

Development of Safety Module for Crowd Management in Simhastha 2016 in Ujjain

Ritu Shrivastava¹, Parag Dalal², A. K. Dwivedi³

¹Research Scholar, Department of Chemical Engineering, Ujjain Engineering College, Ujjain

²Assistant Professor, Department of Chemical Engineering, Ujjain Engineering College, Ujjain

³Professor, Department of Chemical Engineering, Ujjain Engineering College, Ujjain

Abstract: *In the past few decades, it was shown that there are various stampedes at places of mass gatherings (railway stations, sports/political/social and at religious places). At these places, extreme high density crowd may result in disaster (stampede, suffocation and trampling). Infrastructural capacity poses a challenge in such places. In India it has been observed from the past crowd disasters that many places have inadequate risk management strategies. India is a country of many religions, faiths, festivals and events. The population of India is around 1.32 billion, there are lots of mass gathering events being organized almost throughout the year at various levels involving large number of people. Kumbh Mela Known as Simastha in Ujjain. Kumbh Mela, is held once every twelve years at these four places Prayag (Allahabad), Nashik, Haridwar and Ujjain and attracts millions of devotees. In Ujjain Simhastha Mela is held on the bank of River Kshipra Hence, its named as Moksh Dayni. During the whole period near about 4.2 crores of devotees excluding Mahants, Saints, Mahamandleshwar and lakhs of pilgrims has taken holy dip in the river Kshipra. Therefore, it is essential to develop crowd management strategies to avoid casualties. These strategies are not only to provide the way for better crowd management, but also for better route guidance to avoid congestion, finding the pinch points (high risk points) and determining suitability of the venue for an event. For developing these strategies and for safer events an overview proposal of pedestrian simulation is presented in this thesis which can lead to a good management skill.*

Keywords: Simhastha, Crowd Management, Mass Gathering Event, Kshipra River, Stampede, Safety

1. Introduction

There are lots of mass gathering events being organized here at various levels involving large number of people. In India, it has been observed from the past crowd disasters that having insufficient risk management strategies, one of these is Kumbh Mela (Lakshya, N. Bolia). According to epic there was a battle between devas and devils to capture the Urn (Kumbh) containing the nectar, drops of the precious liquid fell on four places – Haridwar, Prayag (Allahabad), Nashik and Ujjain. Kumbh Mela, is held once every twelve years at these four places and attracts millions of devotees. In Ujjain Simhastha Mela is held on the bank of River Kshipra Hence, Kshipra River is also named as Moksh Dayni. The Mela was Scheduled on 22 April, 2016 to 21 May, 2016. During the whole period near about 5 crores of devotees excluding Mahants, Saints, Mahamandleshwar were taken holy dip in the river Kshipra. Therefore, it is essential to develop crowd management strategies to avoid casualties. These strategies are not only to provide the way for better crowd management, but also for determining suitability of the venue for an event, better route guidance to avoid congestion and finding the pinch points (high risk points) (Lakshya, N. Bolia). Finally, an overview of pedestrian simulation is presented that can help in developing more strategies for safer events.

2. Preparation for Simhastha

The Government did a lot of work for Simhastha like bridge construction, Road construction, Railway overbridge, Beautification of Roads, Ghats etc. The govt. had made projects of road and bridge construction worth Rs 720 crore

in which Rs.549 crore for road construction and Rs 171 crore for building of various bridges. They construct four railways-over bridges to avoid traffic during simhastha. They also construct a culvert to connecting Ramghat and Dutt Akhara ghat at the height up to 1.5 feet. The height of the culvert was also increased so that a motor boat can pass under it.

About 33 MGD water will be required for Simhastha Kumbh Mahaparv. The government has planned to take 15 works those were costing Rs 157.57 crore for ensuing safe Simhastha, most of the work includes construction & beautification of the Ghats and their strengthening on the banks of the Kshipra River. Due to these works, bath capacity increased which will lead to less mismanagement at Simhastha time.

3. Satellite Towns

For Simhastha 2016 as many as 6 satellite towns had constructed in Ujjain where arrangements for water, toilets and shade will be made for devotees. For all satellite towns 393 hectare land had been allotted. Entry of passenger buses and four-wheelers were restricted in the city. Visitors were able to commute from satellite towns to religious spots through Magic vans and other vehicles. The distance from Mahakal Temple is shown in parenthesis.

- 1) Buses arriving from Indore road had been stopped at Nanakheda stadium. (approx 05 Km)
- 2) Buses from Dewas Road at Ujjain Engineering College ground. (approx 07 Km)
- 3) Buses from Badnagar at Mohanpura railway crossing. (approx 02 Km)

- 4) Buses from Agar Road on RD Gardi College campus. (approx 10 Km)
- 5) Buses from Maksi Road at Panwasa and (approx 08 Km)
- 6) Buses from Nagda Road had been stopped at Unhel check-post. (approx 10 Km)

4. Technologies Used to Control Crowd

The authorities were planning to make use of the latest technology in order to provide better facilities and monitor the huge crowd. They were trying their best to stay organized and pre-planned to handle the crowd, which was to be in the millions. Pilgrims from across the globe were gathered at the Maha Kumbh Mela for the Shahi Snan the river Kshipra. Crowd management is the most important issue which was handled by around twenty three thousand police staff and sixty thousand special Kumbh Mela volunteers. The 7.25 km long ghats were being renovated for devotees and being rebuilt with stronger GIS-based arrangements.

An ephemeral spiritual city was constructed during the Simhashta Maha Kumbh in Ujjain that spreads on four thousand hectares of land. Keeping in mind the management and security of the massive crowd, the extensive area was divided into six zones, sixteen sectors and around forty-two temporary police stations were created. Along with this, around six hundred CCTV cameras, two hundred fifty-six and four drone cameras watch towers was installed for surveillance. Twenty-five thousand police officials were specially appointed for security purposes during the month long event. Officials had also appointed twenty bomb detection and disposal squads along with twenty-five quick response teams for security purposes. The city police were also being provided with 2,500 wireless sets for effective communication during the clustered event. Authorities are making all the necessary efforts for a hassle-free visit for the devotees during Simhashta. In an emergency of fire blaze Police had integrated fire stations with traffic control. With head count cameras, it was easy to manage the flow of crowd in different zones and divert them to other locations. Mela authority developed different stations like 25 quick response teams, 50 Dial 100 first-response vehicles, 20 bomb detection and disposal squads and 50 sniffer dogs. Also expanded ghats and installed barricades, the Mela administration had also created a panic button on its mobile app. Tapping this button will directly alert the central control. The administration also established 10,000 electric poles that are uniquely numbered and connected to central control room through GIS mapping, if an alarm is raised from any place, control room able to pinpoint the location of the alarm. This numbering in electric poles helps to Govt. to found missing people as well as to found any disaster happened near electric poles.

The free WiFi facility also provided by Govt. for Devotees in Mela shetra, this facility played an important role to connecting people to each other by mobile app. Mobile played an important role in Khoyya-Paya Kendra.

5. Crowd Flow to Ujjain

In Simhashta Mela, the month-long event, one of the largest congregations of Hindus began in Ujjain on 22 April 2016 with the arrival of the June Akhara for a royal bath on the banks of KShipra River. People from different corners of the country had converged on the holy city for the Simhashta Mela, which is being held here after a gap of 12 years. Ujjain is also the abode of Lord Mahakaleshwar, one of the 12 'jyotirlings' in the country. The Kumbh or the Simhashta festival started in Ujjain in Madhya Pradesh coinciding with the full moon of the month of Chaitra in Vikram Samvat 2073 (April 22, 2016).

All roads were converging on the holy city of Ujjain. The devotees and pilgrims who came here to be part of the auspicious occasion from all parts of India and also abroad were enchanted and mesmerized to see the sadhus of different akharas making a dash for the holy dip in the Kshipra River with their hands raised. All were in a trance as they chanted mantras and hailed lord Shiva with the slogan "Jai Mahakal".

The different akharas followed predetermined routes to reach the Kshipra. The Juna Akhada started the "Shahi Snan" at 5.11 am at Datta Akhara. All the 13 Akharas of the seers will take a bath one after another for which elaborate arrangements were made along the banks of Shipra River. Some 11 lakh faithful had reached this ancient city for the First snan.

The second 'Shahi Snan' (Royal Bath) of the month-long Simhashta Kumbh Mela held on 9 May 2016 with Naga Babas of the Juna Akhara venturing into the holy KShipra River chanting Har Har Mahadev. Ramghat had been decked up for the holy dip where the sadhus since predawn to 12 noon will take Royal dip. In Ujjain a sea of devotees had congregated to take part in the holy snan that had become all the more auspicious as it coincide with Akshay Tritiya.

According to the government, approx. 25 lakh faithful had reached this ancient city for the second snan. Snan began with the Juna Akhara.

And for Third shahi snan some 75 lakh faithful devotees had reached this ancient city & took a holy dip in Kshipra River



Figure 1: Crowd during Simhastha (Courtesy: <http://s3.india.com/travel/wp-content/uploads/2016/05/01-Simhastha-occurs-once-in-12-years-in-Ujjain.jpg>)

6. Traffic Plan Adopted

The six flying squads had constituted and four temporary check-posts had also established at the Kumbh Mela premises in Ujjain and its outskirts, which was executing the enforcement activities to control the irregular transportation and provided the smooth and safe traffic arrangements for the devotees. Eighty enforcement staff, including transport inspectors, assistant transport sub-inspectors, head constables and constables was being deployed to control the traffic round the clock.

Peak crowd pressure areas such as Mahakal temple, Barnagar road and Mangalnath road were declared no-vehicle zones. Pilgrims had to walk for around 2-3 Km to tour camps of prominent seers and ghats.

Traffic from Dewas, Indore and Maksi were stopped at the Nanakheda bus stand. Devotees then had got light motor vehicles to reach Sanvrakhedi. The distance between fair area and Kshipra Ghats to Sanvrakhedi is 2 km. Devotees coming from Agar Road were stopped at Juna Somvaria and also carried into the Simhastha fair area by inner ring road and main road. Disabled persons were provided light motor vehicles and other such vehicles like Go-carts. There are 28 ways for bulk transport.

Devotees who entered into the city were provided pamphlets carrying information about fair area, ghat, parking, safety, drinking water, etc. Visitors had to submit their IDs to stay at city hotels. There were separate arrangements for Panchkroshi pilgrimage. There were four zones for the transportation in fair area. There were no-vehicle zone, only two-wheeler zone, independent transport zone and light vehicle zone. It was informed that 4 drone cameras, 600 CCTV cameras and 256 watch towers will be installed at the fair. Along with 25 quick response teams moreover, 20

bomb detection and disposal squads was deployed. Most of the roads near bank of Kshipra River, and near the tents of the akharas where pilgrims would take a bath, had been declared as no-vehicle zones. Major squares like Bhukhimata bypass square, Kamri road square, Narsingh square and Shankracharya square had been declared no-vehicle zones. All types of vehicles would be prohibited on routes leading to Hariom Dhaba from Lalpur and Jaysinghpura square. Two-wheelers would be allowed to ply near Favarra square, Kamri road, KD gate, Begum Bagh and routes like Nai Sadak to Ankrat crossing, Indore gate to Daulatganj square, and Peeplinaka to Juna Somwariya.

On days other than Shahi snan and parv snan Small four-wheeled vehicles were allowed in male areas. Auto stands would also be created at many spots in the city. Naya Sheher and Agar road would be free zones for movement of all kinds of vehicles. Traffic police had also demarcated routes for public transport vehicles. However, vehicles coming from outside the city would be parked at several parking lots made by the authorities.

Traffic police had instructed devotees to strictly follow the routes demarcated by them to avoid accidents and inconvenience. Separate entry and exit routes had been made from different ghats. Important announcement was made through loudspeakers installed at regular distances. Devotees had instructed not to believe in rumors. Traffic police had advised the devotees not to push anyone while walking on the road as this may lead to accidents.

To control crowd during simhastha barricades played an important role. Approx. 10,000 Barricades were used for crowd management. Every four lane was divided into four parts by barricades – two part is to & fro for pilgrims or devotees, another part is for the Govt. Vehicles and other part are for emergency vehicle.



Figure 2 Barricades at Ramghat (Courtsey: <http://www.simhasthujain.in/wp-content/gallery/simhasth-2016-day-15/NEWS-004-PHOTO-C.jpg>)

Barricades were put on every road of Ujjain as well as in every ghats where devotees took a holy dip in river Kshipra and also made in the Mahakal temple area to increase the retention time of devotees to reach the ghat or temple. Govt. apply rounds & round policies to increase the retention time for pilgrims.

7. Conclusion

Simhastha Mela, the name itself projects the belief and vibrant traditions of India. With the religious sentiments, lakhs of devotees from different sectors of the country gathered in the Ujjain City between the periods 22 April to 21 May 2016 and took a holy dip in the River Kshipra. In the presence of proper crowd management planning, a successful event had been done. This Kumbh had implemented many modern techniques like CCTV, GPS, app-based panic buttons, effective fire control system, barricades, electric poles that are uniquely numbered, Crowd management system, etc. This topic covers the overall effects on the social environment due to the conductance of Maha Kumbh by data analysis and few technological advancements. With all advancement, proper crowd management Simhasth 2016 made a successful event without any causality due to the Stampede. There were few casualties occurred due to natural disaster like heavy rainfall before the Second Shahi Snan only that too is being minimized by the proper crowd management system.

References

- [1] Afshar, Abbas, and Ali Haghani. (2008). "Heuristic Framework for Optimizing Hurricane Evacuation Operations." *Transportation Research Record: Journal of the Transportation Research Board*.
- [2] Amar Farooqui, (2011) "Sindias and the Raj: Princely Gwalior C": 131.
- [3] Ammon, R.J.R., (1993). "Risk and Game Management Practices in Selected Municipal Football Facilities". Unpublished doctoral dissertation. University of Northern Colorado, US.
- [4] Anna, J E, Lanza Abbott, and Morgan W Geddie, (2001). "Event and Venue Management: Minimizing Liability Through Effective Crowd Management Techniques." *Event Management* 6 (713): 259–70.
- [5] Barbara Krausz, Christian Bauckhage. "Analyzing Pedestrian Behavior in Crowds for Automatic Detection of Congestions": 1-6
- [6] Bisht A, Singh S K, 2014. "Environmental Management in Mass Gatherings: A Case Study of Maha Kumbh Mela 2013 at Prayag, India" *IRST – International Journal for Innovative Research in Science & Technology* 1 (7): 2349-6010
- [7] Christophe Jaffrelot, (2010). "Religion, Caste, and Politics in India. *Primus*": 241–242.
- [8] Chukwuma Al, and C Kingsley. 2014. "Disaster Risks in Crowded Situations: Contemporary Manifestations and Implications of Human Stampede in Nigeria." *International Journal of Liberal Arts and Social Science* 2 (3): 87–98.
- [9] Executive, Health and Safety. (2000). "Managing Crowd Safely." <http://www.hse.gov.uk/pubns/books/hsg154.htm>.
- [10] James Lochtefeld, (2009). "Gods Gateway: Identity and Meaning in a Hindu Pilgrimage Place". Oxford University Press: 252–253.
- [11] Kama MacLean, (2003). "Making the Colonial State Work for You: The Modern Beginnings of the Ancient Kumbh Mela in Allahabad". *The Journal of Asian Studies*. 62 (3): 873–905
- [12] Kama Maclean, (2008) "Pilgrimage and Power: The Kumbh Mela in Allahabad": 89.
- [13] Lakshay, Nomesh B. Bolia. "Risk management strategies to avoid stampede at Mass gatherings". 1-13.
- [14] Official Site of Simhastha Kumbh Mahaparv Mela Ujjain 2016.