

## Feasibility of Sky-bus for Himalayan Ranges in India

Harsh N Patel <sup>1</sup>

Shyam D Kotecha <sup>2</sup>

Prince M Patel <sup>3</sup>

1. *Student, B.E. (Civil), Faculty of Technology and Engineering, The M.S. University of Baroda, Vadodara, Gujarat, India*
2. *Student, B.E. (Civil), Faculty of Technology and Engineering, The M.S. University of Baroda, Vadodara, Gujarat, India*
3. *Student, B.E. (Civil), Faculty of Technology and Engineering, The M.S. University of Baroda, Vadodara, Gujarat, India*

### Abstract

Sky-bus is an elevated rail system positioned on a set of pillars and longitudinal members which is the latest, economical, eco-friendly, reliable and most innovative but simple mode of transportation developed by Konkan Railway as a rail based futuristic urban mass transit system. Sky-bus failed in Metro city but it will be a great success in Mountainous Region in lifting passenger and cargo to remote regions of Himalaya.

### Keywords

Aesthetic, Eco-friendly, Destruction, Disaster Management, Rapid Transport system

### Introduction

The concept of the SkyBus was initiated from the Konkan Railway Corporation Ltd. The structural design developed at IIT Bombay was fabricated by Kineco, Goa. The project was partly funded by Technology Information Forecasting and Assessment Council (TIFAC), Government of India. This is seen as solution for problem of public transportation problem in thickly populated areas, especially in big cities. The unique feature of this concept that it requires less space and money, as economical concept, as compared to other Mass-Rapid Transit systems. The self-propelled coaches hang over rails mounted on a structure and travel. This concept can be easily implemented even on existing roads. Vehicles can move on the road and Sky-

bus can move on their top. Hence the name Sky Bus. A prototype is ready at Margao railway station, Goa, India.

Taking a case, In June 2013, a multi-day cloudburst centered on the North Indian state of Uttarakhand caused devastating floods and landslides in the country's worst natural disaster since the 2004 tsunami. Though parts of Haryana, Himachal Pradesh, Delhi and Uttar Pradesh in India, some regions of Western Nepal and some parts of Western Tibet also experienced heavy rainfall over 95% of the casualties occurred in Uttarakhand. As of 16 July 2013, according to figures provided by the Uttarakhand government, more than 5,700 people were "presumed dead." This total included 934 local residents. Destruction of bridges and roads left about 100,000 pilgrims and tourists trapped in the valleys leading to three of the four Hindu Chota Char Dhampilgrimage sites The Indian Air Force, the Indian Army, and paramilitary troops evacuated more than 110,000 people from the flood ravaged area.

If we have built Sky-Bus in this Region the Scale of damage to life may have been reduced. Rapid transport system like Sky-Bus can be built between the valleys and reduce the distance by half the time by the Road. Alignment of Sky-Bus Route should be selected in such way the Maximum city in the mountain region is covered. Sky-bus is failed in Metro city but it will be Success in Mountainous Region. This can be used as Disaster Management in rescue effort in evacuating people from the Region even road and Bridges are damaged in disaster prone area.



[ As shown in above Picture, Sky-bus is an elevated rail system positioned on a set of pillars and longitudinal members ]

### About The Technology

Sky-bus is an elevated rail system positioned on a set of pillars and longitudinal members. The Sky-Bus technology offered by Konkan Railway Corporation meets the above requirements, and re-defines the thinking and planning for urban transport being an Eco-friendly Mass urban transport system revolutionizing urban life. It is a patented technology developed for the new millennium and will cause a paradigm shift in urban transportation all over the world. Being an indigenous technology, it will place India on the forefront of the Rapid Transit Industry all over the world while providing the much needed alternative transportation solution, which is financially viable, environment friendly, synergizing well proven existing cutting edge technologies.

Sky-Bus is based on the concept of Sky Wheels presented in 1989 at the World Congress for Railway Research by Mr. B Rajaram, Managing Director of KRCL at Bologna University, Italy. The sky bus uses pre-fabricated latest construction technologies, which save time and money resulting in easy execution of the project in busy urban areas without disturbing the existing traffic pattern. All these structural engineering methods are well-proven. They have IT tools for economical communication and control. The 3 phase asynchronous AC electrical motor used for the

propulsion of sky buses is also well proven and widely used abroad as well as in India.

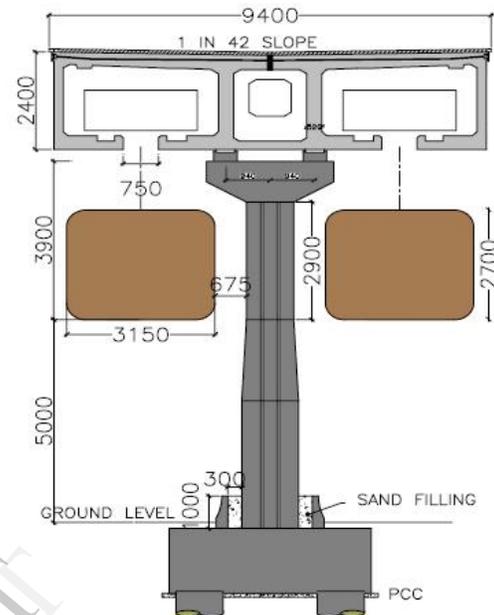


FIG: I.a (Schematic Arrangement)



FIG: I.b Actual Arrangement of Sky-Bus Project at Margao Sky Station

For the Schematic Arrangement, The fixed structure at 8 meters height above road level provides the support and guidance for powered bogies which can run at 100 km/h, with the coach shells suspended below, carry passengers in air conditioned comfort, can follow existing road routes, and while existing traffic on roads continue. It is aesthetically pleasing and there is no concern of a claustrophobic feeling for road users. Aesthetic, and eco-friendly, the Sky-Bus is protected

against derailment, toppling or collision – by design as well as by construction, hence is safer than the existing rail based system. At the cost of Rs. 50 Crore per km. in India, the system is noise – free and pollution – free with a capacity to transport 36000 passengers per hour, scalable to 72,000 passengers per hour as required. With no signaling and having no points and crossings, it is a unique mass-transit system that can be put up within two years in any crowded & congested city. In addition to moving people, the Sky Bus system can carry standard 20 ft. containers, boosting its capacity utilization to double that of other existing systems. Since it operates along existing roadways and within municipal limits, Sky-Bus metro falls under tramway category, under Art 366(20) of the Constitution of India.

[I]. The sky way consists of a concrete box structure 8.4 X 2.4 m. carried over a series of piers at a height of 9 – 10 m. above the existing road level.

[II]. In the middle of the roadway, pile foundations support 1 m. diameter columns approximately 8 m. high, and at a spacing of 15 m. all along the roadway

### Advantages of Sky-bus Metro System

- Fast Transportation in mountainous region.
- No requirement of Land.
- Air & Noise Pollution free.
- Easy accessibility.
- No scope of capsizing of the coaches in case of derailment.
- Deep Penetration as it can reach .of Himalaya regions and Zigzag roads as there is no interference with normal road traffic.
- Low Operational Cost due to the absence of track circuits or signals, points or Crossings.
- All urban transportation needs covering people and goods.

### Environmental Issue

Unprecedented destruction by the rainfall witnessed in Uttarakhand state was attributed, by environmentalists, to unscientific developmental activities undertaken in recent decades contributing to high level of loss of property and lives. Roads constructed in haphazard style, new resorts and hotels built on fragile river banks and more than 70 hydroelectric projects in the

watersheds of the state led to a “disaster waiting to happen” as termed by certain environmentalists. The environmental experts reported that the tunnels built and blasts undertaken for the 70 hydroelectric projects contributed to the ecological imbalance in the state, with flows of river water restricted and the streamside development activity contributing to a higher number of landslides and more flooding.

### Conclusion

After the disaster struck at Uttarakand, the region was totally isolated from rest of India .The Road, Air transportation was blocked, Bridge collapsed in all major routes, and the rescue operation was hampered. If we had Good Road Transportation system in Mountainous region .we would save much precious life. We should Introduce Sky-Bus transportation for passenger and cargo in Himalaya Region. The Region is surrounded by Mountain instead of zigzag road, movement will be as far straight as possible and distance between cities less and travel time is less and for effective movement of Passenger and cargo. We should consider Environment problem due to construction of Project Sky-Bus in this Region and evaluate the Environment Impact assent for the project.

### References

- [1] Konkan Railways Corporation Ltd. (A government of India Undertaking)  
Link: <http://www.konkanrailway.com>
- [2] “National: Sky-Bus Metro resumes after 3 months”  
Chennai, India: The Hindu. 2004-12-23. Retrieved 2010-08-11.
- [3] Sky-bus/Wikipedia  
Link: [http://en.wikipedia.org/wiki/Skybus\\_Metro](http://en.wikipedia.org/wiki/Skybus_Metro)
- [4] IIT BTech Brochure 23 December 2011, Transportation, Page no.101