DISASTER MANAGEMENT PLAN

HIMACHAL ROAD TRANSPORT CORPORATION

GOVERNMENT OF HIMACHAL PRADESH

Shimla 171003

CONTENTS

1. About the Department 6

1.1 Organizational Structure 7

1.2 Purpose of the Plan 8

1.3 Scope of the Plan 8

1.4 Authorities, Codes and Policies 9

1.5 Institutional Arrangements for Disaster Management 9

1.5.1 State Disaster Management Authority 9

1.5.2 State Executive Committee (SEC) 10

1.5.3 Advisory Committee of SDMA 10

1.5.4 District Disaster Management Authority 10

1.6 Plan Management (Implementation, Monitoring and Revision) 10

2. Hazard, Risk and Vulnerability Analysis 12

2.1 Risk Assessment of Himachal Pradesh 12

2.2 Assessment of Sectoral and Departmental Risks 13

2.2.1 Earthquakes 13

2.2.2 Landslides 13

2.2.3 Avalanches 14

2.2.4 Floods 14

2.2.5 Road Accidents 16

2.3 Vulnerability of the Department to Various Hazards and Department Risk 17

2.4 Assessment of Capacity Gaps and Needs 18

2.4.1 Lack of road infrastructure 18

2.4.2 Lack of standard crash barriers 18

2.4.3 Shortage of HRTC Buses 19

2.4.4 Lack of Fire Extinguishers 19

2.4.5 Lack of Disaster Management Equipment 19
2.5 Assessment of Probable Damage and Loss 19
3. Risk Prevention and Mitigation 21
3.1 Risk Prevention 21
3.2 Risk Mitigation 21
3.3 Matrix of Hazard Specific Mitigation Measures 22
4. Mainstreaming Disaster Risk Reduction in Development 23
5. Disaster Preparedness 25
5.1 Preparedness Plan 25
6. Disaster Response and Relief 27
6.1 Response Plan 27
7. Disaster Recovery and Reconstruction 28
7.1 Disaster Recovery 28
7.2 Disaster Reconstruction 28
8. Financial Arrangements 29
ANNEXURE 30
NOTES 34

1. ABOUT THE DEPARTMENT

In July 1949, the passenger and goods services were nationalized in the Himachal Pradesh for the first time. Subsequently, during the year 1958, "Mandi-Kullu Road Transport Corporation" was floated jointly by Govt. of Punjab, Himachal and Railways under the Road Transport Corporation Act, 1950 basically to operate on the joint routes in the States of Punjab and Himachal. With the re-organization of Punjab State in 1966, few hilly areas of Punjab were merged in Himachal and operational areas of Mandi-Kullu Road Transport Corporation came entirely in the expanded State of Himachal. On 2nd October 1974, Himachal Govt. Transport was merged with Mandi-Kullu Road Transport Corporation and was renamed as Himachal Road Transport Corporation (HRTC).

At present, the road network is widely spread in Himachal. In 1974 total routes operated by HRTC were 379 which have grown to 2325 in March 2016 and the fleet strength has grown from 733 to 2645 in March 2016. Bus remains the sole mode of passenger transportation in the state as railways have a negligible presence in the State. The narrow-gauge lines connecting Pathankot with Jogindernagar and Kalka with Shimla are so slow moving that a very small percentage of traffic is carried by them at present; thereby leaving the onus of carrying the passenger traffic on to bus transport.

Ever since its inception, Himachal Road Transport Corporation has played a dominant role in the social and economic development of the State. Himachal Road Transport Corporation has developed a bus route network in the remote and inaccessible areas like Lahaul-Spiti, Chamba, Kullu, Kinnaur, Sirmour and Keylong. Besides providing passenger transport services in the State, Himachal Road Transport Corporation had been operating goods transport services for providing food and essential commodities to the remote corner of the State even where private truck owners hesitated to go. Himachal Road Transport Corporation has undoubtedly played a major role in the economic development of the State.

In the year of 1994, computerization of HRTC was initiated by installing one Server (486 EISA Machine) along with five terminals at Head Office. At present, the computerization in HRTC has spread at various levels. Key statistics of the HRTC is given in table 1.

Table 1: Key Statistics of HRTC

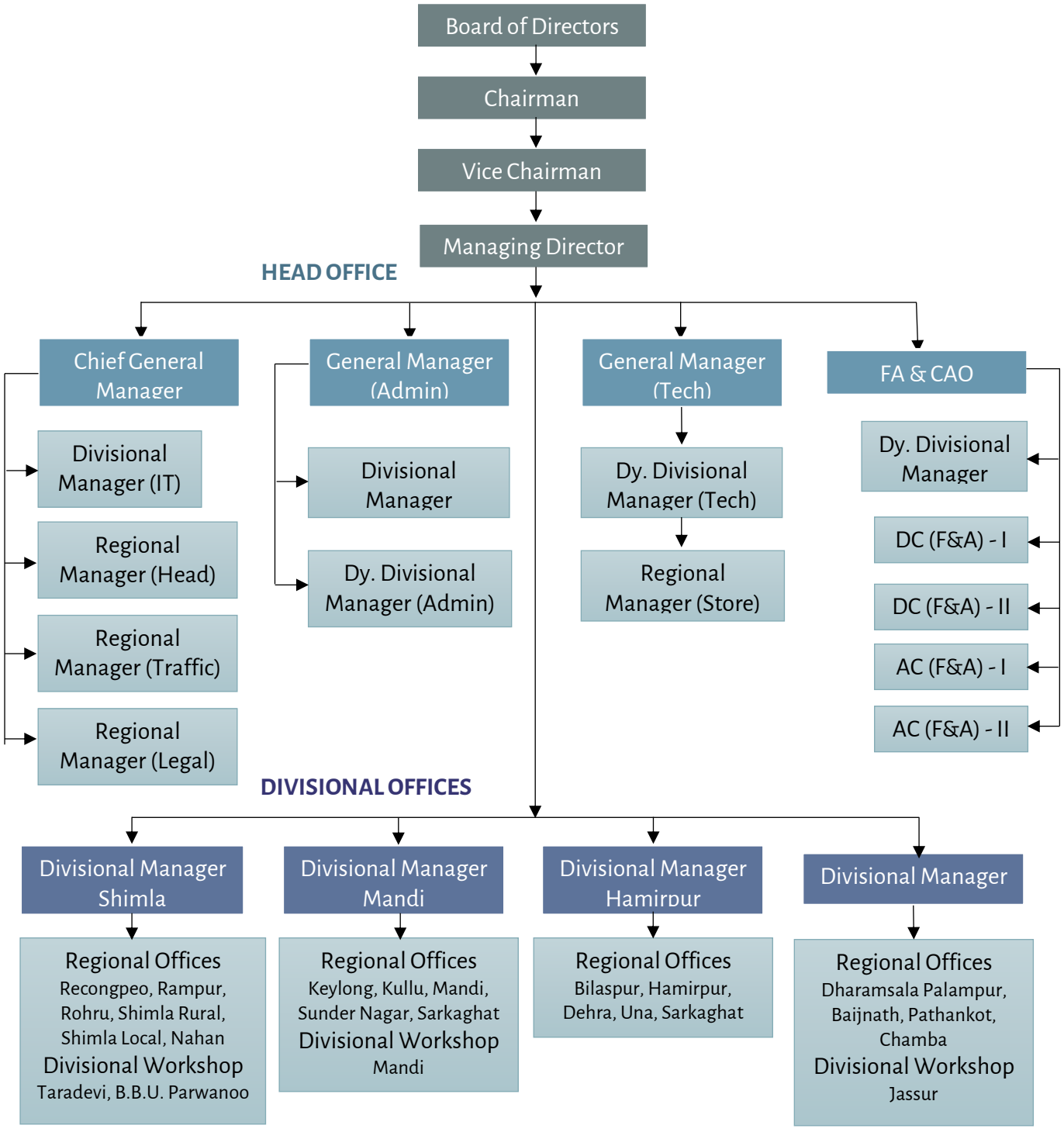
Depots	27
Divisions	4
Vehicles	2645 + 34 Attached
Coverage per day (Kms)	4.84 lakhs
Routes	2325
Services	3580
Average traffic revenue per day	162.00 lakhs
Staff	8619
Staff ratio per bus	4.37

1.1 ORGANIZATIONAL STRUCTURE

Himachal Road Transport Corporation is head by a Board of Directors with Transport Minister as the Chairman. Managing Director is the Chief Executive of the Corporation.

Himachal Road Transport Corporation has a three-tier structure. The Corporate Office at Shimla controls 4 Divisional Offices located at Shimla, Mandi, Hamirpur and Dharamshala. These 4 Divisions controls 23 Regional Offices (Depots) under them.

Figure 1: Organisational Structure of the HRTC



HRTC Infrastructure

HRTC infrastructure includes the following:

1. One Corporate Office
2. 4 Divisional Offices (Shimla, Mandi, Hamirpur and Dharamsala)
3. 27 Depots
4. 4 Divisional Workshops
5. 3 Bus Body Building Units
6. 23 Regional Workshops
7. 7 Driver Training institutes (Jassur, Mandi, Taradevi, Hamirpur, Chamba, Sarkaghat and Kullu)
8. 3 Tyre pre-cure re-treading plants at Mandi, Parwanoo and Jassur

1.2 PURPOSE OF THE PLAN

Every department of the State Government is legally mandated under Section 40 of Disaster Management Act 2005 to prepare its disaster management plan in accordance with the guidelines laid down by the State Disaster Management Authority.

The basic purpose of the plan is to provide guidance to HRTC for mitigating the existing risks and preventing the creation of new risks by assessing the sectoral and departmental risks of disasters. Thus in case of any eventuality of a disaster, the department must be able to perform its functions without any hindrance and this can happen only when the department specific plan is ready. Some of the objectives are as follows:

- To minimise any adverse effects on people, damage to property or harm to the environment in road transport emergency
- To facilitate a rapid and effective emergency response and recovery.
- To provide assistance to emergency and security services
- To communicate vital information to all relevant persons involved in the transport emergency (both internal personnel and external agencies) with a minimum of delay.
- To minimise road accidents by bus authorities.

1.3 SCOPE OF THE PLAN

As per the State Disaster Management Plan, HRTC is the primary agency for transportation, sending personnel and relief material to the disaster-affected area, relocating the affected people, keeping access routes operational and informing about alternate routes. In the event of a major disaster or a calamity, transporting people to their desired destination becomes a major activity. In such times the maximum onus of transporting the people falls on the public transport i.e. HRTC operated vehicles. The DM plan will facilitate HRTC:

- To take measures for prevention and multi-hazards mitigation.
- To reduce response time in organizing the assistance.
- To identify major resources, manpower material & equipment needed to make the plan operational.
- Making optimum use of the combined resources.

1.4 AUTHORITIES, CODES AND POLICIES

All the administrative authorities and employees in the Corporation follow and executive general and specific Rules and Regulations adopted by the Government like all other Departments/Corporations. And the Corporation follows Financial Rules as contained in Accounts Manual. In the Technical Section, relevant manual, code, modality, system etc. which are technically required in accordance with the competency of the Technical Officers and staff, are followed while discharging functions and responsibilities. The Corporation also follows any executive orders, issued by the Government from time to time, which are specifically or in general required to be compiled and executed by it.

Various Rules, Acts and Guidelines implemented by the Corporation:

- Motor Vehicles Act, 1988.
- H.P.M.V. Taxation Act, 1972.
- Motor Transport Workers Act, 1961.
- Workmen's Compensation Act, 1923.
- Road Transport Corporation Act, 1950.
- Financial Hand Book No. 1 (Treasury Rules)
- Financial Hand Book No. 2 (H.P. Financial Rules).
- Financial Hand Book No. 3 (H.P. Public Works Department Rules).
- Financial Hand Book No. 4 (Budget Manual) H.P. P & Goods Taxation Act -1955.

For the functions related to Disaster management following guidelines are to be followed:

- Disaster Management Act, 2005
- National Disaster Management Plan, 2016
- Himachal Pradesh Disaster Management Plan, 2012
- National Action Plan on Climate Change
- National Guidelines issued by the NDMA
- Guidelines and provision for State Disaster Response Fund (SDRF)
- Guidelines for administration of the National Disaster Response Fund (NDRF)

1.5 INSTITUTIONAL ARRANGEMENTS FOR DISASTER MANAGEMENT

The State Government has adopted the Disaster Management Act 2005 as enacted by the Govt. of India for providing an effective mechanism for Disaster Management in the State of Himachal Pradesh.

1.5.1 STATE DISASTER MANAGEMENT AUTHORITY

As per clause b of sub-section (2) of Section 14 of the Disaster Management Act 2005, the Himachal Pradesh Disaster Management Authority under the chairperson of the Honourable Chief Minister was constituted on 1st June 2007 with the following persons as a member of the Himachal Pradesh Disaster Management Authority (HPSDMA):

Table 2: Members of State Disaster Management Authority

#	Member	Designation in HPSDMA
1	Hon'ble Chief Minister	Chairman
2	Hon'ble Revenue Minister	Co-Chairman
3	Chief Secretary	Member
4	Principal Secy. (Rev)	Member
5	Principal Secy. (Home)	Member
6	Principal Secy. (PWD)	Member
7	Principal Secy. (Health)	Member
8	Director General of Police	Member
9	Secretary/Additional Secretary (Revenue)	Member Secretary

1.5.2 STATE EXECUTIVE COMMITTEE (SEC)

As per sub-section (1) of section 20 of the Disaster Management Act 2005, the State Executive Committee under the chairmanship of Chief Secretary was constituted by the Government of Himachal Pradesh. SEC coordinates and monitors the implementation of the National Policy, the National Plan and the State Plan in addition to management of disasters in the state. It monitors the implementation of disaster management plans prepared by the departments of the Government of the State and District Authorities.

1.5.3 ADVISORY COMMITTEE OF SDMA

As per Sub Section (1) of section 17 of the Disaster Management Act 2005, the chairperson of Himachal Pradesh State Disaster Management Authority nominates members of the Advisory Committee to assist the Authority and to make recommendations of different aspects of Disaster Management.

1.5.4 DISTRICT DISASTER MANAGEMENT AUTHORITY

As per Section 25 of the DM Act 2005, District Disaster Management Authority has also been constituted in every district of Himachal Pradesh which is chaired by the Deputy Commissioner of the district.

1.6 PLAN MANAGEMENT (IMPLEMENTATION, MONITORING AND REVISION)

The Department of HRTC will ensure the planning, coordination, monitoring and implementation of the Disaster Management Plan. The nodal officer will have the overall responsibility for implementation of all the activities related to disaster management.

Implementation:

For the process of implementation, the most important component of testing the Safety Plan is to conduct quarterly mock drill or simulation exercise in order to identify the positive elements as well as gaps. Mock

drill exercise is required in order to verify the level of preparedness and improve the coordination during emergencies. This has to be based on past experiences and lessons learnt. Mock-drills at Bus Stands and HRTC workshops will help in evaluating response and improving coordination within the administration, with various departments, non-government agencies, other stakeholders and communities. They help in identifying the extent to which the plans are effective and also aid in revising these if

Monitoring:

The Nodal officer of the department (Managing Director, HRTC) responsible for the proper monitoring and evaluation of the Safety Plan. These drills enhance the ability to respond faster, better and in an organized manner during the response and recovery phase. The Department must ensure the following: -

1. Implementation of Plan within the department, its updation and quarterly mock drill
2. Implementation of all policies and plans of state govt.
3. Implementation of all NDMA guidelines
4. Implementation of all instructions of Revenue & Disaster Management Department
5. Implementation of all guidelines/instructions related to disasters from GoI and state govt.
6. All officers to be trained in Disaster Management

Roles & Responsibilities of Department in Monitoring and Evaluation of Plan

1. Identify and ensure implementation of DRR into all developmental projects and schemes.
2. Monitor the functioning and adequacy of the resources present in the Department every six months.
3. Ensure that all the departmental plans are operational and checked by the respective nodal officers.
4. Monitor that all prevention, mitigation, preparedness and response measures are properly implemented.
5. The monitoring and evaluation could be done through various audits such as:
    a) Electrical Safety Audits of critical infrastructure
    b) Fire-Safety Audits of critical infrastructure
    c) Enforcement of National Building Code in construction of lifeline buildings

Review and Update:

The plan needs constant review and updating based on the following requirements:

1. Major change in the operational activities and location
2. Valuable inputs from actual disasters
3. Lessons learnt from training
4. Inputs from mock drills/ simulation exercises
5. Lessons learnt from major road incidents
6. Technological developments / innovations in identifying potential hazards
7. Inventory of equipment in the Department,
8. Human Resources, their addresses and contact numbers

2. HAZARD, RISK AND VULNERABILITY ANALYSIS

2.1 RISK ASSESSMENT OF HIMACHAL PRADESH

Himachal Pradesh is a mountainous state situated in the western Himalayas with an elevation ranging from 350 meters to 6000 meters. Thus, there is a great variation in the geo-climatic conditions of the state due to the extreme variation in the elevation. The climate varies from hot and sub-humid tropical in the southern tracts to cold, alpine and glacial in the northern and eastern mountain ranges with increasing elevation. These conditions make the state prone to various hazards both natural and manmade. Main hazards consist of earthquakes, landslides, flash floods, cloudburst, snowstorms and avalanches, droughts, dam failures, fires – domestic and wild, accidents – road, rail, air, stampedes, boat capsizing, biological, industrial and hazardous chemicals etc.

Table 3: Frequency and Intensity of Major Hazards

#	Nature of Disaster	Frequency	Intensity
1	Flood/ Flash Flood	Regular Frame	High
2	Drought	Every 3-5 Years	Moderate
3	Cloud Bursts	Regular Feature	High
4	Earthquake	Regular Feature	Moderate to Very High
5	Landslides	Regular Feature	High
6	Avalanches	Regular Feature	Low
7	Lightening	Rare	Low
8	Disease Epidemics	Rare	Low
9	Fire	Regular Feature	High
10	Stampede	Moderate	Moderate

The districts of Chamba, KinnaurKullu and part of Kangra and Shimla fall in very high vulnerable risk (Figure 2). Similarly, districts of Kangra, Mandi, Una, Shimla and Lahaul and Spiti fall in high vulnerable risk status. The district Hamirpur, Bilaspur, Solan and Sirmour falls in moderately vulnerable risk status. The disaster management strategies and infrastructure required to be evolved by taking the factor of vulnerability into consideration.

In the context of devastating hazards such as earthquakes, landslides, floods, road accidents and other traffic hazards the functioning of HRTC operated vehicles are

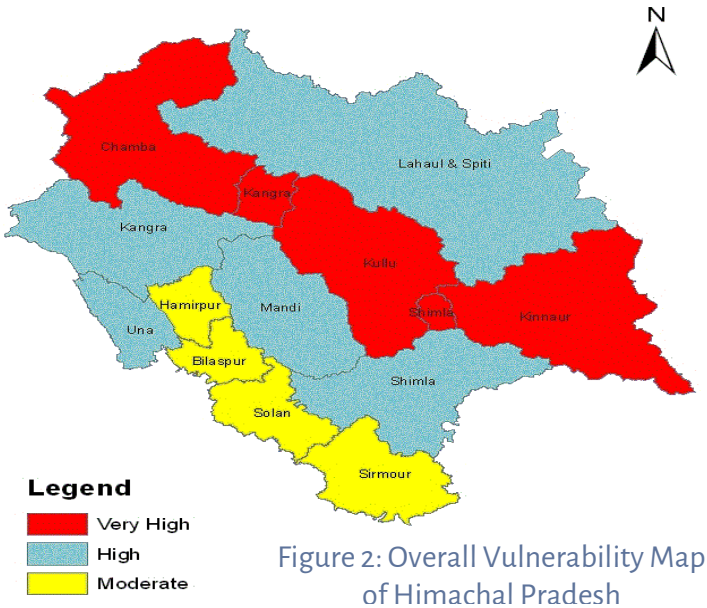


Figure 2: Overall Vulnerability Map of Himachal Pradesh

affected resulting in hampering the transportation in the state. A profound assessment of the sectoral and departmental risk will help HRTC to developed efficient preventive and mitigative measures to make its sector and department resilience to different hazards.

2.2 ASSESSMENT OF SECTORAL AND DEPARTMENTAL RISKS

The sectoral risks of disasters consist of the risks for the entire sector that the department represents whereas, the departmental risks of disasters consist of the risks arising out of the exposure of vulnerable departmental assets to the natural or manmade hazards.

Apart from the growing mobility needs of the locals, there is a heavy tourist inflow of passengers into the state placing additional pressures on the existing transport infrastructure. In absence of other modes, the onus of providing passenger services falls on the road transport system making buses the most important public transport mode in the state. The public transport system in the state mainly comprises bus transport service offered by the state-owned road transport undertaking Himachal Road Transport Corporation (HRTC) provides mobility services to the passengers within the state and also across interstate borders. The corporation also provides obligatory free, concessional and subsidized transport services to various sections of society. In addition, the corporation provides services to far-flung remote areas where the traffic is low making operations infeasible on economic grounds. The total fleet strength of the corporation has increased from 733 in 1974 to 2297 in 2014 (Department of Transport, HP).

The hazards to which HRTC is vulnerable are discussed below:

2.2.1 EARTHQUAKES

Himachal Pradesh is seismic sensitive state as over the years a large number of the damaging earthquake has struck the state and its adjoining areas. Large earthquakes have occurred in all parts of Himachal Pradesh, the biggest being the Kangra earthquake of 1905. The Himalayan Frontal Thrust, the Main Boundary Thrust, the Krol, the Giri, Jutogh and Nahan thrusts are some of the tectonic features that are responsible for shaping the present geophysical deposition of the state. Chamba, Kullu, Kangra, Una, Hamirpur, Mandi and Bilaspur Districts lie in Zone V i.e. very high damage risk zone and the area falling in this zone may expect earthquake intensity maximum of MSK IX or more. The remaining districts of Lahaul and Spiti, Kinnaur, Shimla, Solan and Sirmour lie in Zone lV i.e. the areas in this zone are in high damage risk with expected intensity of MSK VIII or more.

2.2.2 LANDSLIDES

Landslides are one of the key hazards in the mountain regions particularly in the state of HP which cause damage to infrastructure i.e. roads, railways, bridges, dams, bio-engineering structures, and houses but also lead to loss of life, livelihood and environment. According to the analysis carried by TARU in 2015, 6824 villages of the state falls under high landslide risk zone whereas 11061 villages are in the medium risk zone. 824 villages are in low-risk zone of landslides.

The state has a large mesh of highways and village roads comprising of 2178.988 km of a total stretch. Out of the total stretch of the State highway major portion falls in the High vulnerable zone that is 1111.552 km. The remaining stretch of 873.24 km falls in the moderate vulnerable zone. Most of the electricity towers and lines are along the road. Hence damage to road infrastructure will also impact the function of electricity supply.

The important slides in Himachal Pradesh which caused huge damage are:

- Maling (1968). This landslide damaged 1 Km NH-22 and is still active.
- Kinnaur (Dec.1982) This occurred at Sholding Nala collapsing 3 bridges and 1.5 of the road was vanished.
- Jhakri (March 1989) At Nathpa about 500 m of the road was damaged due to this slide and is still active.
- At Luggar bhati on 12 Sept.1995, 65 (39 as per official record) were buried alive during the slide.

2.2.3 AVALANCHES

The higher hills comprising the districts of Kinnaur, L&S & Spiti, Chamba, and Kullu are particularly vulnerable to the hazards of avalanches. The destruction caused as a result of avalanches in the past in Himachal Pradesh though not widespread is confined to the higher reaches of the state only. Avalanches have also the history of damage in Himachal Pradesh. The prominent avalanches in Himachal Pradesh are given in table 4:

Table 4: Major Avalanches in HP

Location	Date / Year	Damages Occurred
Lahaul & Spiti	Jan 1975	Earthquake shocks triggered the avalanche of great dimensions damaging road network
Lahaul & Spiti	Mar 1978	About 30 people killed, road and property damaged.
	Mar 1979	About 237 people killed. Communication disrupted
Tinku	Mar 1991	Tinku avalanche occurs every year 4-5 times from Jan to March. Road was blocked for 40 days in 1991
	Sept.1995	Due to avalanche, huge chunk of debris came down which later changed into flood
Lahaul & Spiti	Nov.1997	There was no causality
Lahaul & Spiti	March 2011	Pindri Nala, 2 laborers died

2.2.4 FLOODS

In Himachal Pradesh, flash flood due to cloudburst is common phenomena. The state experiences riverine flooding of varied magnitude almost every year and Sutlej and Beas are most vulnerable rivers. All the villages and property inside the floodplain and near close vicinity are in the vulnerable zone. According to TARU report (2015), about 59 villages in Beas basin and 280 villages in Sutlej basin are potentially at risk due to inundation caused by river flooding.

Some of the devastating Floods, which caused heavy damage to HRTC operated vehicles, as well as HRTC infrastructure such as bus depots and workshops in Himachal Pradesh, are given in table 5:

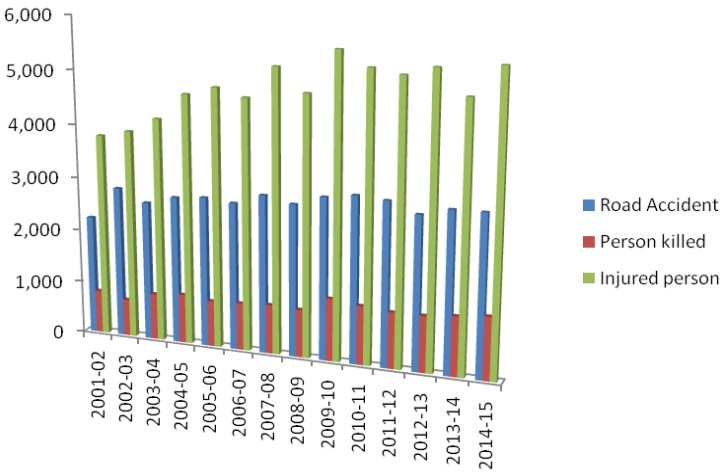
Table 5: History of Floods Damages to HRTC

Prominent Flash Floods	History of Damage Occurred
8th July 1973	Lake formed by the blockage of Satluj river due to Nathpa rock fall damaged Sanjay powerhouse, loss of about Rs. 45 million estimated.
19th Jan. 1975	In Satluj basin two blockages were observed in Spiti valley. One on Parechu River between Sumdo and Kaurik due to landslide created by 19th Jan. 1975 earthquake, which occurred along the Sumdo-Kaurik fault. The blockage was 60m in height and 150m in length created a temporary lake. In March this lake burst causing flash floods in Spiti valley
On 29th Sept. 1988 (2.30 a.m.) a flash flood occurred due to cloud burst in Soldang Khad	• Caused heavy loss of life and property in the Soldng village. • Washed away the Bhabanagar waterworks. • Washed away 2 Km of NH-22 across Soldan Khad. • Created landslides along the eastern slopes of Soldan Khad and the damaged road to Ponda. • Lake was formed on the Satluj river near the conference. • Block stopped the flow of Satluj river for about 30 minutes and created a temporary lake having dimensions roughly about 6000 m long. 200-250 m wide and 25-30 m deep extending up to Wangtoo Bridge. • Lake water entered Sanjay Vidyut Pariyojna and damaged the Power House.
31st July and 2nd August 1991	Cloudburst and flash flood along Soldan Khad in Satluj valley killed 32 people, 15 houses, 35 bigha agriculture land, 600 apple trees, 2Km of the road of NH 22 and 20 m bridge on Soldan Khad washed away. Agriculture land along Leo village situated downstream.
Feb-93	500 m road section of NH-22 washed away by Jakhri slide. Rs. 10 million losses to road and forest land, a village upper slope was in danger. Therefore hampering the HRTC transportation functioning to a large extent.
The first flash flood occurred on 4th September 1995 at 2 p.m. After cloudbursts in the upper catchments of Duling and damaged the PWD rest house. Another flood came at 6 a.m. and 9 a.m. on 5th Sept. 1995 bursting the lake formed during the previous cloudbursts	• 32 people and 35 cattle lost their lives. Huge debris formed a fan along Satluj and formed a take partially blocking the Satluj • Flash flood caused heavy damage due to change in course of Satluj from left to right bank increased the tow and lateral erosion at Tapri. • Washed away 19 houses, HRTC workshop along with 3 buses. • Change in the course is still causing tow erosion to NH-22.

4th – 5th and 12th Sept. 1995	Flood and landslide along Bas river in Kullu valley killed 65 people. NH damaged at numerous places, loss to the government and private property, road and bridges estimated US$ 182 million.
Flash floods in the night of 9th August and 10th August 2001 on Moral-Danda peak in the Rohru sub Division in Shimla District.	Flash floods occurred along two streams, one along the Devidhar area and another along Darkali in Rampur Sub Division. Damage to infrastructures like roads, bridges, Bus depots water supply schemes, forest wealth, agriculture land, horticulture land, footbridges, village paths, residential houses and water mills and loss of 3 lives and 39 cattle and destruction of private property. Total loss in both the Sub Divisions was 145.15 lacs. In Rohru Sub Division 7 bridges, 8 village paths, 8 water supply schemes, and I powerhouse were damaged besides 16 houses, whereas in Rampur Sub Division, 10 bridges, 8 village paths, 1 water supply scheme, I soil conservation plant, 7 residential houses and 16 watermills were damaged.

2.2.5 ROAD ACCIDENTS

Road accidents badly affect the HRTC operated vehicles with the increase of road connectivity and a number of vehicles plying on these roads in the State, the number of road accidents and loss of precious human lives is increasing day by day. Figure 3 provides a total number of road accidents, the person killed and the person injured during 2001-02 to 2014-15. The hilly terrain of the State and rash and negligent driving are the major cause of these accidents. The department of PWD has identified numerous black spots and the department is in the process of improving them to reduce road accidents.



2.3 VULNERABILITY OF THE DEPARTMENT TO VARIOUS HAZARDS AND DEPARTMENT RISK

Table 6: Vulnerability of HRTC to Various Hazards

Nature of Hazards	Area likely to be affected	Stimulus	Outcome
Landslides	All the districts of the State.	The hills and mountains of Himachal Pradesh are liable to suffer landslides during monsoons and also in high-intensity earthquakes. The vulnerability of the geologically young and unstable steep slopes in various Himalayan ranges has been swiftly increasing in recent decades due to inappropriate activity, such as deforestation, road cutting, terracing and changes in agriculture pattern requiring more intense watering.	• Damage to road infrastructure results in road blockage • Road accidents resulting in damage to HRTC Operated vehicles • Loss of lives • Damages HRTC infrastructure such as bus depots and workshops affects the transportation facilities • Damages crash barriers
Floods	All the district of the State.	Due to the diverse topography and high monsoon rains in the area of the Shivalik and lower and mid-Himalayan ranges cause extensive floods during rainy seasons. High river flows due to heavy rains, cloudbursts, glacial lake outburst.	• Damage to roads and Official HRTC infrastructures such as bus depots and workshops • Affects the transportation facilities • Damages crash barriers
Snowfall, Avalanches	Distt. Kinnaur, Lahaul & Spiti, Pangi& Bharmour of Distt. Chamba, High areas of Kullu, Mandi, Sirmour & Shimla District	Heavy snow falls	• Damage to Road & Bridges • Affects transportation & communication system • Supplies of essential commodities are stopped.

			• Movement of people from one place to another is affected.
Earthquake	As per the earthquake hazard map of the state, the areas falling in districts Chamba, Kangra, Mandi, Kullu, Hamirpur Bilaspur are very sensitive as they fall in Very High Damage Risk Zone V, whereas the rest of the areas falls in High Damage Risk Zone IV.		• No communication & Transportation • Damage to HRTC infrastructure
Road accidents	All the districts of the State.	High intensity	• Road accidents resulting in damage to HRTC Operated vehicles • Damages crash barriers • Increases the vulnerability of the passengers travelling and pedestrians.

2.4 ASSESSMENT OF CAPACITY GAPS AND NEEDS

2.4.1 LACK OF ROAD INFRASTRUCTURE

In terms of availability of roads per unit area, the road density at the state level is only 0.62 km per sq. km, much lower than that at the national level value of 1.21 km per sq. km. Also, out of the total motorable roads, only 7 % roads were double lane roads and nearly 90 %were single lane roads. While motorable single lane roads have grown at an average rate of 3.9 % per year between 2004-05 and 2012-13; motorable double lane roads have grown at an extremely slow rate of less than 1% (TERI report 2015, "Green Growth and Transport in Himachal Pradesh") which affects the smooth functioning of vehicles on roads, therefore, increasing the vulnerability of people.

2.4.2 LACK OF STANDARD CRASH BARRIERS

Motorway crash barriers (also known as safety barriers) are designed to prevent vehicles from crossing from one carriageway to the other and to prevent vehicles from impacting or entering roadside hazards. The barriers are also intended to absorb some of the energy from the impact caused by the vehicle striking it and to redirect the vehicle along the line of the barrier so that it does not turn around, turn over or re-enter the stream of traffic. Barriers are used to protect road users where there is an identified risk and where their use can be justified, both in cost and safety benefit terms. Safety barriers are only used where the consequences of a vehicle striking a barrier are considered likely to be less serious than if the vehicle were

to continue unrestrained. Lack of standard crash barriers also creates vulnerability of the HRTC buses carrying passengers in the hilly terrain. According to the road accident reports of Himachal Pradesh either the crash barrier was not there or if the crash barriers were there on the roadside the barriers were not able to hold the impact and resulted in major accidents.

2.4.3 SHORTAGE OF HRTC BUSES

In the state of Himachal Pradesh, 80% of the population is dependent on public transport and a shortage of bused leads to overcrowding of passengers in the buses beyond the capacity of the buses which increase the vulnerability of passengers as well as HRTC operated vehicles staff to manage the passenger ratio.

2.4.4 LACK OF FIRE EXTINGUISHERS

Lack of fire extinguishers in HRTC buses, bus depots and workshops increases the vulnerability of the HRTC infrastructure as well as staff and passengers travelling in buses.

2.4.5 LACK OF DISASTER MANAGEMENT EQUIPMENT

Disaster management equipment such as airlifting bags, cutters etc which are very important for HRTC buses especially in upper Himachal areas where roads are very steep.

2.5 ASSESSMENT OF PROBABLE DAMAGE AND LOSS

Assessment of damage and loss suffered by the sector and by the HRTC due to various disasters in the past will help in projecting future losses and developing an appropriate remedial measure to avoid or minimize those losses. According to the report "Disaster Analysis & Management" 2016, published by the Department of Economics and Statistics, Himachal Pradesh during the period of 2001-2015, the state witnessed 39,854 road accidents in which 13,535 people were killed and other 68,352 were injured. The total road length damaged due to various disasters between 2007 & 2015 was 36,217 km and for the same period of time an amount of Rs. 28,227 lakhs was provided to for repair/restoration of damaged roads and bridges.

Table 7: Major Accidents of HRTC Buses

Year	Major Accidents
2011-12	17
2012-13	36
2013-14	24
2014-15	32
2015-16	23
Total	132

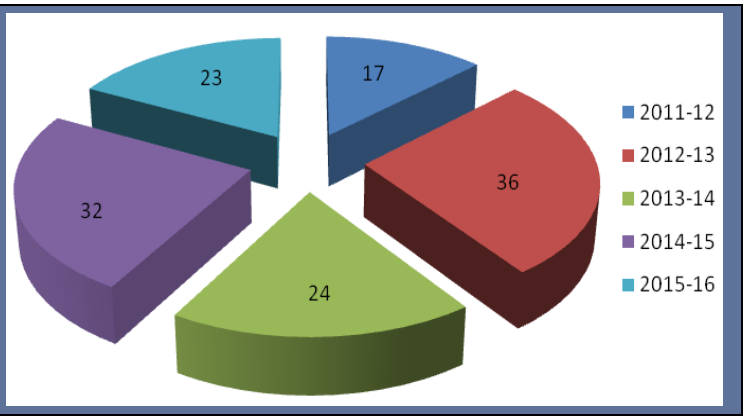


Table 8: Minor Accidents of HRTC Buses

Year	Minor Accidents
2011-12	45
2012-13	61
2013-14	76
2014-15	66
2015-16	86
Total	**334**

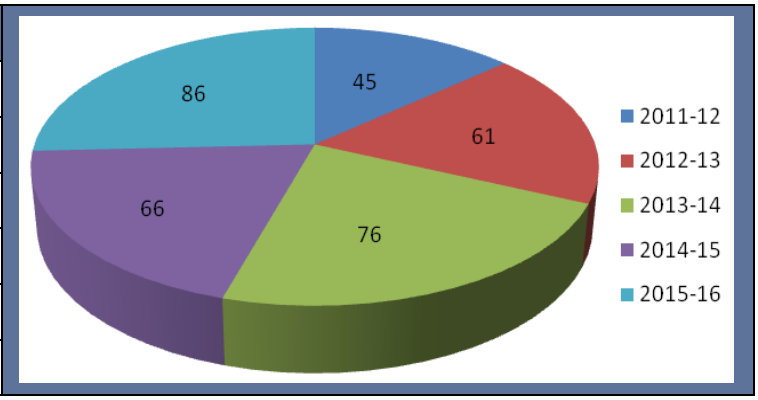
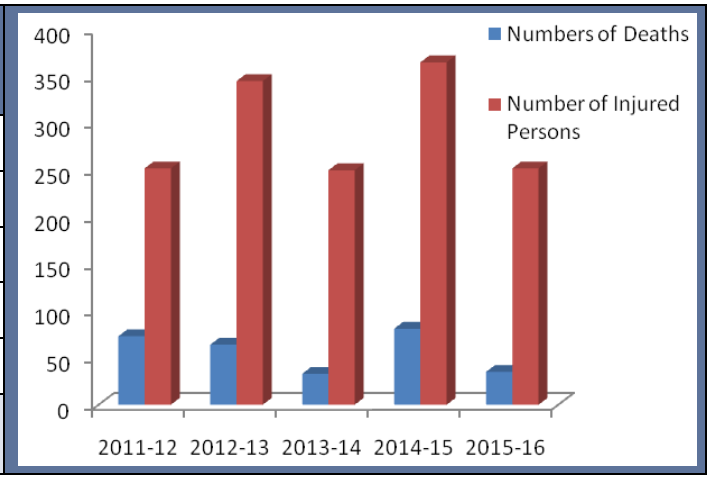


Table 9: Accident Report of HRTC Buses

Year	Numbers of Deaths	Number of Injured Persons
2011-12	73	252
2012-13	64	345
2013-14	33	250
2014-15	81	365
2015-16	35	252
Total	286	1464



3. RISK PREVENTION AND MITIGATION

3.1 RISK PREVENTION

Risk prevention is preventing the creation of new risks of disasters. Such risks may be created unwillingly by the Departments directly through public investments or indirectly through facilitation of private investments that are vulnerable to the risks of disasters. Therefore, every investment should go through HRVA to check if new programmes, activities or projects have the potential to create new risks of disasters. If such investments cannot be avoided these must be protected by safeguards through adequate structural and non-structural prevention measures so that the benefits of investments are fully protected from risks of disasters. For example, assets of the department like offices, equipment's and others should be located at places which have lesser chances of getting affected by a hazardous event. The main idea here is what the department can do within its mandate to increase the idea of risk prevention.

Disaster impact can be prevented for by strict adherence to the safety norms and practices given below:

1. The Bureau of Indian Standards (BIS) has been publishing seismic hazard maps of India since 1962. HRTC should consider those maps and building by-laws of the state while construction of any departmental structure.
2. Preparation of Emergency Preparedness plans
3. Basic disaster awareness and sensitization
4. Conduct of Mock drills to test the plans and organized response
5. Fire Safety Norms. Installation of fire extinguishers in all the buses
6. Regular maintenance of HRTC operated buses
7. Electrical Safety Norms

3.2 RISK MITIGATION

Risk mitigation is reducing the risks of disasters that are already there due to exposure of vulnerabilities to the hazards. Mitigation projects reduce the level of exposures or the depth of vulnerabilities or both through a combination of various structural and non-structural measures. Mitigation projects are always costly and therefore these have to be planned with proper Cost Benefit Analysis (CBA) to ensure that the benefits of the projects outweigh the costs.

The primary objective of mitigation efforts would be:

- To identify, delineate and assess the existing and potential risks and to work towards reducing potential causalities and damage from disasters.
- To substantially increase public awareness of disaster risk to ensure a safer environment for communities to live and work.
- To reduce the risks of loss of life, infrastructure, economic costs, and destruction that result from disasters.
- In view of the prevailing risk and the vulnerabilities perception, the mitigation measures proposed have been categorized under following five major groups:
- Risk assessment: The department should try to improve the understanding of the location of HRTC infrastructures such as bus depots and workshops for potential impacts and linkages between hazards, vulnerability and measures needed to protect the effects on the production after a disaster.

- Construction work: All the newly constructed assets should follow the building by-laws of the state.
- Repair and maintenance: Retrofitting and renovation of the lifeline buildings should be done by the department infrastructure.
- Repair and maintenance of HRTC operated vehicles.
- Research and technology transfer: The department should identify and interact with research institutions to evolve mitigation strategies both structural and non-structural.
- Training and capacity building: Training programs about the awareness of disaster with the training modules and workshops from time to time.

3.3 MATRIX OF HAZARD SPECIFIC MITIGATION MEASURES

HAZARD	MITIGATION MEASURES	
	STRUCTURAL	**NON-STRUCTURAL**
Earthquake	• Revision and adoption of model building bye-laws for construction of bus depots and HRTC workshops both in the urban and rural area. • Undertaking mandatory technical audits of structural designs of major Departmental buildings by the competent authorities. • Assessing the seismic risk and vulnerability of the existing built environment by carrying out a structural safety audit of the HRTC building infrastructure. • Undertaking seismic strengthening and retrofitting of critical structures.	• Seismic hazard risk mapping pertaining to departmental assets. • Developing appropriate risk transfer instruments by collaborating with insurance companies and financial institutions. • Carrying out the vulnerability assessment of earthquake-prone areas and creating an inventory of resources for effective response.
Floods, Flash Floods	• The department along with disaster management authority should demarcate the flood-prone area and no construction should be done there. • Open space for emergency construction of sheds etc. shall be left to the extent possible.	Mitigation plan should be in place to safeguard the departmental infrastructure/ inhabitants from the flash flood.
Landslides / Avalanches	• Risk audit of the department infrastructure at all levels. • Selecting alignments for construction of structures in areas which are less prone to landslides.	Developing an inventory of the existing built environment related to HRTC in areas around existing landslides and in high hazard zones as per the LHZ maps and along strategic roads.
Fire	• Open space for emergency exit in the case of fire. • Fire extinguishers should be installed in all the office buildings and HRTC buses. • Replacement of dilapidated Electrical wires.	Fire safety mock drill.

4. MAINSTREAMING DISASTER RISK REDUCTION IN DEVELOPMENT

Disaster Management Act has stipulated that DM Plans of the Departments of State Government shall integrate strategies for prevention and mitigation of the risks of disasters with the development plans and programmes of the department. The State Policy on Disaster Management, following the National Policy, prescribed 'DRR Mainstreaming' in the following words:

> *"The DRR issues would be mainstreamed in development plans, programmes and policies at all level by all the departments, organisations and agencies. It would be ensured that all the development programmes and projects that originate from or funded by Government are designated with evident consideration for potential disaster risks to resist hazard impact. That all the development programmes and projects that originate from or are funded by Government do not inadvertently increase vulnerability to disaster in all sectors: social, physical, economic and environment."*

Mainstreaming Disaster Risk Reduction (DRR) into Development:

Mainstreaming disaster management into the development planning process essentially means looking critically at each activity that is being planned, not only from the perspective of reducing the disaster vulnerability of that activity but also from the perspective of minimizing that activity's potential contribution to the hazard.

Mainstreaming DRR into development activities has three purposes:

- To make certain that all the development programmes and projects that originate from or funded by Government are designated with evident consideration for potential disaster risks to resist hazard impact.
- To make certain that all the development programmes and projects that originate from or are funded by Government do not inadvertently increase vulnerability to disaster in all sectors: social, physical, economic and environmental.
- To make certain that all the disaster relief and rehabilitation programmes and projects that originate or are funded by Government are designed to contribute to development aims and to reduce future disaster risk.

Table 10: Mainstreaming DRR in Key Activities of HRTC

Key Activities of the HRTC Corporation	Mainstreaming DRR Actions
New construction of bus depots and HRTC workshop	Ensure all the bus depots and workshops are earthquake resilient and not constructed in highly flood or landslide-prone areas. Assess disaster risks due to any new construction or maintenance activity.
Training of HRTC staff	Department to include disaster management activities and disaster management syllabus in training modules and workshops.

Purchase of HRTC vehicles	• HRTC Corporation to get risk insurance for all the vehicles purchased and should be according to the needs of the state of Himachal Pradesh.For example, small size buses are preferred in the state because of a maximum number of narrow single lane roads in the state of H.P. • Ensure buses to have proper emergency exit and as per the safety norms.
Purchase of heavy machinery for HRTC workshop	Ensure risk insurance for the machinery purchased.
Disaster management awareness	All HRTC buses to display disaster management emergency toll-free number displayed as well as IEC material painted on sides of the buses.
Safety of passengers	All buses to have GPS installed.

5. DISASTER PREPAREDNESS

5.1 PREPAREDNESS PLAN

Disaster preparedness has been defined as the state of readiness to deal with a threatening situation or disaster and the effects thereof". The Department may review their state of readiness and prepare a strategic action plan to deal with possible disaster situations.

Himachal Pradesh Road Transport Corporation can take the following measure to make the department disaster ready:

Disaster preparedness for HRTC establishments

- All bus depots, workshops and driving institutes to have disaster management plan
- Fire extinguishers installed in all the buildings
- All Regional offices to have JCBs, Cranes and disaster rescue equipment.
- All bus depots to have disaster management IEC and helpline numbers displayed.
- HRTC to conduct regular disaster management mock drill and disaster management training workshops in all regional offices.
- Bus stand in charge responsible for Safety Audits, Repairs and maintenance, maintenance of fire extinguishers, electrical appliances etc.
- All bus depots to have disaster management emergency control room setup.

Disaster preparedness for HRTC buses and staff

- HRTC should plan smallest and safest route maps with the help of GIS & such portable devices may be installed in all HRTC buses so that the driver should know all the possible alternate routes in case of emergency
- Fire extinguisher conforming to CMVR as per AIS -052 to be provided in all buses.
- First aid box in all buses and other HRTC vehicles.
- All vehicles to have disaster management kit comprising of ropes, emergency light etc.
- Display of emergency control room numbers inside the buses.
- Buses to be properly checked in workshops regularly.
- Rigorous training to drivers at the time of initial recruitment.
- Disaster management training for all the drivers and other staff of HRTC.
- Strict disciplinary action against the drivers committing accidents.
- In-service training to the accident-prone drivers.
- Ban on cassette players and fixing of bigger size rear inner view mirror.
- Periodical medical check-up of drivers.
- Attending buses in the workshops as per the maintenance schedule prescribed by the vehicle's manufacturers.
- Issuance of medical fitness certificate by the technical supervisory staff at the time of out-shedding after repair.
- No bus should be operated on a road unless the same is declared fit by the Road Inspection Committee for the operation of a bus.
- Prepare case studies of all major and minor accidents for a lesson learnt.

Roles and responsibilities of the nodal officers:

Roles and responsibilities of the nodal offices are as under:

1. Act as the focal point for disaster management activities of the department. The department may ensure that he / she has the mandate to work immediately without waiting for directions from the higher authorities. This will save time.
2. Provide his / her contact and alternate contact details to State Disaster Management Authority / District Disaster Management Authority and Revenue Department, State and District Emergency Operation Centre, all line departments and agencies.
3. Accountable to any communication/ actions related to disaster management of the department.
4. Take lead to prepare the department disaster management plan, Emergency Support Function (ESF) plan and Standard Operating Procedure.
5. Constitute the Quick Response Team (QRT) in the department as per the need and organize training for members.
6. Help the department to procure the equipment necessary for search and rescue, first aid kits and disburse the same to Incidence Response Teams and for the department if required.
7. Provide regular information on disaster or task assigned to him to State Emergency Operation Center/ Revenue Department during and after disasters in consultation with the department head.
8. Attend Disaster management meeting, training, workshops or any related programme on behalf of the Department.
9. Identify an alternate nodal officer and build his/her capacity.
10. As per the need of the department, set up a control room and assign another official (s) for control room duty.
11. Identification and staffs for deployment on-site operation centres (on-site control room during a disaster)
12. In consultation with the department, make an arrangement of an alternative communication system for the department.
13. Mobilize resource for disaster response activities as per the resource inventory put in the department Disaster Management plan if it is needed by the department or other line departments.
14. Organize regular awareness programmes in the department.
15. Organize the periodic mock drills at least twice a year as per the suitability of the department and update the plans at all levels and ensure participation of the department in mock drills or other agencies and other departments.
16. To have liaison with other departments and functionaries working in the field of Disaster Management

6. DISASTER RESPONSE AND RELIEF

6.1 RESPONSE PLAN

The response plan of the Department includes the design of actions based on Standard Operating Procedures and tested through mock drills and exercises that would be initiated on a trigger mechanism based upon the impending or actual occurrence of an event of a disaster. Many Departments and agencies of the State Governments will be required to perform important functions relating to relief and rehabilitation. The response plan of the Department should provide detail with the logistic, financial and administrative support necessary for discharging these functions and the manner in which these functions shall be discharged. In response to any disaster, HRTC vehicles provide transportation conveyance of causalities (in case of shortage of ambulances) from incident point to nearest first aid post and maintaining the balance between demand and supply of humanitarian logistics. Provide details of alternative routes in case of emergency, help police and other important departments in performing rescue operations

Functioning of Control Room of HRTC:

The corporation has installed landline number 2656326 in the control room functioning 24 hours at ISBT, Tutikandi. The control room number is available with each driver and conductor and whenever any break down / untoward incident occurred in HRTC, the same is reported to the control room in-charge by driver / conductors for taking remedial measures. The control room in-charge conveys the message to the nearest RM/Booking office. In case of any fatal accident, the regional manager immediately reports the matter to district administration, police and nearest hospital so that they should be kept prepared in advance. The telephone number of each regional manager and booking office is available in the control room. The corporation has two helpline numbers i.e. 94180000529 & 980500005529 for round the clock. Any passenger can report the incident to the control room. The helpline number indicated in all buses of the corporation.

Emergency response team:

HRTC should constitute emergency response team in each regional office to respond to any disaster emergency or accident. It is very important that all team members are well trained and backup members are clearly identified. There should be regular emergency drills with different scenarios so that the team can gain experience in dealing with different emergencies and the usage of emergency equipment.

Team members should be selected on the following criteria:

- Medically certified where required
- Live within a short distance from the HRTC office building so that they can be called up quickly.
- Can be easily contacted both on and off duty
- Ability and willingness to attend drills and training

7. DISASTER RECOVERY AND RECONSTRUCTION

7.1 DISASTER RECOVERY

The process of recovery from small-scale disasters is usually simple. Recovery operations get completed almost simultaneously with the response, relief and rehabilitation. However, in medium and large disasters involving widespread damages to lives, livelihoods, houses and infrastructure, the process of recovery may take considerable time as the relief camps continue until houses are reconstructed. Often intermediary shelters have to be arranged before the permanent settlements are developed.

7.2 DISASTER RECONSTRUCTION

Post-disaster construction provides an opportunity for 'Building Back Better' so that the reconstructed assets are able to withstand similar or worse disasters in future. It is difficult to anticipate such reconstructions as these would depend on the types and location of the disasters and the nature reconstructions to be made, which would be known only after the disasters.

Reconstruction is time and funds absorbing phase of disaster management. The construction department will be persuaded to include disaster resilient features in new constructions. Reconstruction programmes will be within the confines and the specification as laid down by the by the government known as National Building Codes.

Note: HRTC will only be concerned about the reconstructions activities of its own infrastructure.

8. FINANCIAL ARRANGEMENTS

Section 40(2) of the Disaster Management Act stipulates that every department of the State Department while preparing the DM Plan, shall make provisions for financing the activities proposed therein. Normally the funds required for risk assessment and disaster preparedness must be provided in the budgets of every concerned department. Such funds are not very sizeable and departments should be able to allocate such funds within their normal budgetary allocations.

Here the idea is to come up with a separate disaster management budget head within the budget allocation of the department.

This budget can be used to work upon the already suggested mitigation and preparedness measures, as response and relief are already being taken care of by the SDRF and NDRF. This budget head can work with a very basic amount initially as the marginal costs involved in mainstreaming DRR in existing programme is not very sizable. Also, the funds required for risk assessments and disaster preparedness are also not very large. This budget will help in institutionalizing the entire process. And once the department starts having a separate budget for prevention and mitigation, at least some measures will start automatically. The department told that they can have a budget head of 10 percent of the total amount in the disaster management budget head, as most of the schemes are directly related to disaster management.

ANNEXURE

I. Resource Inventory

1. Number of buses under HRTC

#	Name of Unit	No of HRTC Buses	No of JNNURM buses	Total buses
1	Recongpeo	66	0	66
2	Rampur	89	34	123
3	Rohroo	82	25	107
4	Rural	99	31	130
5	Local	123	47	170
6	Taradevi	110	14	124
7	Solan	76	17	93
8	Nahan	84	20	104
9	Mandi	80	50	130
10	Kullu	117	38	155
11	Keylong	58	0	58
12	Sarkaghat	86	29	115
13	Sundernagar	61	34	95
14	Dharamshala	93	38	131
15	Chamba	95	50	145
16	Palampur	67	35	102
17	Baijnath	74	27	101
18	Pathankot	75	43	118
19	Hamirpur	88	52	140
20	Dehra	72	33	105
21	Una	71	45	116
22	Bilaspur	70	37	107
23	Nalagarh	76	38	114
24	Parwanoo	11	13	24
25	N/Bagwan	31	41	72
26	D.W .Taradevi	15	0	15
	Total	1969	791	2760

2. Number of HRTC tankers, trucks and cranes in the State

#	Name of unit	Tanker, Truck & Crane
1	R/Peo	Tanker
2	Local	Tanker
3	Taradevi	2 Tankers
4	D / W Taradevi	Tanker
5	Solan	Tanker
6	D /shala	Tanker
Total number of Tankers 7		
7	Taradevi	Truck
8	D/W Taradevi	Truck
9	Pathankot	Truck
10	Keylong	Truck
11	D/W Mandi	Truck
12	Hamirpur	Truck
Total number of trucks 6		
13	Rampur	2 cranes
14	D/W Taradevi	Crane
15	Nahan	Crane
16	D/ shala	Crane
17	Chamba	Crane
18	Hamirpur	Crane
19	Una	Crane
20	Bilaspur	Crane
21	Sarkaghat	Crane
22	D/W Mandi	Crane
23	Shimla	Crane
Total number of cranes 13		

II. Steps taken by HRTC to Minimize the Accidents

1. Rigorous training to drivers at the time of initial recruitment.
2. GPS is installed in new 300 HRTC Volvo buses.
3. HRTC state emergency operating centre for quick response action in case of an emergency.
4. Strict disciplinary actions are taken against the drivers committing accidents.
5. In-service training to the accident-prone drivers.
6. Ban on cassette players and fixing of bigger size rear inner view mirror.
7. Use of Breath Analysers to detect driving under the influence of liquor by drivers.
8. Periodical medical check-up of drivers.
9. Emergency door is provided behind the Rear Axle at the right side of the bus for more safety to passengers in all the HRTC buses.
10. Attending buses in the workshops as per the maintenance schedule prescribed by the vehicle's manufacturers.
11. Issuance of medical fitness certificate by the technical supervisory staff at the time of out-shedding after repair.
12. No bus is operated on a road unless the same is declared fit by the Road Inspection Committee for the operation of a bus.
13. The PCRA and chassis manufacturers impart refresher courses/training to the drivers.
14. Ban on mobile to the driver while on

III. The comparative performance of the Corporation for last 4 years is as under:

#	Particulars	Unit	2006-07	2007-08	2008-09	2009-10
1	Fleet Strength at the end (Buses Only)	Nos.	1783	1976 + 37 (Attached)	1881 + 27 (Attached)	2005 + 21 (Attached)
2	Routes	Nos.	1874	1991	1975	2032
3	Total Coverage during the year (Buses only)	Lakh Kms.	1546.47	1580.00	1632.02	1654.82
4	Passengers Kms. Covered	Lakh	38310	44026	47577	
5	Incidence of accidents	Per Lakh Kms.	0.02	0.10	0.11	0.07
6	Incidence of Break-downs	Per 10000 Kms.	0.20	0.18	0.16	0.16
7	Load Factor	%	64.54	62.11	55.00	60.00
8	Fleet Utilization	%	98.26	98.00	98.00	99.00
9	Per Km. Expenditure	Rs.	20.97	23.28	24.14	26.46
10	Per Km. Income	Rs.	18.95	19.20	20.68	20.78
11	Total Income	Lakh Rs.	30346.21	32472.02	37217.47	39658.61
12	Total Expenditure	Lakh Rs.	33606.97	36481.47	40635.66	43408.43
13	Loss	Lakh Rs. (-)	3260.76	4009.45	3418.19	3749.82

NOTES