

USER PERSPECTIVE  
&  
TECHNICAL ASSESSMENT REPORT  
DEMONSTRATION AND FIELD TRIAL  
OF MOBILE LIFT

5<sup>th</sup> March 2010



**National Centre for Accessible Environments**

A project of Samarthyam Trust (Regd. No. 35922)

B-181, Mansarovar Garden, New Delhi-110015

Telefax: +91-11-41019389 (M) 9810558321

Email: [samarthyaindia@yahoo.com](mailto:samarthyaindia@yahoo.com)

Web site: [www.samarthyam.org](http://www.samarthyam.org)

## INTRODUCTION

SLR coaches/ rolling stock of Indian Railway (IR) have a vertical height difference with respect to station platform which creates difficulties for boarding by persons with reduced mobility (senior citizens, families with young children, pregnant women, persons having medical conditions such as cardiac, arthritis and fracture etc.) and persons with disabilities (PwDs) particularly locomotor disabilities. The concept of mobile lift is to facilitate easy boarding/deboarding of passengers with reduced mobility and locomotor disabilities to/from rail coach.

Samarthyam has worked in close collaboration with Research Designs & Standards Organization (RDSO) since 2002 on the following:

1. Development of accessible coach for disabled with accessible toilets and internal circulation space for wheelchair users. Samarthyam interacted with Shri Gautam Dutta and Shri Adarsh Khare of RDSO on these issues and blue prints/drawings of coach for the disabled were vetted and frozen.
2. Samarthyam's Access Resource Group has also undertaken Disability Sensitization and Awareness including mock ups of toilet cubicles and circulation spaces inside the coach for RDSO; ICF, Chennai and RCF, Kapurthala.
3. A device (Mobile lift) to provide easy access to rail coach for mobility aid users by bridging the vertical and horizontal gap between the coach and the platform.

## INITIAL TRIAL OF MOBILE LIFT ON SEPTEMBER 2009

Initial trial of the Mobile lift was held in September 2009 at Lucknow station. The demonstration involved transfer of a wheelchair user on a smaller aisle chair (having four castors) which was carried up/down by a powered Mobile lift. To improve upon the prototype design by Callidai Motor Works, Samarthyam provided inputs on diverse access needs and transfer techniques of PwDs. It was stressed that persons with severe disabilities prefer to use their own wheelchair which is customized as per their needs instead of transferring on another chair. Hence from users perspective Samarthyam recommended a device (with wheelchair securing) which minimizes transfers and encourages independence, dignity and safety of PwDs.

## DEMONSTRATION AND FIELD TRIAL ON 5<sup>th</sup> MARCH 2010

Demonstration and field trial of a motorized lift was carried out by Callidai Motor Works at NDLS extension platform no. 1 (opposite Rail Niwas on State Entry Road). The lift now had an option for carrying either a standard wheelchair or an aisle chair as earlier, as per the recommendations provided by Samarthyam. Demonstration and trial of Mobile lift were carried out for both the 'Coach For Disabled' and standard rail coach.

It was attended by following senior officers from Ministry of Railways and RDSO:

**Mr. A.K. Singh**

Executive Director (Mechanical Engineering coaching)

**Mr. Dilip Kumar Agarwal**

Executive Director (Carriage)

**Mr. Vinay Srivastava**

Director (Carriage)

Samarthyam, National Centre for Accessible Environments, was invited to provide users perspective and check suitability of the device.

Represented by:

**Ms. Anjlee Agarwal** (assisted wheelchair user)  
Executive Director

**Mr. Ashwani Kumar Agarwal** (independent wheelchair user)  
Director

**Mr. Debabrata Chakravarti**  
Director (R&D, Assistive Device unit)

**Mr. Joseph Kwan**, from Hong Kong, Global Chair Rehabilitation International, International Commission on Technology and Accessibility (ICTA) and Work Programme Director, International Union of Architects (UIA), Architecture for All, Region IV

## OBSERVATIONS

1. Mechanical parameters such as lift capacity of 300kg; raising height upto one meter from platform level without destabilization and no loss of height in case of electrical/motor failure being claimed by Callidai are fairly adequate for current requirements, but may be vetted by RDSO.
2. Wheelchair user could board and deboard the Coach for Disabled, fairly conveniently through the Mobile lift.



3. Person with reduced mobility, used an aisle chair with castors (provided by Callidai) and could also successfully embark, reach upto the berth in the aisle chair and disembark the standard coach through the Mobile lift.



#### **Suggestions for improvements/modifications:**

1. Existing gradient of front swing up/down ramp is steep (1:4) and cannot be accessed independently by wheelchair user.
  - ✚ Ramp to be extended so as to provide maximum gradient of 1:8.
2. Platform size is 805mm (width) x 960mm (depth).
  - ✚ It is recommended to increase depth to 1200mm to accommodate customized wheelchairs such as reclining wheelchairs which have a long wheelbase and motorized wheelchairs.
3. Front swinging ramp/bridge plate was wobbly during docking and undocking at raised coach height.
  - ✚ It is recommended to increase thickness of chequered plate platform and ramp/bridge plate for stability and safety.
  - ✚ Extra reinforcement at underside of ramp/bridge plate is also recommended.
4. The wheelchair was fastened by Velcro belts, which are prone to wear and frequent maintenance.
  - ✚ Bottom harnesses with micro adjustment to suit all kinds of wheelchairs or tyre wedges/shackles are recommended in addition to Velcro fasteners. It is also recommended that the Velcro should be fastened to the wheel and not to the hand rim of the wheelchair.
5. A fold up/down seat is recommended for elderly and other mobility aid users such as walker, walking stick, crutches. It is demonstrated by Mr. Joseph Kwan in the photo.



6. Proximity limit switches or suitable device to be provided on the Mobile lift to prevent its front wheels from falling in the gap between platform and coach and/or collision with coach during docking. Callidai offered to experiment with infra-red sensors for the same.
7. Canopy for advertisement space, if provided, should have clear front and side view for operator and passenger.

### **POST DEMO MEETING**

After the demonstration and field trial, discussions were held at the office of Mr. Jitendra Kumar Singh, Sr. Divisional Mechanical Engineer (Ministry of Railways), Northern Railway.

### **Operational issues:**

1. Not for profit initiative of IR and free facility for PwDs.
2. Callidai will maintain and operate the service 24x7.
3. Passenger can inform arrival and need in advance to Callidai through SMS/phone. Callidai will inform passenger details to its personnel at the destination station for deboarding, to ensure reliability of the system.
4. Proposal to be submitted by RDSO to the Railway Board for approval to operate Mobile lift in 10 to 15 metro and other big cities. MOU to be signed with Callidai following approval.
5. Mobile lift to be initially operated on NDLS and Chennai railway stations on pilot basis for generating user feedback on device and service.
6. Mandatory staff training to all operators for assisting / transferring person with disabilities and reduced mobility. This shall include disability etiquettes and manual transfers. Samarthyam will provide technical support in the same.

### Other issues:

1. Provision of lift for PwDs to cross platforms in existing railway stations as a retrofitting measure.
2. Provision of subways in future railway station construction.
3. Manufacture of prototype of coach for disabled as per frozen design standards.
4. Air conditioning and reservation of Coach for Disabled in Superfast and Express trains.

As a competent national research organization, Samarthyam had earlier technically vetted designs of Coach for Disabled leading to freezing and manufacturing of prototype. Similarly if so desired, Samarthyam will certify suitability of Mobile lift.

Samarthyam's team thanked officials of IR and RDSO for their initiative and hospitality as well as Callidai's team for their efforts in designing and manufacturing Mobile lift. It is the first step forward to realizing the dream of reliable and sustainable solution to an inclusive IR.

### The access audit team of Samarthyam with Callidai team and Officers from RDSO and Ministry of Railway

