RTD Fact Sheet Template

STATE OF THE ART OF THE INTERVENTIONS FORESEEN RTD FACT SHEET	
Reference Measure	5.1 BOL Urban Traffic Safety Plan
Date of Submission	31/1/2011
Date of Approval	01/09/2011 (by ISIS)
Author(s)	Giorgia De Chiara-TeMA
Editor(s)	Loredana Marmora (by ISIS)

Context and Purpose

The Plan, as part of the PGTU (Urban Traffic Plan), focuses its attention on the urban street accidents, where the Municipality, owner of the street, has got an exclusive competence of intervention. The Plan presents the accidents evolution trend in the municipal territory from 1997 to 2008: 2008 is the year that sees a lower number of accidents, injuries and deaths, either in the city centre or in the municipal territory.
Furthermore, the Plan presents a comparison with other 15 Italian cities with more than 200.000 inhabitants, where it appears that Bologna is at the fifth position for accidents every 1000 inhabitants and at the fourth position for deadly accidents every 1000 inhabitants. This comparison with other cities of similar dimensions and inhabitants, shows that Bologna can improve its position, reducing the number of accidents through four intervention path: traffic engineering to reduce road accidents, protection of vulnerable road users, education/making aware and road control.
The RTD work, realized between months 4-8 was aimed at investigate the state of the art of the interventions foreseen within the plan with particular reference to: the black spots with the highest rate of accident analysis, project of new circulation rules, market analysis of ITS for safety, road safety plan, evaluation of results.

Description of RTD Activity

The RTD activity investigated first of all the **state of the art** of the interventions foreseen within the Safety Plan:

- interventions on black spots: the Safety Plan identifies the black spots with the highest rate of accident (a black spot is a term used in road safety management to denote a place where road traffic accidents have historically been concentrated). For the first 30 black spots (the ones with the highest accident rates) the Plan provides measures aiming at improving the quality of the infrastructure and at reducing the number of road accidents: on the 30 black spots where some interventions aimed to improve the quality of the infrastructure and the safety on the road were planned, 15 have been realized or are actually under realization; the other 15 interventions are at different levels of planning and realization.
- protection on weak users: with reference to safety analysis related to mortal accidents happened in very closed zones (from 1999 to 2004), between the 11 zones where structural interventions were planned 6 have been realized
- other interventions related to the protection of the pedestrian crossings have been realized: 7 road segments equipped with middle traffic islands, 12 road crossings with traffic lights. The 30 km/h zone has to be planned.
- within the speed control 20 STARS locations (STARS is a system for red light crossing control and automatic enforcement that consists of a photographic camera settled into protective devices see measure 8.5) have been realized.

Below the performance analysis of the interventions realized is reported:
The situation of accidents, deaths and injuries “before” and “after” the realization of these different categories of interventions have been analyzed in order to show the efficacy of every kind of intervention.

- Middle traffic islands: analysis of the 7 road segments[1]. Given that the data are referred to different periods of observation (the interventions have been realized in different periods of time) the comparison above is more significant if reported in terms of percentage, as follows:

TRAFFIC ISLANDS	ACCIDENTS	DEATHS	INJURES
BEFORE	31	2	37
AFTER	23	0	27
Δ%	-25,8%	-100%	-27%

- Creation or settlement of crossings equipped with traffic lights: analysis of 12 road crossings[2] (the total analysis comprehended the hour and the date of the accident, the typology, death on the 24h, death at the 30th day, and vehicles involved)

CREATION OR SETTLEMENT OF CROSSINGS EQUIPPED WITH TRAFFIC LIGHTS	ACCIDENTS	DEATHS	INJURES
BEFORE	35	0	48
AFTER	22	1	36
Δ%	-37,14%	-	-25%

- STARS: actually in Bologna there are 24 sections controlled by Stars, that correspond to 15 video- controlled crossings. The following scheme shows the data on the accidents one year before and one year after the activation of the system STARS. The settlement took place in 2 phases with a first testing whose results are reported on the first three positions of the list; then are reported the results of the second phase. In the scheme are underlined in yellow the number of accidents and injuries after the settlement of the system, while are underlined in turquoise the intersections that had the settlement of STARS in the second phase (the partial totals refer to the settlement of this second phase).

Crossings		**Sept 2002 Ago 2003**	**sept 2004 Ago 2005**	**Sept 2005 Ago 2006**	**Sept 2007 Ago 2008**	**Sept 2008 Ago 2009**	Δ	**Δ%**
Saffi Malvasia	Accidents	17	13	5	3	2	-15	-88,24%
	Injures	28	16	8	3	2	-26	-92,86%
Lenin Po	Accidents	10	5	5	7	4	-6	-60,00%
	Injures	17	8	8	10	7	-10	-58,82%
Mattei Martelli	Accidents	8	6	5	3	5	-1	-16,67%
	Injures	16	7	7	3	8	1	14,29%
San Donato Del Lavoro	Accidents	11	11	7	10	4	-7	-63,64%
	Injures	13	18	9	16	6	-12	-66,67%
San Donato Repubblica	Accidents				2	3	1	50,00%
	Injures				4	5	1	25,00%
Carducci Dante	Accidents				8	6	-2	-25,00%
	Injures				14	7	-7	-50,00%
Dagnini Orti	Accidents				5	1	-4	-80,00%
	Injures				6	1	-5	-83,33%
Masi Leandro Alberti	Accidents				6	2	-4	-66,67%
	Injures				7	2	-5	-71,43%
Shakespeare Peglion	Accidents				0	0	0	0,00%
	Injures				0	0	0	0,00%
Beroaldo Andreini	Accidents				2	3	1	50,00%
	Injures				2	3	3	50,00%
Murri Gandino	Accidents				5	4	-1	-20,00%
	Injures				6	5	-1	-16,67%
M.E. Lepido	Accidents				1	0	-1	-100,00%

[1] Zanardi, Via Felsina, Via Dante, Barca, Barbieri Francesco, Ferrarese, Panzini
[2] Pietra-Emilia, Murri Parisio, Tocana Mascagni, Toscana Camaldoli, Emilio Lepido Salute, Zanardi Poste, Don Sturzo, San Donato Repubblica, San Donato Zacconi Beroaldo, Salvemini Einaudi La Malfa, Quercia Matteotti, Silvani Calori

Cavalieri Ducati	Injures				6	0	-6	-100,00%
Togliatti De Pisis	Accidents				3	2	-1	-33,33%
	Injures				7	2	-5	-71,43%
Sabotino Vicini	Accidents				3	2	-1	-33,33%
	Injures				5	2	-3	-60,00%
Laura Bassi Mezzofanti	Accidents				5	4	-1	-20,00%
	Injures				10	4	-6	-60,00%
	Accidents			**51**		**31**	**-20**	**-39,22%**
PARTIAL TOTAL	**Injures**			**85**		**37**	**-48**	**-56,47%**
	Accidents			**84**		**42**	**-42**	**-50,00%**
GENERAL TOTAL	**Injures**			**137**		**54**	**-83**	**-60,58%**

Other analysis have been carried out considering the accidents took place in sections where no interventions have been realized (not even time regulations) in order to verify STARS influence on crossings equipped with traffic lights.

Outputs and Results

	Typology of intervention		accidents	deaths	injures
1	Protection of the pedestrian crossings tank to traffic islands (1)	before	31	2 (2)	37
		after	23	0	27
		Δ %	-25,8%	-100%	-27%
2	Pedestrian crossings equipped with traffic lights (isolated and in support of intersections that already had traffic lights (1)	before	35	0	48
		after	22	1	36
		Δ %	-37.14%	-	-25%
3	STARS	before	84		137
		after	42		54
		Δ %	-50%		-60.58%

(1) the number of accidents/injures is not referred only to pedestrians but it includes all typologies of road accidents
(2) pedestrians injures during pedestrian crossing crossing

For the categories of interventions 1 and 2 it is possible to see that, even though they were thought mainly to support the pedestrians, finally they produced some benefits also for the general conditions of the traffic, probably because they produced a reduction of the speed and a better detection of the conflict spots between the different road users. On traffic lighters where Stars is installed, there has been a 50 % reduction of accidents and a 61% reduction of injuries. In 2009, deadly accidents in Bologna increased (the accidents detected are24). The results regarding deaths and injuries reduction, have been better than the expectations.
The analysis considering the accidents that took place in sections where no interventions have been realized has evidenced that the crossings are those where accidents were already low therefore the result are not completely indicative of the general course. In any case not a correlation with the carried out installations and with a total trend in lessening regarding the accidents in all Bologna territory it's observed.

Resulting Decision-making

In the measure 5.1 the efforts are concentrated on the vulnerable road users, aiming at developing solutions to improve both safety and mobility of them. The study is a measure landmark for making informed decisions, according to measure 5.1 approaches (accident reduction, in which traffic engineering interventions are taken to reduce the number and severity of accidents in black spots, and spatial accessibility of vulnerable road users, in which actions are made in order to promote the mobility vulnerable users), thanks to the results monitoring since they can show the efficacy of every kind of intervention and the evidence of the most critical situations. The RTD results represent the base line for the measure evaluation approach.

Lessons Learnt

The realization of a plan needs the coordination (from a technical and organizational point of view) of different subjects. The main insights learnt in the process of conducting the RTD activity, necessary in order to develop the entire measure process, is the importance of a great and continuous cooperation between, first of all, 3 different subjects: Municipality Police offices, Mobility offices and Public Works offices, in order to obtain an integrated information management that supports all decisions, to guarantee the process continuity and reliability towards citizens

Cost-effectiveness

The RDT activity was a substantial element of the measure implementation, necessary to direct future decisions also regarding next interventions to be realized (the analysis have been carried out in deep, considering specific data for each accident registered)

Dissemination and Exploitation

The focus of the measure 5.1 is part of a general strategy deployed by the municipality, via the PGTU (Urban Traffic Plan), that aims to improve the road safety and mobility; therefore it is possible to consider this measure in a more general context also comprehending the effects of the measures:

5.2 Safer Road to School;

8.5 Stars Automatic Enforcement of Traffic Lights.

The base line of data and results obtained are utilized also for the others two measures reported above and useful for making the related decisions, highlighting the most critical situations and the first results of the interventions foreseen.

.