

SKY BUS TECHNOLOGY

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ABSTRACT

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. The most precious asset in growing urban areas is land. After its allocation for residential and commercial purposes hardly 6% to a maximum of 18% of land in cities forms road ways. The road ways once laid almost remain constant and indeed may be effectively reduced by uncontrolled encroachments. With the physical constraint on road area in the wake of increasing population, the intensity of loads and traffic volumes on the roads increase. As more and more people from different habitats try to converge on to the central business district, the roads are left with no capacity to improvise and handle the excess traffic, leading to congestion. Roads take one exactly to the point where one wants to go. But the capacity is limited in terms of passengers per hour that can be handled, considering speed limits and lane width limitations.

I. TECHNICALITIES OF SKY BUS TECHNOLOGY

The fixed structure at 8 metres height above road level provides the support and guidance for powered bogies which can run at 100 kmph, with the coach shells suspended below, carry passengers in air conditioned comfort, can follow existing road routes, 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 (pph), scalable to 72,000 pph as required. With no signalling 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.

1.1 SKY WAY

- [1] 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.
- [2] 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.
- [3] It has two heavy 52 - 60 kg. / Metre rails fixed with appropriate fastenings within the concrete box support at standard gauge that guide the sky bogie.
- [4] There are no points & crossings.

1.2 SKY BOGIE

- [1] Standard two axle bogies can be used in metros for speeds of 100 kmph (but can have higher speeds if required, upto 160 kmph) of standard gauge.
- [2] Linear Induction motor technology is incorporated with 4 th rail driving, which is above the bogie and 3 phase AC motors with regenerative power capability are used.
- [3] Third Rail is used for current collection.
- [4] Braking - Since the bogie is mounted, 3 levels of braking namely - Regenerative, disc brakes and finally, Emergency mechanical brakes are provide to ensure the safety of commuters.

1.3 SKY COACHES

- [1] These are double walled light shells with large wide windows suspended from the sky bogies.
- [2] Controlled banking on curves is possible. Curves with radii of 50 m. can be negotiated.
- [3] The coaches are air conditioned and fixed with automatic doors.
- [4] They also have special 4 m. wide sliding doors for quick entry and exit of passengers.
- [5] Each pair of coaches carries 300 persons and service every one minute or 30 seconds is possible.

II. SKY STATIONS

- [1] Unlike conventional mass transit systems, Sky Bus needs smaller stations about 50 mt. long.
- [2] Stations are available at every 1 km. It is a natural footbridge across the road. From up line to down line the station provides natural access, which is easy.
- [3] Service is available at every 30 seconds or 1 minute, which means virtually no waiting time for passengers.
- [4] Totally automated without drivers, access control is electronic by prepaid cards being swiped in.
- [5] Stations act only as an access facility, and not as passenger holding area.

III. ADVANTAGES OF SKY BUS

- [1] In this new technology of Sky bus, almost no land acquisition will b''e required, except for providing for right of way on existing roadways.

- [2] Only at terminal points, of about 2000 to 4000 square meters of area will be required, that too at places away from the urban centre.
- [3] No demolition of structures or no gardens will be destroyed.
- [4] No Vandalism. Not vulnerable to persons throwing stones. Track is inaccessible.
- [5] Fastest evacuation in case of fire as compared to underground metros.
- [6] If at all derails, cannot fall down, coach keeps hanging. Hence no capsizing takes place as compared to railways and underground metros.
- [7] No Deaths due to trespassing or falling off from train. In normal metros like Mumbai daily 2 to 3 deaths occur on the system with total casualties reaching almost 2000 per year.
- [8] Sky Bus follows existing busy roads, thus reaches the very heart of the city decongesting the roads. This is not possible in case of Normal Railway.
- [9] Capital cost is lowest. Almost 50 per cent of elevated systems and 25 per cent of underground metro required for same performance standards.
- [10] It has lowest running cost. Sky bus has maintenance free tracks, has no signals and points and crossings to maintain.
- [11] Sky bus does not make interference with normal road traffic. It does not require road over or under bridges.
- [12] Since the system involves guide ways in the sky, which does not fall into an exact definition of Railway, the number of agencies involved in clearing and executing the project will be minimum and only one authority at state level can be created for implementing the project.
- [13] It can be built on roads with Fly over. It is not an impediment.
- [14] From the date financial closure is achieved, the project can be completed and commissioned within 2 years.
- [15] Sky bus riding is aesthetically pleasing and has no noise pollution.
- [16] Sky bus is insulated against floods, rains and obstruction on track

VI. CONCLUSION

The Sky bus is the technological breakthrough that India has achieved. Sky bus is an improved railway technology, eliminating the problems of existing metro rail systems, like - derailment collisions and capsizing crushing people – which have been suffered by country for decades. Financially Sky bus metro makes urban transport dream come true for administrators and people. The sky bus metro is one single technology which can change the face of our cities, take out almost 10 million road vehicles in the cities and make the cities live able, improving quality of life and attract and sustain economic activity to generate wealth.

REFERENCES

1. www.konkanrailway.com
2. www.google.com/skybustechology
3. www.wikipedia.com
4. [Http://civilenggseminar.blogspot.in/](http://civilenggseminar.blogspot.in/)
5. <http://www.seminaronly.com/>