

2014 Global Level Crossing  
Safety and Trespass Prevention Symposium  
University of Illinois at Urbana-Champaign



# Global Level Crossing Safety and Trespass Prevention Symposium

University of Illinois, Urbana-Champaign, Illinois, USA

3<sup>rd</sup> to 8<sup>th</sup> August 2014



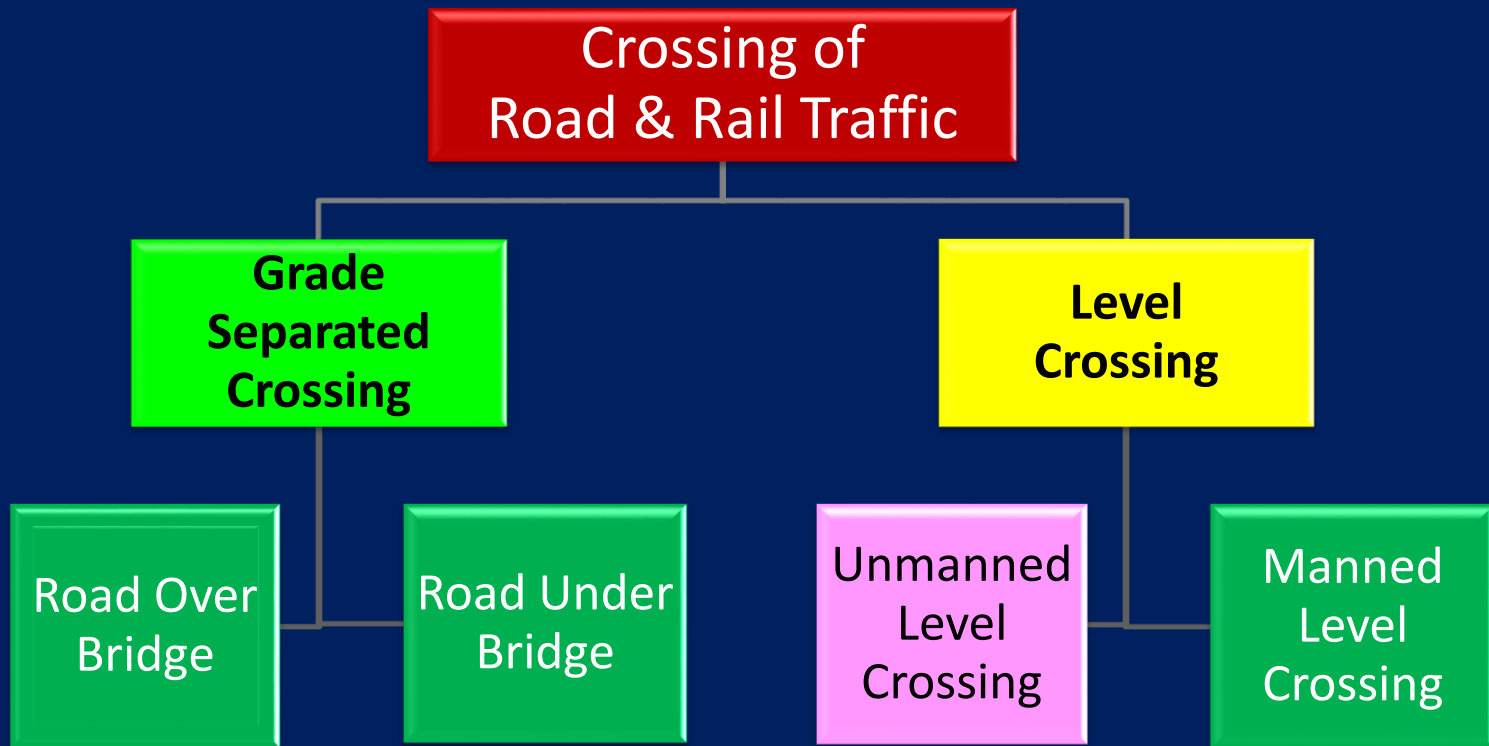
## Efforts of Indian Railways to Reduce Level Crossing Accidents

*Alok Kumar, Director (Safety) &  
Sanjiv Garg, Advisor (Safety)  
Ministry of Railways, India*

# Flow of Presentation

- ❖ Conflicts at Rail-Road Interface i.e. Level Crossing
- ❖ Indian Railways Network & Level Crossings.
- ❖ Scenario of Level Crossings on Indian Network.
- ❖ **Elimination of Unmanned Level Crossings**
  - Performance in Past 5 Years & Roadmap Ahead
- ❖ Trend of Level Crossing Accidents
- ❖ Reducing Level Crossing Accidents: **Engagement, Education, Engineering, Enforcement and Economics.**
- ❖ What Shall We Do ?
- ❖ Participation of IR in **2<sup>nd</sup> Global Road Safety Week of UNECE & ILCAD-2013** at Geneva in May 2013.
- ❖ Safety Campaigns on Level Crossing by IR.
- ❖ Conclusions

# Conflict at Road-Rail Interface



*TVU: Train Vehicle Unit (TVU) product of average number of Road Vehicles and Trains passing a level crossing in 24 hours.*

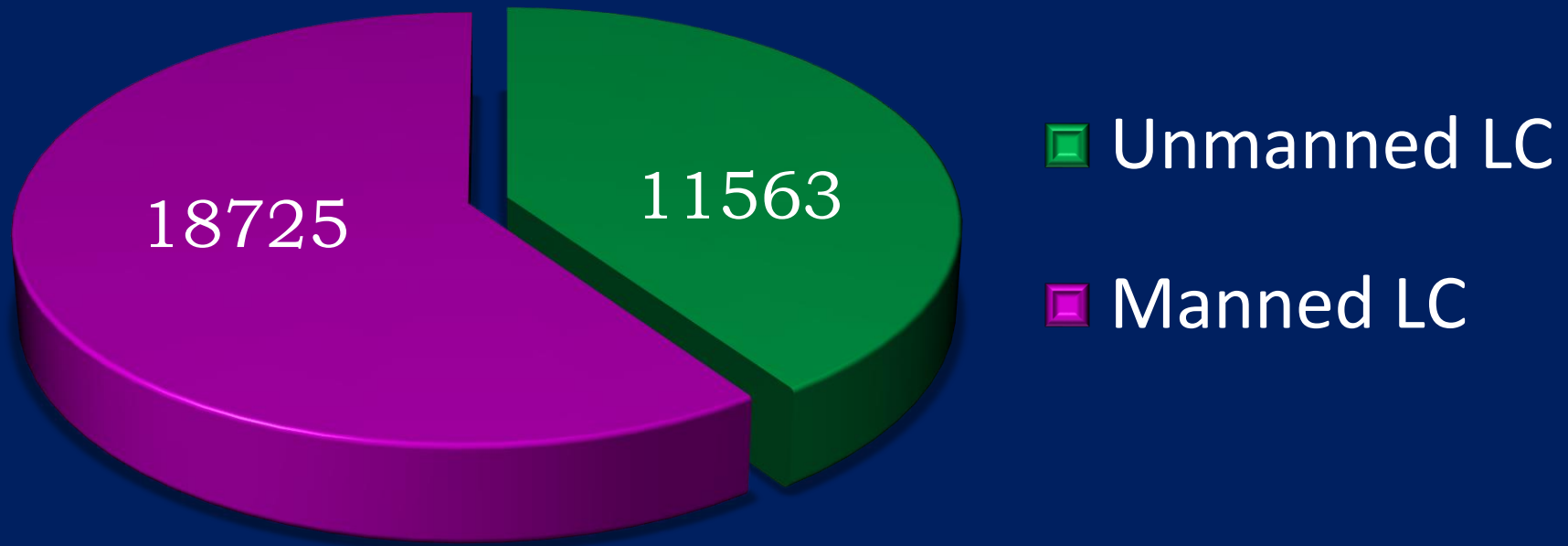
# Indian Railways Network

(As on 31.03.2013)



- ❖ No. of Railway System : 17 Zonal Rlys
- ❖ Staff directly Employed : 1.3 Million
- ❖ Route Kilometer : 65,436 Km
- ❖ Block Stations : 7172 Nos
- ❖ Passenger Carried/Day : 23 Million
- ❖ Freight Carried/Year : 1008 Million Ton

# Number of Level Crossings on IR (Manned & Unmanned : As on 1<sup>st</sup> Apr'2014)



*\*Total Number of Level Crossings ( Manned & Unmanned) are **30348 Nos.***

*\*There are no GUARDED-Unmanned Level Crossing on Indian Railways unlike European Countries. Cheap and robust solutions are to be found for eliminating these level crossings.*

# Scenario of Level Crossings on IR

- ❖ Currently Indian Railways have 65436 route kilometres and carries about 23 million passengers per day. Through painstaking efforts the index of Train Accidents per “million train kms” has been brought down from *0.44 in 2002-03 to 0.10 in 2013-14.*
- ❖ Indian Railways network has 30,348 Level Crossings (as on 01.04.2014) out of which, 18,725 (62%) are Manned and balance *11,563 (38%) are Unmanned.*
- ❖ These Level Crossings contribute *43% (50 out of 117) of all Consequential Train Accidents* and *67% Fatalities (101 out of 149)* over Indian Railways.

# Scenario of Level Crossings on IR

- ❖ The onus for safe movement over unmanned level crossing lies with the road users (section 131 of “*Motor Vehicles Act, 1988*” and section 161 of “*The Railways Act, 1989*”) as per existing law in India.
- ❖ Analysis indicates that manning of Unmanned Level Crossing is not an ideal solution. Indian Railways envisages *elimination of all unmanned level crossings* within a time frame of next five years or less.
- ❖ To further enhance safety it has been decided *to replace all Level Crossings by Grade Separators* (Road Over Bridge/Road Under Bridge) gradually in the long term.



# ELIMINATION OF UMLC on IR

- **VISION 2020** : Elimination of all unmanned level crossing within a time frame of five years.
- **Method of Elimination of Unmanned Level Crossing**
  - Road Over Bridges: high TVU LC (>0.1 Million)
  - Road Under Bridges At Bank
  - Merger/Diversion To Adjacent LC
  - Closure Of Low TVU LC
  - Manning Of Unmanned LC
- **Bottleneck**
  - ROB: Land Acquisition , Encroachment removal
  - RUB: Technical Feasibility
  - Closure: Permission from Government, Public Outrage
  - Manning: Manpower Requirement



# Number of Unmanned LCs Eliminated in last five years (2008-2013)

Year	By Closure/ Merger/Subway	By Manning	Total
2008-09	556	259	815
2009-10	553	377	930
2010-11	800	434	1234
2011-12	481	777	1258
2012-13	700	463	1163
<b>TOTAL</b>	<b>3090</b>	<b>2310</b>	<b>5400*</b>

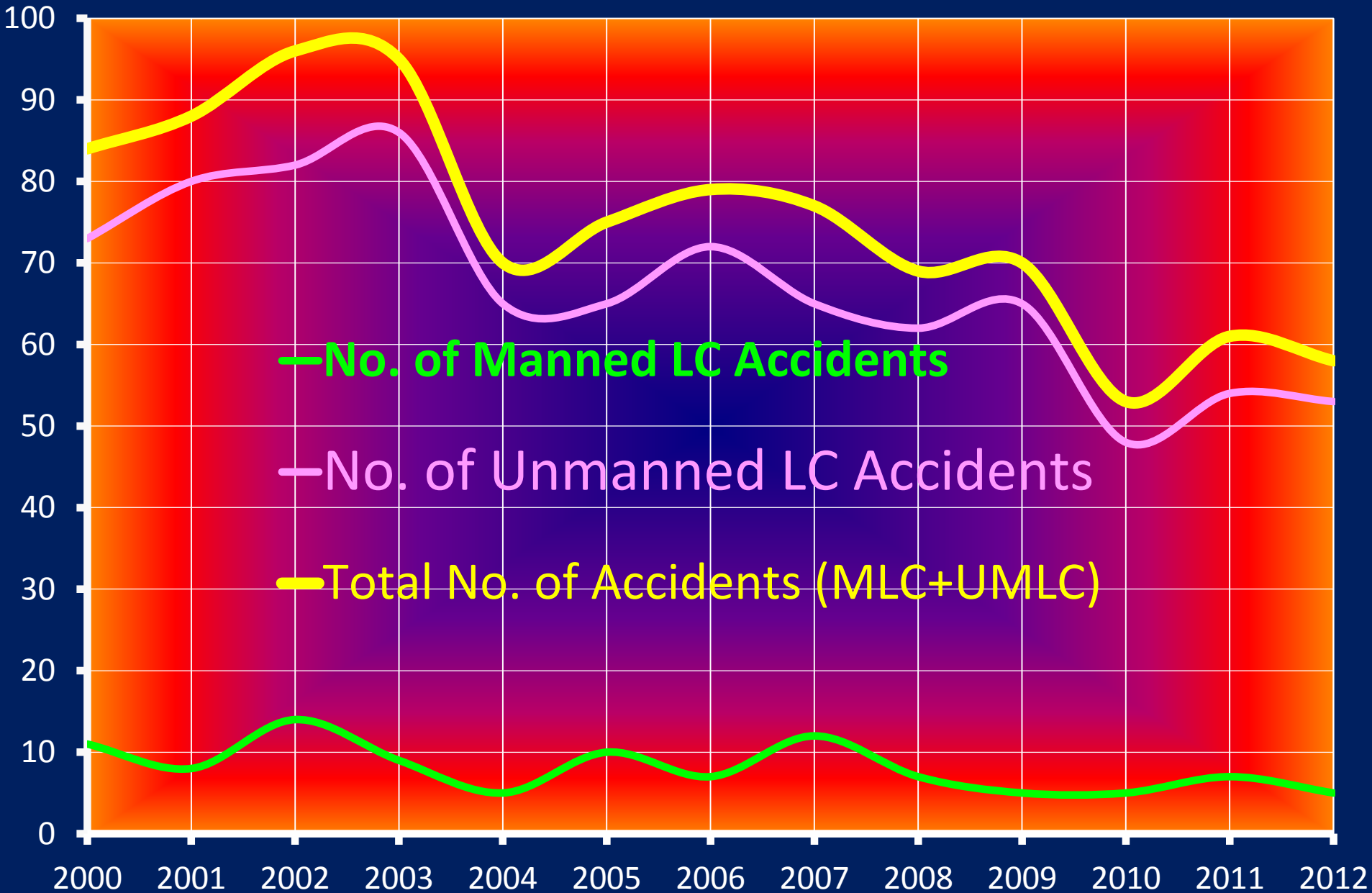
*\*After elimination of above 5400 Level Crossings, there are still 12582 nos (as on 01.04.2013) of Unmanned Level Crossings which poses threat to errant road users and train passengers too!*

## Number of UMLC planned for Elimination during the 12<sup>th</sup> Five Year Plan (2012-2017) by IR.

Items	2013-14	2014-15	2015-16	2016-17	Total
<b>CLOSURE</b> of Low TVU LC	173	309	218	207	907
<b>MERGER</b> to nearby LC/RUB/ROB	203	377	366	360	1306
<b>ROB</b> by Road Under Bridge Construction	476	1286	1272	1390	4424
<b>RUB</b> by Road Over Bridge Construction	5	18	17	15	55
<b>MANNING</b> of Unmanned LC	495	936	814	871	3116
<b>TOTAL</b>	<b>1352</b>	<b>2926</b>	<b>2687</b>	<b>2843</b>	<b>9808*</b>

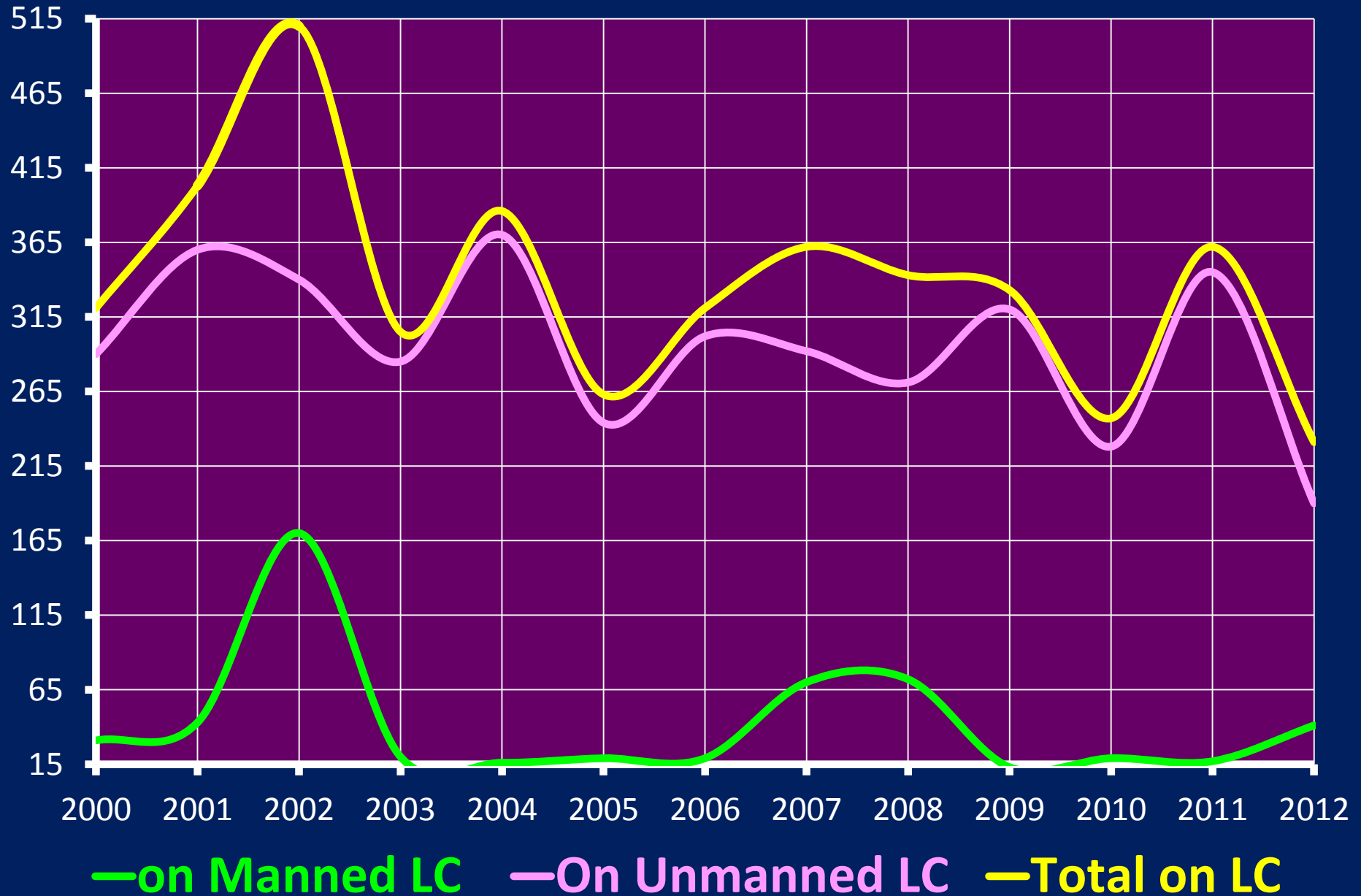
*Total number of UMLC (as on 01.04.2013) is **12582** and of these 9808 have been planned for elimination. Balance 2774 UMLC have not been planned, being on different gauge (metre gauge/narrow gauge) and will be taken up during gauge conversion as per the Uni-gauge policy of Ministry of Railways.*

# Number of Accidents on Level Crossings on IR



Note : Year 2012 on Graph Means Financial Year 2012-2013 ( 1<sup>st</sup> April 2012 to 31<sup>st</sup> March 2013)

# No. of Casualties (Killed/Injured) on Level Crossings on IR



Note : Year 2012 on Graph Means Financial Year 2012-2013 ( 1<sup>st</sup> April 2012 to 31<sup>st</sup> March 2013)

## *Five Es: Engagement, Education, Engineering, Enforcement and Economics*

- ❖ Indian Railways have been pioneers in implementation of the five Es (*Engagement, Education, Engineering, Enforcement and Economics*) through various means.
- ❖ 1) **Engagement**: NGOs, R&D Organisations and Engineering Colleges have been engaged to tackle the issue of LC Accidents.
- ❖ 2) **Education**: Indian Railways periodically launch regional and nation wide safety campaigns to improve awareness of road users from time to time through distribution of Hand Bills, Posters, SMS, propagating safety messages at public events, in public places, shops, cinemas, advertisements in print media, radio talks, street shows ('nukkad natak'), morning walks, cultural programs, etc. Further, lessons on level crossing safety have been included in school syllabi and safety parks have been established. IR are also setting up 3 Safety Villages at Lucknow, Bangaluru & Kharagpur. Setting up of a Safety Simulation Centre has also been announced recently.

## *Five Es :Engagement, Education, Engineering, Enforcement and Economics*

- ❖ **3) Engineering:** Engineering Technology is made use of to develop various safety systems on level crossings, like double lifting barrier, electrified boom, LED signals etc. Cable Stayed Road Over Bridges are being provided at major busy railway yards. R&D is being promoted in collaboration with academic institutions and business houses.
- ❖ **4) Enforcement:** Enforcement is ensured through consistent monitoring/implementation of legislation provided in law (*Motor Vehicles Act/The Railways Act*) related to use of level crossing. Crossing of tracks at unauthorised locations is treated as a punishable offence. Safety checks are conducted in association with Traffic Police (RTO), Railway Police (GRP & RPF), NGOs and penalty is imposed on defaulters.
- ❖ **5) Economics:** Works of elimination of unmanned level crossings are funded by *Prime Minister/Chief Minister/Members of Parliament Development Funds, Village Road Schemes (MNREGA)* and from Petrol/Diesel Cess.

# What Shall We Do ?

- ❖ In spite of the mass-publicity and awareness drives level crossing accidents remain a major cause of human death. The need is to PUBLICIZE the typical **ILLUSION** at Level Crossings.
- ❖ Research Projects, required to study the level crossing accident scenario need to be started.
- ❖ Running of special courses for Rail-Road Safety say, IRTE, India, University of Birmingham UK etc.
- ❖ UNECE has constituted a “Group of Experts” on Level Crossing safety and shall take a lead role and bring all organizations, working for safety on level crossings under one umbrella.
- ❖ Funding arranged by sponsorship by industry working for level crossing safety equipment, etc.



# GLXS-2012: Global Level Crossing Safety Symposium

7<sup>th</sup> to 12<sup>th</sup> October 2012, London, UK





# International Level Crossing Awareness Day: 7th May 2013, Geneva



Below[LtoR]:

- (1) **Dr. Eva MOLNAR**, Director, Transport Division, UNECE, Geneva
- (2) **Vassiliki MYLONA**, Road Safety Institute, Greece.
- (3) **Isabelle FONVERNE**, Projects Officer, UIC, Paris.
- (4) **Tamo VAHEMETS**, CEO, Operation Lifesaver, Estonia.
- (5) **Alok KUMAR**, Director(Safety,) Ministry of Railways, New Delhi

Above[L to R] :

- (1) **Jurg SUTER**, Swiss Federal O/O Transport
- (2) **Alok Kumar**, Director(Safety,) Ministry of Railways,
- (3) **Martin Gallagher**, Network Rail Head of Level Crossings
- (4) **Massimo Costa**, Italian Railway Investigation Body .





# UNECE's 67<sup>th</sup> Session of Working Party on Road Traffic Safety and ESCAP at IRTE, Faridabad, India, 4<sup>th</sup> to 6<sup>th</sup> December 2013



UNECE ESCAP ADBO  
(WP.1) Working Party on Road Traffic Safety (67th session)  
5 & 6 December 2013,  
College of Traffic Management,  
Faridabad, NCR Delhi, India  
FIA Foundation IRU

UNECE  
United Nations Economic Commission for Europe

UNITED NATIONS  
ESCAP  
Economic and Social Commission for Asia and the Pacific

SECRETARY WP.1

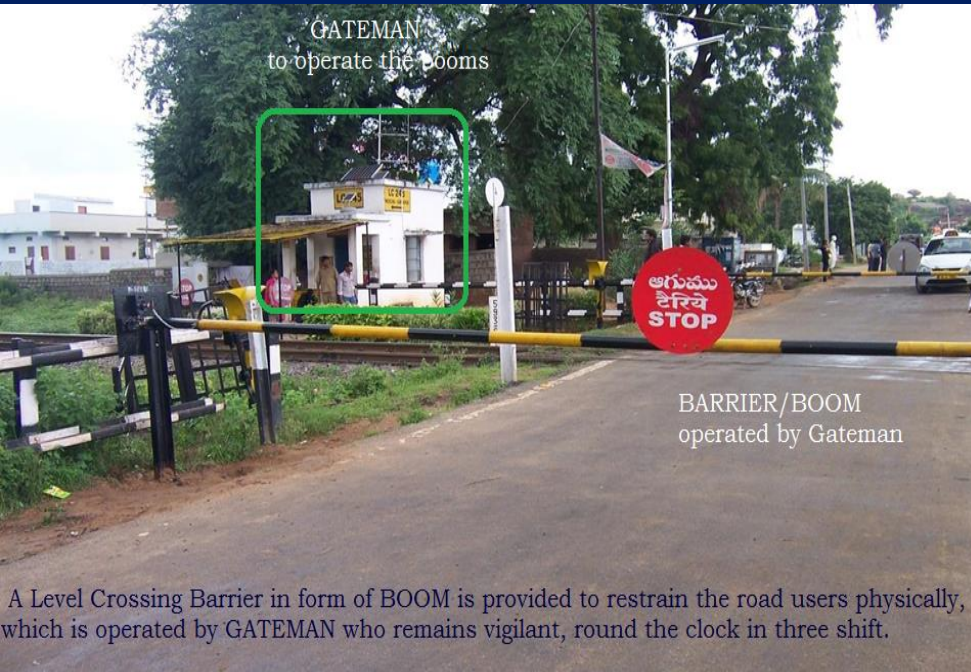
CHAIR

RUSSIA FOUNDATION

SINGAPORE



GATEMAN  
to operate the booms



BARRIER/BOOM  
operated by Gateman

A Level Crossing Barrier in form of BOOM is provided to restrain the road users physically, which is operated by GATEMAN who remains vigilant, round the clock in three shift.





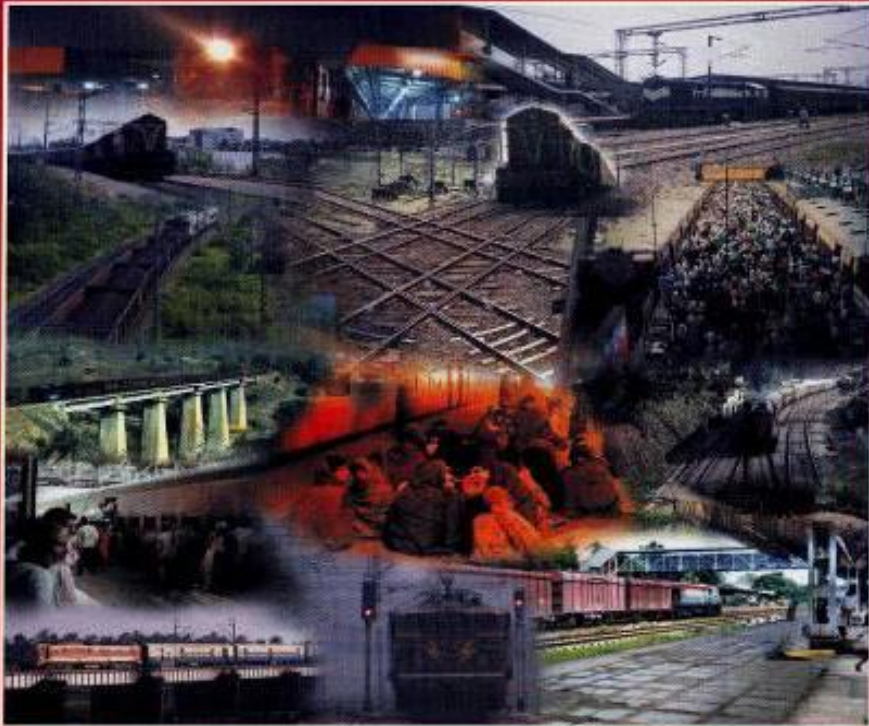
INNOVATIVE POSTERS AT LC – Deep Impact as Reported in Forbes Magazine, India



<http://forbesindia.com/article/work-in-progress/how-unmanned-level-crossings-spell-danger/34303/1#ixzz2mfhfROSp>



# Publication of LC Safety Leaflets



## **UNMANNED**

Remember, all vehicles are under statutory obligation to follow the rules under Section 131 of Motor Vehicles Act, 1988 and Section 161 of the Indian Railways Act, 1989 regarding negligently crossing unmanned level crossings. Violation shall be punishable with imprisonment, which may extend to 1 year.

## **MANNED**

Violation of rules regarding opening/breaking of gates in case of manned level crossings, is a punishable offence under Section 160 of the Indian Railways Act, 1989, which prescribes imprisonment for a term extending to 3 to 5 years.

## **SAFETY RULES FOR MANNED & UNMANNED RAILWAY CROSSINGS**



**South Eastern Railway**  
*Rail Safety is no accident*



**South Eastern Railway**  
*Rail Safety is no accident*

# CONCLUSION

- ❖ Accidents at Rail-Road Interface (Level Crossings) is a global problem and each region is trying to tackle in their own way.
- ❖ Loss of Human Resource...
- ❖ Understanding of the Problem!
- ❖ If IRTE plans a workshop in 2014 –ASEAN countries must participate...
- ❖ Exchange of Technology & Knowledge.....
  - ILCAD, GLXS
  - Group of Experts on Level Crossings
  - Branch of Operation Lifesaver in each region
  - Other such NGOs to be enlisted.



THANK  
YOU