

# **Operation and Strategy Note**

On

## **Traffic Calming Strategies to Improve Pedestrian Safety in India**

### **Being Implemented By**

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### **Project Supporting Agency**

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# 1. The Project: An Introduction:

## 1.1 Background and Need of the project

1.1.1 **Current Scenario of Road Safety:** The magnitude of road traffic accidents, fatalities and injuries in India as per Government data is quantified in Table 1:

**Table 1 Road Accident Statistics**

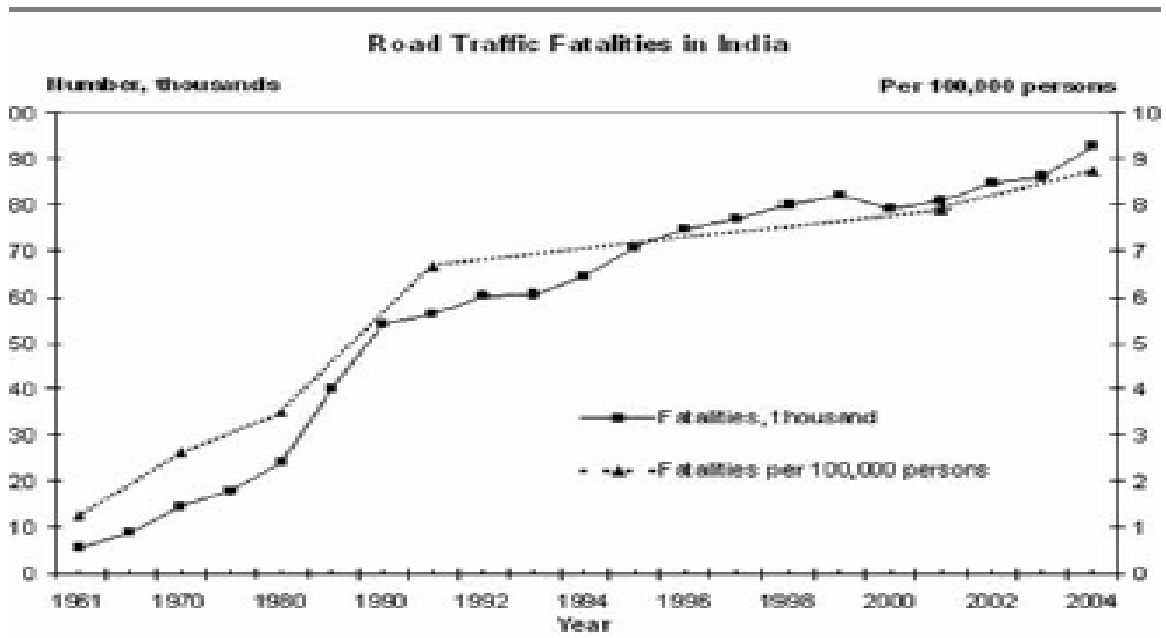
| Year    | All Roads |                |                 | National Highways |                |                 |
|---------|-----------|----------------|-----------------|-------------------|----------------|-----------------|
|         | Accidents | Persons Killed | Persons injured | Accidents         | Persons killed | Persons injured |
| 1999    | 386456    | 81966          | 375051          | 103839            | 28713          | 98427 (P)       |
| 2000    | 397449    | 78911          | 399265          | 110508            | 30216          | 124600          |
| 2001    | 405637    | 80888          | 405216          | 115824            | 32108          | 119592(P)       |
| 2002    | 407497    | 84674          | 408711          | 131738            | 33621          | 132307          |
| 2003    | 406726    | 85998          | 435122          | 127834            | 33153          | 131102          |
| 2004(P) | 429910    | 92618          | 464521          | 130265            | 34723          | 143140          |

**P Provisional**

Source: MoRTH, 2006

1.1.2 While the figure of fatalities may be close to the actual number of deaths in road accidents in India, the number of injuries reported appears to be underestimated. Various studies indicate that the actual number of injuries could be 15 to 20 times the number of deaths. Furthermore, these figure do not account for growth in motor vehicle numbers in the coming years.

1.1.3 The following figure shows the trend of road traffic fatalities in India over the past 45 years. It reveals that both absolute number of fatalities (bold line) and the fatalities per 100,000 population (dotted line) have been increasing monotonically.



It is apparent from the above figure that morbidity and mortality from road accidents is increasing rapidly. Road accidents victims are predominantly male, within the age group of 5-44years (>70%), the most productive section of our society. Children saved earlier from communicable and infectious diseases are now becoming victims of this man made epidemic. However, there is no organized programme to combat morbidity and mortality on Indian roads while there are structured programmes to combat communicable diseases, with substantive allocation of plan funds.

Table 3 Disease- related Mortality and Plan Allocation

| Diseases     | Number of deaths                | Centrally Sponsored Schemes   | Outlay Xth Plan (2002-2007) (Crores Rs.) |
|--------------|---------------------------------|---|--|
| Tuberculosis | 37,639(2004)                    | National TB Control Programme   | 680                                      |
| Malaria      | 638(2005)                       | National Vector Borne Diseases Control Programme(including Malaria,Kala-Azar,Filaria,Dengue and J.E.) | 1370                                     |
| AIDS         | 1094(8286 cumulative till 2005) | National AIDS Control Programme including Blood Safety Measures and National S.T.D. Control Programme | 1270                                     |
| Road crashes | 92618(2004)                     | *   | 187                                      |

- No significant and major scheme.

Source:

Indiastat.com(<http://www.indiastat.com/India/ShowData.asp?secd=16&ptid=0&level=1m>),Ministry of Shipping Road Transport and Highways(2006)& Tenth Plan Document([http://planningcommission.nic.in/plans/planrel/fiveyr/10th/volume2/v2\\_app.pdf](http://planningcommission.nic.in/plans/planrel/fiveyr/10th/volume2/v2_app.pdf))

## **2. Title of the Project**

Traffic Calming Strategies to Improve Pedestrian Safety in India

### **2.1 Project Summary**

Traffic safety is rapidly growing as a health problem all over the world, especially in the developing countries. In low and middle-income countries like India, road traffic injury account for about 85 percent deaths and for about 90 percent of annual disability adjusted life years (DALYs). Projections show that, by 2020, road traffic injuries will become the third leading contributor to the global burden of disease and injury, without appropriate action. This increase is primarily due to rising motorization in developing countries resulting in many fatalities and injuries among pedestrian.

Traffic Calming aims at reducing motorized traffic in an area and to slow down speeds. Holistic Traffic calming Strategies when implemented will result in a much more attractive environment for people living in the area or visiting it as a pedestrian or bicyclist. It will also reduce the feelings of insecurity and it will heavily reduce the risk of severe accidents ( well designed speed reducing measures can reduce serious accidents by up to 90%!). It will help to create a more friendly, useful, and attractive environment with few(er) severe accidents, less noise and less pollution.

### **2.2 Goals**

1. The project will aim to pin point and bring to light the weakness of Indian road Designs and provide a manual, first of its kind in India, suggesting remedial Traffic calming Strategies for important policy/decision makers, namely, Indian police personnel, transport personnel and engineers. Experiences from Sweden and other countries clearly demonstrate the significance of these strategies.
2. Today traffic injury, which is major, but neglected public health challenge requires concerted efforts for effective and sustainable prevention. This project will enrich and add to the concerted effort of other group working in this area.
3. This project will, in the long term, prevent many families from being driven deeply into poverty by the loss of the breadwinner and the added burden of caring for members disabled.

### **2.3 Objectives (Expected Outcome, Results and Benefits of the Project)**

1.The research component of the project will to pin point and bring to light the weakness of Indian road Designs and provide a manual, first of its kind in India, suggesting remedial Traffic calming Strategies for important policy/decision makers, namely, Indian police personnel, transport personnel and engineers. Experiences from Sweden and other countries clearly demonstrate the significance of these strategies.

2.This manual aims to become the basis for generating awareness among Indian traffic and transport personnel in the years to come. It would also help in launching of awareness generation programmes and workshops on Traffic Calming. Methods with the ultimate aim to reduce the number and severity of pedestrian and other vulnerable road user casualties in road traffic.

3.The recommendations of this project when implemented will directly help to improve and better the quality of the environment on the roads, for the poor and pedestrians, and for people living besides and around the main arterial roads. It will also heavily reduce the risk of severe accidents it will indirectly help to reduce noise pollution, air pollution and poverty by preventing loss of the breadwinner and added burden of caring for members disabled.

4.This project will provide an opportunity to build a partnership with Sweden, which in the long run will help to utilize more successful experiences from Sweden and other parts of the world in order to change the said Indian Road safety scenario.

5.This Project will be an appropriate beginning in the right direction to ensure equal protection for all road users, which would be the guiding principle to avoid an unfair injury and death of poorer people and vulnerable road users.

6.This project will, in the long term, prevent many families from being driven deeply into poverty by the loss of the breadwinner and the added burden of caring for members disabled.

## **2.4 Area of operation**

The project will be now focus in Jaipur city and near by area and will be implemented in following critical locations of the city and near by area, to be identified based on the data provided by local authority.

- **National Highways**
- **State Highways**
- **Major District Roads**
- **Other District Roads**
- **Rural Roads**
- **Critical accident-prone locations in Jaipur city**

Following are the numbers of critical location to be identified

On National Highways ----- 6 Nos.  
On State Highways -----6 Nos.  
On Rural Roads -----6 Nos.  
In Jaipur City -----6 Nos.

Total Nos. of Location -----24 Nos.

2.4.1 This would facilitate co-operation of local police/decision makers, which is an important requirement of the project. Twenty-four sites representing typical safety problems for pedestrian and cyclists would be selected on the basis of data collected from the police department.

2.4.2 Areas comprising schools, hospitals, shopping complexes, small cross section in rural area and residences would be given preference.

## **2.5 Duration of the project**

The project starts in the month of Nov.07. Formation of India team is going on. Formal Launching ceremony of the project will be in the first week of March 08. And shall complete in two years time, which is divided into eight quarters.

## 2.5 Traffic Calming Strategies

1. Every day thousands of people are killed and injured on our roads. Men, women and children walking, cycling or riding to school or work, playing in the streets or setting out on long trips never return, leaving behind shattered families and communities. Millions of people each year spend long weeks in hospital recovering from severe crashes while many are never able to live, work or play as they used to. Current efforts to address road and traffic safety are minimal when compared with this growing human suffering.

2. The project aims at identifying accident Prone area sites in Jaipur and near by area, studying the shortcomings and causes that make these sites accident-prone and developing and testing thereafter holistic traffic calming strategies on a “large enough scale” for Indian cities. The project intends to test and modify measures developed and found efficient from the safety point of view in Sweden and other highly motorized countries. The aim is to find out whether these measure will have a desirable local impact on the behaviour of different kinds of road users-primarily car drivers and pedestrians. Those measures that are found to be effective in Indian conditions will then be summarized in a manual for the Indian police personnel, transport personnel, planners and engineers suggesting remedial road designs that would help in calming traffic. No such manual exists till date in India.

3. Traffic Calming aims at reducing motorized traffic in an area and to slow down speeds.

Holistic traffic calming strategies when implemented will result in a much more attractive environment for people living in the area or visiting it as a pedestrian or bicyclist. It will also reduce the feelings of insecurity and it will heavily reduce the risk of severe accidents (Well-designed speed reducing measures can reduce serious accidents by up to 90%). It will help to create a more friendly, useful, and attractive environment with few (er) severe accidents, less noise and less pollution.

### III. Project Activities

| S.N. | Activities   | Time                                 | Responsibility               | Budget in Rs                     |         |
|------|--|--------------------------------------|------------------------------|----------------------------------|---------|
|      |  |                                      |                              | Appl. 1                          | Appl. 2 |
| 1.   | Formation of Indian and Swedish team and Advisory Board/Consultant Salaries/Honorarium<br>a)CUTS Team<br>b)Indian Team<br>c)Advisory Board<br>d)Swedish Team | Q1<br>Q2(Feb.08)<br>Q2(Feb.08)<br>Q1 | CUTS/Swedish Team            | 3496000                          | 4302645 |
| 2.   | Launching of the project   | Q2(March08)<br>First weak            | CUTS                         | 50000<br>CUTS Cont.              |         |
| 3.   | Training of In-house CUTS` representatives on selection of sites cum formal launch of the project. (2 days)  | Q2(First weak of March 08)           | Delhi I.I.T.                 | 66800<br>+<br>3739(CUTS cont.)   |         |
| 4.   | Identification of sites  | Q2(March-April 08)                   | Indian Team                  |                                  |         |
| 5.   | Training of Indian Team (21 days)  | Q2-Q3<br>April-May08                 | Delhi I.I.T/Swedish Team     | 420500<br>+<br>39261(CUTs cont.) |         |
| 6.   | Research Study<br>1) Field Study " Before"<br><br>2)Analysis of Before study<br><br>3)Analysis & Formulation of first set of Traffic calming measure         | Q3-Q4-Q5<br><br>Q5<br><br>Q5-Q6      | Indian Team/<br>Swedish Team | 393000                           | 329280  |



|     |  |                         |                                     |         |       |
|-----|--|-------------------------|-------------------------------------|---------|-------|
|     | 4)After studies field work   | Q6                      |                                     |         |       |
| 7.  | Executing change & Making After studies  | Q6 (Last two month)     | Indian Team/<br>Swedish Team        |         |       |
| 8.  | Analysis of finding  | Q7 (First month)        | Indian Team/<br>Swedish Team/Expert |         |       |
| 9.  | Expert Analysis  | Q7 (First-Second month) | Expert/Swedish team                 |         |       |
| 10. | Workshops<br>a) Jaipur- One day<br>b) Calcutta- One day<br>c) Banglore- One day<br>d) Mumbai- One day<br>e) National Workshop at New Delhi- Two days | Q7 (last month)         | Indian Team/<br>Swedish Team        | 1096000 | 6720  |
| 11. | Draft Manual   | Q8 (First-Second month) | Indian/Swedish Team                 |         |       |
| 12. | Final Manual   | Q8 (Last Month)         | Swedish Team                        | 500000  | 90000 |

Q1—Nov. 07 to Jan.08

Q2---Feb.08 to April 08

Q3--- May 08 to July 08

Q4--- Aug. 08 to Oct. 08

Q5---Nov. 08 to Jan. 09

Q6---Feb. 09 to April 09

Q7---May 09 to July 09

Q8---Aug 09 to Oct.09

## **Details of Activities**

### *3.1 Formation of one Indian and one Swedish team and Advisory Board*

3.1.1 Indian and Swedish team are proposed to be formed under the project. Indian team would be dedicated to identified city and such team would comprise two civil engineers, one or two police personnel, a state transport representative, a psychologist and local area representative, which makes six different local area representatives for identified locations, beside CUTS representative.

3.1.2 The Swedish team will comprise a team leader, Prof. Christer Hyden or a replacer, two members of the field analysis team and two already trained civil engineers.

#### 3.1.3 Time Period/ Financial Resource

To be accomplished in the first and second quarter of the project.

The financial resources for the Indian team, Swedish team`s honorarium and salaries and the advisory board expenses is in all Rs.6843536.00

### *3.2 Designing of the 'Evaluation and Training Module'*

3.2.1 The Swedish and the I.I.T, Delhi will first design the evaluation and training module, which will be used to study the effects of the selected sites. This evaluation tool will work out 'what to study' and 'how to study' in the 'before' and 'after' studies.

#### 3.2.2 Time Period/ Financial Resource

To be accomplished in the second quarter of the project.

The financial resource available for this activity is Rs.51539.00

### *3.3 Training of the Indian Team*

- 3.3.1 The CUTS' in house team will first be trained by the I.I.T professors on how to select the accident-prone areas from the data collected from police. The Indian team will then be trained by the Swedish and the Delhi I.I.T experts to study the shortcomings in the selected areas by the training module developed by the teams.
- 3.3.2 The study module will include behavioural studies, speed measurements and conflict studies
- 3.3.3 Time Period/ Financial Resource  
The proposed activity needs to be accomplished in the second and third quarter of the project.  
The financial resource for this is Rs 459061.00
- 3.4 Field Study/ Research
  - 3.4.1 The Swedish team in collaboration with the Indian team will then study the defects of the areas identified. Parts of these sessions will be video recorded.
  - 3.4.2 From the analyses of the results and findings, different remedial measures will be proposed for testing. The first set of traffic calming measures effective for Indian cities would be formulated. Simple measures that do not require time/high costs and could be installed/removed would be tested.
  - 3.4.3 The Swedish team in collaboration with the Indian team will again study the effects of the changes implemented by making 'after' studies some months after the implementation of the measures. These observations will be identical to the earlier study. Even these sessions will partly be video recorded.
  - 3.4.4 Time Period/Financial Resource  
All these activities are to be accomplished between third quarter to the seventh quarter of project.  
The financial resource available for this activity is Rs1046600.00
- 3.5 Expert Assessment

- 3.5.1 It is realised up front that implementing changes could, in some cases, be constrained by budgetary and/or other factors. It is proposed to organise 'expert assessments'. Expert assessments are proposed to be organised through questionnaires (which will be based on the finding of the site-analyses) to experts world-wide.
- 3.5.2 The questionnaire to expert's worldwide will include estimations of possible safety effects of different kinds of proposed measures that are specific to India. For summarising the questionnaire results, Meta analysis will be used.
- 3.5.3 Time Period/Financial Resource  
The activity to be accomplished in the sixth and the seventh quarter of the project.  
The financial resource available for this activity is Rs1046600.00

### 3.6 Workshops

- 3.6.1 One workshop is proposed to be organised in each of the four selected cities (Jaipur, Calcutta, Bangalore, Mumbai) and Two days National Workshop at New Delhi in which the findings of the 'after' studies or / and the results of the "expert assessment" will be presented.
- 3.6.2 Local authorities, experts, and policy/decision makers of that region will attend the workshops.
- 3.6.3 The presentations in the workshops will involve animations built on video recorded events from locations that have been studied, and will include, e.g., accident-prone situations and other safety relevant behaviour. The main idea behind the use of animations will be to facilitate a discussion that is built on facts rather than "general ideas".
- 3.6.4 Traffic is a difficult issue. Everybody is an expert on traffic safety and there is always a great risk that prejudices will play a too important role in discussions. Using animations linked to facts from the studies will help to clean the discussions and conclusions from irrelevant aspects. At the workshops, the results of the Meta analysis mentioned above will be incorporated.

### 3.6.5 Time Period/Financial Resource

This activity will be accomplished in the seventh quarter of the project.

The financial resources for workshops is Rs1000000.00

## 3.7 Documentation of the Manual

3.7.1 Based on the findings, discussions and feedback from the workshops, the first proposed set of efficient Traffic Calming designs would be revised and circulated once again to the people who attended the workshops in the four cities , to find out their final views on the feasibility of the proposed design and content of the proposed manual.

3.7.2 Thereafter a draft manual would be presented to the Advisory Board incorporating the final set of measures

### 3.7.3 Time period/Financial Resource

This manual is to be completed in the first two months of the quarter eight.

The financial resources available is Rs590000.00

## 3.8 Documentation of final manual and its distribution

3.8.1 The final manual will be documented taking in all the feedback and harmonizing the measures. The final version will once again be presented to the Advisory Board.

3.8.2 The manual will be distributed to the Transport Departments, Traffic Departments and Municipal Corporations of all the Indian cities.

3.8.3 In future, this manual will be used as the basis to conduct workshops to create awareness among traffic and transport professionals. Even in Europe, no such comprehensive manual exists, which is resulting in implementation of a wide range of measures that are sometimes confusing.

### 3.8.4 Time Period/Financial Resource

The Documentation, printing and distribution of the final manual will done during the eight-quarter of the workshop.

The financial resource available is Rs900000.00

| Activity |                                | Quarter |    |    |    |    |    |    |    |
|----------|--------------------------------|---------|----|----|----|----|----|----|----|
|          |                                | Q1      | Q2 | Q3 | Q4 | Q5 | Q6 | Q7 | Q8 |
| 1        | Training of CUTS In-house team | √       |    |    |    |    |    |    |    |

|    |   |   |   |   |   |   |   |   |   |
|----|---|---|---|---|---|---|---|---|---|
| 2  | a)Launching of the project<br>b)Designing “Evaluation & Training Module” (2 Days) |   | √ |   |   |   |   |   |   |
| 3  | Identification of critical sites in Jaipur and near by area                       |   | √ | √ |   |   |   |   |   |
| 4  | Formation of the Indian team  |   | √ |   |   |   |   |   |   |
| 5  | Formation of the Swedish Team   | √ |   |   |   |   |   |   |   |
| 6  | Formation of Advisory Board   |   | √ |   |   |   |   |   |   |
| 7  | Training of Indian Team   |   | √ | √ |   |   |   |   |   |
| 8  | Field Study of selected sites-<br>“Before” Studies                                |   |   | √ | √ | √ |   |   |   |
| 9  | Analysis & Formulation of First Set of Traffic Calming Measures                   |   |   |   |   | √ |   |   |   |
| 10 | Executing Changes & Making<br>“After Studies”                                     |   |   |   |   | √ | √ |   |   |
| 11 | Analysis of Findings  |   |   |   |   |   |   | √ |   |
| 12 | Expert Analysis   |   |   |   |   |   |   | √ |   |
| 13 | Workshops   |   |   |   |   |   |   | √ |   |
| 14 | Draft Manual  |   |   |   |   |   |   |   | √ |
| 15 | Final Manual  |   |   |   |   |   |   |   | √ |

(Q means a quarter – 3 months- hence 8 quarters for 2 years)