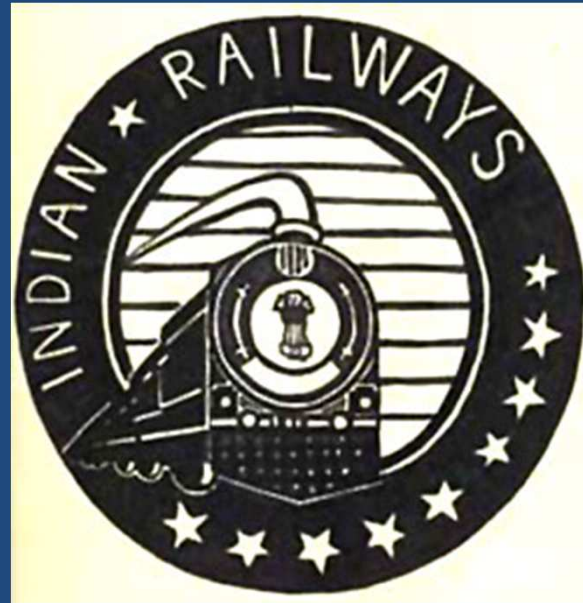


# LEVEL CROSSING SCENARIO ON INDIAN RAILWAYS



Presented By:  
**Alok Kumar**  
**Director(Safety)**

# INDIAN RAILWAYS : VAST SYSTEM

## ➤ TRANSPORTS :

- Appox. 1000 MT freight traffic per year
- Appox. 23 million passengers per day.

## ➤ VASTNESS:

- 17 Zonal Railway Headquarters & 69 Divisions
- Total Route Km : 64460 km (Broad Gauge : 55189 Km)
- Total Running Track Km : 87040 Km
- Employ around 1.3 million staff

## ➤ TRACK STRUCTURE:

- Around 75176 km of track is laid with 60 kg/52 kg rails
- 74607 km of track is laid with PSC Sleepers
- 65941 km (86%) track on LWR/CWR

## ➤ ROLLING STOCK:

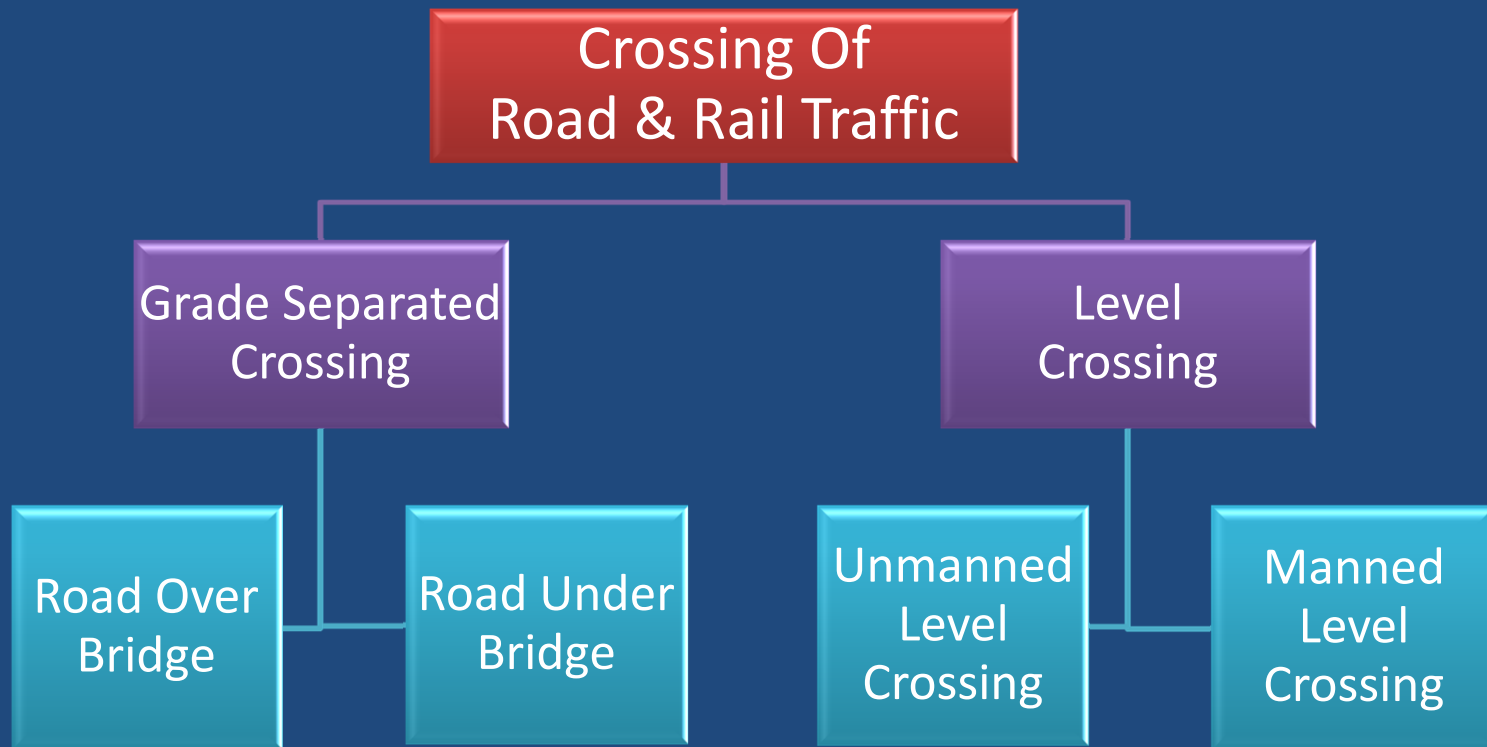
- 53220 passenger coaches, more than 0.2 million wagons
- 9213 locomotives



# CORPORATE SAFETY PLAN

- **LIFE CYCLE:** One Decade: 2003-2013
- **SALIENT POINTS :** Investment of more than 35 million(GBP) Entailing multi-pronged strategy, laying emphasis on infrastructure and new technologies to reduce human dependence
- **REDUCTION OF ACCIDENTS RATE :**
  - **TARGET :** bringing down the accident rate from 0.44 in 2003 to 0.17 per Million Train Kilometer in 2013
  - **ACHIEVEMENT:** Excelled by touching the figure of 0.14 in year 2011-12.
- **MEASURES TAKEN TO REDUCE LC ACCIDENTS**
  - Use of Train Actuated Warning Device (TAWD) and ACD.
  - Social awareness Program.
  - Construction of ROBs/RUBs at LC with TVUs >1 lakh.
  - Manning of Unmanned level Crossings.
  - Provision of phones & Interlocking of Level Crossing Gates

# RAIL ROAD CONFLICT



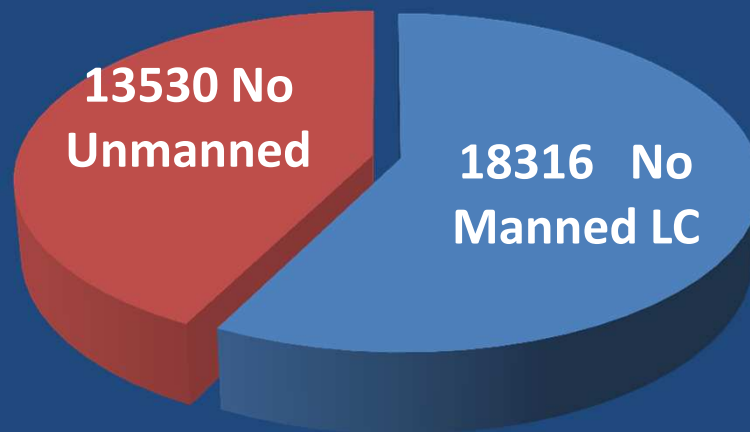
*Train Vehicle Unit(TVU) product of average number of Road Vehicle and Trains passing a crossing in 24 hours.*

# LEVEL CROSSING ON IR

## Distribution of Unmanned & Manned Level Crossing on Indian Railway

(As On 01.04.2012)

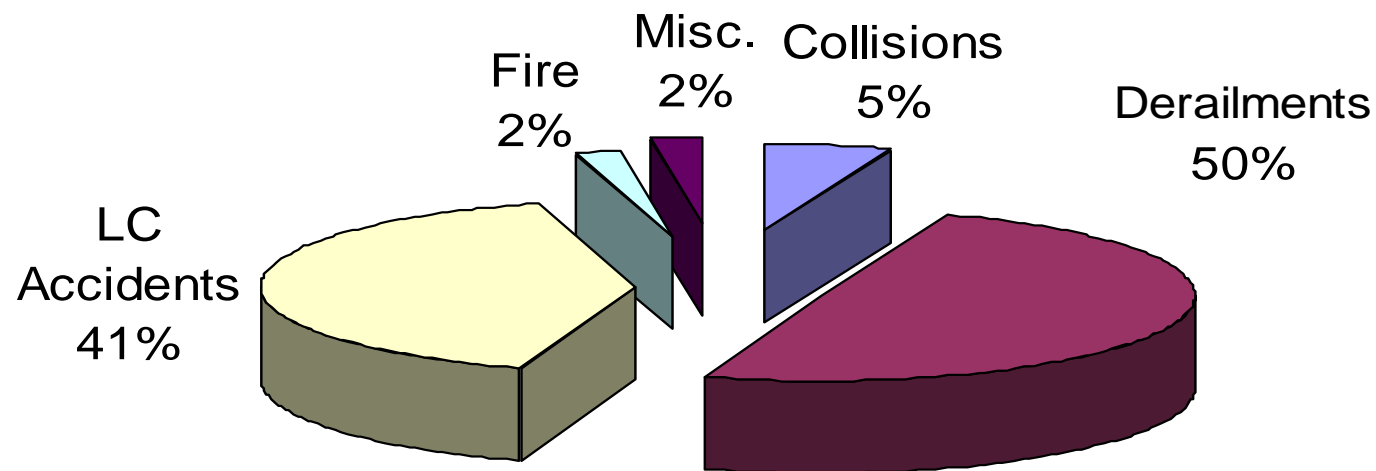
Distribution of  
Unmanned &  
Manned Level  
Crossing on IR  
(01.04.2012),  
0% 0%



■ Manned ■ Unmanned

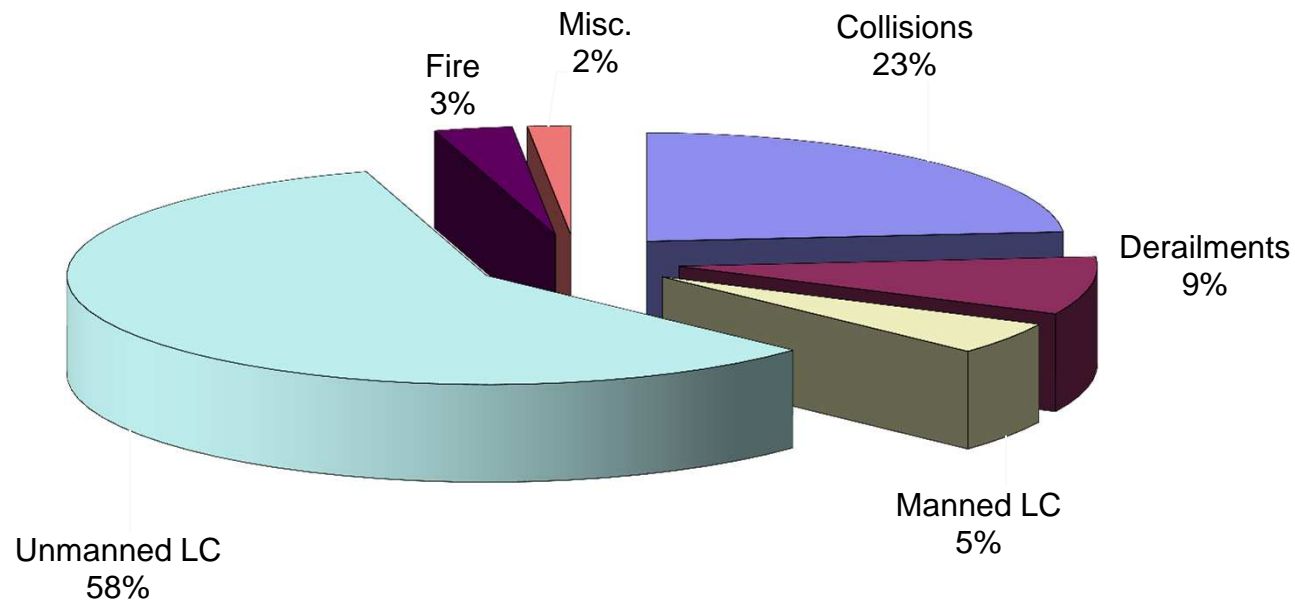
# LC ACCIDENT: CAUSE OF CONCERN

**Type wise Accidents since  
2007-08 to 2011-12**



# LC CASUALTIES: CAUSE OF CONCERN

## Loss of life ( 2007-08 to 2011-12)





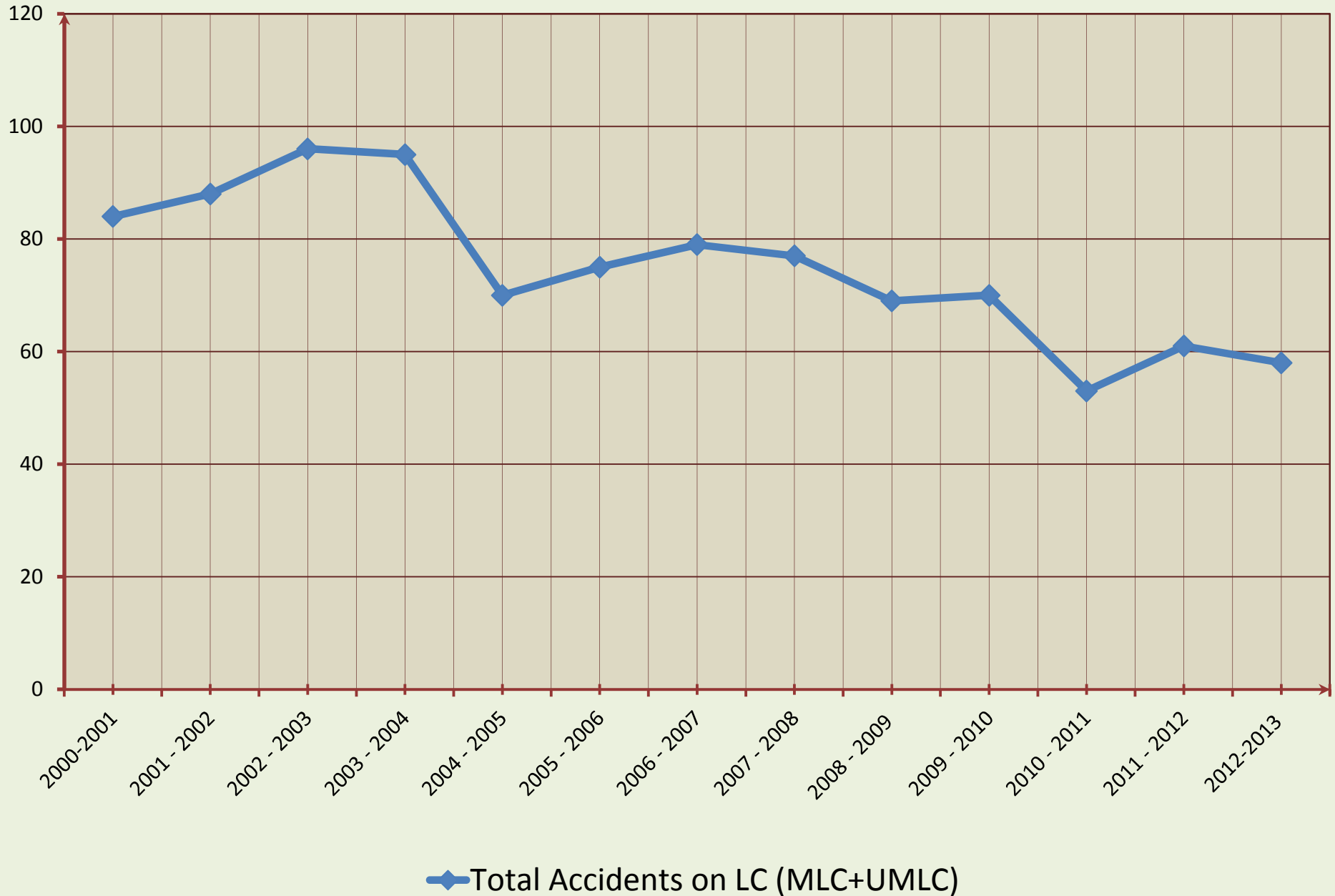
## ACCIDENTS ON LEVEL CROSSING ON IR ( As on 01.03.2013)

Year	Accidents On Manned LC	Accidents On Unmanned LC	Total Accidents (MLC+UMLC)
2000-2001	11	73	84
2001 - 2002	8	80	88
2002 - 2003	14	82	96
2003 - 2004	9	86	95
2004 - 2005	5	65	70
2005 - 2006	10	65	75
2006 - 2007	7	72	79
2007 - 2008	12	65	77
2008 - 2009	7	62	69
2009 - 2010	5	65	70
2010 - 2011	5	48	53
2011 - 2012	7	54	61
2012-2013	5	53	58
<b>Total in 12 Yrs</b>	<b>105</b>	<b>870</b>	<b>975</b>

## REPURCUSSION ON LEVEL CROSSING ON IR ( As on 01.03.2013)

Year	Manned LC			Unmanned LC			MLC+UMLC		
	Killed	Injured	Casualty	Killed	Injured	Casualty	Killed	Injured	Casualty
<b>2000-2001</b>	16	15	31	138	152	290	154	167	<b>321</b>
<b>2001 - 2002</b>	14	29	43	163	197	360	177	226	<b>403</b>
<b>2002 - 2003</b>	76	94	170	147	193	340	223	287	<b>510</b>
<b>2003 - 2004</b>	12	8	20	138	147	285	150	155	<b>305</b>
<b>2004 - 2005</b>	9	7	16	173	197	370	182	204	<b>386</b>
<b>2005 - 2006</b>	6	13	19	120	124	244	126	137	<b>263</b>
<b>2006 - 2007</b>	11	8	19	146	156	302	157	164	<b>321</b>
<b>2007 - 2008</b>	27	43	70	148	144	292	175	187	<b>362</b>
<b>2008 - 2009</b>	18	54	72	129	142	271	147	196	<b>343</b>
<b>2009 - 2010</b>	7	6	13	170	150	320	177	156	<b>333</b>
<b>2010 - 2011</b>	7	12	19	130	98	228	137	110	<b>247</b>
<b>2011 - 2012</b>	6	11	17	204	141	345	210	152	<b>362</b>
<b>2012-2013</b>	18	23	41	121	69	190	139	92	231
<b>Total in 12 Yrs</b>	<b>227</b>	<b>323</b>	<b>550</b>	<b>1927</b>	<b>1910</b>	<b>3837</b>	<b>2154</b>	<b>2233</b>	<b>4387</b>

# Decreasing Trend of Accident on Level Crossings



# THREE LC ACCIDENT IN A WEEK

- (i) On 24.08.2012 at 08.42 hours while Train No.16318 Rourkela-Bhubaneswar Inter-city Express was on run, it dashed with one goods carrier Auto-rickshaw at unmanned level crossing No.ST-7 'C' between Sambalpur City and Maneshwar stations in Sambalpur Division of East Coast Railway. In this unfortunate incident, **14 persons lost their lives**. This incident was caused due to the negligence of road vehicle user in observing precautions laid down in Motor Vehicles Act and the Railways Act while negotiating unmanned level crossings.
- (ii) On 25.08.2012 at 17.45 hours while Train No.75705 Dn Ring Rail was on run and approaching unmanned level crossing No.SK/220 between Siliguri Jn. and Baghdogra station in Katihar Division of Northeast Frontier Railway, one car dashed against Train engine. In this unfortunate incident, **4 persons lost their lives**. This incident was caused due to the negligence of road vehicle user in observing precautions laid down in Motor Vehicles Act and the Railways Act while negotiating unmanned level crossings.
- (iii) On 29.08.2012 at 11.10 hours while a Goods Train was on run, one car trespassed at unmanned level crossing No.24 and hit against the train engine between Didigul-Eriodu stations of Salem Division of Southern Railway. In this unfortunate incident, **2 persons lost their lives**. This incident was caused due to sudden trespass, carelessness and negligence on the part of the car driver while crossing unmanned level crossing.

# TYPICAL MANNED LC



2 May 2013

Safety Directorate, Ministry Of Railways,  
Government Of India

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# TYPICAL UNMANNED LC



# TYPICAL ACCIDENT AT LC



2 May 2013

Safety Directorate, Ministry Of Railways,  
Government Of India

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# TYPICAL ACCIDENT AT LC





# DAMAGE TO LOCO ALSO



# LC ELIMINATION POLICY

- **VISION 2020** : Elimination of all unmanned level crossing within a time frame of five years.
- **HIGH LEVEL SAFETY REVIEW COMMITTEE:**
  - HLRSC was formed under Chairmanship of Homi Bhabha Chair Professor, Department of Atomic Energy ,Sh. ANIL KAKODKAR , which has studied the Safety Scenario and suggested measures to improved safety over Indian Railways.
- **Method of Elimination of 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

# ROAD OVER BRIDGES

- ❖ ROB is planned where TVU\* (Traffic Vehicle Unit) is above 0.1 million.
- ❖ Cost of one ROB is around 3.5 million £ (GBP)
- ❖ cost of ROB is equally shared between the concerned STATE GOVT & CENTRAL GOVT
- ❖ Time taken is 3 to 4 years.
- ❖ Construction of ROB requires land acquisition, encroachment removal for its approaches making it a tedious job.



# ROAD OVER BRIDGE IN CUTTING



2 May 2013

Safety Directorate, Ministry Of Railways,  
Government Of India

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# ROAD OVERBRIDGE ON BANK



**ROB in lieu of LC No.7  
Chennai Egmore - Villupuram Section,  
Chennai Division, Southern Railway,  
Construction.**

# ROAD UNDER BRIDGE

- The cost varies from 0.1 to 0.5 million £ (GBP)
- completion takes 1 to 2 years.
- This is the most cherished method of elimination .
- Construction of RUB/Subway in lieu of level crossings does not require any further sanction of Commissioner Of Railway Safety (CRS), if pre-cast RCC boxes are inserted through cut & cover method under complete blocks of all affected lines.

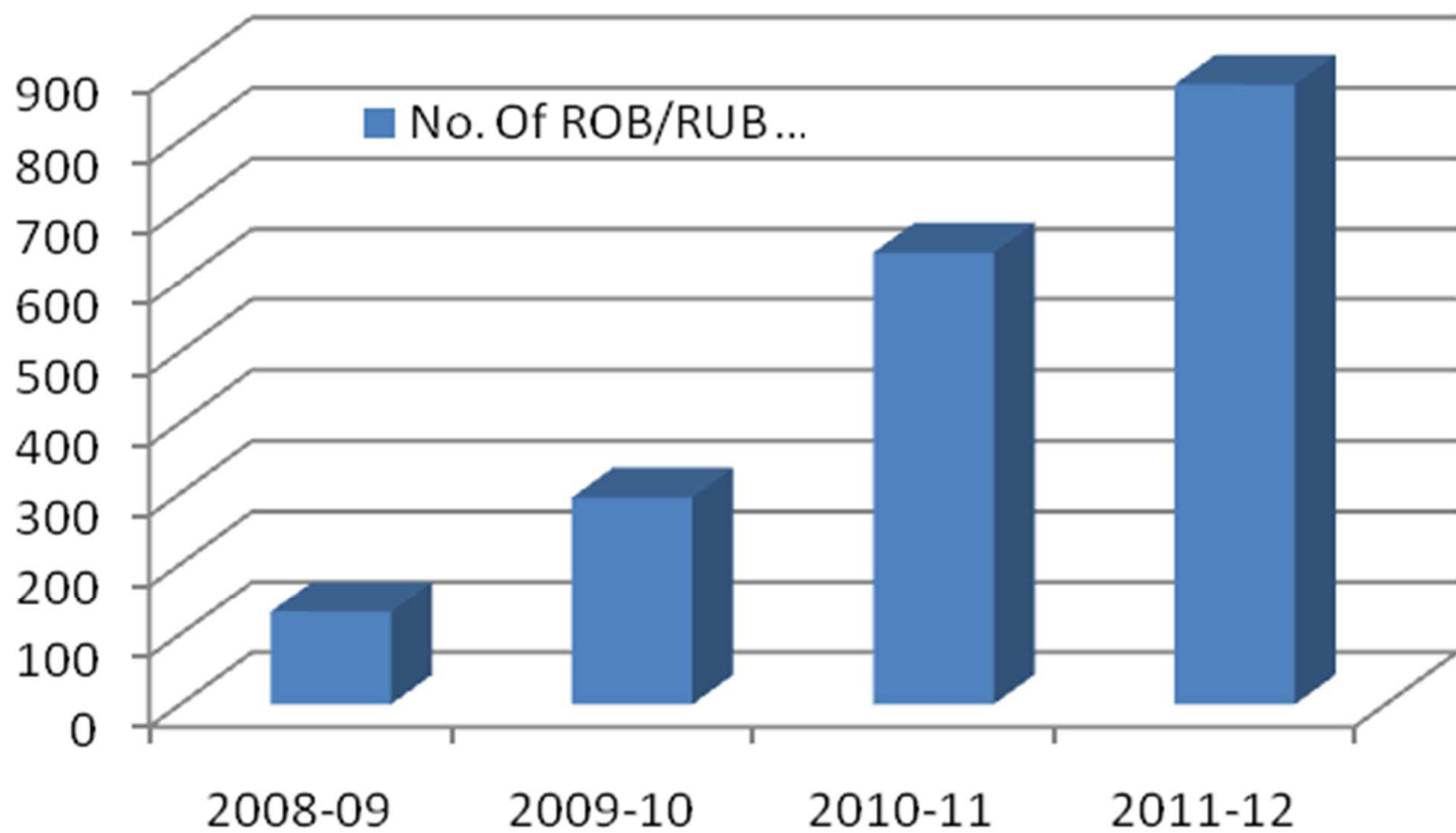
# MERGER & CLOSURE

- **MERGER OR DIVERSION:** Railways have planned construction of Diversion Roads from Unmanned crossing to nearby Manned Xing or ROB/RUB to divert road vehicles for safe passage and have permitted up to one km long Diversion Roads through Railway land or Railway Bridges. Railways have closed 206 unmanned gates by providing Diversion road since 1.4.2010 and identified 1085 more, out of which 199 being sanctioned this in current year Railway Budget.
- **CLOSURE:** By closing unmanned level crossings having NIL/negligible traffic by way of Train Vehicle Unit where roads are non-existent on either side. **Closure of unmanned level crossings does not require CRS sanction.**

# NUMBER OF LEVEL CROSSING CLOSED



# Number Road Over /UnderBridges Completed



# MANNING

- The unmanned level crossings which cannot be eliminated by other means (ROB/RUB, Merger/Diversion, and Closure) will be progressively manned based on rail-road traffic volume, visibility conditions.
- One time capital cost is about 12000 £ (**GBP**) for infrastructure
- Annual maintenance cost is around 2300 £ (GBP).
- All Unmanned Level Crossings Gates with TVU above 3000 qualify for manning.
- However if the visibility is restricted (Below to 800 meters for road users) then the criterion of 300 is relaxed to 2500.
- However, any level crossing found vulnerable and technically feasible to be eliminated can be taken up for manning irrespective of the TVU.
- Manned level crossings having heavy traffic density are being progressively interlocked with signals on a planned basis.

# FUND REQUIREMENT

- Requirement of funds to carry out the various Railway works related to Road Safety is 1.6 billion British Pound excluding the funds already available and accrual in Railway Safety Fund (RSF).
- In addition to that, Railway requires approximately 1.7 billion British Pound to construct ROB/RUB/Subway on Dedicated Freight Corridors (DFC) to eliminate all level crossings on DFC routes.
- So the overall requirement for Indian Railway works out to 3.3 billion British Pound excluding the funds already available and accrual in RSF.

# TECHNOLOGICAL SOLUTIONS

- **ACD**- Anti Collision Device: already been provided on 1736 Route KM at a cost of about 12 million £ (**GBP**), which also provides additional safety shield at manned and unmanned level crossings, through an audio-visual indication to road users.
- **TAWD**- Train Actuated Warning Devices for giving audio/ visual warning to road users about an approaching train has been under process on IR to reduce accidents at unmanned level crossings. These devices will be installed at selected 100 level crossing gates on IR.

# OTHER SOLUTIONS

## ➤ EDUCATING AT THE GRASSROOT LEVEL:

- School Syllabus include Chapter on LC
- Children are promoted to participate in Drawing Competition based on Safety at Level Crossing.
- In ILCAD, participated actively.

## ➤ SAFETY CAMPAIGNS

- Media- TV, Cinema, Radio
- Advertisement Media
- SMS, Posters, Nukkad-Natak

## ➤ SAFETY DRIVES & AMBUSH

- Joint Ambush Check with Police to penalize the trespassers and takeup under LAW
- Safety Drive with help of NGO ( Non-Governmental Organizational )
- NDRF ( National Disaster Response Force) are called for mock-trials mimicking actual scenario)

**THANKS**