

Land requirement for depots for augmentation of bus fleet in NCT

Environment Pollution (Prevention & Control) Authority for Delhi and NCR

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Delhi needs to augment its fleet of buses for public transport. In its July 1998 order, the Supreme Court had directed the city government to augment its fleet from 5000 to 10,000 by April 2001. In the ongoing hearing on air pollution in Delhi January 5, 2016, the Amicus had informed the court about urgent need to augment public transport and asked for directions to be issued to the Delhi government to comply on this matter. The Delhi government informed the Supreme Court that it is unable to add to its fleet of buses because of the lack of land for parking the buses and requested for intervention to direct DDA, which reports to the Union government to provide the land expeditiously. In the hearing on February 16, 2016, the matter was discussed again and the Union government submitted that while 7 new land sites for bus depots had been handed over, it was their contention that bus parking areas remained unutilized. The Supreme Court requested EPCA to examine the matter and to make recommendations regarding providing of any further space for parking of buses.

EPCA has since then reviewed the current bus depot land availability and also what is required in future so that this impediment for public transport augmentation is removed.

1. Assessment of DTC and cluster bus fleet and bus depot land availability

DTC is operating its fleet of buses from 43 depots with a total area of 249 acres, which also includes Millennium Depot of 46 acres. Considering the recent order of the Hon'ble court, according to which DTC has been asked to relocate the buses from Millennium Depot within one year, DTC will have *203 acres to park its 4338 buses*.

It is estimated that a bus depot of 5 acres can house 120 buses (including workshop). In this way DTC can park *4872 buses on the depot land* available with them. Therefore, DTC can park 534 buses in addition, on the available land.

In addition, a total of *2432 buses* have been contracted out under cluster scheme out of which *1490 buses* are under operation

These buses operate from 9 depots having total area of *59 acres*, which also includes 120 buses parked in the Millennium Depot with 5 acres. Considering the said Court's order, *54 acres* of land will be available for cluster operation.

Therefore, the total bus depot land available is 257 acres in the city.

If this bus fleet has to be augmented then the additional land requirement for a fleet of 11000 buses is 202 acres and for a fleet of 16,000 buses it is 409 acres.

2. Additional bus depot land available with Delhi government

The Delhi government has given EPCA details of the areas that are currently under their possession for constructing bus depots (see table below).

As per this information, a total of 68 acres is available with Delhi government, where they are currently constructing bus depots. This land can be used to park 1600 buses.

S. No	Depot Land	Area in acres	Date by which Depot will be created	Completion Date
1	Rewla Khanpur	4	30.06.2016	01.11.2016
2	Karkari Nahar	5	30.06.2016	01.11.2016
3	Bawana-1	3.75	30.06.2016	14.02.2017
4	Dwarka (2 lands)	10	30.12.2016	31.08.2017
5	Dichwakala	5	30.06.2016	17.11.2016
6	Rani Khera-I Rohini Phase-V	6.67	30.09.2016	28.02.2017
7	Rani Khera-II Rohini Phse-V	6	07.10.2016	10.03.2017
8	Rani Khera-III	6	14.10.2016	17.03.2017
9	BBM Depot-II	2.72		03.05.2017
10	Narela	10	Being considered for developing as multi level depots	
11	East Vinod Nagar	4.8		
12	Bawana Sector-5	4		
	Total	68	1600 buses can be brought in additionally	

In addition, approximately 47.5 acres of land across 4 land pockets (tabulated below) have been allotted by DDA to Transport Department but the possession of these lands could not be given because of litigation issues. As per the discussion with DDA, land pocket at **Karkari More (16 acres)** will only available. Officials of transport department, DDA and EPCA conducted a joint inspection on 08.03.2016 to check if the land in Karkari More could be available. Based on site visit and discussion with the

occupants, the inspection team came to know that said land pocket is under litigation and encroachment. DDA cannot construct an access road because the approach area is used as a cremation ground. Based on this EPCA agreed that these land areas are unsuitable for bus depots and requested DDA to examine new parcels of land.

Table: Land handed over by DDA for bus depots but under litigation

Sl no	Location	Area in sqmt	Allotted date	Remarks
1	Vasant kunj	38900	19.01.2011	Land is in litigation by private party
2	Rohini sector-37	49000	19.03.2012	The matter is under litigation between DDA and private party
3	Karkari More	64260	12.02.2015	Land has encroachment, slums and litigation issues. Also the approach road is not enough
4	Rohini sector-32 Phase-IV	40000	22.01,2015	Possession could not be made by DDA

The Delhi government has identified potential pockets of land adding up to 55.9 acres. This has been submitted to DDA by EPCA to check if these lands are available and if they can be transferred for building bus depots.

Table: Additional land identified for bus depot by Delhi government

S. No	Zone	Name of village/place	location	Approx area (in acre)
1	Rohini	Shahbad Daulatpur	Khasra No. 222-229	7
2	South East	Saidulajab	--	9.5
3	South East	Maiden Garhi	Khasra No- 199-213, 272-280,485-489	20
4	South West	Mehrauli	Khasra No 74077	8.6
5	South West	Mahipalpur	Khasra No 924-926	2.2
6	West	Bamnoil	2 plots on opposite sides of road	8.6
				55.9

Table: Current and future requirement for bus depot land

S. No	Particulars	Scenario-1		Scenario-2	
1	Total Number of Fleet Required in Delhi	11000		16000	
2		DTC	Cluster	DTC	Cluster
3	Distribution Ratio between DTC: Cluster (50%: 50%)	5500	5500	8000	8000
4	Total Land requirement in acres	230	230	335	335
5	Existing area under Depot in acres (excluding 46 acres of Millenium Depot)	203	54	203	54
9	Total Land requirement in acres	202		409	
10	Area of land other 12 land pockets available for Depot in acres	68		68	
11	Additional land requirement	134		341	

3. Strategies to optimize on current land

EPCA has also reviewed possible strategies to optimize on land that is already available. The following options were explored and discussed with officials of the Delhi Transport Department and DDA.

a. To use the existing bus terminal lands – unlike bus depots, these are lands where overnight parking does not happen but only temporary parking. EPCA has done an exhaustive study to identify the terminal lands that are in the vicinity of existing depots so that with the additional provision of security, buses can be parked overnight. As these lands are in the vicinity of the depot a schedule can be drawn up to service buses periodically, which are then parked in the depot workshop.

DTC has approximately 28.30 acres (net of built up area) of land pockets under terminals, (which needs to be used for parking during night¹).

b. Multilevel parking in depot land: The bus parking can be optimized greatly by constructing multilevel depots. It will optimize the use of land and reduce the dependency on identification of new land pockets for future fleet expansion. Moreover new land

¹ BEST-Mumbai is following the same practice, call it “Satellite Parking”

pockets will be located outside city limits, which results in high dead mileage, which can be avoided in case of multi-level depot land located within city limits.

In a conventional bus depot of 5 acre 120 buses can be parked. The MPD 2021 provides for bi-level bus parking depots (basement and ground), which would be able to park 180 buses in the same 5 acre land.

However, construction of multilevel bus depots will increase bus parking substantially.. In the multilevel parking, bus parking and depot operations are allowed on ground, first and second floor and roof of second floor. This can park up to 315 buses in 5 acres of land and will take up only 64 sq metre per bus, against conventional ground parking of 169 sq metres/bus (see table below).

Particulars	Base Case (only Ground level)	Bi-level	Multilevel (G+2)
Land Area in Acres	5	5	5
Land Area in sqmt	20234	20234	20234
Total Buses can be Parked	120	180	315
Area per Bus in sqmt	169	112	64

EPCA has also assessed the cost implications of conventional, bi and multi-level parking depots.

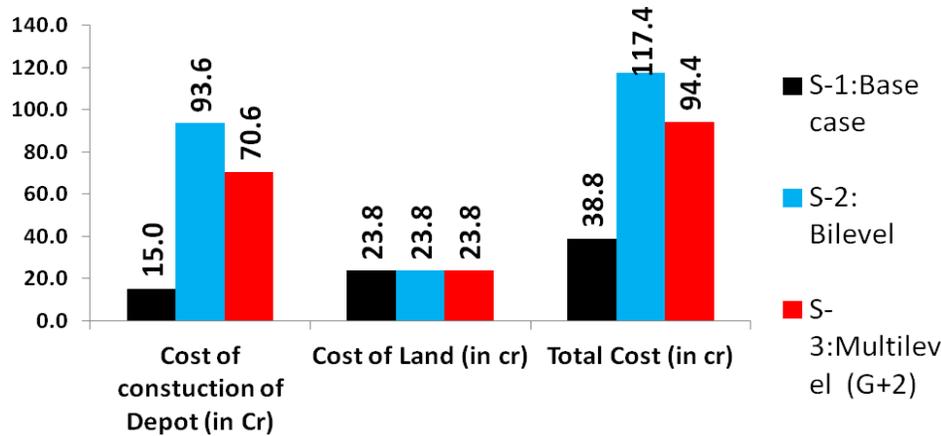
The cost of a multilevel depot is higher than conventional on ground bus depot, but it is lower than bi-level depots. When the cost of land taken at Rs 4.75 crore/acre, which is lower than market price but is based on the transfer rate of DDA is taken into account, then the comparison is rationalized – Rs 38.8 crore for conventional depot of 5 acres, as against 94.4 crore for a multi-level depot.

But this cost estimation changes completely, when done on the basis of each bus parked. Then the total cost per bus in a conventional-on ground bus depot is Rs 32.29 lakh/bus, as against 29.95 lakh/bus in multi-level depots.

If a higher (and true) land value is estimated, then the cost of multi-level bus depots becomes even more economical. This provides value for money and provides for much more efficient use of space.

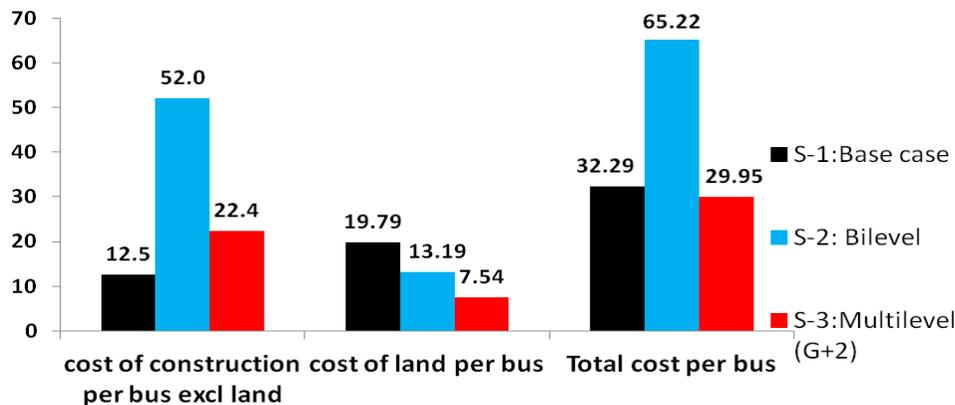
In all cases, the current specifications for bi-level bus depots are uneconomical **(See graph 1-2-3)**

Graph 1: Cost Analysis (Total Cost)



** Land cost @ 4.75 crores/acre- transfer rate at no profit no loss*

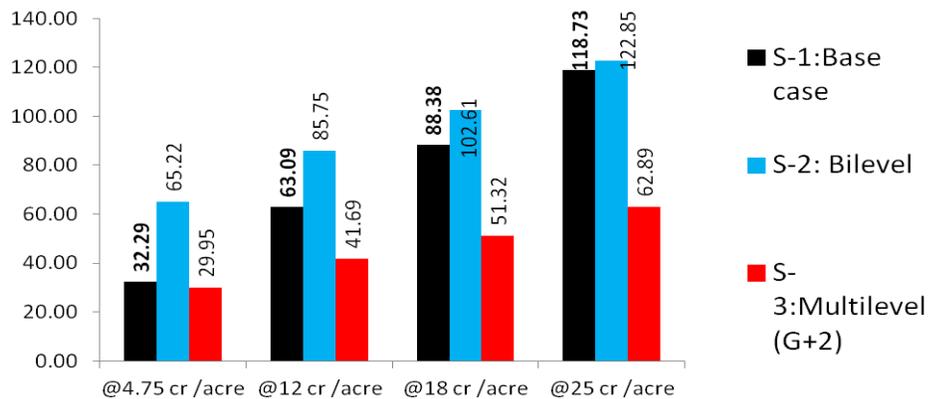
Graph 2: Cost Analysis (Cost/Bus)



All figures in Lakhs

** Land cost @ 4.75 crores/acre- transfer rate at no profit no loss*

Graph 3: Cost/bus at different land values



*Total cost of depot per bus in lakhs

4. EPCA assessment and recommendations on bus depot

1. Delhi government has sufficient depot land, which can park up to additional 2000 buses. Therefore, there is no reason for delay in bus purchase up to 2000 buses.
2. In the available bus depot land of 257 acres, can house 6168. Currently, on road there are DTC (4338) and cluster (1490), totaling 5828 buses. In addition, it has got 68 acres of land, which can park up to 1600 buses.
3. In addition, there is a requirement for augmenting buses. Our assessment is that for parking of 11,000 buses, there is an additional requirement of 134 acres, which goes up to 341 acres for parking 16,000
4. Transport has given DDA land adding up to 55.9 acres, which DDA is examining to see if these can be made available for depot. This decision will be known in 2 weeks.
5. Transport depot must examine and implement plan as proposed by EPCA to optimize on its current land by utilizing the terminal lands in the radius of bus depots.
6. DDA should revise the relevant provision in Master Plan Delhi, 2021 (section 12.14.3.6) regarding bi-level parking to be replaced with Multi level depots parking for public buses.
7. Delhi government should based on this revision of MDP, which allows for multi-level bus depots begin process of construction. This will greatly optimize on current land and also reduce the dead-mileage as many of the current bus depots are within city limits.