Working Party on Transport Statistics

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Information on the "SafeFITS" project

Note by the secretariat

I.   Background

1.   Road safety is an important sustainable development goal, yet relatively underappreciated and greatly underfunded. Every year, about 1.3 million people die globally and another 20 to 50 million sustain non-fatal injuries as consequences of road traffic accidents. Road accident injuries now rank as the world's eighth-leading cause of death and young adults aged between 15 and 44 years account for 59% of global road traffic deaths. Approximately 90% of killed in road crashes are from low- and middle-income countries; yet they own around 54% of the world's motor vehicles. The costs of road crashes are estimated to 2% to 5% of GDP in developing countries, undermining efforts to reduce poverty and accelerate sustainable development. More than half of global deaths are among pedestrians and motorized two-wheeler drivers. These losses are tragic and needless and these alarming findings underscore the urgent need for action to improve road safety globally.

2.   In 2010 UN General Assembly (GA) has proclaimed decade 2011-2020 as the United Nations Decade of Action for Road Safety, with a goal to stabilize and reduce the forecasted level of road traffic fatalities globally by increasing activities conducted at the national, regional and global levels. Recently adopted (April 2016) GA Resolution A/70/L.44 reaffirms adoption of the Sustainable Development Goal (SDG) targets on road safety outlined in the 2030 Agenda for Sustainable Development:

- SDG target 3.6, which aims to reduce global road traffic deaths and injuries by 50% by 2020 and

- SDG target 11.2, which aims to provide access to safe, affordable, accessible and sustainable transport systems for all by 2030.

3.   At the same time, two major UNDA financed projects have been completed under the leadership of UNECE:

- UNDA financed project Improving Global Road Safety: setting regional and national road traffic casualty reduction targets, led by UNECE Sustainable Transport

Division, was finalized in 2010 and resulted in a set of road safety measures that are focused on specific targets with proven results in improving road safety.

- The project *For Future Inland Transport Systems (ForFITS)*, finalized in 2013, aimed to facilitate knowledge based transport policy decision making related to CO_2 reduction. The project developed the ForFITS tool, which estimates the expected amount of CO_2 generated by the inland transport modes for different transport policy options (transport activity, energy use, modal split, vehicle fleet etc.).

4. Building on the knowledge base in UNECE and largely due to success of the ForFITS and other technical assistance activities, the secretariat developed the project concept for SafeFITS to close the gap in the theoretical assessment of results of road safety policy, measures and trends. The International Road Transport Union (IRU) has agreed to finance the development of the SafeFITS tool.

5. Project "Safe Future Inland Transport Systems (SafeFITS)" aims to facilitate knowledge-based transport policy decision making related to road casualty reduction. The SafeFITS was planned with the primary objective to assist governments and decision makers, both in developed and developing countries, to decide on the most appropriate road safety policies and measures in order to achieve tangible results in improving road safety. The model will be based on historical road safety data and relations between several road safety parameters/indicators and it is expected to provide information on effectiveness of different road safety scenarios based on the chosen policies/measures.
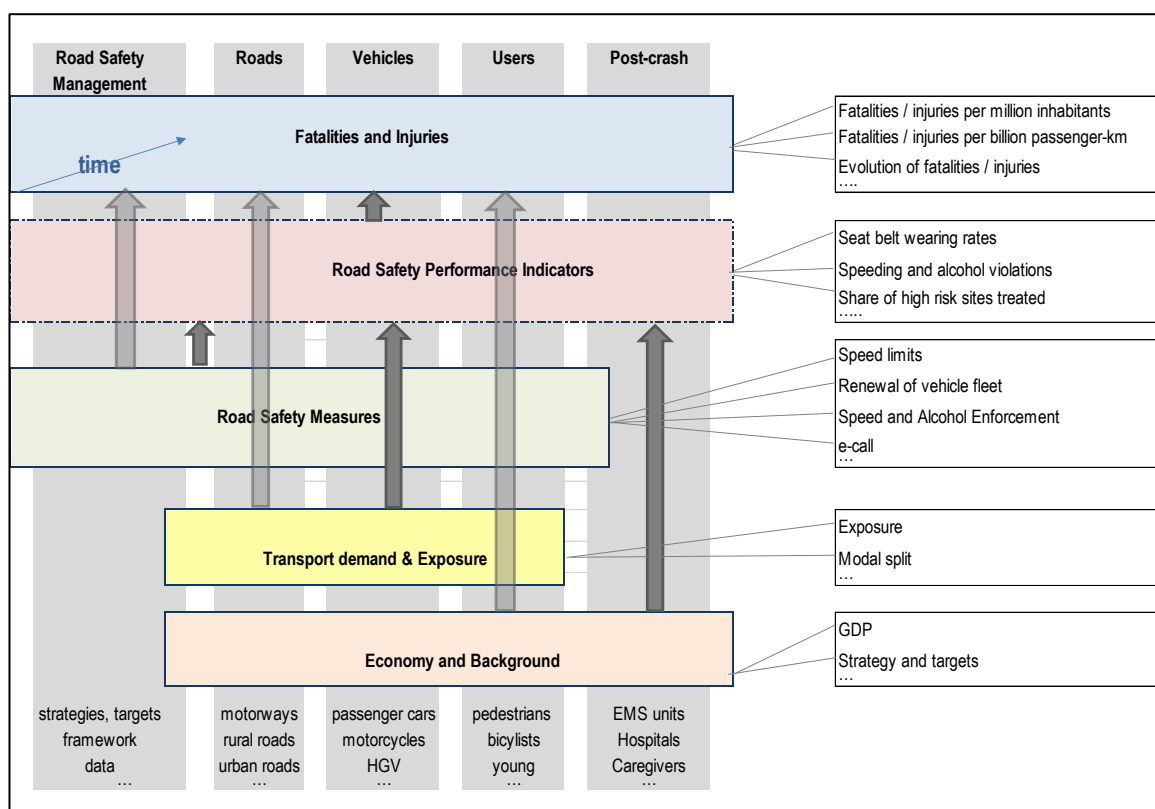
II. Methodological Framework

6. In the SafeFITS project, the road safety management system is represented by five layers (Economy and Management, Transport demand and Exposure, Road Safety Measures, Road Safety Performance Indicators, Fatalities and Injuries) and five pillars (Road Safety Management, Road Infrastructure, Vehicle, User and post-Crash Services).

7. The layers can be described as follows:

- Economy and Management: the first layer reflects the structural, economic, cultural and regulatory characteristics (i.e. policy input) of each country, that are related to road safety performance;

- Transport demand and Exposure, at the second layer, reflects the characteristics of the transportation system and the exposure of the population due to urbanization and urban sprawl, modal split (share of trips per mode), road network type, share of traffic (vehicle- and passenger-kilometres) or travel per mode and per road type etc.

- Road Safety Measures (policy output): the third layer includes the specific road safety programmes and measures and their characteristics;

- To link these first three layers to the final outcome, an intermediate (fourth) layer specifies the operational level of road safety in the country, containing road Safety Performance Indicators (SPIs) on issues in the five pillars;

- Final outcomes are expressed in terms of fatalities and injuries (road casualties) to understand the scale of the problem. This information is in layer 5.

Figure 1
SafeFITS Conceptual Framework

Road Safety Management	Roads	Vehicles	Users	Post-crash

Fatalities and Injuries

time

Fatalities / injuries per million inhabitants
Fatalities / injuries per billion passenger-km
Evolution of fatalities / injuries
....

Road Safety Performance Indicators

Seat belt wearing rates
Speeding and alcohol violations
Share of high risk sites treated
.....

Road Safety Measures

Speed limits
Renewal of vehicle fleet
Speed and Alcohol Enforcement
e-call
...

Transport demand & Exposure

Exposure
Modal split
...

Economy and Background

GDP
Strategy and targets
...

strategies, targets framework data ...	motorways rural roads urban roads ...	passenger cars motorcycles HGV ...	pedestrians bicylists young ...	EMS units Hospitals Caregivers ...

III.   Current situation

8.   The research and development (R&D) nature of the SafeFITS project and the fact that until today very few projects globally dealt with prediction of the outcomes of the road safety strategies imposed the necessity for project implementation in phases. Each phase presented a separate R&D project and only after completion of the given phase – based on that phase deliverables – Steering Committee was able to decide on continuation of the project implementation.

9.   The SafeFITS Project Phase I resulted with a Literature review of the most relevant road safety studies and projects for SafeFITS development, a list of statistical data required and a draft outline of the Conceptual Framework for SafeFITS model. The Phase I showed the feasibility of the project continuation towards SafeFITS model. The SafeFITS Phase II resulted with the SafeFITS Conceptual Framework with an outline of the model (with description of three Modules), data requirements and a list of the most relevant relations/causalities to be included in the SafeFITS model (Module I). The Phase II concluded that deterministic models could not be developed for SafeFITS and that statistical models based on robust road safety indicators' database could be the most appropriate solution. The result of Phase III should be a draft SafeFITS model and application/user interface, tested and verified by pilot tests.

10.   The SafeFITS Project Phase I started in the first quarter of 2015 and included:

• a literature review of the most relevant road safety studies and projects that can be used for the development of the SafeFITS tool;

- a list of statistical data that are considered necessary to describe and monitor road safety performance, along with the identification of the available data sources; and

- a draft outline of the conceptual framework of the SafeFITS model.

11. The SafeFITS Project Phase II started in July 2015 and was finalized at the end of November 2015. Building on SafeFITS Project Phase I, the Phase II produced the following results:

- SafeFITS conceptual framework - The SafeFITS conceptual framework includes an outline of the SafeFITS model architecture and a description of data requirements. The SafeFITS model (to be developed in Phase III) will include three distinct and complementary modules, all serving road safety policy analysis:

    - An "intervention analysis" module to allow the user to perform intervention analyses, i.e. forecast the safety effects of a specific road safety measure or intervention for a given country and short time period, all other things kept constant.

    - A "benchmarking" module, to allow the user to benchmark a country against other countries, by comparing the road safety outcomes in relation to the basic road safety indicators, and identifying the priority areas on which the country should focus on for the improvement of its road safety outcomes.

    - A "forecasting" module which will allow the testing of scenarios of measures and programmes at the national level.

- List of the most relevant relations (causalities) - Building on the results of the broad literature review of Phase I, a detailed review was performed seeking to identify quantifiable causal relations linking the priority indicators of the SafeFITS model to the outcome indicators (casualties and fatalities). The identification of relations/causalities of the model's priority indicators was reviewed in conjunction with the development of the model's conceptual framework and the results will be used in "intervention analysis" SafeFITS module.

IV.   The next steps

12.   The SafeFITS Phase III has started in May 2016 and should develop the knowledge base, the database (proposed data set presented in the annex) and the SafeFITS statistical model and enable the implementation of the three modules and the related user interfaces. The development of the model will require from the consultant, systematic road safety related data collection for all relevant countries. After completing the data collection and based on the relationships between indicators and outcomes, the final structure of the SafeFITS model will be defined and the model's parameters will be estimated. Model calibration and validation will be done before model's pilot tests.

13.   In order to continue discussion on SafeFITS with road safety professionals (renowned representatives of academia and practitioners) a round table will be organized to seek peer review comments. Round table will be held in the second part of 2016.

14.   Draft SafeFITS model will be tested and assessed through pilot tests of the model in a few selected countries (possibly in 2016) and seek synergy with the UNDA funded "Strengthening the national road safety management capacities of selected developing countries and countries with economies in transition" project. Based on the test results, the model parameters will be further calibrated and adjusted.

15.   Once completed:

- The SafeFITS model will be made publicly available in a customized application, with necessary guidelines for application;

- The literature review, the description of the model and the round table summary will be issued as an UNECE publication;

- UNECE will use the SafeFITS tool in its on-going and future road safety projects.

Annex

Proposed Data Set

	INDICATOR	SOURCE
	Economy & Management	
1	Population numbers for 2010	WHO, 2013
2	Area (km2)	CIA
3	GNI per capita for 2010 in US dollars	WHO, 2013
4	Number of registered vehicles	WHO, 2013
5	Number of cars and 4-wheeled light vehicles	WHO, 2013
6	Motorized 2- and 3- wheelers	WHO, 2013
7	A lead agency is present	WHO, 2013
8	The lead agency is funded	WHO, 2013
9	There is a national road safety strategy	WHO, 2013
10	The strategy is funded	WHO, 2013
11	Country has time-based national road safety targets	WHO, 2013
12	Blood alcohol concentration limits less than or equal to 0.05 g/dl?	WHO, 2013
13	Blood alcohol concentration limits lower than 0.05g/dl for young/novice drivers?	WHO, 2013
14	Blood alcohol concentration limits lower than 0.05g/dl for commercial drivers?	WHO, 2013
15	There is a national seat-belt law	WHO, 2013
16	The law applies to front and rear occupants	WHO, 2013
17	There is a national helmet law	WHO, 2013
18	There are helmet standards	WHO, 2013
19	Law applies to hand-held phones	WHO, 2013
20	Law applies to hand-held and hands-free phones	WHO, 2013
21	Front and rear seat belts	WHO, 2013
22	Airbags	WHO, 2013
23	Anti-Lock Braking System	WHO, 2013
24	Billion passenger-km travelled by road /rail	IRTAD
25	Billion Vehicle km of travel for passenger cars	IRTAD
26	Technical inspection mandatory for passenger cars	ERSO/CP
27	Driving licences thresholds (minimum ages per category) for passenger cars	ERSO/CP
28	Driving licences thresholds (minimum ages per category) for motorcycles	ERSO/CP
29	Driving licences thresholds (minimum ages per category) for trucks and goods vehicles	ERSO/CP
30	Country has a target to eliminate high-risk roads	to be defined
31	Country has adhered to the United Nations road safety related agreements and conventions	to be defined
32	Country has dedicated funds to implement road safety strategy	to be defined
33	Country has officially approved guidelines for road design, RSAs etc.	to be defined
34	Billion Vehicle km of travel for motorcycles	to be defined
	RS Measures	
35	Audits on new roads	WHO, 2013
36	Audits on existing roads	WHO, 2013
37	Universal access telephone number	WHO, 2013
38	Effectiveness of enforcement- Seat- belt	WHO, 2013
39	Effectiveness of enforcement- Alcohol	WHO, 2013
40	Effectiveness of enforcement- Speed	WHO, 2013
41	Maximum speed on urban roads (km/h)	WHO, 2013
42	Maximum speed on rural roads (km/h)	WHO, 2013
43	Maximum speed around schools (km/h)	WHO, 2013
44	Demerit/ Penalty Point System in place	WHO, 2013
45	New cars subjected to new car Assessment Programme	WHO, 2013
46	HRS network coverage	IRTAD, 2014
47	Country has data systems in place to monitor progress in achieving road safety targets;	IRTAD, 2014
48	Country has systems in place to monitor road user attitudes and behaviour	IRTAD, 2014
49	compulsory / voluntary education programmes in primary / secondary school	ERSO/CP
50	compulsory / voluntary education programmes for particular groups (e.g. elderly, bicyclists)	ERSO/CP
51	Length of road sections improved (lighting, visibility, markings, signing, road surface, etc.)	to be defined

	INDICATOR	SOURCE
	RS Performance Indicators	WHO, 2013
52	Helmet wearing rate- All riders	WHO, 2013
53	Helmet wearing rate- Drivers	WHO, 2013
54	Helmet wearing rate- Passengers	WHO, 2013
55	Seat-belt wearing rates- drivers only (%)	WHO, 2013
56	Seat-belt wearing rates- Front seat occupants (%)	WHO, 2013
57	Seat-belt wearing rates- Rear seat occupants (%)	WHO, 2013
58	Length of non-paved roads per 1000Km of road network	CIA
59	Estimated % seriously injured patients transported by ambulance	WHO, 2013
60	Average percentage occupant protection score for new cars sold	ETSC, 2008
61	Percentage of drivers above legal alcohol limit in roadside checks	ETSC
62	Median age of the passenger car fleet	ETSC, etc
63	Mean speed on rural roads- Low speed limit	ETSC
64	Mean speed on rural roads-High speed limit	ETSC
65	Mean speed on urban roads (km/h)- cars&vans	ETSC
66	Mean EMS response time	to be defined
67	Share of High Risk Sites treated	to be defined
68	Percentage of rural road network not satisfying design standards	to be defined
	Fatalities & Injuries	
69	Reported number of road traffic deaths (2010)	WHO, 2013
70	Estimated road traffic death rate per 100.000 population	WHO, 2013
71	Road User fatalities (%)- Drivers/ passengers of 4- wheeled vehicles	WHO, 2013
72	Road User fatalities (%)- Drivers/ passengers of motorized 2 or 3- wheelers	WHO, 2013
73	Road User fatalities (%)- Cyclists	WHO, 2013
74	Road User fatalities (%)- Pedestrians	WHO, 2013
75	Road User fatalities (%)- Other or unspecified users	WHO, 2013
76	Proportion of road traffic deaths that are attributable to alcohol %	WHO, 2013
77	Fatalities/ million population-2009	IRTAD
78	Fatalities/ million population-2010	IRTAD
79	Fatalities/ million population-2011	IRTAD
80	Fatalities/ million population-2012	IRTAD
81	Fatalities/ million population-2013	IRTAD
82	Annual avg % reduction in fatalities (2004-2013)	IRTAD