Strengthening Post Crash Care by capacity assessment of health care facilities along the National Highways and Expressways

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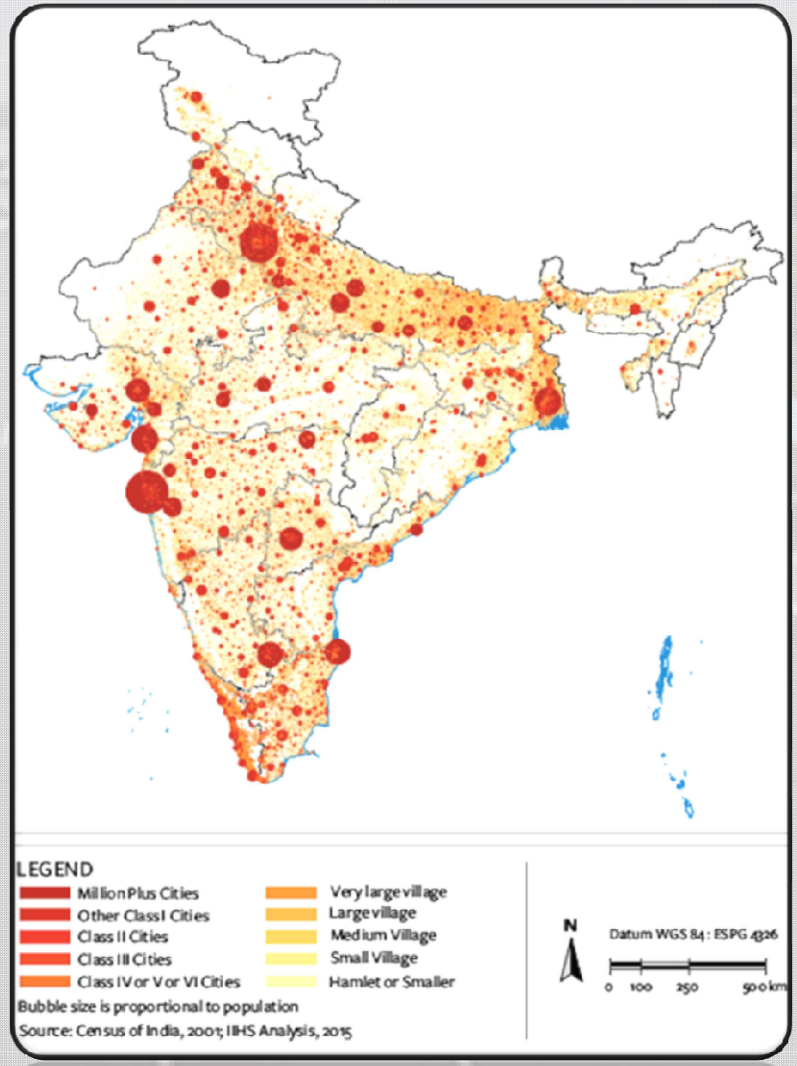
Rapid Urbanization

- cities > 10 million
- cities with > 5 million
- Cities > 1 million
- 4% Urban Population
- crease in construction activity
- igration to bigger cities for job pportunities

Census of India 2011.

Population Density



Exponential growth in Road Network

- d largest road network in the world
- akh kilometres
- m per day in FY 2020-21
- ensity 1.70 km /Sq Km

(0.91)
d States (0.989888)
), Brazil (0.18)

- m of roads per 1000 people.
- atively India's roads are a mix

rn highways
w, unpaved roads, and are

- ment in national highways

95.87 crore (US$2.0 billion) in 2005-06 to ₹98,988.06
(US$14 billion) in 2015-16

Multiple Causes of Injuries

Transport related Injuries highest

Public Health Problem

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Roads and Road Traffic Injuries in India

India 2019

idents – 480,652

aths – 1,54,732

son Injured – 4,39,262

Every Hour

idents – 55

aths – 17

son Injured – 56

With a population of over 1.
billion, there were 210 mi
registered motor vehicles in
at the end of March 2015

At least 17 deaths occurred from road traffic accidents every hour, in 2016

Working age group of 18-60 account for 83.3% of the t road accident fatalities

Road traffic injuries caused 65% more DALYs in 2016 than they did in 1990

Indian economy takes a 3% every year due to road traffi accidents (GDP loss of USD billion in terms of value)

Source: WHO, World Bank, National Crime Records Bur

Gross Under-reporting of the Fatality Data

The Million Death Study estimated 47%-64% greater RTI fatalities than the NCRB-reported official statistics

Recent studies, using data from the health sector suggest the possibility of higher underreporting by traffic police*

The Global Burden of Disease (GBD) study

- Several national health data systems
  - Survey of Causes of Death (SCD), Medical Certification of Cause of Death (MCCD), Million Death Study (MDS)
- 253,993 (95%CI: 239,573 - 266,974) deaths in India in 2016**
- 68% greater than the Government of India estimate of 150,785 deaths

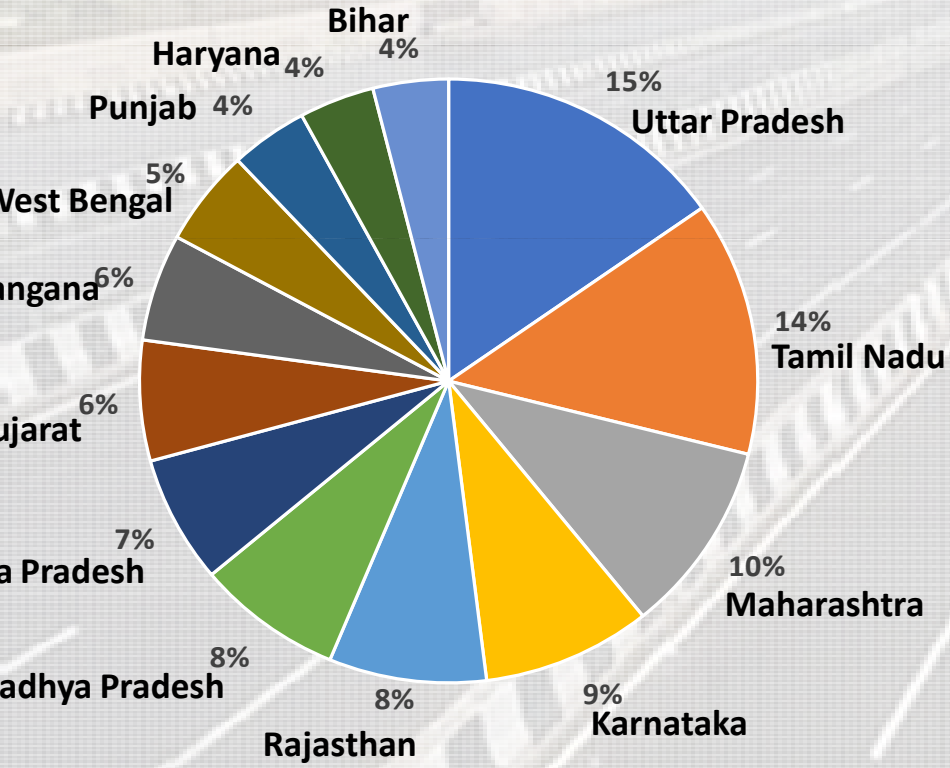
** Road Safety in India: Status Report 20*

***Institute for Health Metrics and Evaluation (IHME) 20*

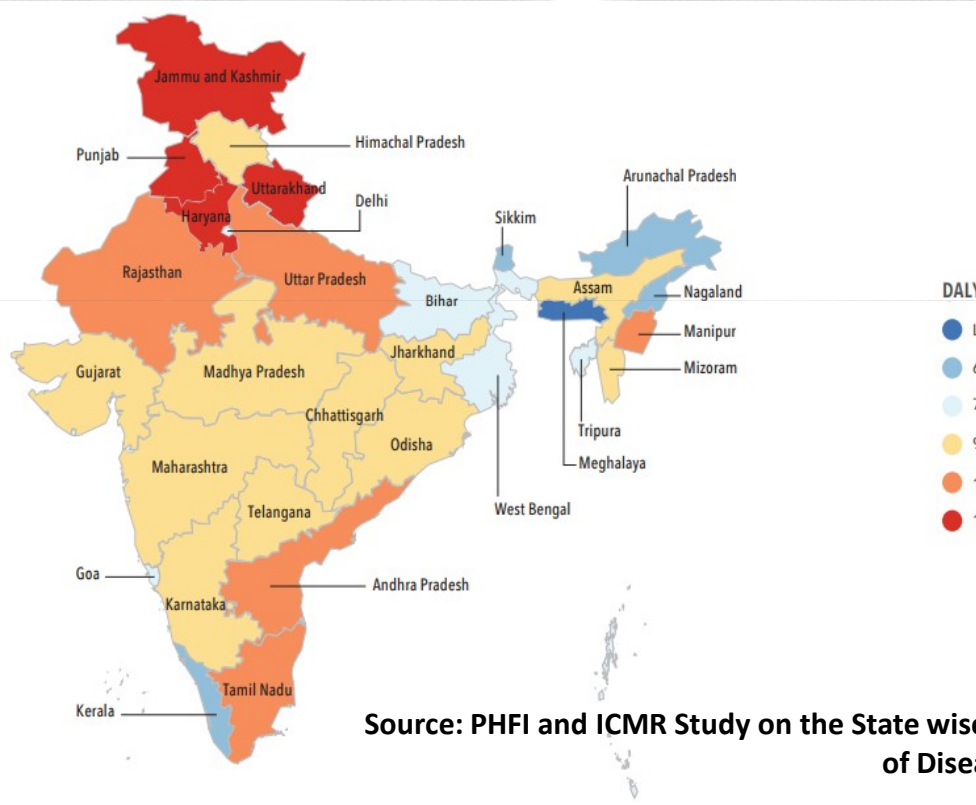
Road Traffic Fatalities and Disabilities India

7% of total number of Persons Killed in Road Accidents and 86.5% of total number of Road Traffic Accidents were unted by 13 States

Road Traffic Deaths in Top 13 States in India



DALYs associated with road injuries in India, 2



Source: PHFI and ICMR Study on the State wis
of Dise

Non-Fatal Injuries – The Injury Pyramid

tio between critical, serious and minor injuries was
29:69 (Varghese and Mohan 1991)

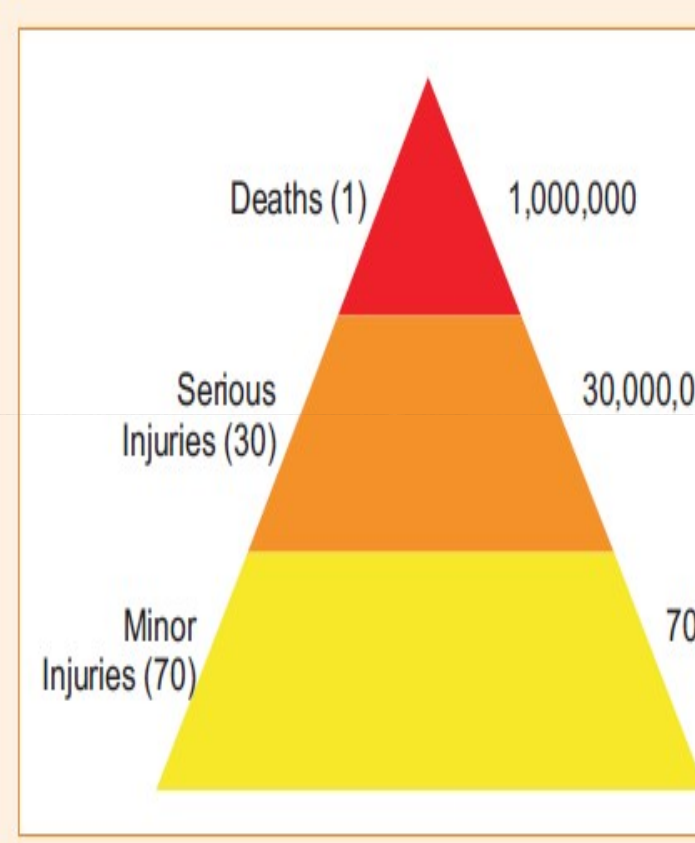
nservative estimate

- deaths, injuries requiring hospital treatment, and minor injuries in India are likely to be about 1:15:50

16

- 150,785 : 2,262,000 : 7,539,000
- As non-fatal injury data in India are unreliable police data should not be used for epidemiology of road traffic injuries

Mohan, Tiwari & Bhalla 2016)



Gururaj et al, NIMHANS, Bangalore. WI

Injury: Silent Genocide

61%
of injuries
occurred on roads, streets or highways

51%
of patients were injured in road traffic incidents

45 - 55%
Transport related Injuries

45 - 55%

Falls (pediatric/ old age group)
Work Place Trauma
Agricultural related trauma
Fire Arms, Intentional self harm
Assault, Fall of objects
Burns, Drowning Natural Disasters
Terrorist Attacks
Possibility of "NBC" events

29%
of patients were injured in falls (low and high)

Falls were more frequent in children (ages 0 – 14)

1 in 4
presentations were motorbike or moped related injuries

The five “E’s” of Road Safety

gineering of Roads

gineering of Vehicles

ucation (IEC InfoEduComm)

forcement of Law

nergency Medical Services

y high mortality and morbidity

mes) for the same Injury severity in India as compared to western data

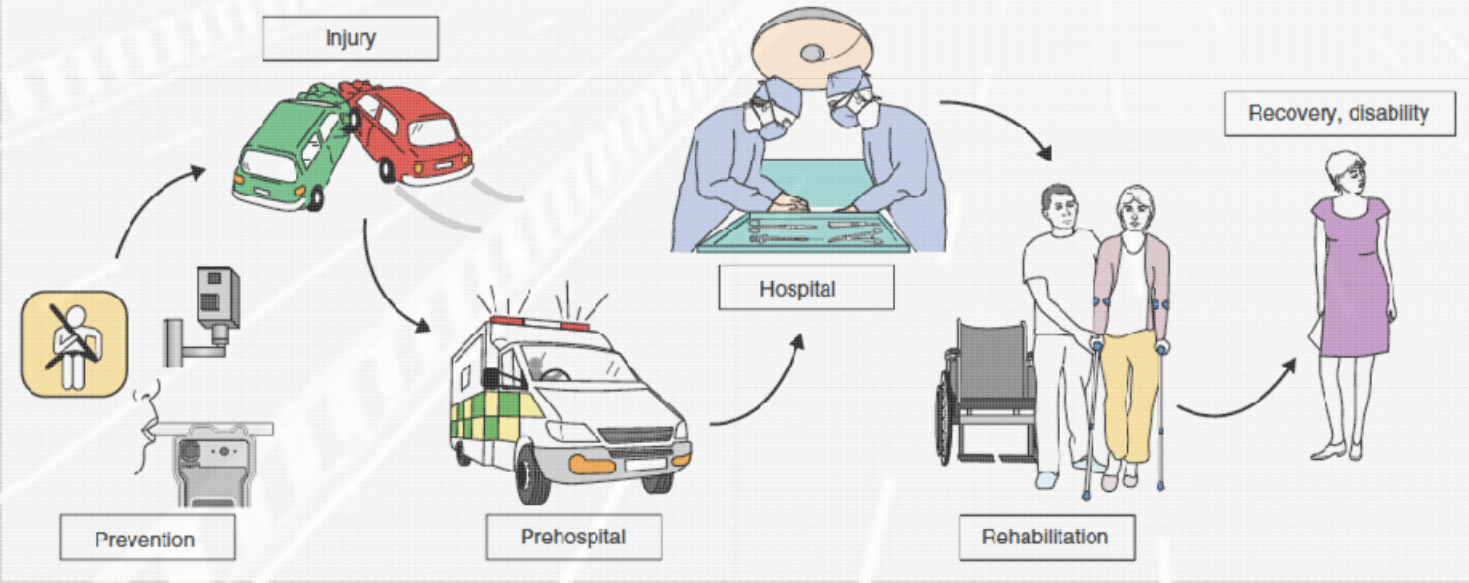
RIMITIVE OR NON EXISTENT "TRAUMA CARE SYSTEMS"

ack of dedicated Pre-hospital care

bsence of trained manpower in Pre-hospital; In-hospital Acute trauma care and rehabilitation

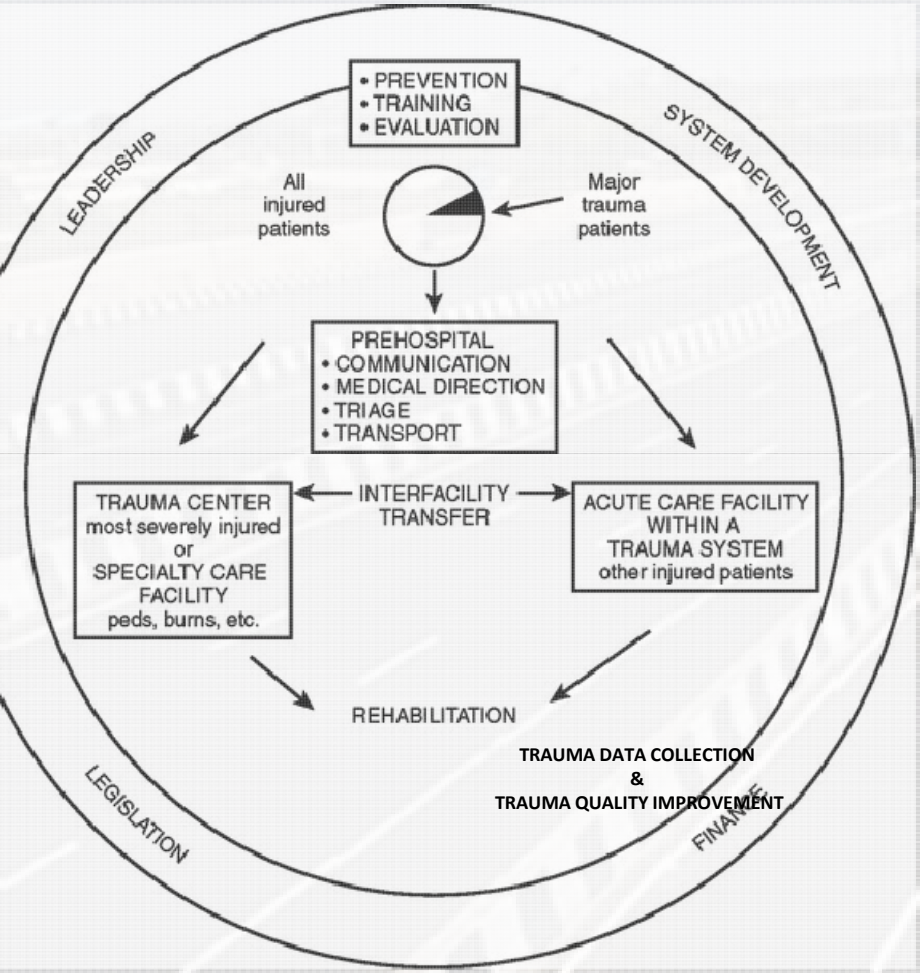
ack of Trauma related hospital data (registry) and Trauma Quality improvement programs.

'Getting the right patient to the right place at the right time for the right care'



Source: R. L. Gruen, B. J. Gabbe, H. T. Stelfox and P. A. Cameron, British Journal of Surgery 2012; 99(Sup

Concept of an Inclusive Trauma System



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VIER

ma Care in India: Capacity Assessment
ey From Five Centers

Check for updates

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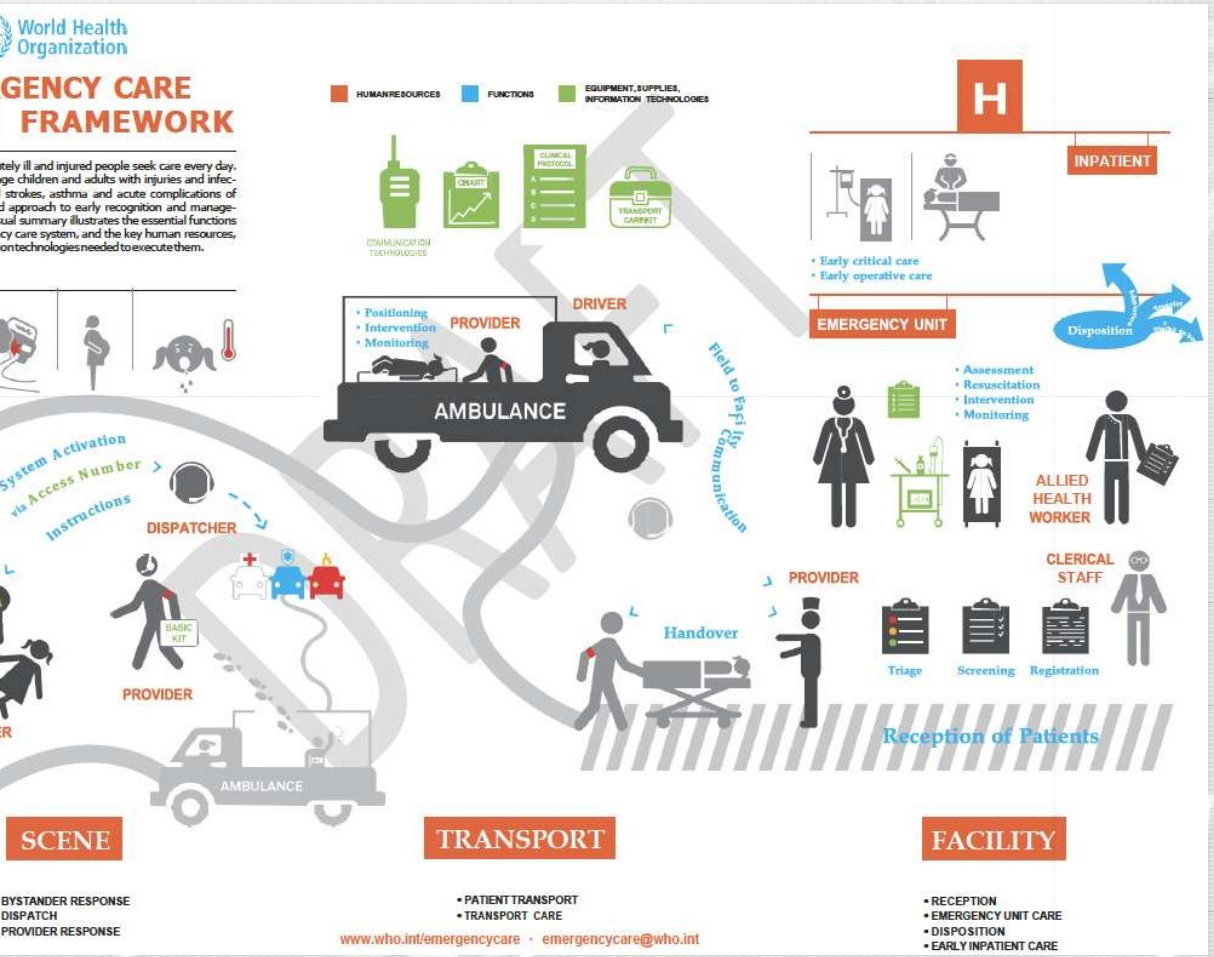
- Five Cities
- 30 Trauma Facilities
  - Level – I (5)
  - Level – II (10)
  - Level – III (15)
- Methodology crysta
- 3 Main Tools Validat
- Infrastructure
  - Building & Equipme
- Manpower Assessm
  - Number
  - Knowledge/ Skills

ignificant imbalance between the recommended resources, including trained manpower, equipr and skills, and the resources which are available in the trauma care facilities is reported

mportance of Capacity Assessment of In-hospita Trauma Care



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mportance of Capacity Assessment of In-hospita Trauma Care

Audit

Better Outcom

apacity Assessment Survey for Trauma Care alon
Bundelkhand Expressway' – A pilot

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Aim

To assess existing trauma care facility along the under construction ‘Bundelkhand Expressway’

Methodology

The cross-sectional study was conducted along the under construction Bundelkhand Expressway.

Each entry/exit point ‘node point’ on expressway was mappe

Detailed survey of existing healthcare facility with 50 or mor beds within 15 KM radius of each node was conducted.

Methodology

Data were collected by trained professionals

- By direct observation
- By interviewing administrator
- By clinician
- By technical staff of that heathcare facility

Basic information was collected based on the format of GOI's operational guidelines on trauma care capacity building.

Enlisting of available manpower and equipments was done a
Govt of India's operational guidelines for capacity building.

Availability of knowledge+skills and equipment+supplies was
assessed by the survey tool on trauma care capacity.

Healthcare facility were classified as per WHO guideline for
essential trauma care into either level I,II,III or IV.

The Bundelkhand Expressway

Green Field Project

Under UPEIDA - Uttar Pradesh Expressways Industrial Development Authority

Total Length: 295.28 Km

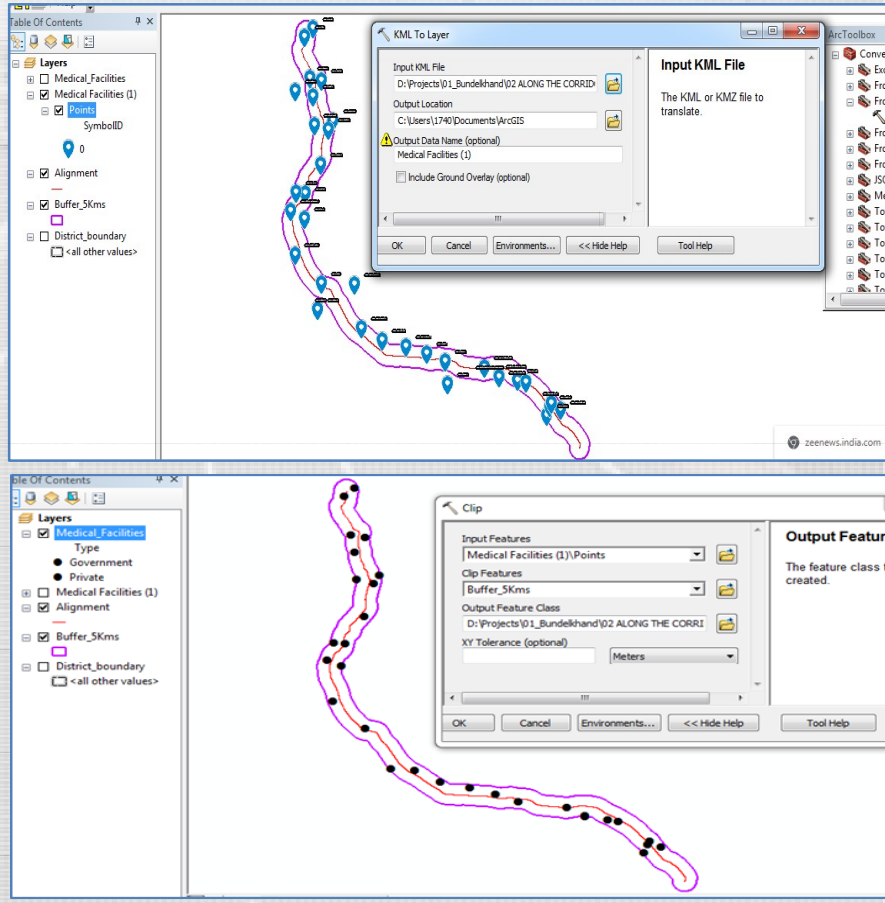
Passes through 7 Districts

– Chitrakoot, Banda, Hamirpur, Mahoba, Jalaun, Auraiya, and Etawah

Development Under 6 Packages

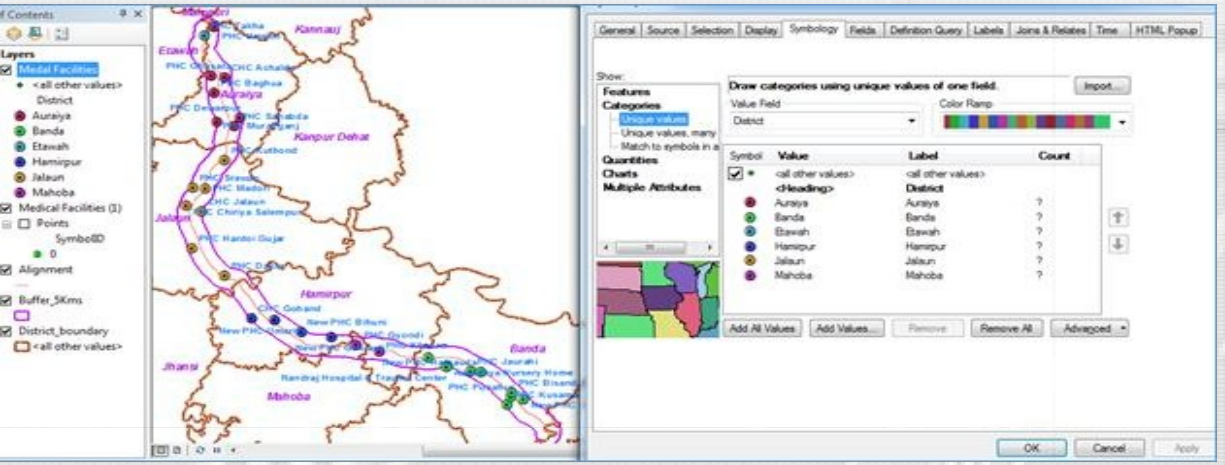
Desk research before conduct of field survey

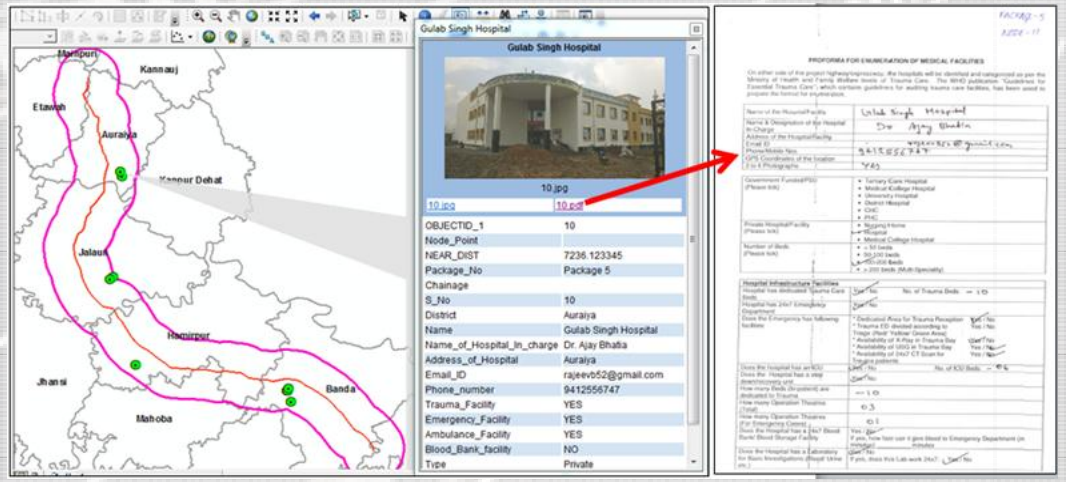
- Using ArcGIS software & Open Source data of Bundelkhand Expressway
  - either side 5kms along Bundelkhand expressway were identified and onscreen digitization
- Using google earth, all medical health care facilities mapped
  - Converted into kml file and Imported into the ArcGIS Software



Courtesy: IRF-IC and ICT Pvt

Pilot – 5 Km Range Arial distance from Alignment





- Chitrakoot – Etawah
- Assessment Included listing Health Care Facilities - 5 Km Both Sides of Expressway (A
- Although 30 HCF were identified in the segment
  - Only PHC's and 2 Small Private Hospitals
  - PHC's not 24x7 facilities
  - Small Private Hospitals Inadequa Trauma Facilities

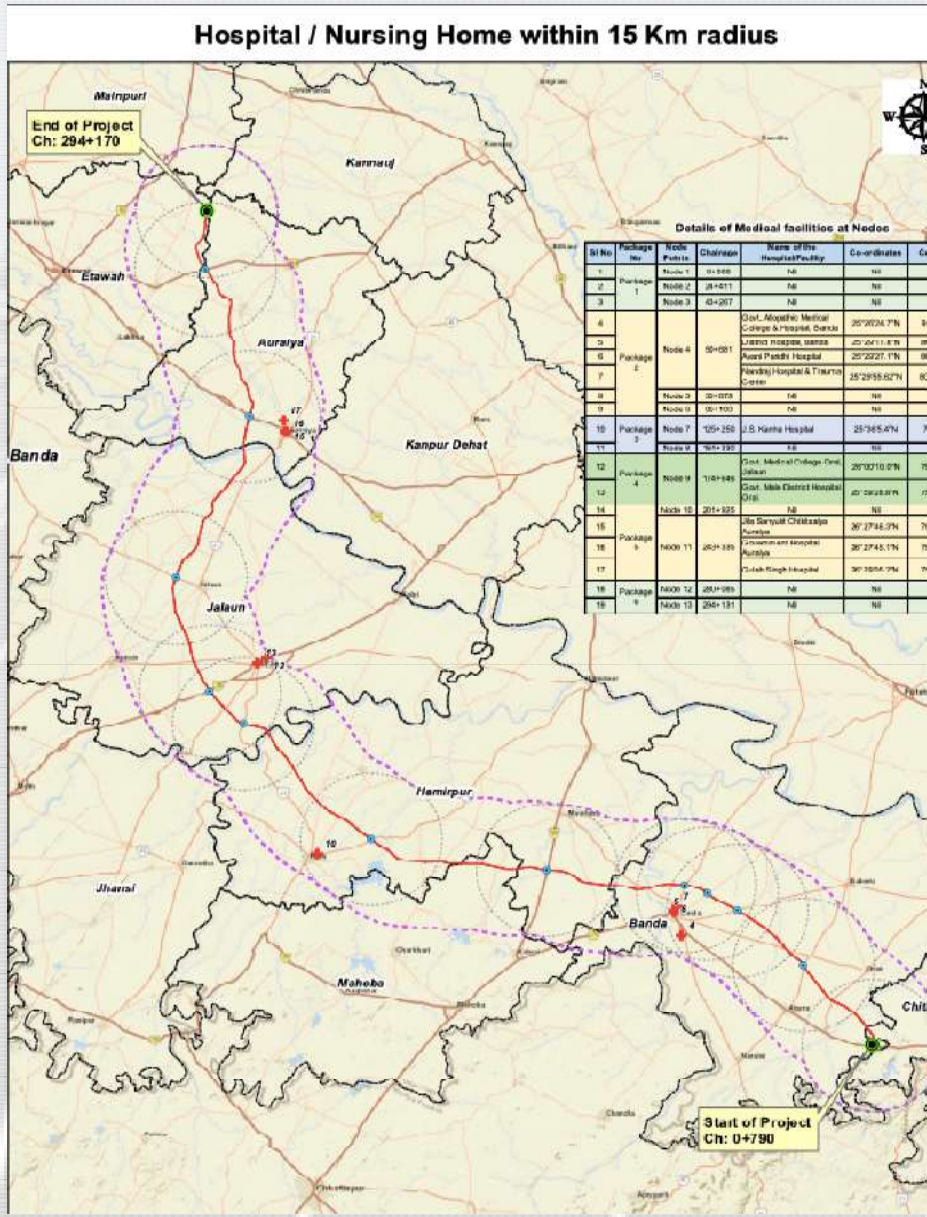
Phase – II

tended the Distance – 15 Km

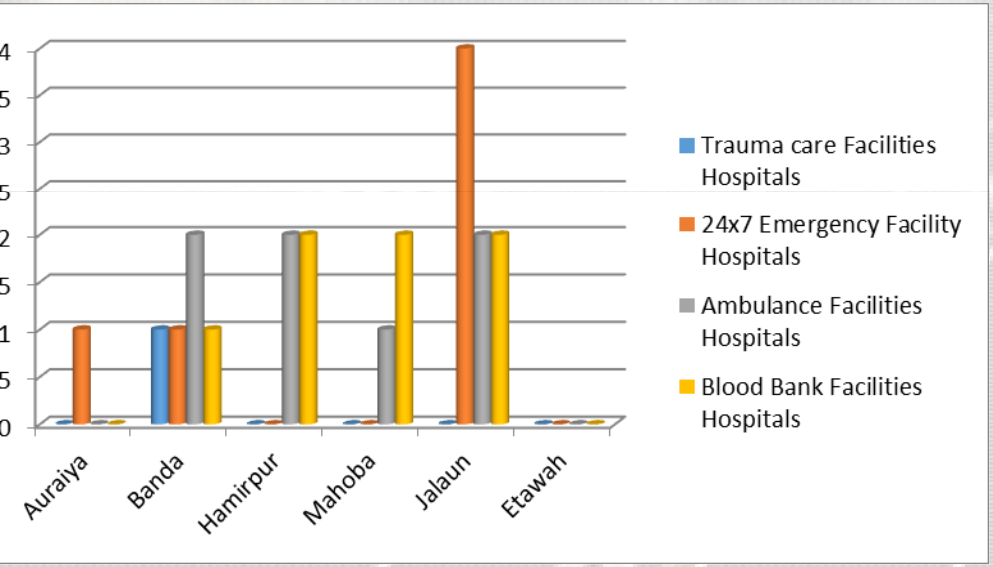
6 Packages

Now Studied

- Not Arial distance
- Distance from Entry/ Exit Points
- Thirteen Entry/ Exit Nodes
- Increased the distance to 15 km
- Health Care Facilities
  - >50 Beds
  - Or had Emergency Department
  - 24X7 Blood Bank



Prelim Analysis



rict wise available facilities with the hospitals Within15km radius at exit entry nodal points from Expressway

District wise Govt. and Private Medical healthcare faciliti				
Sl. No	District	No of Private Medical healthcare facilities	No of Govt. Medical healthcare facilities	Total No Medic healthca faciliti
1	Auraiya	1	2	3
2	Banda	2	2	4
3	Hamirpur	1	0	1
4	Mahoba	0	0	0
5	Jalaun	0	2	2
6	Etawah	0	0	0
Total District wise Govt. and Pvt. Medical Healthcare Facilities				

Prelim Results

Total Exit Points/ Nodes: 13

Total existing healthcare facilities: 08

Exit Nodes with no healthcare facility (<15Km): 10

Node 4 had the highest density of existing facility (4 hospitals with 15 KM radius.

Node 9 & 11 each had 02 existing healthcare facility.

Node point	Total hospital	Location	Level	Total beds	Trauma Beds
1	-	-	-	-	-
2	-	-	-	-	-
3	-	-			
4	04	Banda	Medical college	480	NIL
		Banda	District hospital	120	10
		Banda	Private hospital	108	5
		Banda	Private hospital	50	10
5	-	-	-	-	-
6	-	-	-	-	-
7	-	-	-	-	-
8	-	-	-	-	-
9	02	Orai	Medical college	250	Nil
		Orai	District hospital	120	Nil
10	-	-	-	-	-
11	02	Auraiya	District hospital	75	Nil
		Auraiya	District hospital	50	Nil
12	-	-	-	-	-
13	-	-	-	--	-

Prelim Results

Perceived Level of hospitals in terms of trauma care

- Level 1: 02 (1 each in node 4 & 9) [Medical College Hosp.]
- Level 2: 04 (1 each in node 4 & 9, two in node 11) [District Hosp.]
- Level 3: 02 (node - 4) [Private Hosp.]

None of the Hospitals were actually close to the Level of Care they should have

Prelim Results

Hospital infrastructure

- 05 hospitals had round the clock functioning emergency departmer
- 02 hospitals had dedicated trauma reception area/ ED
- 01 hospital had designated triage areas
- 02 hospitals had X-ray and USG in Emergency
- 01 hospital had round the clock functioning CT scan.
- 07 Hospitals had Blood Bank
- 02 hospitals had ICU for trauma care
- 07 Hospitals had Ambulance

Prelim Results

Human resources (Manpower)

- 06(75%) hospital had general/trauma surgeon
- 06(75%) hospital had orthopaedic surgeon
- 06(75%) hospital had anaesthetist
- 01(12.5%) hospital had neurosurgeon
- 04 (50%) hospital had CMO/ Emergency Doctor

However **none had round the clock** in-house

Surgeon, Neuro Sx, Orthopedician, ICU Physician or anaesthetist.

Prelim Results

Indicator of process structure

- Only 01 hospital had ED triage protocols
- 02 hospitals had mass casualty protocols
- 02 hospitals had Blood Bank (transfusion protocols)
- 02 hospitals had transfer out protocols
- None had red area resuscitation protocols
- Only 01 hospital had doctor/ nurse having done short term training program (like ATLS, ATCN)

Conclusion

The Facilities in the vicinity of “Bundelkhand expressway” fall short of health care facility as per minimum standard.

Uneven geographical distribution of hospitals pose a significa challenge against timely institution of trauma care.

Available hospitals have grossly inadequate resources as per requirement of GOI guidelines for trauma care

In process of secondary analysis of facilities

Finally will frame Gap Analysis and give Recommendations to the State Government

Summary

Assessment of Pre- Hospital Care (Ambulance Services) and Health Care Facilities should be a part of the Project

Such Audits should be done on a regular basis

Data of patients reaching these hospitals and their outcomes should also be analyzed

Recommendations made by such audits should be binding on the health care facilities / Governments

Such projects should be taken up on a Pan-India model

Thank You

J P N Apex Trauma Centre
All India Institute of Medical Sciences

- **Level I – Standalone Trauma Centre**
- **State of the art Patient Care**
- **Trauma Education**
- **Trauma Research**
- **Design Systems**
- **Role Model**