease
- Implementing the System:**
 - * Finding the optimum traffic signal at which the sensors must be placed to make it efficient
 - * Implementing this new smart traffic system we need to remove the unnecessary traffic signals that will cause another problem
 - * Designing the pavement layer above the sensors needs a certain type of aggregates and asphalt binder

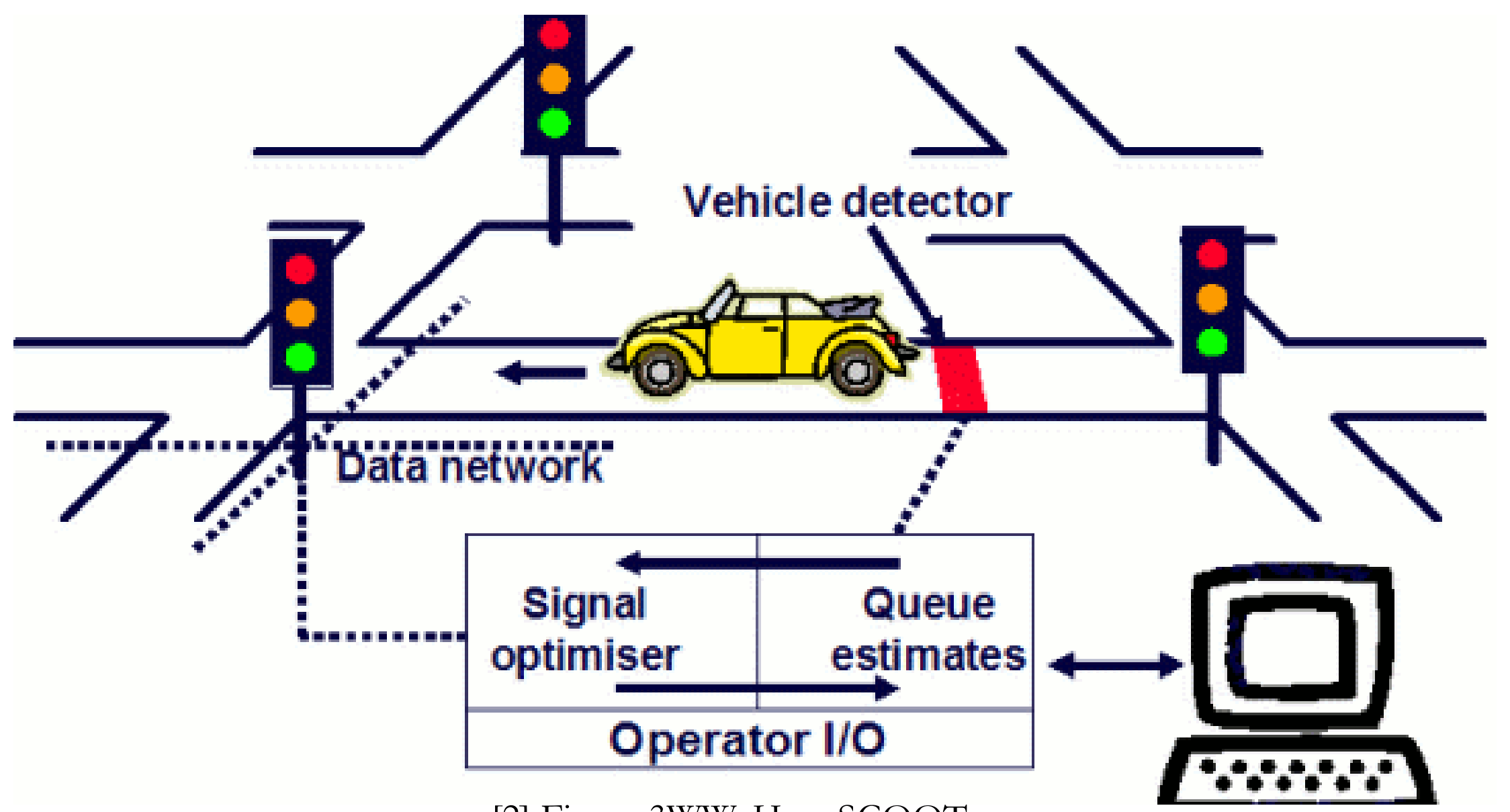
SOLUTIONS

- * Solar panels will generate electricity for the traffic signals using sun light (figure 1)
- * Generators will be used when solar panels fail to work due to weather



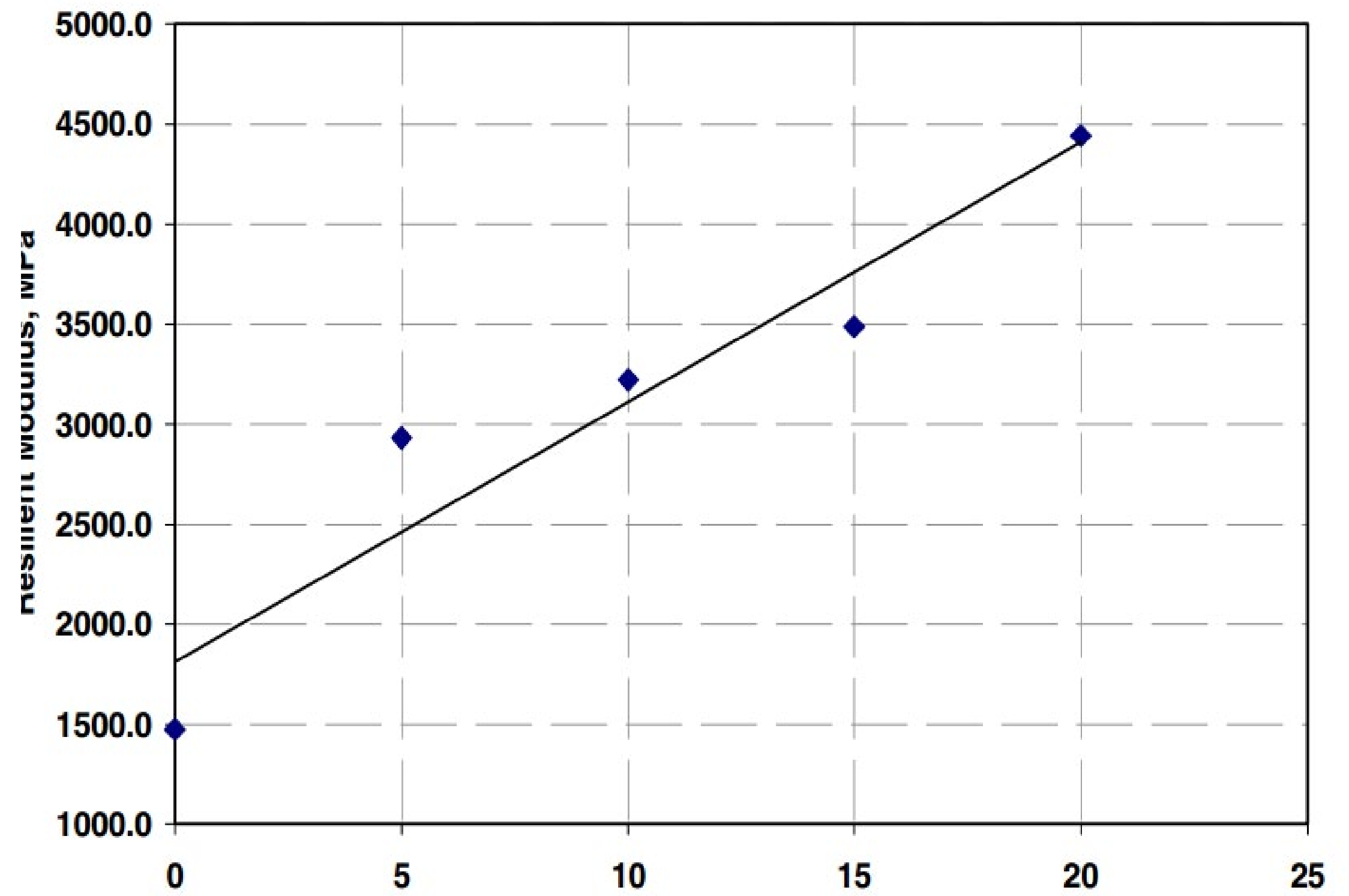
[1] Figure 2: Solar panels in traffic signals

- * The SCOOT (Split Cycle Offset Optimization Technique) system models the progression of the traffic from detector through the stop line (figure 2)
- * The WVDS (Wireless Vehicle Detection System) enables SCOOT to deliver accurate highly available and dependable traffic data in real time



[2] Figure 3WW: How SCOOT

- * The smart traffic system will be placed at needed intersections
- * Unnecessary traffic signals will be removed
- * Specific type of aggregate (synthetic light weight aggregate) mixed with PG 64-28 asphalt binder will be used (graph 1)



[3] Graph 1: Plot of resilient modulus vs. percentage of SLA in mix

EVALUATION

The smart traffic system has a quick response to traffic flow by reducing the delays, and it is environmental friendly since it uses solar energy to function. Also the pavement used in the smart traffic system is heavy load and high temperature resistant (table 1).

Previous Control	% Reduction in journey time using SCOOT	% Reduction in delay using SCOOT	% Reduction in stops using SCOOT
Fixed-time	8 (cars) 6 (buses)	19	5

[4] Table 1: Reduction in time after SCOOT was implemented

REFERENCES

[1] http://upload.wikimedia.org/wikipedia/en/archive/f/f0/20110803121601!Solar_traffic_light_1.jpg
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 [4] M.J.H CHANDLER, DJ COOK, "Traffic control studies in London: SCOOT and bus Detection," in PTRC Annual Summer Meeting July 1985. Seminar M, P269, pp 111-128.