

STARS PROJECT FINAL REPORT



GROUP ANKARA

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1. INTRODUCTION

We are two students of Civil Engineering Department of Middle East Technical University in Ankara, Turkey (Fig.1) . We first thought to take part in STARS project in November 2011 and we made an application to the project and presented our idea to reduce speed. After acceptance of our idea and Speed Management Camp in Brussels We started to work on our project that aims to reduce speed and prevent accidents in our city.

Our city Ankara is the capital city of Turkey that has nearly 4 million population and high level of traffic volume. There happens a lot of accidents on roads and a lot of people die as a result of high speed. In this project we aim to reduce speed with an effective project and make people aware of the danger of speed.

This reports main object is to explain the stages of our project and mention about the results of our implementation by giving statistics before and after implementation.



Figure 1. Picture of Group Ankara



Figure 2. the Place of Ankara in Turkey Map

2. PROJECT IDEA

According to General Directory of Highways in Turkey major cause of the traffic accidents happen because of high speed. Beside according to traffic accident statistics of Turkey, drivers can not adjust their speed most of the times (Fig.3.).

DRIVER FAULTS	TOTAL	%
Unable to adjust vehicle speed to road due to road, air or traffic conditions	36.079	34,40%
Failure to yield the right of way	16.739	15,96%
Failure to turning regulations	15.042	14,34%
Tailgating	10.543	10,05%
Failure to other traffic safety regulations	6.236	5,95%
Frequent or unsafe lane changes	4.991	4,76%
Impaired driving	3.310	3,16%
Failure to traffic signals	2.860	2,73%
Entering to no entry roads	2.678	2,55%
Other	2.460	2,35%
Influence of alcohol	1.511	1,44%
Collision to safety parked vehicles	1.212	1,16%
Passing when it is restricted	808	0,77%
Unsafe parking	415	0,40%

Figure3. Causes of Traffic Accidents in Turkey (GDM, General Directory of Highways)

According to the evaluation of statistic, best thing to prevent road accidents is to make drivers adjust their speed according to road conditions. There are a lot of area in Ankara where need an extra attention for traffic safety.

2.1. Project Area

Before the STARS Speed Management Camp in Brussels we started to search an area where accidents occur due to high speed. We found an area that is a U-Turn road and a lot of people dies due to high speed. Our aim was to reduce speed of drivers and prevent accidents in this area. After a month an highway underpass bridge construction started our implementation area. Therefore we started to search again an area exposed to accident risk. Our instructors from the university Asst. Prof. Dr. Hediye Tüydeş Yaman and Inst. Zerrin Ardiç Eminağa helped us to find an area that need an traffic safety implementation and they gave us a map of accidents in Ankara. We evaluate a lot of area and examine in place. Then we specified the Malıköy-Esenkent road where to many traffic accident happens where exist many horizontal curve and where have insufficient illumination (Fig.4).

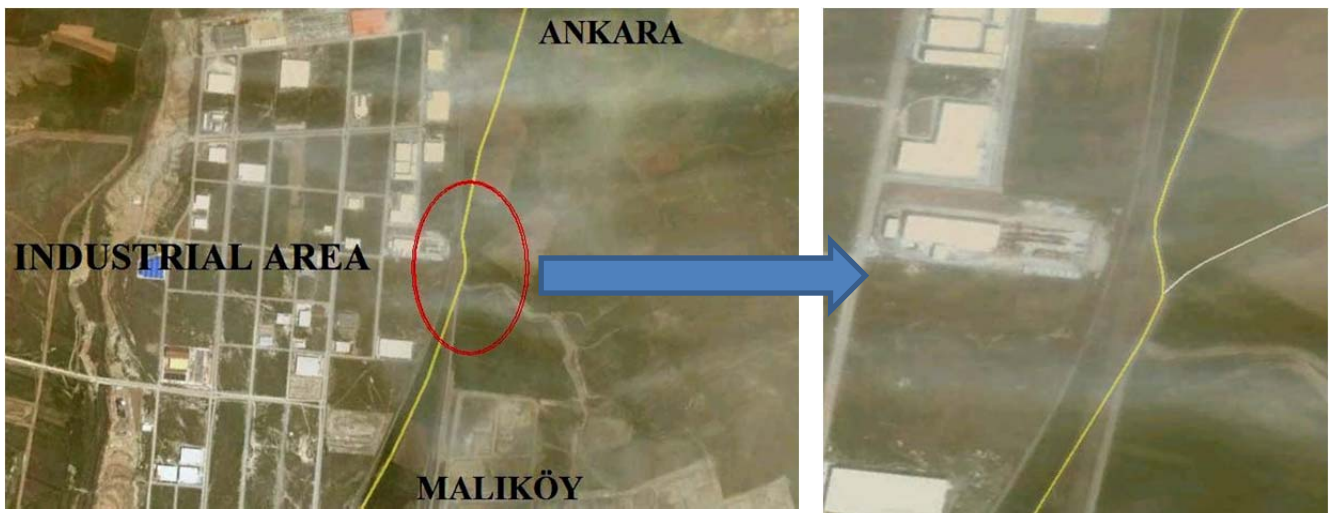


Figure 4. Sattelite Images of Malıköy-Esenkent Road

Malıköy-Esenkent Road is the main road in the Sincan District where nearly 400.000 people live and has a big industrial area and this road has a high volume of traffic

especially in morning and evening hours when a lot of people are going to their business. Beside a lot of trucks use this road to reach Industrial area.

2.2. Accident Statistics of Area

Gendarmerie forces are responsible from the traffic of this force, so we first contact with the gendarmerie forces to discuss the convenience and need of an road safety implementation for this area. Gendarmeria forces told us a lot of accidents happen in this road and they said they would be very glad to take part in implementation and prevent accidents in this road. We researched area with gendarmerie forces and measure the speed of drivers passing on the road with the radar car (Fig.5).



Figure 5. Picture of the area in April 2012

Then we took some accident statistics of this area from the gendarmeria forces. When statistics are evaluated, we saw that every year accident number is increasing (Fig.6) and no precaution is taken to prevent it.

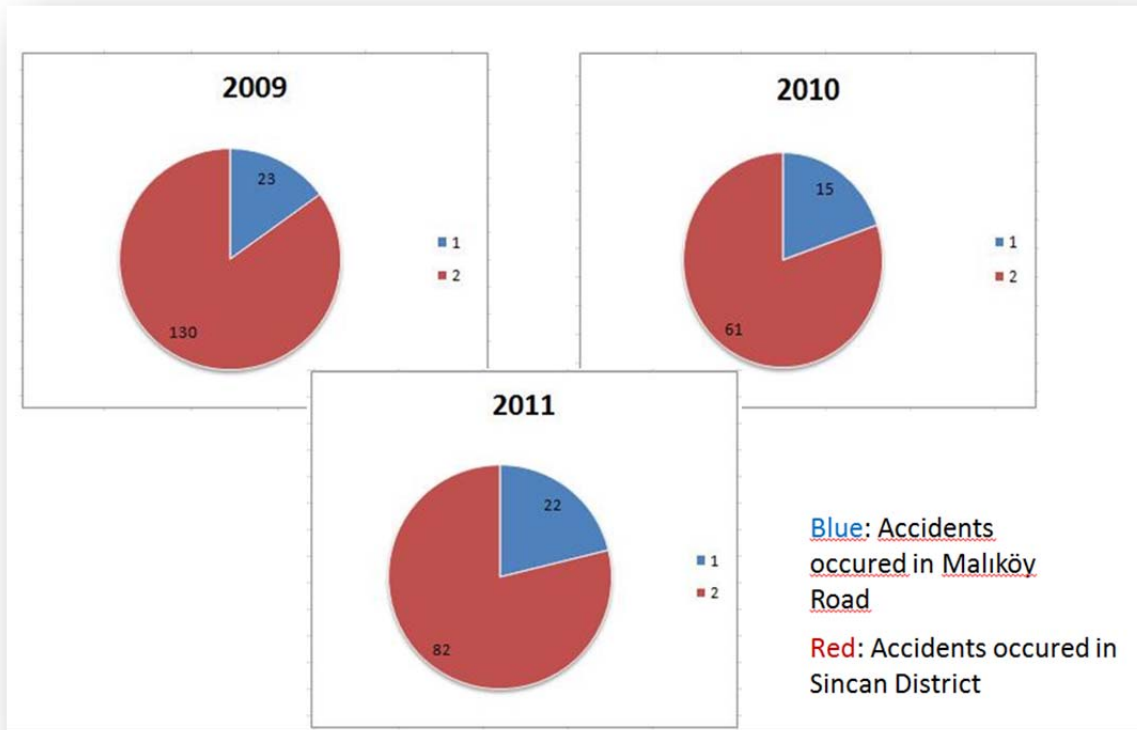


Figure 6. Number of Accidents occurred in Maliköy Esenkent road

When we went to the implementation area we saw the lack of traffic signs and there were no road marks and lane lines(Fig 7.). There were sharp bends on the roads. The road width was 8.20m.



Figure 7. Picture of Project Area Before Implementation

3. SELECTION OF THE IMPLEMENTATION TYPE

For Malıköy-Esenkent Road we decided to use Dragon Teeth Road Marking Method as the road has sharp and dangerous bends and there is a need to reduce driver's speed by taking their attention to the danger of the road.

Dragon's Teeth is a series of triangular road markings which are placed in each side of the road. The purpose of using these type of road marking is changing from country to country. For example, in the United Kingdom and Italy, "Dragon's Teeth" are used before entering to the rural community; however, in New Zealand, "Dragon's Teeth" pavement markings are used for increasing safety in school zones. However, these type of road markings were not used in Turkey before our implementation.

Advantages of Dragon Teeth Road Marking:

- Cost-effective
- Increase road safety
- Do not affect vehicle operation (emergency sit.).
- Do not affect the passenger comfort.
- Do not affect drainage of the road surface.

Disadvantages of Dragon Teeth Road Marking:

- Road markings are invisible under winter conditions (snow and ice)
- Additional maintenance is required because of wearing and fading

4. IMPLEMENTATION STAGES OF PROJECT

4.1. Local Authority Permission

Our project area Malık y-Esenkent Road is under the responsibility of 4. Region General Directory of Highways. Therefore according to make an implementation on the road we first had to take permission from General Directory of Highways. By the help of our instructor Hediye T ydeŖ Yaman we wrote a petition letter to General Directory of Highways. Due to very long procedures, we waited until June,2012 to get permission for implementation. After getting permission the technicians of General Directory of Highways wanted to examine the area where we want to implement our project. We went project area and examine the danger of the area.

4.2. Finding Sponsorship

We wanted to make our implementation with the best firm that is expert on road markings therefore we went to “Belplas” that is expert on road markings and this firm does all road markings of Ankara Municipality. We went there to get a cost of 800 m implementation of dragon teeth and normal lane markings. We explain the formwork of Dragon Teeth and explain our aim. When we got the price of the project we started to find sponsor for our project.

We attended to Traffic Safety Symposium in Ankara that a lot of disciplines are joining and there were a lot of firm that attends this symposium. This was a chance to explain our project to this firm. We made contact a lot of companies in this symposium. There was a lot of company who were interested in our project. Especially there was an international oil firm who was interested but we conflict with them later. Then, “Filli Boya- Betek Boya” firm was interested and they agreed to be sponsor of our project. Founded in 1988, Betek Boya San. ve Tic. AS has been the leading company in architectural paints and thermal insulation systems in Turkey. The long history of Betek started with the development of high quality products in the fields of concrete admixtures, ready-mixed mortars and water insulation materials for construction materials industry(<http://www.filliboya.com.tr/en/>)

4.3. Implementation

After long efforts to get permission and to find sponsorship, we have finally got chance to implement our project in October,2012. Before implementation we went to the implementation area again we took photos(Fig. 8) and also we took speed measurements on 02 October 2012. We decided to implement dragon teeth markings before entrances of two way curve and we decided to paint road markings and lanes 800 m along the road.



Figure 8. Entrances of curves before implementation.

Then we decided to implement our project on 8 October 2012. We went to implementation area with a paint truck of “Belplas” and with 8 workers who are responsible for the painting of road. First we paint the standart lane lines(Fig .9) along the road which is important to adjust position of the vehicles on the road.



Figure 9. Lane Markings.

After painting lane markings we started to paint dragon teeth triangles at the entrances of the curves. Dragon teeth formworks were prepared before the implementation (Fig 10.)

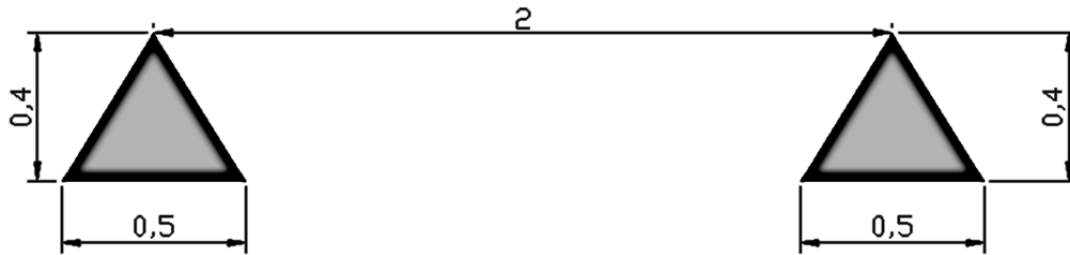


Figure 10. Dimensions of Dragon Teeth (in meter)



Figure 11. Dragon Teeth Implementation



While painting the triangles it was hard to make drivers not to cross on the fresh paint. Also after the painting we throw the glass spherules on the paint that makes markings shine in the night and it increase visibility in the dark (Fig 11).

4.4. Results of Implementation

In order to understand that our project actually works, we had to take speed measurements after implementation to compare before measurements that we took on 02 October 2012. We took speed measurements on the side by calculation average speed on the road between two points and we took measurements after project on 23 October 2012. According to the results of measurements before and after the project, we calculated that average speed has decreased 16% after implementation. This is a very important number and after to project there happened no accident on the road.

Date 02.10.2012	
Time	V(km/h)
13.35	65.26
13.35	61.89
13.35	71.05
13.36	58.38
13.36	77.70
13.36	73.97
13.37	74.74
13.39	76.87
13.40	71.76
13.41	76.06
13.41	66.87

$V_{ave} = 70.41$ km/h

Date 23.10.2012	
Time	V(km/h)
13.25	56.35
13.26	59.69
13.26	60.13
13.26	62.28
13.27	61.13
13.28	58.25
13.28	60.19
13.28	59.01
13.30	59.78
13.30	56.40
13.31	57.35

$V_{ave} = 59.14$ km/h

5. COMMUNICATION

In order to increase the awareness of people against speed danger and in order to tell people about our project we created a blogsite that explains concepts and steps of our project. (<http://www.ejderdisi.blogspot.com/>)

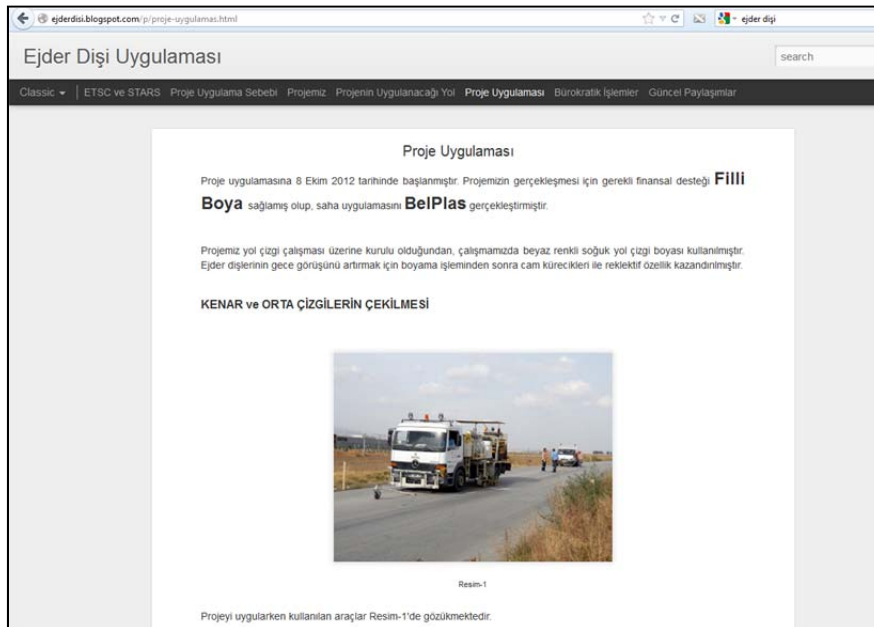
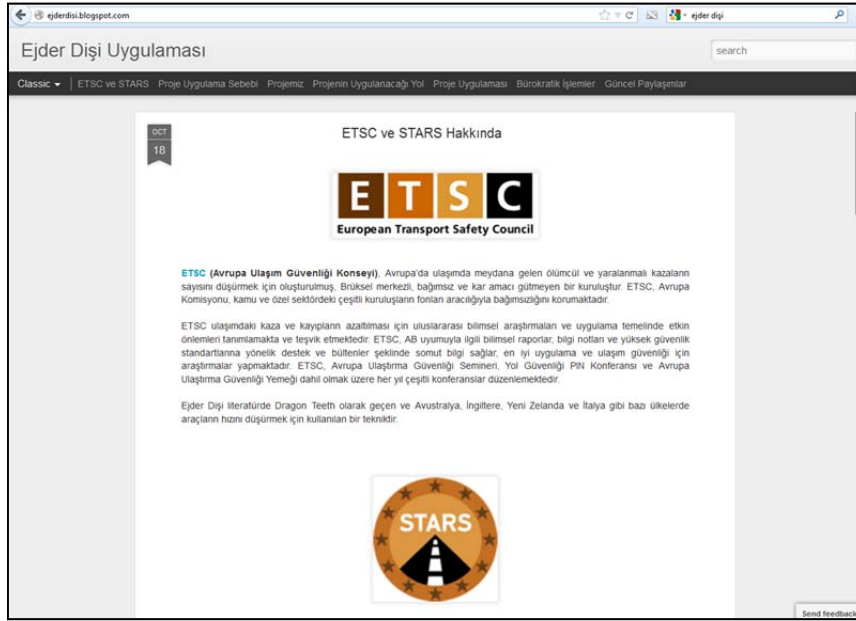


Figure12. Screenshots of Website



6. CONCLUSION

When applying to this project our first aim is to prevent deaths due to traffic accidents by reducing speed of vehicles on the roads. This type of a project is implemented for the first time in Turkey. By dragon teeth application, we achieved to reduce speed and prevent accidents in Malıköy-Esenkent Road. We manage to reduce average speed about 16%.

Our next step is to spread this application to another regions of Ankara. Beside we aim to attend the next Roadway Safety Symposium which will be held on May 2013 in Ankara as a speaker to explain and introduce our project to another people.

STARS project gave us the chance to work for reduce traffic speed, prevent accidents and save lifes. Being a part of an international project organized by European Transport Safety Council, we gained both very good experience and responsibility.

European Transport Safety Council – www.etsc.eu

Middle East Technical University – www.metu.edu.tr

Sponsor : “Filli Boya” - www.filliboya.com.tr/en/

Dragon Teeth Website www.ejderdisi.blogspot.com/

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