

**AN APPROACH TO ENHANCE THE SAFETY OF
PASSENGERS USING MECHANICALLY CONTROLLED
DOORS IN CITY BUSES**

A PROJECT DONE BY

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Safe operation of Automatic door

A project done for MTC

TO AVOID ACCIDENTS DUE TO FOOT BOARD TRAVELLERS



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ABSTRACT

- ❑ The aspiration of this project is to scale down casualties due to foot board travelling. The prodigious upsurge of industries has led to proliferating populations to cities.
- ❑ Normally a bus can accommodate only 73 passengers (48 sitting and 25 standing). On an average, a typical bus accommodates about 150 passengers with many travelling on the foot board.
- ❑ About 103 persons died out of 451 fatal accidents involving city buses in Chennai in the year 2012. Around 30 % of the overall accidents were due to foot board travelling.

OBJECTIVES OF THIS INVENTION

- ❑ To avoid accidents caused by foot board travelling in city buses we have designed a safe door system.
- ❑ To give a relaxed driving experience to the driver at all conditions.
- ❑ To standardize Metropolitan transport systems in India.
- ❑ This system is compatible with all types of buses manufactured for Indian road conditions.
- ❑ To reduce the cost spent on relief funds for people affected due to accidents.

DEFAULT SYSTEM IN MODERN BUSES

- ❑ There are 3652 buses in service MTC, of which 1440 buses are having pneumatic doors fitted in it.
- ❑ Tipping switches for operating the door is provided in the dash board.
- ❑ When the driver operates the switches, air from reservoir moves the piston in double acting cylinder to move backwards. This action opens the door.
- ❑ When the switch is operated in opposite direction, the door closes.

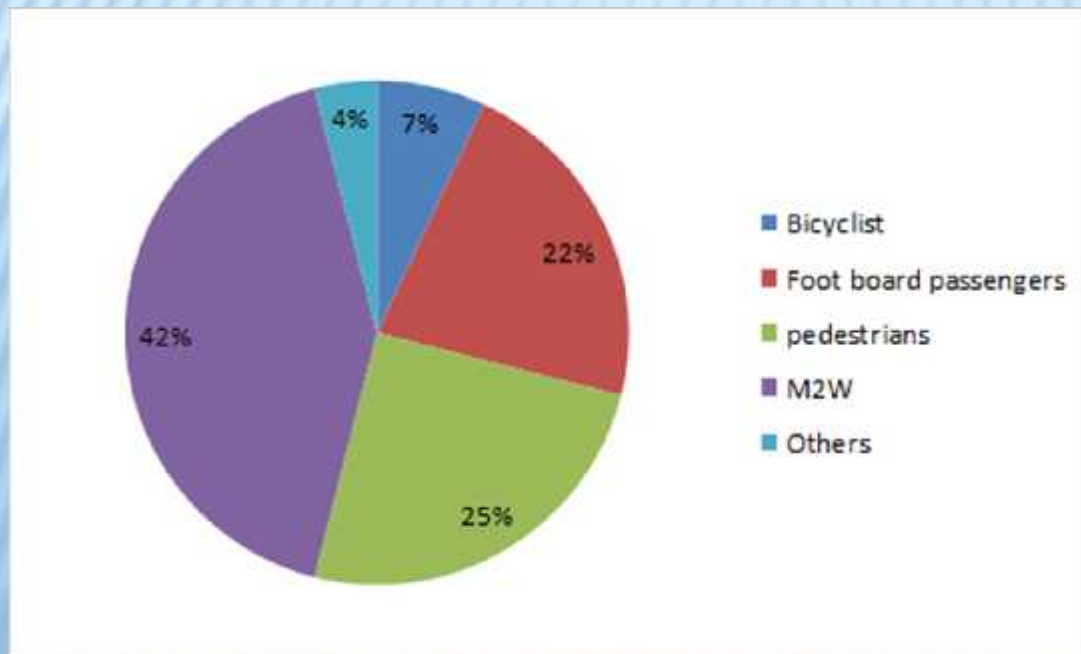
MTC PERFORMANCE INDICATORS

SI No.	Item	2008 - 2009	2009 - 2010	2010 - 2011	2011 - 2012	2012 - 2013
1.	TOTAL FLEET	3260	3280	3421	3497	3637
2.	AVERAGE AGE OF BUS	3.59	2.23	2.72	3.44	4.29
3.	NEW BUSES PUT ON	732	774	326	183	143
4.	SCHD SERVICES	3000	3057	3140	3189	3365
5.	EFFECTIVE KMS (in lakhs)	3033.60	3329.29	3471.52	3511.49	3442.74
6.	KM/BUS/DAY	298	308	316	315	309
7.	F.U. %(INCL HNR)	88.11	92.11	88.09	88.35	85.09
8.	KM EFFICIENCY %	99.04	101.08	98.75	98.81	93.91

ACCIDENT STRATEGY OF MTC BUSES

	2007-2008	2008-2009	2009-2010
Number of fatalities	150	144	138
Number of accidents	1,455	1,531	1,710

MTC (CHENNAI) FATAL ACCIDENTS REPORT (2008-2009) :



- ❑ 22 % of accidents are caused due to foot board passengers
- ❑ These are mainly caused by run over due to rear tires.

CONSTRUCTION

- ❑ Air from reservoir is taken and fed into tipper switch, from this switch two air lines are taken for the actuation of double acting piston.
- ❑ A pilot pressure from the inlet of actuation (closing action) of the cylinder is taken and is used as pilot pressure inlet for the 3/2 solenoid valve. which is coupled with brake system.

WORKING

✘ DOOR OPEN CONDITION:

When the door is in open condition, pilot pressure is provided to PE converter. This actuates the solenoid valve and the flow of air is cut off from reservoir to the brake valve. This causes braking of the vehicle .



WORKING (CONT..)

□ DOOR CLOSED CONDITION:

When the door is closed, there is no supply of pilot pressure and so there is no change of position of the spool. Thus there is no supply of air from the reservoir and hence there is no application of brake by this system.

A BUS WITH THE SAFE DOOR

- We have installed the safe door system in MTC bus, details of which are given below:

Parameters	Details
Bus No.	ADI 3004
Bus Reg. No.	TN 01 N 9277
Bus Route No.	29 C
Bus Origin	Tiruvanmiyur
Bus Destination	Perambur
Distance	29 Kms
Name of the Depot	Adyar
No. of days of running	1 month
Time for one trip	2 hrs 20 mins
Time for one single	1hr 10 mins

FEEDBACK

DRIVER:

- ❖ Comfortable driving
- ❖ Relaxed driving experience
- ❖ Tension due to passengers travelling in foot board is reduced.



Thank
you