

# Reconstruction & Renewal of Bhuj City

## **The Gujarat Earthquake Experience -** *Converting Adversity into an Opportunity*

*a presentation by:*

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# Bhuj City – Key Facts

- A 500 year old traditional unplanned city
- Headquarters of Kutch district – seat of district government
- Population of about 1,50,000
- Strong Livelihood base - handicrafts and handloom work
- Disaster Profile
  - Earthquakes – Active seismic faults surround the city
  - Drought – every alternate year

**One of the  
worst affected cities  
in the earthquake of 2001**

**2370 dead, 3187 injured  
6402 houses destroyed  
6933 houses damaged  
+ markets, offices, civic  
Infrastructure etc**

# Vulnerability of Urban Areas – Pre-Earthquake



- Traditionally laid out city - Historical, old buildings with poor quality of construction
- Poor accessibility in city areas for immediate evacuation, rescue and relief operations
- Inadequate public sensitivity for disaster preparedness
- Absence of key institutions for disaster preparedness  
urban planning, emergency response, disaster mitigation
- Inadequate and inappropriate equipment/ facilities/ manpower for search and rescue capabilities

# URBAN RE-ENGINEERING GUIDING PRINCIPLES

- **RECONSTRUCTION AS A DEVELOPMENT OPPORTUNITY**
  - *Provide a Better Living Environment*
- **DEVELOPING MULTI-HAZARD RESISTANT CAPABILITY**
  - *Improved Technologies and Materials e.g;*
- **ENSURING PUBLIC PARTICIPATION**
  - *In Planning and Implementation*
- **PLANNING URBAN RE-ENGINEERING**
  - *On Scientific and Rational Criteria*
- **RESTORING EARLY NORMALCY**
  - *Reconstruction in the Minimum Possible Time*

## A. Institutional Development

- **Gujarat Urban Development Company** - nodal agency at the State level for planning, procurement, design, supervision and implementation
- **Area Development Authorities** - newly set up to oversee the urban reconstruction process & rehabilitation in the worst affected towns of Kutch

## B. Programme development/ implementation

- Accurate **base mapping** - 16 studies carried out
- **Development Plans (DPs) and Town Planning Schemes (TPS)** - Urban planning, infrastructure design and implementation
- **Consultants** deployed for
  - Urban Planning
  - Infrastructure and Supervision
  - Architecture and Design

## C. Community participation

**More than 1,800 consultative meetings conducted for incorporating public objections and suggestions in the development and town planning processes**



# URBAN RE-ENGINEERING

## D. Planning

- **Spatial Planning - Land use planning**
- **Microzonation - Land Suitability**
- **Quick Accessibility - defined hierarchy of road structure, suitable width, looping**
- **Creating Open Spaces - recreational and refuge areas**
- **Ensuring Plot frontage to roads**
- **Providing core public amenities / facilities - water, sewerage, municipal buildings, town hall, etc**

## E. Codes and Regulations

- **Adoption of improved General Development Control Regulations and National Building Code**

## F. Equipment

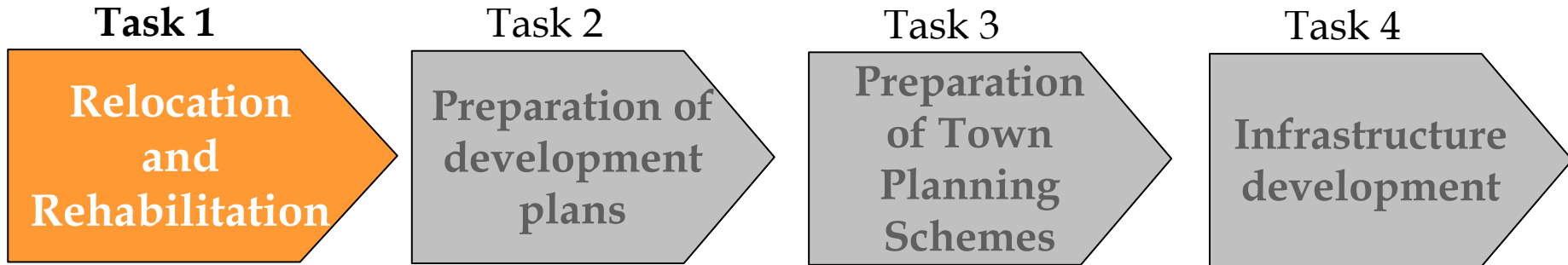
- Procurement of Disaster Response/ Urban Search and Rescue equipment

## G. Capacity Building Training

- Public Information Dissemination - Do's and Don'ts
- Trained Manpower - Effective Rescue and Relief Operation



# The reconstruction task was undertaken scientifically and methodically...

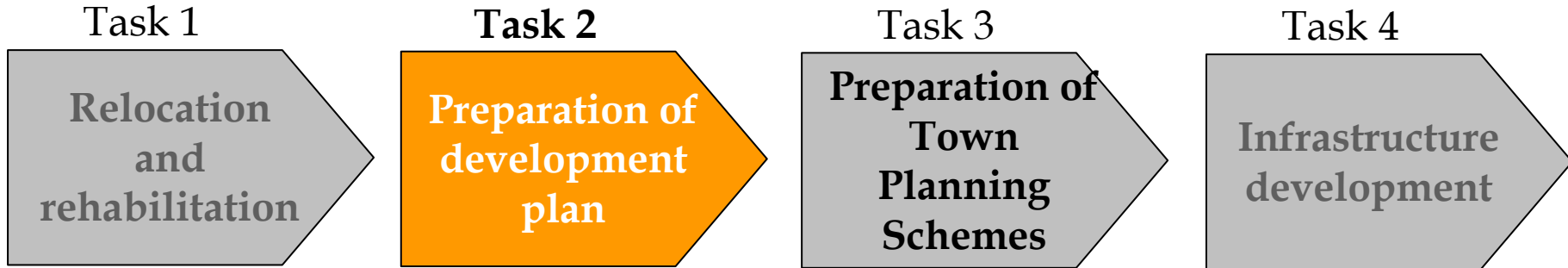


## Who was Relocated

*Those who were land losers to town planning, tenants, those left holding unviable plots*

- Identification of Relocation sites in Bhuj
- Providing Land and infrastructure facilities
- Planning for Plot layout and infrastructure
- Plot allocation to individuals
- Site and infrastructure development - to be completed by the time plots are allotted

# The reconstruction task was undertaken scientifically and methodically...



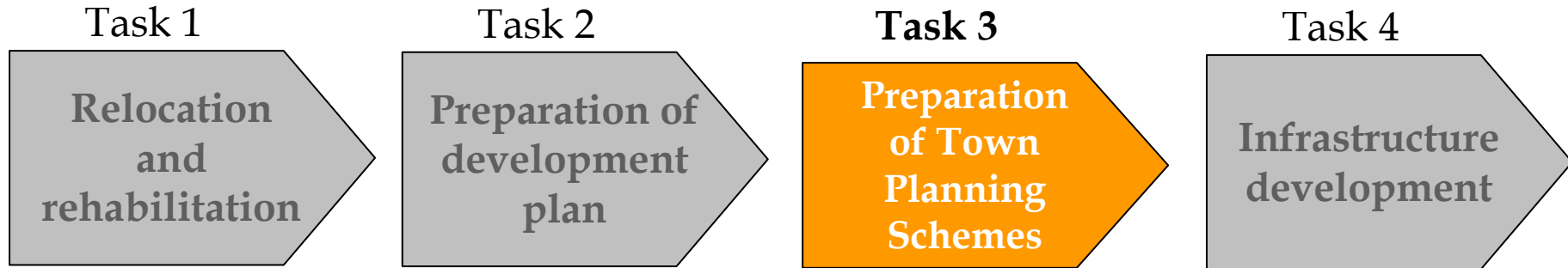
**Development plans for each town prepared through extensive public consultations and survey processes...**

- Questionnaire surveys
- Focus group meetings
- Ward meetings
- City-level workshops
- Display of maps at the ADA and the Consultants' offices

**There was significant community involvement - over 1800 meetings held with different stakeholders...**

- Local and state govt. officials
- Community groups and opinion leaders
- Local trade and industry
- Real estate developers
- Women's, artisan's, professional's groups
- Defense officials

# The reconstruction task was undertaken scientifically and methodically...



**Town planning schemes have been developed after very detailed and exhaustive studies...**

## Base Studies and Analysis

1. Base map preparation
2. Total station survey
3. Land use and value studies
4. Demography
5. Regional context
6. Industry, trade and commerce
7. Traffic and transportation
8. Damage assessment studies
9. Geological, seismicity studies
10. Assessment of relocation needs
11. Inventory of Govt. lands
12. Social infrastructure
13. Physical infrastructure
14. Heritage resources
15. Urban design
16. Household surveys

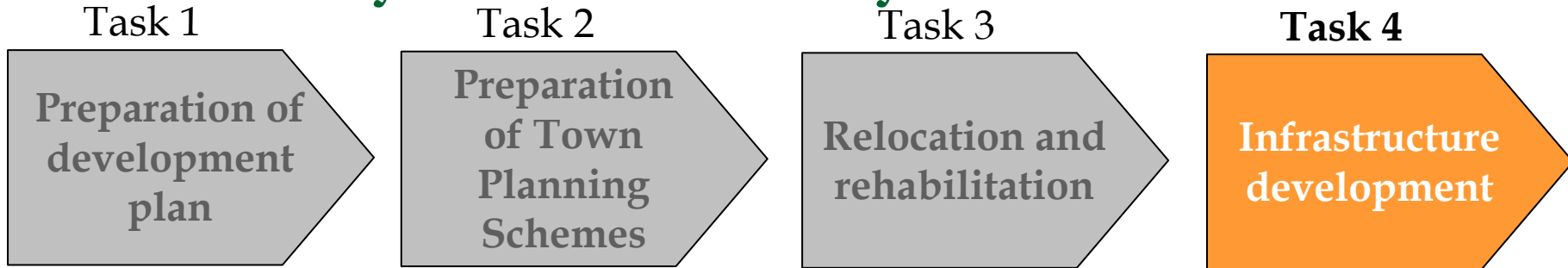


## **Institutional support from...**

- **Geological Survey of India**
- **Central Ground Water Board**
- **Area Devt. Authority's Expert Group - CEPT & IIT**

# The reconstruction task was undertaken

## scientifically and methodically...



**Land development of relocation sites**

**Construction of municipal buildings, parks and gardens**

**Reconstruction of roads and street lights**

**Laying of treated Water Supply network and a pipeline hierarchy**

**Providing Sewerage systems and treatment plants and solid waste disposal sites**

# URBAN RE-ENGINEERING

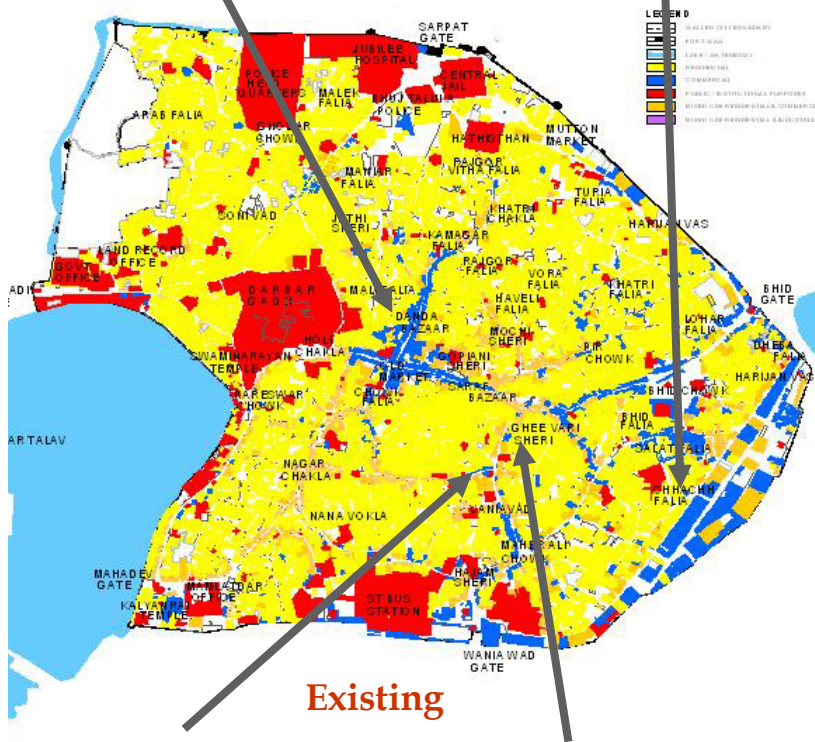
## PREPARATION OF DEVELOPMENT PLANS

Traditional markets on specific streets

Traffic congestion

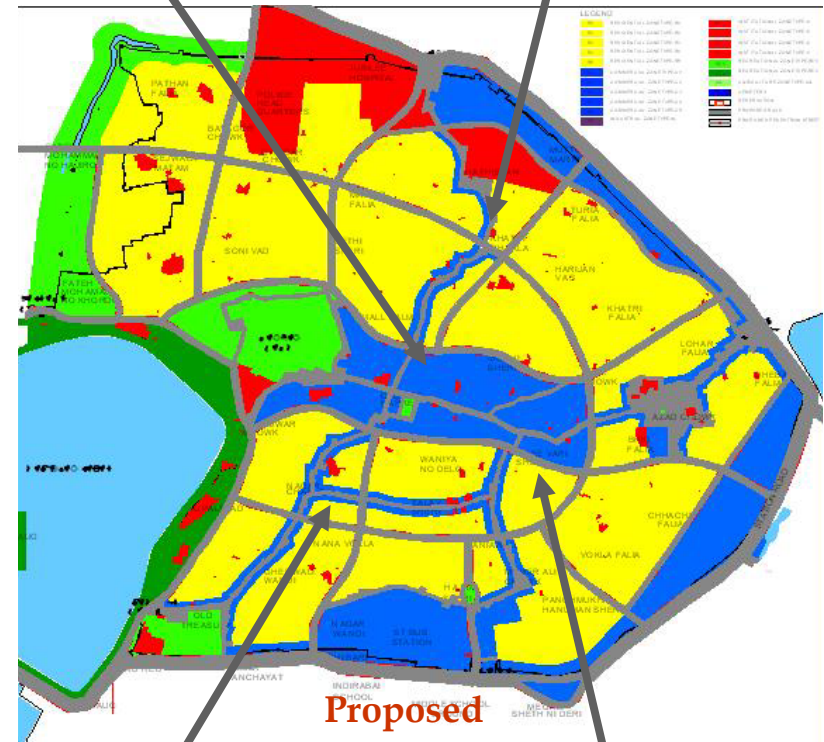
Large central market area

Markets/ streets for pedestrians



No hierarchy of streets

Plots have no proper access



Well planned street network

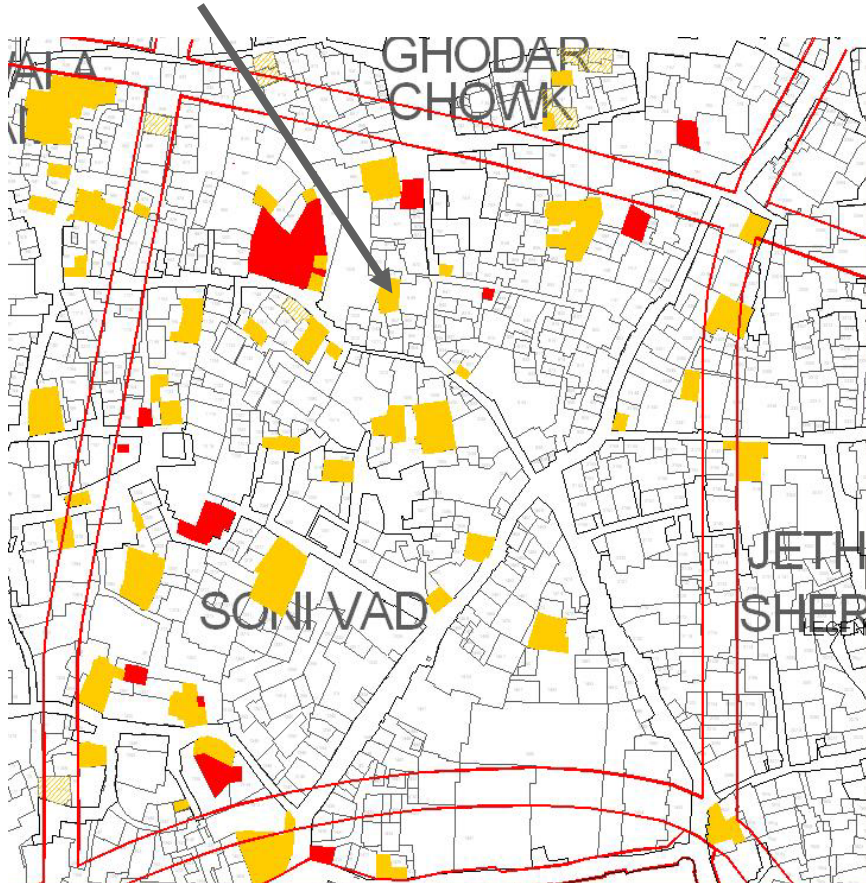
Proper access for all plots



# URBAN RE-ENGINEERING

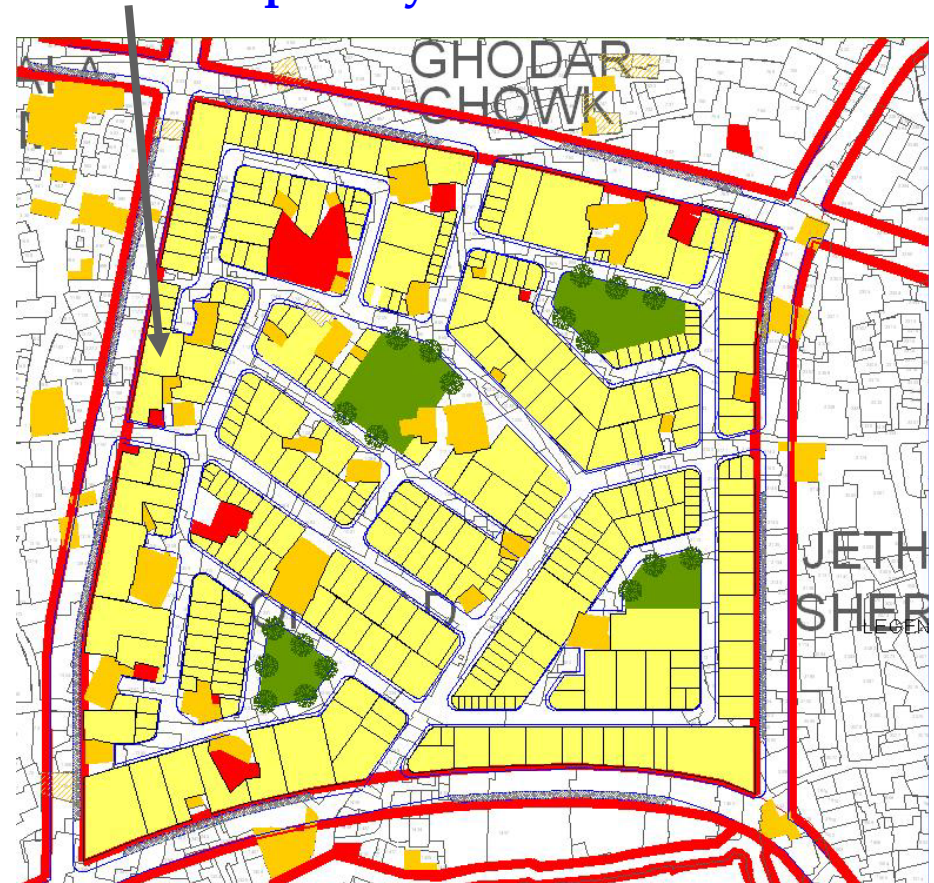
## PREPARATION OF 13 TOWN PLANNING SCHEMES

Previous plot layout



Before the implementation of the Town Planning Scheme

New plot layout



After the implementation of the Town Planning Scheme

# URBAN RE-ENGINEERING

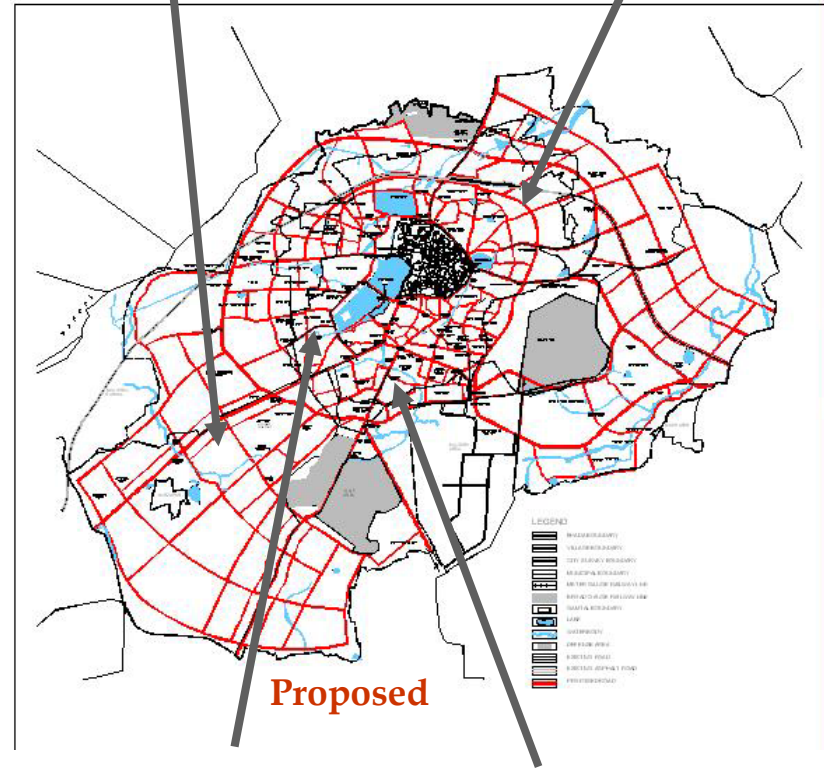
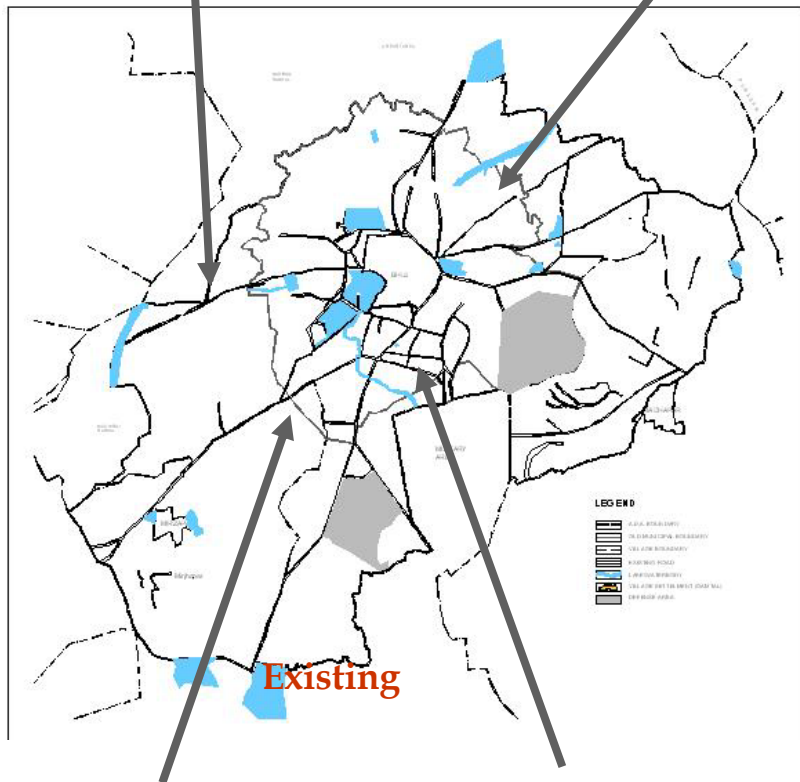
## ROAD NETWORK PLANNING

Road network in periphery poor

No clear pattern

New roads for growth areas

Ring - radial pattern



No hierarchy

Poor quality of construction

Clearly defined hierarchy

Better quality of construction



# URBAN RE-ENGINEERING



GSDMA

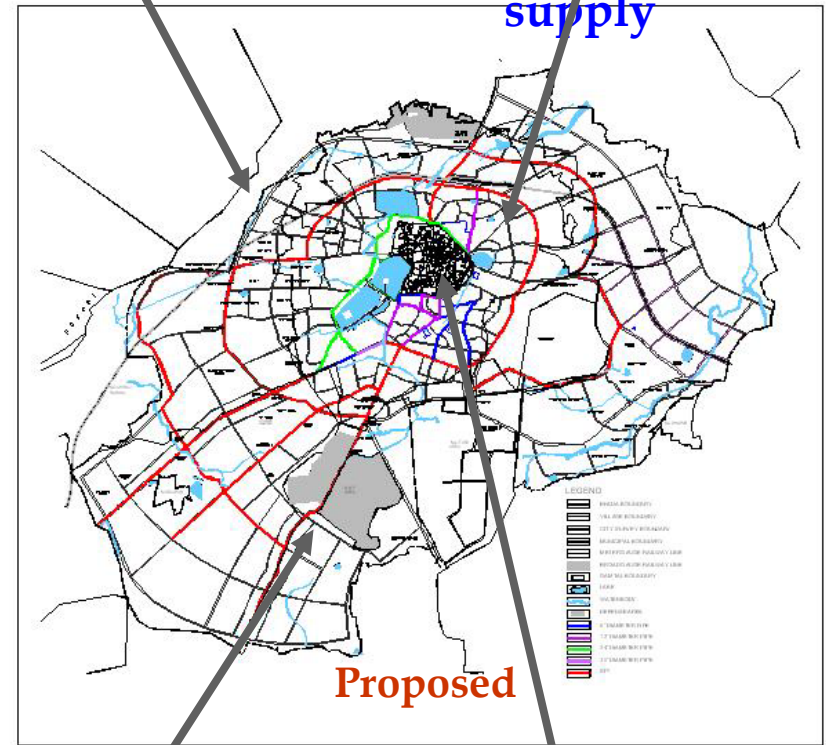
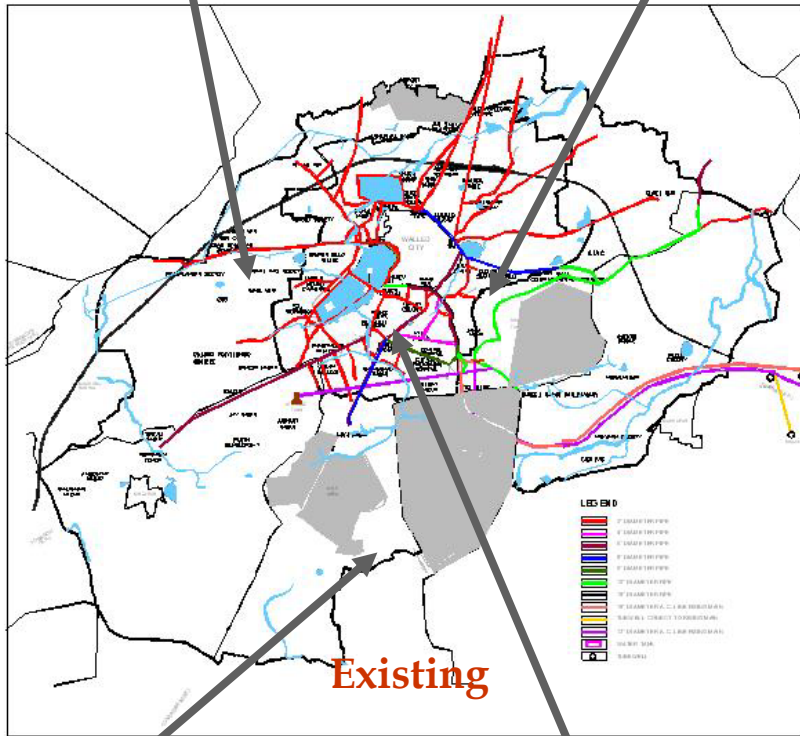
## WATER SUPPLY AND SEWERAGE NETWORK PLANNING

City only partly served

Inadequate supply

Service to entire city

New water distribution network with adequate supply



Periphery has no piped supply

Pipes in old city damaged

New system for periphery

Reconstruction of city networks



# Overall Bhuj City Renewal Effort



## Physical & Financial Achievements with Timeline

| <b>Works</b>  | <b>Physical Achievement</b>                                   | <b>Expenditure (\$ million)</b> | <b>Timeline</b>  |
|---|---|---------------------------------|------------------|
| <b>Municipal &amp; Public Buildings</b>                   | <b>50 buildings</b>   | <b>1.70</b>                     | <b>29 months</b> |
| <b>Water Supply &amp; Sewerage Network including ESRs</b> | <b>Water supply - 167 km, Sewerage - 158 km and ESRs - 13</b> | <b>14.00</b>                    | <b>48 months</b> |
| <b>Road Network</b>                                       | <b>144 km</b>   | <b>27.70</b>                    | <b>52 months</b> |

# Contact Details

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