

# ON-BOARD

## Bus Identification and Homing System for the Visually Impaired

### Need

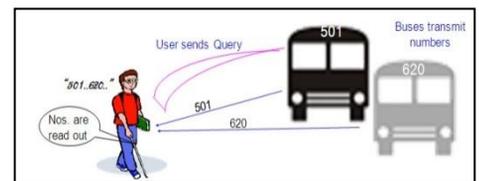
Independent mobility is a precursor for seeking education and work. Public transport plays an important role in providing a cost-effective solution. Despite being crucial for the visually impaired, the current infrastructure of the public transport system poses great difficulty for the visually impaired in accessing public buses.



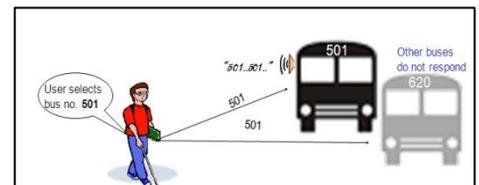
User boarding the bus using ON-BOARD

### Technology Solution

- RF based system consisting of two modules – for User and Bus respectively
- When user hears any bus approaching, initiates query to get the bus number(s)
- User module speaks out the numbers of all buses in the vicinity
- On selecting a particular bus to board, bus module responds with the bus number
- User follows the audio cues from the bus module to localize the entry door and board the bus



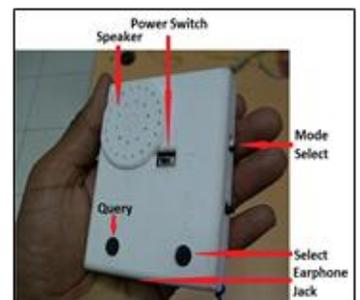
Query stage



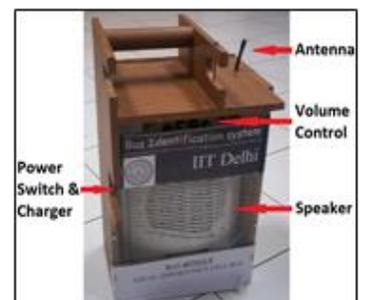
Selection stage

### Salient Features

- Fully controlled by the user, without any external assistance from the driver or others.
- Improves mobility, gives independence & boosts self-esteem.
- Particularly suited to traffic conditions in many developing countries where multiple buses frequently arrive together and line up arbitrarily at a crowded bus stop.
- Requires minimal modifications on the bus.
- Adaptable to be used for trams, trains, metro rails etc.
- Also useful for senior citizens and individuals with low-vision.



User Module



Bus module



## Installation and User Feedback

The OnBoard system has been installed on IIT Delhi and Delhi University buses and successfully tested with volunteers from the **National Association for the Blind, Delhi** and **Delhi University**. User feedback was extremely positive. They found the auditory cues easy to identify, and successfully identified and boarded the correct bus.

Road trials were done with a visually challenged person identifying and boarding the desired bus with the system under normal traffic conditions from real bus stops along **Mehrauli Road** and **IIT Campus Road**. The user was successfully able to identify the bus and board it independently amongst real road traffic and noise.

## Recent development

Pilot trials on Delhi Roads on regular city buses are being planned with support from DIMTS (Delhi Integrated Multi Modal Transit System Ltd)

## Publications/Awards

- Paper on On-Board published at TRANSED 2010 in Hong Kong held in June 2010 and at TRANSED 2007, Montreal, Canada.
- Innovative Student Project Award, Indian National Academy of Engineering (INAE), 2008 [National Award]
- Best Industry Relevant Research, Forum for Innovation and Technology Transfer (FITT), IIT Delhi, 2008.
- IIT Delhi Alumni Association Award, 2007.

## User Testimonials

*“This is a great easy-to-use system. It solves my everyday problem. With this device I can finally start reaching my college on time. All by myself. Thank you very much.”*

Mr. Yogesh, Saksham Trust

*“The bus route number identification system is the only and most urgent requirement for persons with blindness or low vision. Once the module is there in the buses, there would be a non-ending demand for this.”*

Mr. Dipendra Manocha, National Association for the Blind



User boarding on Delhi University Bus



User boarding on IIT Bus



Current difficulty in boarding public buses



Bus Identification and Boarding simplified after system is installed