

Botanical Garden of the University of Valencia (Spain) 14-15/June/07

Urban Traffic Accident data collection and analysis in Europe: Survey study

Urban Accident Analysis Systems

Project co-financed by the European Commission, Directorate-General Transport and Energy (TREN-03-ST-S07.30828)

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Transport



[Objective]:: Stages of the study

- Obtain an approximation of the characteristics of the current accident collection and analysis systems carried out at the local and European level.
- Prior stage: Convention with the DGT. Survey about urban traffic accident data management in Spain.
- 1st Stage: European Survey "A" sent to contacts expert in traffic - in different European countries.
- 2nd Stage: European Survey "B" from the results obtained in the previous stages.





[Prior stage: Spain]:: Description

The survey on Urban traffic accident data management contains 87 items of different type, Likert scale type, of multiple answers, single answer, and open question.

The items refer to:

- Descriptive characteristics
- Accident rate evaluation
- Police forces and traffic management
- Specific training
- Procedures (information record, management, analysis...)
- Resources (materials, questionnaires, programmes...)
- Representativity (under-reporting)
- Data quality (under-recording, biases,...)
- Analysis possibilities and information usefulness
- Monitoring within 30 days
- Identification of strong and weak points, new ideas
- Complaints and actions of accident prevention
- Collection of the documentation used
- Objective: To diagnose the situation of the procedures, systems and quality of the collection of traffic accident questionnaire information in urban areas with municipal competences in traffic in Spain. To study the current information needs by analysing and identifying the main deficits and deficiencies in the use of data collection and codification.





Observatorio Nacional de Seguridad Vial

[Prior stage: Spain]:: Study stages Sample

- Establishment of a Technical Commission of multidisciplinary work of which function has been to put together the fundamental contents of the survey and evaluate each item, through the achievement of a pilot test.
- Elaboration of a first version "pilot survey-questionnaire". Study, evaluation and modification of the contents and design of the definitive version of the survey.
- Design of the sample distribution based on the size of the population. For that, a minimum size of 5.000 inhabitants is considered, establishing layers from the following points of cut: 20.000, 50.000, 150.000 and 500.000. This raises groups of accumulated population enough approximate. With that all the great cities are covered, reducing the coverage as the size of population reduces.
- Sending of the survey.
- Follow up of the reception of the survey and use of different reminder strategies to collect the information.
- Entry of the questionnaires received and analysis of the information.
- Writing of a final report in which the study carried out and the most important results are commented and explained, and a diagnosis and the main conclusions are extracted.

[1st Stage: European Survey A]:: Description

- The European Survey "A" sent to several contacts expert in traffic contains 24 items of different type; with many open questions.
- Objective:
 - To receive feedback about the adequacy of the selected procedures to distribute the survey to the police agents in charge of the urban traffic accidents.
 - To know some main characteristics about the urban traffic accident management in each country, aiming to avoid terminological confusions.
 - Instrument of decision to design one or several surveys.
 - The items refer to:
 - Police forces competent in urban traffic accidents
 - Organizations competent to take the decisions about traffic
 - Addresses of the contacts
 - Documents used by the police to collect information
 - Organisation that carries out urban accident rate statistics
 - Use of specific software
 - Actions carried out to improve the data quality, reliability and management
 - Negative or improvable aspects of the current collection systems
 - Best practices

[2nd Stage: European Survey **B**]:: Description

- The "B" survey is aimed at the police forces competent on urban accidents in the different European countries
 - <u>Objective:</u> To obtain an approximation of the characteristics of the current accident rate collection and analysis systems carried out at the local level in Europe. Concretely:
 - Collection systems
 - Data management
 - Data storage
 - Main identified problems

- The survey has been sent in three languages (English, French, Spanish) and it could be filled in on paper or on-line.
- The European Survey "B" contains 39 items of different type; Likert type scale, multiple answer, single answer, and open question.
- The items refer to:
 - The characteristics of the municipality
 - Accident rate information
 - Specific training of the police
 - Completion of statistical questionnaires
 - Collection systems
 - Identification of strong and weak points, new ideas
 - Accident rate evaluation





[Main results]:: Police action, traffic accident competences and management

Almost all the countries that answer the European survey point out that in their cities they do have traffic units (i.e. that exclusively attend traffic and road safety questions). The police generally do not depend on the Town Council except for Estonia, Luxembourg, Poland and Spain.

- Most of the police agents in charge of the urban accidents are competent in the roads that belong to the municipality:
 - State or regional unique police forces: The polices of the Czech Republic, Estonia, Sweden, Slovenia, Luxembourg and Poland are competent in urban zones and in motorways.
 - Motorway police forces different from the ones that act in urban zones: In Spain, Belgium, Germany, Hungary, the Netherlands and France.
- The coexistence of several police forces is usual, most of the time with different action scopes and sometimes shared like in Italy. The disparity of territorial competences and distributions of the different polices makes the comparison very difficult.

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Country	Who collects the accident data	Another police	
Belgium	Local Police	The national one and a mobility deferral service	
Bulgaria	No answer		
Cyprus	National or federal police	With the help of the regional police	
Czech Republic	National or federal police		
Estonia	Regional police		
Hungary	Local police	Regional police	
Germany	Local police	Der Polizeipräsident in Berlin	
Lithuania	Local police		
Luxembourg	National or federal police		
Romania	Regional police	National or federal police	
Slovakia	National or federal police		
Slovenia	Regional police		
Switzerland	Local police	Canton police	
United Kingdom	om Local police		
Spain	Spain Local police Traffic Civil C		
The Netherlands	Regional police	KLPD (national)	
Italy	Polstrada Police	Carabinieri	
Greece	Local police		
Poland	Regional police	Police Authority (country) District Police (regional) Local Police(towns)	
Sweden	Local police	Regional	
France	National Police	Gendarmerie	

[Main results]:: Police training

- According to the surveyed polices:
- Hungary and Belgium are the only countries in which the police in charge of the accident data collection have not received any specific training.
- The Czech Republic facilitates training with practical experience.
- Switzerland and United Kingdom train the departments according to the task they fulfil (e.g.: Switzerland trains the agents that collect data only for the questionnaire completion).
- In Spain, according to the CUAAS Survey, 50% of the police are trained for filling in statistical questionnaires. 43% on the DGT questionnaire.



In Spain, the size of the town is a decisive factor for the training of the agents.

The smaller training for statistical questionnaires in Spain as for the SAU survey may be due to the size of the municipalities that answer the survey.



[Main results]:: Traffic accident definition

- The traffic accident definition causes divergences among European countries, so this does not allow an accurate comparison of the accident rate between the countries.
 - WHO definition: traffic accident is the accident in which there is at least one vehicle involved in a public road or in a private road allowing the access to the public and in which, there is at least one fatality or injured person.
 - Germany, Luxembourg and United Kingdom answer that the definition of the traffic accident in their country does not correspond to the WHO definition.
 - Belgium, Cyprus, Czech Republic, Slovakia, Estonia, Hungary, Lithuania, Romania, Slovenia, Switzerland and Spain do adopt this definition, even though the nuance of the incorporation of the damage only accidents is made.



[Main results]:: Traffic accident definition

	PUB. ROAD	MOB.	VICTIMS	MATERIAL	OBSERVATIONS
Belgium	×	÷	36		The fatal accident is distinguished Suicides are excluded
Bulgaria					
Cyprus	×	÷	36	*	
Czech Republic	*	×	æ	*	Material damages when exceeding a certain amount
Estonia	×	×	<mark>.*</mark>		for the statistics, only with casualities.
Hungary	×	÷	36	*	Fortuitous and unintentional accident
Germany	×	×	*	*	For material damages, tow-away vehicle Suicides are excluded Accidents caused by alcohol
Lithuania	×	÷	*		
Luxembourg	×	×	38t	*	Non-motor vehicles are included It does not rule out natural death
Romania	×	×	*	*	
Slovakia	×	×	*	*	
Slovenia	×	×	*	*	
Switzerland	×	×	*	*	Premeditated action is excluded
United Kingdom	×		*		STATS-20 definition - Motor or non-motor vehicle - In motion or not - Up to 30 days for notification - Includes "Royal Parks" y level crossings - Natural death and suicide are excluded



[Main results]:: Traffic accident definition

	PUB. ROAD	MOB.	VICTIMS	MATERIAL	OBSERVATIONS
Spain	*	÷	×	*	Statistically, with casualties only
France	÷	*	÷		Suicides, premeditated action and natural disasters are excluded
Greece	*	÷	÷		
Italy	*	*	÷		The vehicle has to be in motion
The Netherlands	*	×	*	*	Statistically, the slight ones are not included. No exact definition of the slight ones. Suicides are excluded All if the police is involved. The protocol and the amount of information vary according to the situation.
Finland	*	÷	*		The slight ones are not included. No exact definition of the slight ones.
Austria	*	÷			Suicides are excluded
Denmark	*	÷			Suicides are excluded
Norway	*	÷			
Poland					Collects every accident no matter the consequences
Portugal	*	×			Suicides are excluded
Sweden	*	×			Natural death is not ruled out Statistically, only with casualties. Material damages for insurance companies and trials.



[Main results]:: Data collection Documentation

- There are no differences between the documents that generates an accident in motorway or in urban area in any of the surveyed countries except for Germany.
- Except for Sweden, Germany and Estonia, all the countries have to fill in several documents to collect all the accident information.
- However, we have to bear in mind that:
 - The needs of the urban information are different from the motorway ones.
 - The management characteristics are different and more varied.
 - The available means in the municipalities are not always sufficient.
- The coexistence of different police forces in charge of collecting traffic accident information makes necessary the establishment of standardized procedures to collect, manage, exploit or analyse the accident rate data.

Country	Could you point out the documents that the "police" have to generate in your country when dealing with a traffic accident with casualties?				
	Document 1	Document 2	Document 3	Document 4	
Belgium	x	Х			
Czech Republic	х	х	х	х	
Estonia	х				
Greece	х	х	х	х	
Hungary	х	х			
Italy	х	х	х		
Luxembourg	x	х	х	х	
Netherlands	x	х			
Sweden	x				
Slovenia	х	х	х		
Germany	х				
Poland	х	х	х		
Spain	х	х	х		
United kindom	х	х			

[Main results]:: Collection of information "in situ"

- Objective: to know what is the methodology used to collect accident data in the place where it happens.
 - → Own form (in paper) developed for that purpose
 - → Free notes
 - → Entry of the data directly in a laptop
 - Directly in the national statistical questionnaire
- Cyprus, Czech Republic, Hungary, Romania, Switzerland, Sweden and United Kingdom directly collect the information if the national statistical questionnaire.
- In the Czech Republic, Hungary, Slovakia, Sweden and Switzerland the data is directly entered in a laptop. In Spain, this methodology is used by 3,1% of the surveyed municipalities.



Recogida de información en el lugar del accidente

::[Main results] Questionnaire for the accident statistics

- ➔ In all the countries there is a compulsory national statistical questionnaire. (In Germany it is integrated in the computer system).
- → The statistical questionnaire is the same for all the accidents with casualties (slight, serious or fatal). Luxembourg has a statistical questionnaire for the fatal accidents.
 - → It is like that is spite of the fact that:
 - \rightarrow In the slight accidents there is less time for intervention.
 - \rightarrow The training of the agents that attend these accidents use to be smaller.
 - The investigation procedure is much more lower than the one carried out for more serious accidents.
 - \rightarrow In many cases, the police are not present.
- Added to this questionnaire, several countries report the existence of local traffic accident questionnaires that are also filled in in case of accidents with casualties. (Belgium, Hungary, Switzerland, Spain).
- Countries like Slovenia, Poland, Bulgaria, Hungary, Germany, Luxembourg, Romania, Switzerland and Spain report the existence of other specific questionnaires for damage-only.
- Moreover, in several countries, special accidents are recorded no matter its severity: alcohol related, with the police...



- All the countries fill in and send the accident rate statistical questionnaires to one or several central organizations in their country (National database, Scientific Institutes, National Service of Statistics, Police Central Office, National Council of Road Safety, General Directorate of Roads...).
 - There are differences between the countries in connection with the methods used to fill in and send the statistical information. Even in a same country, depending on the municipality or region the system varies. More and more countries are using computer systems to fill in and send the data.
- The ideal information entry and sending system would imply a police software that:
 - allows carrying out several steps/formalities avoiding the duplication of entering information.
 - contains a unique exchange file for the police with the central organization.
 - allows sending electronically the data and with the minimum delay.
- In exchange, the central administration should:
 - allow the access to the data for the police that have sent them.
 - allow the comparison between similar municipalities.
 - facilitate the obtaining of lists according to the urban needs.







[Resultados principales]:: Aplicaciones informáticas

En la encuesta CUAAS, más específica realizada en España para la DGT se obtuvieron los siguientes resultados:

El 35,4% no utilizaba ninguna herramienta informática para la introducción y almacenamiento estadístico de datos de accidentes

El 5,2% utiliza SIG y realiza algún estudio

El 3,1% utiliza SIG y no realiza ningún estudio

El 31,3% de los municipios no tratan estadísticamente los datos de accidentes de tráfico

Las bases de datos y herramientas ofimáticas y los programas de elaboración propia específicos son los más utilizados, sobre todo en los municipios de más de 50000 habitantes.

El 63% de los municipios más pequeños no utilizan ninguna herramienta informática para introducir o almacenar la información.





[Resultados principales]:: Tratamiento estadístico a nivel local

- Según la encuesta española, los programas más utilizados para el análisis estadístico son las hojas de cálculo. Los municipios de mayor tamaño utilizan en mayor medida Access.
 - El uso de calculadora y métodos más tradicionales es aún muy elevado, no sólo en los municipios más pequeños.
 - Los programas de elaboración propia son característicos de los municipios de mayor tamaño, pero menos utilizados.
 - El 32% no trata ni analiza estadísticamente los datos de accidentalidad.
 - El 57% de los municipios más pequeños y el 30% de los municipios entre 20000 y 50000 habitantes no tratan estadísticamente la información.



[Main results]:: Questionnaire evaluation

- In the survey, the police were asked to evaluate the following questions:
 - The information collected during the police action on accidents only contribute to identify the guilty persons. (item 30)
- The information collected for the official accident statistical questionnaire has only a bureaucratic purpose. (item 31)
- The statistics obtained on the accidents are useful to guide the road safety police actions. (item 32)
- The completion of the current official accident statistical questionnaire implies an extra work that is worth investing time (item 33)
- The completion of the own/municipal/local accident questionnaire (if it exists) implies an extra work that is worth investing time. (item 34)
- In general, statistics are useful but the police do not have access to them. (item 35)

País	item 30	item 31	item 32	item 33	item 34	item 35
Bélgica	4,3	4	8,3	5	5	0,6
Bulgaria	1	1	9	5	10	0
Chipre	0	1	10	10		0
República Checa	5	4	8,5	5	0	3,5
Estonia	4	1	9	7		0
Hungría	0	0	8	8	8	0
Alemania	0	1,5	9	2	0	4
Lituania	5	3	10	4	4	1
Luxemburgo	7	2	8	8		0
Rumanía	6	0,5	8,5	5	5	0
Eslovaquia	0	7	9	3	0	0
Eslovenia	3	3	8	8		0
Suiza	3	3	9	9	5	2
Reino Unido	2	0	9	10		0
España	3,2	4,5	8,2	7	7,4	5,6
Media Europea	2,9	2,3	8,7	6,4	4,4	1,5



- The accident severity affects the collection of the accident information.
- Firstly, the surveyed countries emphasize thay:
 - When an accident is fatal, the accident statistical questionnaire ius always filled in and sent.
 - When the accident is serious, several surveyed municipalities admit that they never fill it in.
 - This percentage of municipalities that do not fill in the questionnaire is even higher when the accidents are slight.
- This procedure varies from several questions for each country, and municipality or region:
 - Economic and technical resources available
 - Amount of accidents to collect
 - Training of the technical staff
 - Contents of the statistical questionnaire and complexitiy
 - Appropriate applications or computer systems
 - Circumstances of the filling in
 - ...



[Main results]:: Severity criterions

- These circumstances affect the establishment of comparisons between different municipalities / regions and countries.
- Secondly, the difference of criterion to set the casualty severity is another obstacle to carry out comparisons.
 - Hospitalization criterion (standard criterion)
 - Injury type and severity
- The hospitalization criterion has several problems:
 - Transfer time.
 - Available means (hospital beds, doctors, ambulances).
 - Hospitalization differentiated with admission. ¿Is the time spent in the emergency services counted?.
 - Transfer to another hospital.
 - In many cases, the relationship police/doctor is not appropriate and it is difficult to know the information.
 - For Spain, this criterion is different from the one that is used at the legal level. This causes doubts among the agents.
- The WHO definition based on the injury type and severity is not used given its complexity.



[Main results]:: Severity criterions

	Serious injury criterion			
Belgium	Hospitalization criterion 1 day			
	3 days			
	Hospitalization longer than 24 hours or fatality after 30 days.			
Bulgaria				
Cyprus	Injury criterion Disability for more than 25 hours.			
Czech Republic	Injury criterion. Medical certificate			
<u>Estonia</u>	Injured person: person that needs assistance			
	Serious injured person: No specific definition			
Hungary	In-patient or inuries that imply a treatment for more than 8 days			
Germany	In-patient for more than 24 hours or fatality after 30 days			
Lithuania	Just using the definition of "injured person".			
	The level of injuries are not distinguished.			
Luxembourg	In-patient for more than 24 hours			
Romania	Injuries: A person that has lost consciousness or that one of its organ has stopped its functions,			
	with a mental or physical disease, fractures, lacerations, serious cuts or others, or an in-patient for more than 30 days.			
Slovakia	Treatment for more than 7 days.			
Slovenia	Injuries: they have a classifier of injuries.			
	In-patient for more than 24 hours.			
Switzerland	In-patient for more than 24 hours.			
United Kingdom	STATS 20.			
	STATS 20 criterions. It shows a table of examples:			
	Fracture, internal injuries, serious cuts,			
	Burns (excluding friction), crush			
	Concussion, serious general shock general that needs hospital treatment			
	Admission in the hospital immediately or after.			
	Death caused by the accident within 30 days or more.			



[Main results]:: Severity criterions

	Serious injury criterion	
Spain	In-patient for more than 24 hours or fatalities after 30 days.	
France	In-patient for more than 6 days	
Greece	Several criterions: (WHO Classification)	
	In-patient for more than 24 hours	
	Fatalities after 30 days	
Italy	No difference between slight and serious injuries	
The Netherlands	In-patient.	
	Fatality after 30 days.	
Finland	No difference between slight and serious injuries	
Austria	Several criterions:	
	- Injury implying an health deterioration and disability to work for more than 24 hours or	
	- In-patient for more than 7 days or	
	- Fatality after 30 days.	
Denmark	Injuries (WHO). are considered to be the fractures, the concussions, the internal injuries, the	
	lacerations or serious cuts, the states of shock that need medical treatment in general and any	
	other injury that involves an hospitalization.	
	Fatality after 30 days	
Latvia	In-patient for more than 24 hours	
Malta	Serious injuries	
Norway	In-patients for more than 24 hours.	
	Injuries implying serious or permanent invalidity	
Poland	In notion for more than 7 days or serious injuster	
Porto and	In-patien for more than 7 days or serious injuries	
Fortugal	In-patient for more than 24 hours	
Sweden	In-patient	

[Main results]:: Monitoring of the serious injuries to 30 days

Nowadays, the <u>monitoring of the</u> <u>victims to 30 days is carried out in most</u> <u>of the surveyed countries, except for</u> <u>Spain, Luxembourg and Portugal</u> that carry out a limited number of monitoring and apply correction factors later.

The hospital centres or medical units that attend the patient in Estonia and Lithuania have to communicate the state of the patient, so the police just monitor to 24 hours.

In Belgium, Cyprus, Czech Republic, Slovakia, Slovenia, Romania and Switzerland, the monitoring is done by an agent, sometimes in collaboration with the medical staff, sometimes with the public prosecutor and other entities.

Sweden has the STRADA database, in which the traffic accident information and the health data are combined.

	Monitoring of the seriously injured persons within 30 days			
Country	Police monitoring	Description		
		The agent has to contact the victim or the hospital within 30 days.		
Belgium	Yes, within 30 days	Thanks to the Insurance Federation that has the data of its clients. Thanks to the hospitals that carry out the monitoring of the victims.		
Bulgaria	Yes	For 30 years we are applying the uniform definition of the traffic accident fatality: death within the 30 days after the accident.		
Cyprus	Yes, within 30 days	We are doing it and there are no difficulties.		
Czech Republic	Yes, within 24 hours and 30 days	Since the beginning we are doing it because this is necessary to assess accident rate and compare with other countries. By asking to hospitals and doctors.		
		Done by the State police.		
Estonia	No	We have a working system where the hospitals have to communicate to the police all the fatalities (caused by an accident) within 30 days after the traffic accident. Afterwards, the agent enters the data in the database.		
Hungary	Yes, within 24 hours and 30 days	We are doing it but we cannot be sure whether the death is caused by the accident or by a medical error. The death may happen after 30 days. This means that the statistics are not correct, but it is better than nothing.		
Germany	Yes, within 24 hours	And lately the information is obtained.		
Lithuania	No	The medical staff has to inform the police when there is a fatality. No data is lost in these cases.		
Luxembourg	No, within 24 hours	The time needed to do it is too high.		
Romania	Yes, within 30 days	Being immediately informed by the medical unit when a patient passes away.		
Slovakia	Yes, within 30 days	We are doing it with important modifications in the questionnaire.		
Slovenia	Yes, within 30 days	We are doing it with the assistance of the doctors. They inform us on the state of the victims during the 30 days following the accident.		
Switzerland		The police station informs us when a person passes away after a traffic accident, or the hospital does.		
	Yes, within 24 hours and 30 days	The agent in charge of the accident carries out a monitoring to 30 days and if the victim passes away, he enters it in the database. The department controls it and communicates it to Statistics.		
United Kingdom	Yes, within 24 hours	We are already doing it.		
Spain	No, within 24 hours	Correction factors		
The Netherlands	Yes			
Sweden	Yes	STRADA		
France	Yes			
Portugal	No, within 24 hours	Correction factors		

[Conclusions]: Problems of the current records

- Problems of the current system:
 - Needs of computer and technical resources.
 - There are not electronic means (pda/laptop) to collect the accident data directly in the place of the accident.
 - High delay to close an accident (2-3 months)**.
 - Work and coordination procedures.
 - Discrepancies in the criterion of the injury severity.
 - Problems in the collection of fatality within 30 days.
 - Complexity of the questionnaire. (Under-recording).
 - Information not adjusted to the urban needs and the new technologies.
 - Excess of information for the statistics.** (Under-reporting & under-recording).
 - Positioning systems to locate the accident are not yet available.
 - Excess of time to fill in the documents**
 - There is a high number of unknown accidents (bicycles, pedestrians, slow vehicles). (Under-reporting).
 - There is no integration between the police data and other sources.



[Conclusions]:: Quality control and noteworthy elements

- 3 out of 4 surveyed countries have developed actions to improve the quality. These actions are in the line of:
 - Formal control of the accident data.
 - Design and improvement of computer applications, cartography**
 - Training on accident management and experience of the agents.
 - Data filters.
 - Data check by a superior.
 - Data validation by an external statistical agency.
 - Cooperation between regional, local and national initiatives.
 - Unique accident data entry.
 - Different criterions of information collection.
 - Information decrease.
 - Compare with accident data from other organizations.
- Noteworthy elements of their systems
 - Integration of all the accident documents.**
 - Allows carrying out statistics and information availability.***
 - Shares information with other institutions.**
 - Exchange file of standard information.
 - Description of the accident type and causes, use of images.
 - Comparisons of accidents that happened in the same scene (2,5km).
- These initiatives from most of the countries implies a knowledge of the information quality and the disposal to carry out strategies to increase it.

[Preguntas]::

- ¿Coincide la definición de accidente de tráfico con la utilizada en su ciudad?
- ¿Los criterios utilizados para definir a los heridos graves se ajustan a los utilizados actualmente en su ciudad/ país?
- ¿Qué criterio considera el más adecuado para definir la gravedad de las lesiones?
- ¿Identifican alguna de las problemáticas descritas con las existentes en su ciudad?
- ¿Se ajusta el cuestionario estadístico a sus necesidades urbanas?
- ¿Qué información le interesaría disponer para sus estudios en seguridad vial?
- ¿Atiende todos los accidentes de tráfico con víctimas que ocurren?
- ¿La información que se conoce del accidente, es la misma independientemente de la gravedad del accidente?
- Están llevando a cabo algún tipo de actuación para intentar solucionarlas?
- ¿Qué se considera zona urbana a efectos de intervención policial?



Botanical Garden of the University of Valencia (Spain) 14-15/June/07

Thank you for your attention!

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