

# Sakarya making more room for cycling

Report workshop Sakarya 26 & 27 March 2013



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## 1. Introduction

In the framework of the celebration of 400 years of diplomatic relationships between Turkey and the Netherlands in 2012 the Netherlands Ministry of Infrastructure and Environment commissioned the Dutch Cycling Embassy to assist a Turkish city in the development of a cycling project. The first task was to identify a suitable Turkish city. The envisaged co-operation with the Turkish Ministry of Environment didn't work out because of personal changes at the concerned department. In order to speed up the implementation of the project, the Dutch Cycling Embassy decided in consultation with the Netherlands Embassy in Ankara and the Netherlands Ministry of Infrastructure and Environment to direct the efforts to Sakarya, a municipality in the north of Turkey with as its main city Adapazari.

In 2010 the Dutch NGO Interface for Cycling Expertise was commissioned by EMBARQ Türkiye to conduct a series of 3 workshops in Sakarya and two other Turkish cities to assist those cities in the development of cycling-inclusive transport policies. The main output of those workshops in Sakarya was the design of a pilot cycle route of about 5 km combined with recommendations for further development of cycling-inclusive transport policies.<sup>1</sup>

The proposed goal of the 2013 workshop was twofold:

- > The evaluation of the developments in Sakarya after the 2010 workshops and to identify lessons learnt that can be relevant for other Turkish cities;
- > To come up with concrete recommendations for Sakarya to enhance the quality of their plans for cycling both on technical and on policy level.

The preparation of the workshop was done in consultation with EMBARQ Türkiye, the Turkish branch of the international NGO EMBARQ, working on sustainable urban transport. EMBARQ Türkiye acted as liaison between the Dutch Cycling Embassy and the Municipality of Sakarya. After some consultation it was decided to have the workshop session in Sakarya on 26 and 27 March 2013. The programme was as follows:

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<sup>1</sup> Reports of these workshops can be found at [http://www.i-ce.nl/index.php?option=com\\_content&task=view&id=159&Itemid=78](http://www.i-ce.nl/index.php?option=com_content&task=view&id=159&Itemid=78)

**26 March 2013**

Morning: arranging last details

- |         |   |
|---------|---|
| 14.00 h | Opening workshop, introduction participants                   |
| 14.15 h | Summary of 2010 workshops and results                         |
| 14.50 h | Presentation Sakarya progress after 2010                      |
| 15.15 h | Discussion and first assessment                               |
| 15.45 h | Presentation Sustainable Urban Mobility                       |
| 16.15 h | Interactive exercise: factors that influence mobility choices |
| 17.15 h | Closing   |

**27 March 2013**

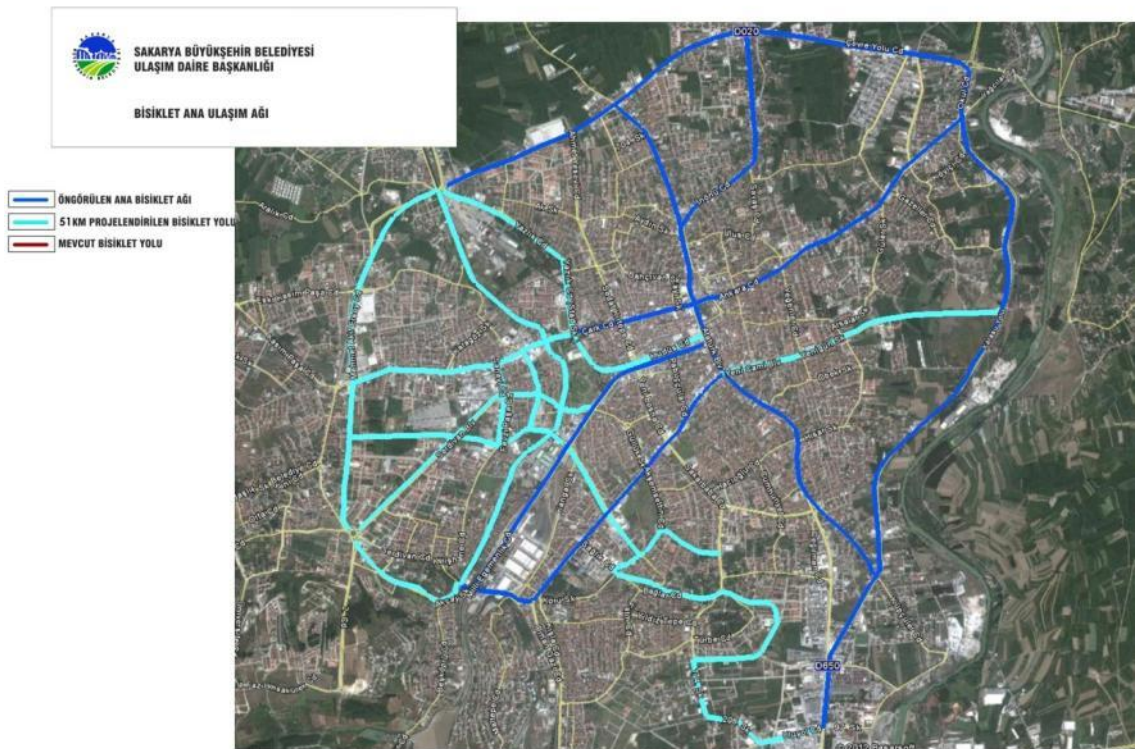
- |         |   |
|---------|---|
| 09.30 h | Presentation of interactive exercise 26 March, dialogue with secretary general Sakarya mr. Fatih Turan  |
| 10.15 h | Site visit by bus to see the roads and streets that will become part of the planned cycle route network |
| 12.15 h | Lunch   |
| 13.15 h | Continuation site visit: look at some specific intersections  |
| 14.30 h | Informal discussion about design plans and design details   |
| 16.00 h | Closing   |

The sessions were moderated by mr. Serdal Öncel, senior transportation engineer at EMBARQ Türkiye. The Dutch team consisted out of Tom Godefrooij, senior policy advisor at the Dutch Cycling Embassy and Ron Bos, strategic policy advisor at Goudappel Coffeng Mobility Consultants.

## 2. Review of progress cycling planning Sakarya

### 2.1 First findings

The workshops conducted by EMBARQ and I-CE in 2010 resulted in the design of about 6,5 km bicycle tracks and bicycle lanes along a route of about 3,5 km (as the largest part of the route had cycle facilities on both sides of the road). In the meantime the Turkish Ministry of Environment has engaged in a policy to support the implementation of cycling facilities so as to contribute to improved air quality in cities. On the one hand the prospect of ministerial co-funding has delayed the implementation of the pilot route, on the other hand it has given Sakarya an extra incentive to continue the development of a cycling route network. At the date of the workshop there are plans for the implementation of about 60 km of cycling facilities. According to planning a tender for implementation will (or has) start(ed) on 22 April 2013. On the 5<sup>th</sup> of June an official of the Ministry of Environment will come to Sakarya to open the first section of the cycle route network.



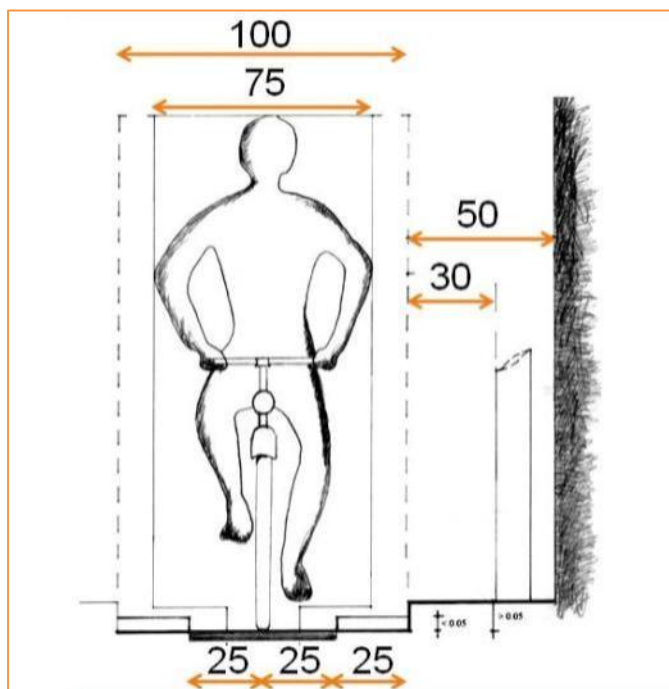
Cycling route network Sakarya

The city of Sakarya presented also an overview of the envisaged cross sections of all routes:

	MESAFE			KALDIRIM	YEŞİL	BİSİKLET YOLU	KORUYUCU	AYIRICI	PARK	YOL	REFUJ	YOL	PARK	AYIRICI	KORUYUCU	BİSİKLET YOLU	YEŞİL	KALDIRIM
1	M. AKİF ERSOY VE 2. CADDE	3490	3550	2,5	0	1,25	0	0,15	0	6,6	2	6,6	0	0,15	0	1,25	0	2,5
2	ÇARK CADDESİ	2070	2087	3.5-2.0	0	1,1	0,5	0,15	0	11.0-9.5	0	0	0	0,15	0,5	1,1	0	3.5-2.0
3	3. CADDE	1347	1367	2.0-1.5	0	1,25	0	0,15	0	6	1,2	6	0	0,15	0	1,25	0	2.0-1.5
4	KRIŞHANE	310	293	2.0-1.5	0	1,35	0	0,15	0	8	2	8	0	0,15	0	1,35	0	2.0-1.5
5	ZÜBEYDE HANIM CADDESİ (saski)	205	423	2.0-1.5	0	1,35	0	0,15	0	8	2	8	0	0,15	0	1,35	0	2.0-1.5
6	MUHSİN YAZICIOĞLU CADDESİ	1800	1851	3.5-2.0	1,35	1,1	0,5	0,15	0	7,25	3	7,25	0	0,15	0,5	1,1	1,35	3.5-2.0
7	SANAYİ CADDESİ 1	475	442	1,5	0	1	0	0,15	0	6	0	0	0	0,15	0	1	0	1,5
8	SANAYİ CADDESİ 2	270	287	1,5	0	1	0	0,15	0	6	1	6	0	0,15	0	1	0	1,5
9	KIRIŞHANE CADDESİ 2	425	442	1,5	0	1	0	0,15	0	6	0	0	0	0,15	0	1	0	1,5
10	KIRIŞHANE CADDESİ 3	340	352	2.0-1.5	0	1,25	0	0,15	0	8	2	8	0	0,15	0	1,25	0	2.0-1.5
11	CUMHURİYET CADDESİ	323	338	2.0-1.5	0	1,1	0	0,15	0	6,5	1	6,5	0	0,15	0	1,1	0	2.0-1.5
12	MALİYE CADDESİ	590	554	2.0-1.5	0	1	0	0,15	0	14	0	0	0	0,15	0	1	0	2.0-1.5
13	YAZLIK CADDESİ 1	560	558	3.5-2.0	0	1,85	0	0,15	0	7	0	0	0	0,15	0	1,85	0	3.5-2.0
14	YAZLIK CADDESİ 2	720	818	3.5-2.0	0	1,85	0	0,15	0	4,35	1,8	4,35	0	0,15	0	1,85	0	3.5-2.0
15	YAZLIK CADDESİ 3	580	577	3.5-2.0	0	1,85	0,9	0,15	0	7	0	0	0	0,15	0,9	1,85	0	3.5-2.0
16	YAZLIK CADDESİ 4	470	446	3.5-2.0	0	1,85	0	0,15	0	7	0	0	0	0,15	0	1,85	0	3.5-2.0
17	YAZLIK CADDESİ 5	270	244	0	0	0	0	0	0	7	0	0	0	0,15	0,85	3	0	3.5-2.0
18	A NECDET GÜVEN	655	640	0	0	0	0	0	0	6	0	0	2,5	0,15	0,35	1,8	0,7	3
19	YENİ CAMİ BULVARI	2600	2585	2.0-1.5	0	1,85	0	0,15	0	7	2	7	0	0,15	0	1,85	0	2.0-1.5
20	ZÜBEYDE HANIM CADDESİ 1	660	714	2.0-1.5	0	1,1	0	0,15	0	6	2,5	6	0	0,15	0	1,1	0	2.0-1.5
21	ZÜBEYDE HANIM CADDESİ 2	495	488	2.0-1.5	0	1,1	0	0,15	0	7	1,25	7	0	0,15	0	1,1	0	2.0-1.5
22	AKŞEMSETTİN CADDESİ	595	590	2.0-1.5	0	1,1	0	0,15	0	5,5	0	0	0	0,15	0	1,1	0	2.0-1.5
23	MİMAR SİNAN CADDESİ	595	584	2.0-1.5	0	1,1	0	0,15	0	6,5	0	0	0	0,15	0	1,1	0	2.0-1.5
24	BAĞLAR CADDESİ	1090	1040	2.0-1.5	0	1,1	0	0,15	0	6,7	0	0	0	0,15	0	1,1	0	2.0-1.5
25	1063 SOK.	460	610	2.0-1.5	0	1	0	0	0	6	3	6	0	0	0	1	0	2.0-1.5
26	YAVUZ SULTAN SELİM CADDESİ	1125	1120	3.5-2.0	0	1,85	0	0,15	0	6	1.1-18.5	6	0	0,15	0	1,85	0	3.5-2.0
27	SHT. İLHAN ARAS CADDESİ	1150	1089	2.0-1.5	0	1,1	0	0,15	0	6	3	6	0	0,15	0	1,1	0	2.0-1.5
28	ULUYOL CADDESİ	550	590	0	0	0	0	0	0	9	1	9	0	0,15	3,75	2,75	0	2.0-1.5
29	6. CADDE	1000	948	2.0-1.5	0	1,35	0	0,15	0	7,75	0,65	7,75	0	0,15	0	1,35	0	2.0-1.5
29	ÇARK DERESİ	4500	4500		0		0	0,15	0					0,15	0	3,5	0	
30	BAGLANTILAR	950	950	2.0-1.5	0	1,1	0	0,15	0	7	0	0	0	0,15	0	1,1	0	2.0-1.5
		30670	31077															
		61340	62154															

The columns on the previous page are indicating the name of the road/street, the length of the section and the width of the various segments of the cross section: sidewalk, cycling track/lane, green verge, separator, parking lane, main carriage way, median, main carriage way, parking lane, separator, green verge, bicycle track/lane and sidewalk. It appears that the designed width of the cycling facilities varies from 1.00 m to 1.85 m.

This resulted in a debate about required width of cycling facilities. The Dutch experts stipulate that one of the functional requirements of any cycling facility is that the facility should allow for taking over. The implication is that the width should be enough for at least two cyclists side by side. Depending on the type of separation (and particularly the height differences) this would require a minimum width of 1.50 to 1.80 m, as can be derived from the profile of clearing space.



Profile of clearing space

The Sakarya engineers claimed that there was insufficient space for the recommended widths, and that they were not allowed to take more space at the cost of the remaining main carriage width. Upon that the Turkish Ministry of Environment has made guideline for cycling infrastructure stating that the minimal width for cycling paths should be 1 m. Such 'official' minimum widths too often appear to become the 'recommended' standard at least in the perception of designers and decision makers.

The Dutch experts can understand the position of the Sakarya engineers, being stuck in between the Dutch recommendations from the 2010 workshops, the restrictions put upon them by the local decision makers and the published Turkish guidelines. Nevertheless they are also very clear that the design for such narrow cycling facilities will never get a 'stamp of approval' from Dutch experts.

The site visit showed the workshop participants most stretches of roads and street where cycling facilities are planned to be implemented. The following comments on the Sakarya plans and recommendations for improvement are based on the combination of the data supplied by the Sakarya engineers and the observations during the site visit tour. These comments and recommendations reflect the technical implications of a supposed (political) choice in favour of an unambiguous promotion of the use of bicycles in Sakarya and subsequently to shift the balance between motorised transport and active transport resulting in a larger modal share of cycling. Such a political choice is supposed to contribute to a more sustainable and people-friendly development of Sakarya.

## **2.2 General comments**

1. As has been stressed in the 2010 workshop series planning and designing for cycling should become an integral part of transport planning. To arrive at a level of genuinely 'cycling-inclusive' transport planning it is important to develop an integral vision on the preferred roles of the various modes of transport in the 'ideal' urban transport system. Such a vision enables both decision makers and transport experts to find a proper balance in the allocation of road space and budgets for the various modes of transport and to make comparative assessments in the case of conflicting interests. It is our impression that such an integrated vision on cycling in Sakarya is still lacking. Cycling facilities seem to be appreciated as a 'useful add on' to the existing traffic system: they can be built only when (and as long as) they don't affect the existing road space for motorized traffic. Thus Sakarya is risking to miss the opportunity to utilize the potential of cycling to prevent or solve (some of) the problems associated with excessive use of private cars.
2. A number of design challenges in Sakarya have to do with the current traffic volumes in a given spatial context. Solutions can be looked for at two levels: at the level of the facility (i.e. the concerning road section or intersection) and at the level of the network (i.e. circulation patterns). Often the spatial context doesn't allow for satisfactory solutions for given traffic volumes. Without intervening in the traffic circulation (thus affecting those traffic volumes) designs will inevitably be sub-standard compromises. It is our impression that Sakarya is not yet fully utilizing the possibilities of interventions at the network level. European experiences show that

city centres become more attractive if (through) traffic is restricted and motorised traffic is diverted as much as possible to the outskirts of the city. An additional benefit of such an approach is that it promotes the use of more sustainable modes of transport.

3. Following on the previous comment it is our impression that many arterial roads are over-dimensioned or that the density of this type of arterials is too high. The standard for these arterials seems to be 2x2 lanes with a median. The legal maximum speed was told to be 50 km/h, but the road design is inviting much higher speeds. Thus there is a mismatch between design and desired road use. To do more firm statements on the density of the arterial network and the concerning road dimensions we would need more detailed data. However, we are convinced that it would be worthwhile to make such an analysis of the Sakarya road network.

## 2.3 Detailed recommendations at cross sections as presented

### General remark

We have understood that sidewalks are not the responsibility of the transport department. We would recommend an integrated decision on all elements of the cross sections including the sidewalks. As we lack information, we haven't taken into account the possibilities to create more room for cycling by taking space from the sidewalks. As we have observed that there are many pedestrians in Sakarya and that sidewalks are sometimes very crowded, we indeed would be cautious to recommend space for cycling at the cost of the space for walking. Yet there might be specific locations with low volumes of pedestrians where narrowing the width of the sidewalk could be an option. But again, we recommend being very cautious in considering this option.

### M. Akif Ersoy Ve 2. Cadde

Proposed width of cycling track is 1.25 m alongside a road with dual carriageway of 2x6.5 m. As mentioned before, the recommended minimum width in case of a physical barrier between track and main carriageway should be 1.80 m. Additional space could be created by:

- > Reducing the width of the lanes on the main carriageway to 6 m (3 m per lane). This is still an acceptable width for 50 km/h speeds; and/or
- > Reducing the width of the median; or
- > Reducing the number of lanes at the main carriage way: 2x1 instead of 2x2.

Whether this solution is feasible is depending on the envisaged traffic volumes. In an urban setting one lane will be sufficient for about 1200 motor vehicles/h. At intersections one might need extra turning pockets (and thus a larger road width).

### **Çark Caddesi**

The proposed cross section for this road has cycling tracks of 1.25 m as well as a 2m parking lane on both sides of a single-track road of 7 m. Apart from the narrowness of the cycling track there might be a problem with the width of the separator between the cycling track and the parking lane. Cyclists might be 'doored' by people leaving a car on the right hand side. The narrowness of the cycling track doesn't help either as cyclists hardly have the possibility to make an evasive manoeuvre. In such situations the width of the separator should preferably be 0.7m so as to allow for a safe opening of the door. An alternative cross section could be:

- > 2.4 m parking lane, 1.50 m cycling lane, 6 m main carriageway, 1.50 m cycling lane, 2.4 m parking lane. The combined width of parking bay and cycling lane is wide enough to avoid 'dooring' (i.e. cyclists being hit by the inattentive opening of a car door), and as the cycling lane is only separated from the main traffic lane by a painted line, cyclists can make evasive manoeuvres if required. Narrowing down the width of the main traffic lanes will help to enforce the 50 km/h speed limit.

### **3. Cadde**

Proposed width of cycling track is 1.25 m alongside a road with dual carriageway of 2x6 m with a median of only 1.2 m. Space to widen the cycling track to 1.8 m could be created by:

- > Taking out the median. This might not be the best solution as it will result in a very wide road; so a better solution would be:
- > Reducing the number of lanes at the main carriage way: 2x1 instead of 2x2. Whether this solution is feasible is depending on the envisaged traffic volumes. In an urban setting one lane will be sufficient for about 1200 motor vehicles/h. At intersections one might need extra turning pockets (and thus a larger road width).

### **Krişhane**

Proposed width of cycling track is 1.25 m and 0,5 of green verges on both sides alongside a road with dual carriageway of 2x7.6 m with a median of 2 m. Space to widen the cycling track to 1.8 m could be created by:

- > Reducing the width of the lanes on the main carriageway to 6 to 6.5 m (3 to 3.25 m per lane); or
- > Adding the green verge to the cycling track; and/or
- > Reducing the width of the median; or
- > Reducing the number of lanes at the main carriage way: 2x1 instead of 2x2. Whether this solution is feasible is depending on the envisaged traffic volumes. In an urban setting one lane will be sufficient for about 1200 motor vehicles/h. At intersections one might need extra turning pockets (and thus a larger road width).

### **Zübbeyde Hanım Caddesi (saski)**

Similar proposed cross section as the previous one and thus similar suggestions for improvement

### **Muhsin Yazicioğlu Caddesi**

Proposed width of cycling track is 1.1 m and 0,5 of green verges on both sides alongside a road with dual carriageway of 2x7 m with a median of 3 m. Space to widen the cycling track to 1.8 m could be created by:

- > Reducing the width of the lanes on the main carriageway to 6 to 6.5 m (3 to 3.25 m per lane); and/or
- > Adding the green verge to the cycling track; and/or
- > Reducing the width of the median; or
- > Reducing the number of lanes at the main carriage way: 2x1 instead of 2x2.

Whether this solution is feasible is depending on the envisaged traffic volumes. In an urban setting one lane will be sufficient for about 1200 motor vehicles/h. At intersections one might need extra turning pockets (and thus a larger road width).

### **Sanayi Caddesi 1 and Kirişane Caddesi 2**

Proposed width of the cycling track is 1 m at both sides along a single-track road of 6 m. In fact we should conclude that between the curbs there is insufficient space for a proper cycling facility at both sides (assuming that there is traffic in two directions!) If this would be a one way road for motorised traffic, the none could consider to have only one traffic lane with proper cycling tracks at both sides. Other possibilities to consider are:

- > To create a mixed profile with traffic calming measures. Whether this is feasible depends very much upon road function in the network and traffic volumes.
- > To have only one two-directional track at one side of the road with a 0.3 m separator between track and traffic lane. Such a solution, however, would require a very careful design of the intersections at both sides of this road section.

Obviously this is a road section of which we would need more information about traffic volumes and circulation patterns to come up with a firm recommendation.

### **Sanayi Caddesi 2**

The proposed cross section is 'doubling' the proposed cross section for Sanayi Caddesi 1 with a 1 m median. Space for a proper width of the cycling tracks can only be found by taking out a traffic lane. As mentioned at the previous suggestions, a one sided two directional cycling track might result in a more effective use of the available road space, but would require very careful intersection designs.

### **Kirişane Caddesi 3**

Proposed width of cycling track is 1.25 m on both sides alongside a road with dual carriageway of 6 and 8 m with a median of 2 m. As this cross section is asymmetric it will be a bit more drastic to create sufficient wide cycling tracks on both sides of the road along the lines of earlier suggestions above. Another approach here could be:

- > Restrict the width of the 8 m carriageway to 6 m and use the additional available 2 m to create a one-sided two directional cycling track of 2,5 and a 0,75 m green verge.

### **Cumhuriyet Caddesi**

Proposed width of cycling track is 1.1 m alongside a road with dual carriageway of 2x6.5 m with a median of only 1 m. Space to widen the cycling track to 1.8 m could be created by:

- > Reducing the width of the lanes on the main carriageway to 6 m (3 m per lane). This is still an acceptable width for 50 km/h speeds. This would still be insufficient to create space for a 1.8 m cycling track. So additionally one could:
- > Reduce the width of the median; or
- > Reduce the number of lanes at the main carriage way: 2x1 instead of 2x2. Whether this solution is feasible is depending on the envisaged traffic volumes. In an urban setting one lane will be sufficient for about 1200 motor vehicles/h. At intersections one might need extra turning pockets (and thus a larger road width).

### **Maliye Caddesi**

Proposed width of the cycling track is 1.1 m at both sides along a single-track road of 14 m. This cross section looks as very unattractive for all road users and will probably be perceived as dangerous. We would recommend to reconsider the total road lay out of this road to at least slow down and homogenise the traffic flows. It would be obvious to continue the lay out of the previous suggested cross section.

### **Yaslik Cadessi 1,2,3,4,5 & A Necdet Güven**

The designs for these road sections are constituting the pilot route design that was the outcome of the 2010 workshops with EMBARQ and I-CE. These road sections have sufficiently been discussed before and do meet the required quality standards.

### **Yeni Cami Bulvari & Yavuz Sultan Selim Caddesi**

Also these cross sections, proposing cycling tracks of 1.85 m wide, would meet the quality standards for cycling infrastructure.

### **Zübeyde Hanım Caddesi 1**

Proposed width of cycling track is 1.1 m alongside a road with dual carriageway of 2x6 m with a median of 2.5 m. Space to widen the cycling track to 1.8 m could be created by:

- > Reducing the width of the median; and/or
- > Reduce the number of lanes at the main carriage way: 2x1 instead of 2x2. Whether this solution is feasible is depending on the envisaged traffic volumes. In an urban setting one lane will be sufficient for about 1200 motor vehicles/h. At intersections one might need extra turning pockets (and thus a larger road width).

### **Zübeyde Hanım Caddesi 2**

Proposed width of cycling track is 1.1 m alongside a road with dual carriageway of 2x7 m with a median of 1.25 m. Space to widen the cycling track to 1.8 m could be created by:

- > Reducing the width of the lanes on the main carriageway to 6 m (3 m per lane). This is still an acceptable width for 50 km/h speeds.
- > Reduce the number of lanes at the main carriage way: 2x1 instead of 2x2. Whether this solution is feasible is depending on the envisaged traffic volumes. In an urban setting one lane will be sufficient for about 1200 motor vehicles/h. At intersections one might need extra turning pockets (and thus a larger road width).

### **Akşemsettin Caddesi**

Proposed width of the cycling track is 1.1 m at both sides along a single-track road of 5.5 m. Clearly this road section has insufficient space for segregated cycling facilities on both sides. There are two options for a better solution:

- > Create a road for mixed use and apply traffic calming measures. For this approach we would recommend to widen the sidewalk, may be alternating at both sides so as to create traffic calming chicanes, and/ applying road humps. Whether this approach is applicable depends also on traffic volumes, but our impression is that at Akşemsettin Caddesi traffic volumes are reasonable low.
- > Another approach could be to create a one-sided two directional cycling track at one side of the road. As stated before this requires also a careful design of the connected intersections as, in the perception of drivers, cyclists pop up from an unexpected direction.

### **Mimar Sinan Caddesi & Bağlar Caddesi**

Proposed width of the cycling track is 1.1 m at both sides along a single-track road of 6.5 respectively 6.7 m. For these road sections the suggestions of the previous road

section could be applied. But as there is a bit more space available an additional option here could be:

- > Application of (only painted) cycling lanes of 1.5 m combined with 2x3 m for motorised traffic.

### **1063 Sok**

Proposed width of cycling track is 1 m alongside a road with dual carriageway of 2x6 m with a median of 3 m. Space to widen the cycling track to 1.8 m could be created by:

- > Reducing the width of the median; and/or
- > Reduce the number of lanes at the main carriage way: 2x1 instead of 2x2. Whether this solution is feasible is depending on the envisaged traffic volumes. In an urban setting one lane will be sufficient for about 1200 motor vehicles/h. At intersections one might need extra turning pockets (and thus a larger road width).

### **Sht İltan Aras Caddesi**

Proposed width of cycling track is 1.1 m alongside a road with dual carriageway of 2x6 m with a median of 3 m. Space to widen the cycling track to 1.8 m could be created by:

- > Reducing the width of the median; and/or
- > Reduce the number of lanes at the main carriage way: 2x1 instead of 2x2. Whether this solution is feasible is depending on the envisaged traffic volumes. In an urban setting one lane will be sufficient for about 1200 motor vehicles/h. At intersections one might need extra turning pockets (and thus a larger road width).

### **Uluyol Caddesi**

On this road section there is a dual carriageway of 2x9 m and on one side a two directional cycling track of 3 m separated by a wide verge of 3.75 m. This design is meeting the desired quality requirements.

### **6. Cadde**

Proposed width of cycling track is 1.25 m alongside a road with dual carriageway of 2x7.85 m with a median of 0.65 m. Space to widen the cycling track to 1.8 m could be created by:

- > Reducing the width of the lanes on the main carriageway to 6 m (3 m per lane). This is still an acceptable width for 50 km/h speeds.
- > Reduce the number of lanes at the main carriage way: 2x1 instead of 2x2. Whether this solution is feasible is depending on the envisaged traffic volumes. In an urban setting one lane will be sufficient for about 1200 motor vehicles/h. At intersections one might need extra turning pockets (and thus a larger road width).

### **Çark Deresi**

Çark Deresi seems to be a cycling track following its own line. For this design we have no further comments or recommendations.

### **Baglantılar**

Proposed width of the cycling track is 1.1 m at both sides along a single-track road of 7 m. We recommend to choose from one of the following options depending on the traffic volumes:

- > Create a road for mixed use and apply traffic calming measures. For this approach we would recommend to widen the sidewalk, may be alternating at both sides so as to create traffic calming chicanes, and/ applying road humps. Or:
- > Application of (only painted) cycling lanes of 1.5 m combined with 2x3 m for motorised traffic.



### 3. Mobility Culture within a larger perspective

#### 3.1 Introduction

Next to the focus on infrastructural design, the second part of the workshop was used to broaden the view on integrated mobility policy, including cultural en societal aspects, so as to shed light upon the factors that influence individual choices of transport modes. As an introduction a model was presented that allows to elaborate mobility behaviour at three aspects or 'layers':

- A) Environmental aspects, such as climate, natural habitat and the spatial structure of the city. These aspects define the 'needs to move';
- B) Technical aspects, such as the availability of modalities and infrastructural network. these aspects define the 'possibilities to move'.
- C) Cultural aspects, such as peoples' motivations, desires, beliefs etc. These aspects define the 'choices to move';



**Mobility behaviour is the result of intertwining aspect consisting cultural, environmental and technical aspects**

These three aspects, which are a rather theoretical division, are intertwined. In practice this means one aspect can never be observed in isolation. There is always a certain amount of interaction between for example cultural aspects and environmental aspects, or between technical aspects and environmental aspects. In order to explain this, we showed some examples of interaction:

### **A Urban environment influencing mobility behaviour**

The type of environment does influence people's mobility behaviour. At a certain moment in time certain behaviour(s) will become the standard behaviour, thus constituting the 'mobility culture'. If the only way to get to the shopping mall is by car and free parking space is offered without limitation, this will create circumstances for a car-based mobility culture (of even car-based culture), as shown on the left picture taken in Russia.

In many situations students do not have the resources to drive cars or even do not have the need to. A campus is often designed as a non-motorised traffic environment with small 'commuting' distances and lots of green areas. This creates opportunities for cycling and walking, such as can be seen in Tsinghua University, Beijing. The surrounding city has a totally different urban structure and different mobility culture.



### **B Technical developments influencing mobility behaviour**

In many urban environments availability of space is a policy issue. Parking often becomes a political issue. In many urban environments a shift can be seen from 'owning (a vehicle)' into 'having access to (a vehicle)'. (Why owning one if you only need it one hour per day?) This is a broader societal trend, influencing many aspects of life, especially for young urban inhabitants. The fastest growing form of transportation now in many urban environments is bike sharing. Also car sharing becomes very popular, as (parking) space is limited and the expenses of owning a car are rising. This service-based mobility is currently developing in urban environments, such as Amsterdam. The supply of such a (technical) transport system may have an impact on individual mobility choices.



### **C Cultural changes influencing mobility behaviour**

A third way to influence mobility behaviour is due to a result of changes in societal beliefs or simply habits. The emergence of (for example) mobile telecommunication and more recently social media gives a different meaning to the term 'mobility'. This does not only imply physical movement, but might be more explained as 'connectivity'. On the one hand this reduces the need for physical meetings (and movements), but on the other hand creates new ones, perhaps on a larger scale or on a less regular basis. This can be recreational, but teleworking does create new mobility (and spatial!) needs.

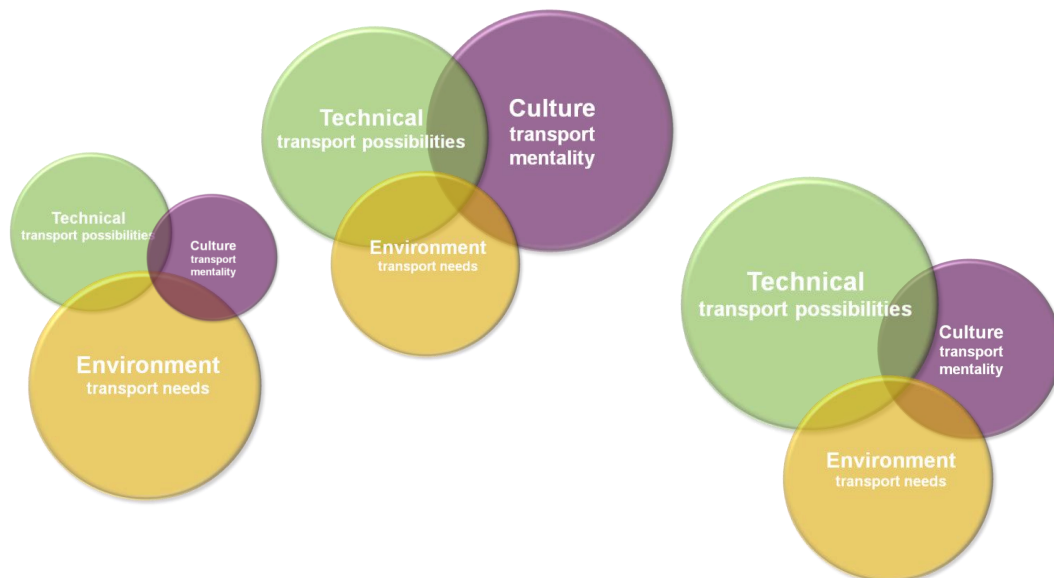
Also creating public awareness can bring about cultural changes, for example by organising events such as a running match through social media, as can be seen on the pictures. Using facebook as a platform, Nike is organising matches in order to create awareness for health and non-motorised mobility in urban areas (and using it for promotional campaigns also).



### Using the model in mobility policy

The model has the goal to elaborate further policy steps in, for example, the development of cycling. It gives a framework for prioritising aspects: is focus needed on infrastructure? Or rather public opinion? Or perhaps technical aspects?

For example: Dutch cycling policy has been mainly focussed on creating a safe and complete network for cycling, as cycling culture has always been a part of Dutch mobility culture. As urban networks have been completed, now a shift to creating regional networks (cycling highways) is to be seen. Regarding the technical aspects, cities such as New York, London, Barcelona have been developing bikeshare-programs. This has not been the case in the Netherlands because most people own a bicycle themselves already. So every case, depending on geographical location and cultural setting needs its own 'recipe'.



Different ways of creating policy: focus on environment, cultural aspects or technique

### 3.2 Satisfiers and dissatisfiers for mobility behaviour in Sakarya

After the introduction of the model, we asked the participants (both from the municipality of Sakarya and EMBARQ) which aspects are important for mobility choices of inhabitants of Sakarya. The main question was: *How do people make mobility choices in Sakarya?* We asked two sub-questions:

- > What aspects are helpful in creating a good mobility system?
- > What aspects are obstacles in creating a good mobility system?

The (theoretical) background on these sub-questions is the idea of (dis)satisfiers, derived from psychological science. A satisfier is an aspect which invites people to act in a certain way, for example cycling. A dissatisfier is the opposite: an aspect that discourages people from acting that way. Often dissatisfiers are universal, for example (lack of) safety (not just for cycling, but in general people do not want to get into unsafe situations). Satisfiers are less universal and might be embedded in societal beliefs and habits, or even differ per person. Satisfiers might be aspects such as: convenience, looking cool, getting more healthy, etc.

(Yet we have to admit that the sub-questions are a bit ambiguous in this respect: the absence of a dissatisfier could be mentioned as a positive factor for the Sakarya situation, as the absence of a satisfier might be looked upon as a negative factor. The answers given appeared to reflect this ambiguity!)

In order to give the participants a start we defined several aspects which can be of importance. Next to this, participants were able to come up with their own criteria.

#### **Environmental aspects:**

- > Availability of infrastructure
- > Road safety
- > Natural surroundings
- > Climate
- > Attractiveness of urban environment
- > Presence of car industry
- > ...



#### **Technical aspects:**

- > Availability of travel mode
- > Travel time
- > Travel costs
- > Convenience of travel mode
- > ...

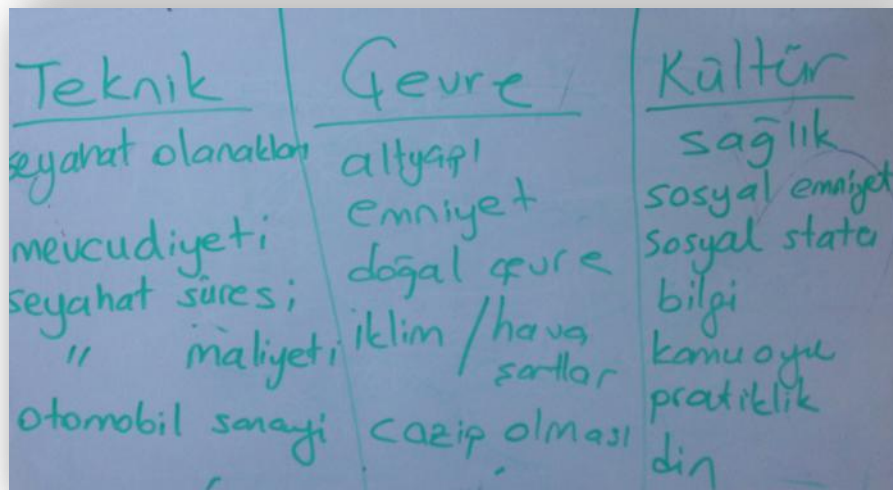


#### **Cultural aspects:**

- > Policy on travel mode
- > Societal importance of health
- > Social safety of travel mode
- > Social status of travel mode



- > Knowledge on travel mode
- > Public opinion on travel mode
- > Influence of religion
- > ...



The participants were asked to write down the most important satisfiers and dissatisfiers on mobility choices in Sakarya.

After that we collected the results and asked the participants to shortly explain their choices. Although the question was about 'mobility choices' in general, many

participants stated that their answer was focused on aspects that are positive or negative for the willingness of people to use bicycles as a mode of transport.

The next day we returned the results to the participants. The table below gives insight in the amount of times a certain aspects is mentioned as positive or negative factor. In some cases we collected aspects that had the same meaning (for example: weather and climate) and categorised it as one aspect (but named twice).

Positive		Negative	
Attractivity	2	Attractivity	1
Automotive industry	1	Automotive industry	3
Availability	5	Availability	3
Climate	2	Climate	1
Convenience	6	Convenience	3
Health	6	Infrastructure	4
Infrastructure	1	Knowledge	2
Knowledge	1	Policy	1
National funding	1	Safety	10
Policy	1	Short term thinking	1
Political will	1	Social status	6
Public opinion	1	Travel cost	6
Religion	2	Travel time	1
Safety	4		
Topography	6		
Travel cost	3		
Travel time	5		

#### Results of the workshop: satisfiers and dissatisfiers on cycling

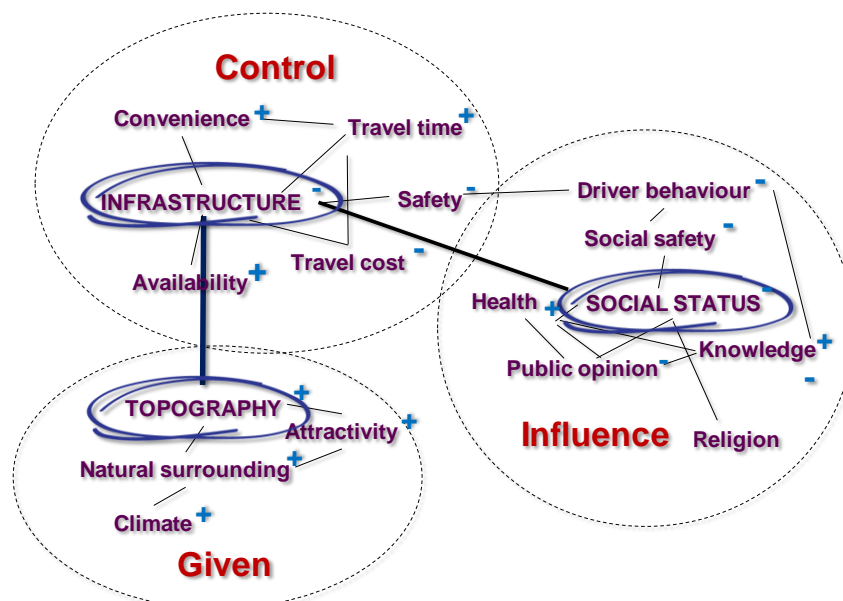
Some aspects are named both positively (satisfier) and negatively (dissatisfier). This is not surprising as personal choices differ: what is important for one person may be less important for others. Upon that there was the ambiguity of the questions as mentioned above. In this exercise our goals was to identify the main aspects, which are mentioned by many participants to be relevant for Sakarya. Aspects that are important for choosing a travel mode are: availability of travel mode, convenience when using a certain travel mode, health, topography of the city and travel time with a certain mode. Main dissatisfiers are: availability of infrastructure, travel safety, social status of travel mode and travel costs.

### 3.3 Recommendations for policy

After identifying the aspects that are most important, it is necessary to get insight in coherence between these aspects. Therefore we collected these into a 'word cloud', consisting of three 'sub-clouds' which are more or less one unit. The cloud shows related aspects which are directly interdepending on each other. Changing one aspect means the surrounding ones are directly affected. The + of – implies a positive impact (satisfier) or negative impact on cycling (dissatisfier).

The encircled aspects are the so called 'key aspects' which need to be influenced. If these are influenced, other aspects will benefit from that. There are three key aspects:

- > Social status, which can be influenced by the municipality of Sakarya through campaigns and raising awareness (or even by law). It is categorised as a dissatisfier, which means if not beneficial to cycling, less people will cycle. The current status of cycling in Sakarya is low, so is not beneficial now.
- > The availability and quality of cycling-friendly infrastructure, which is direct control of the municipality of Sakarya. Influencing this aspect will also have effect on the surrounding aspects. Cycling infrastructure is a dissatisfier, which means if not available in a right manner this will directly influence negatively the amount of cycling. The infrastructure plans of Sakarya will positively benefit cycling.
- > Topography, which can be seen as a 'given' condition. The topography of the area of Sakarya is mentioned as being positive for cycling, and is categorised as a satisfier: if beneficial, more people will go cycling, but it is not a major pre-condition.



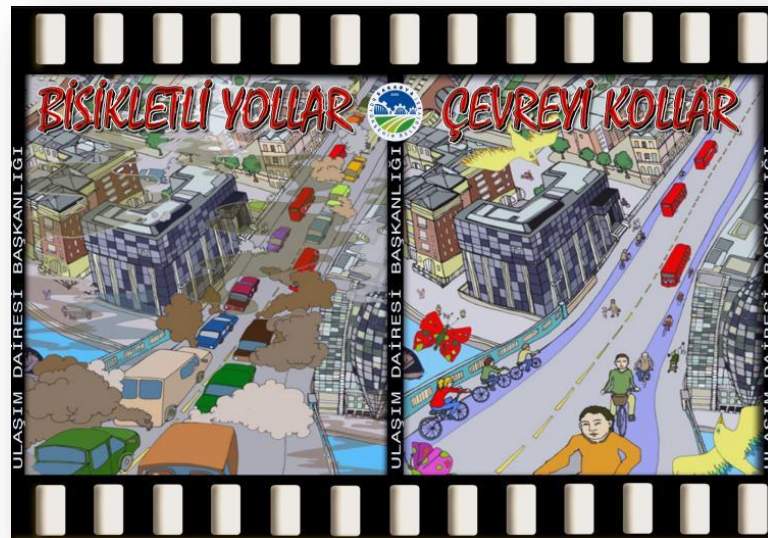
Word cloud with important satisfiers and dissatisfiers on cycling in Sakarya.

### 3.4 Recommendations for further development of cycling culture

Cycling can be stimulated in Sakarya by influencing one or more of the key-aspects mentioned in the previous paragraph. Sakarya is well on its way to plan and implement cycling-friendly infrastructure and to create a coherent cycling network.

As a recommendation we propose a 'phase two' on creating a cycling culture in Sakarya by influencing the 'social status' aspects. Interventions in this realm will have an impact on public opinion, health, status and eventually drivers' behaviour and social security on the road. The implementation of the cycling infrastructure should be accompanied by a public (awareness) campaign on the benefits of cycling. This includes education, promotion and discussion with stakeholders. The campaign should be positively brought, focussing on the beneficial aspects for inhabitants, such as health, safety, fun, environment, etc. It should be noticed not everyone will be affected by the same arguments (satisfiers are different), but safety is likely to be a shared concern for many inhabitants. Next to this, it might be positive to incorporate some 'role models' in the campaign. This might be popular persons, politicians, but also 'regular people' that people can relate to, depending on what is suitable in the context.

For this campaign we recommend to use the lessons of best practices worldwide, to be adapted to Turkish culture. Thus the campaign should focus on the right aspects and use the proper 'language' for the identified target groups. A suggestion from our side would be to conduct another workshop with international experts on cycling promotion. less focussing on the technical aspects but rather on the cultural and societal aspects (Of course these two are never fully separated). From the municipality of Sakarya both the Department of Infrastructure and the Department of Communication need to be involved.



Conceptual campaign poster on cycling, by the Municipality of Sakarya

## 4. Summary

The municipality of Sakarya has taken up the challenge to better include cycling in its transport policies. In 2010 city officials participated in a series of 3 workshops initiated by EMBARQ Türkiye and conducted by the Dutch ngo Interface for Cycling Expertise. This series of workshops resulted in the design of a pilot cycling route from Sakarya's sugar factory to the city centre and railway station. After 2010 the Sakarya Transportation Department proceeded with the further planning and design of a cycling route network.

The initiative of the Netherlands Ministry of Infrastructure and Environment in 2012 to support a Turkish city in improving its cycling policies provided an opportunity to revisit Sakarya, to evaluate the developments to date, to review the newly developed plans, and to give recommendations for the improvement of the plans. Thereupon this was an opportunity to formulate 'lessons learnt' for other Turkish cities that want to start up the inclusion of cycling in their transport policies.

The workshop learnt that the lessons of 2010 were used for the design of an additional 50 kms of cycling infrastructure. However, Turkish guidelines that have been drafted since 2010 suggest that smaller widths are acceptable in comparison with the minimum widths recommended by the Dutch experts in 2010. An important recommendation therefore is, to welcome the coming into existence of Turkish guidelines for cycling infrastructure and to ask for a review of these guidelines with involvement of international experts. For Sakarya we suggest to reconsider a number of the cross sections as proposed for their cycling routes. Also we made some general recommendations with regard to an integrated cycling-inclusive vision on transport for Sakarya, and subsequently the overall network management in Sakarya.

The provision of cycling infrastructure is meant to result in increased bicycle use. And although safe and attractive cycling-friendly infrastructure is an important condition for increased bicycle use, probably it won't be enough to bring about substantial shifts in the modal share of cycling and thus to take full advantage of the potential of cycling to contribute to the liveability of Sakarya. Therefore we recommend to look also at other elements that make a cycling culture. The low social status of cycling in Turkey is definitely one of the challenges that needs to be addressed. We propose that the implementation of cycling infrastructure will be accompanied by public awareness and promotion campaigns. It would be worthwhile to make an in depth analysis of all cultural and societal factors in Sakarya (and Turkey) that interfere with the emergence of a Turkish cycling culture.

