

## CHAPTER 9

### COST ESTIMATES

#### 9.1 INTRODUCTION

9.1.1 Project Cost estimates for East-West and North-South corridor of Ahmedabad Metro has been prepared covering civil, electrical, signalling and telecommunication works, rolling stock, environmental protection, rehabilitation etc. considering 25 kV AC traction at June 2004 price level, both for Capital and Operation & Maintenance costs.

9.1.2 While preparing cost estimates, various items have generally been grouped under three major heads on the basis of

- (i) Route km. Length of alignment
- (ii) No. of units of that item and
- (iii) Item being an independent entity.

All items related with alignment, whether in elevated or at-grade construction, permanent way Traction & power supply, signalling and telecommunication, whether in main lines or in maintenance depot, have been estimated on rate per route km basis.

The cost of elevated and at-grade station structures including other electrical works and automatic fare collection installations have been assessed in terms of each station as a unit. Similarly, for items like rolling stock, Receiving sub-station (RSS)/ Traction sub-station (TSS), costs have been estimated in terms of number of units required for each item. In remaining items, viz. land, utility diversions, rehabilitation, etc the costs have been assessed on the basis of each item taken as an independent entity.

9.1.3 In order to arrive at the cost of various items, cost have been assessed on the basis of accepted rates in various contracts, awarded for similar works by DMRC. A suitable escalation factor has been applied to bring these costs to June 2004 price level. For some of the items, tenders have been finalised recently and some of these tenders are with fixed price rates (i.e. no escalation is payable during contract period). Such rates have been adopted as they are. In some of these tenders, there is an element of Customs Duty (CD) on the equipment/ components to be imported for the work, Work Tax (WT), etc. built in the quoted rates. The element of customs duty and works tax have been excluded for working out the project cost.

9.1.4 The overall capital cost for East-West and North-South corridor of Ahmedabad Metro, at June 2004 price level, works out to **Rs. 3588** crores excluding CD and WT, but including general charges @ 3% on all items except land, 2% design charges on all items, and 3% contingencies on all items including general charges. The abstract capital cost estimate is shown at **Table 9.1**.

**Table 9.1**  
**Project Cost-Estimates for Ahmedabad Metro**

June 04 Price  
level

			<b>East-West Corridor (Ahmedabad-Thaltej)</b>	<b>North South Corridor (AMPC/Vishala-Gandhi Nagar)</b>
			<b>Length = 10.900Km (including ramp portion for entry to depot)</b>	<b>Length = 32.650 Km and 0.30 Km at surface for entry to depot</b>
			<b>Stations - 11 Nos (Elevated)</b>	<b>Stations - 26 Nos (Elevated) excluding 5 Nos future station</b>

S. No.	Item	Unit	Rate without Taxes (In Crores)	Qty.	Amount (In Crores)	Rate without Taxes (In Crores)	Qty.	Amount (In Crores)
<b>1</b>	<b>Land</b>							
<b>1.1</b>	<b>Govt. Land</b>							
	To be arrange free of cost							
<b>1.2</b>	<b>Pvt. Land</b>	Hact.	10.00	1.65	16.50	10.00	3.57	35.70
	Sub Total (1)				<b>16.50</b>			<b>35.70</b>
<b>2</b>	<b>Alignment and Formation</b>							
2.1	Elevated alignment	R. Km.	20.00	10.90	218.00	20.00	32.65	653.00
2.2	Approach to Depots at surface	R. Km.				6.15	0.30	1.85
2.1.3	Extra cost for interchange arrangement at Aaykar Bhawan		LS		30.00	LS		30.00
	Sub Total (2)				<b>248.00</b>			<b>684.85</b>
<b>3</b>	<b>Station Buildings</b>							
3.1	Elevated Stations, type A	Each	9.00	7.00	63.00	9.00	18.00	162.00
	Elevated Stations, type B	Each	10.00	2.00	20.00	10.00	4.00	40.00
	Elevated Stations, type C	Each	11.00	2.00	22.00	11.00	4.00	44.00
	Sub Total (3)				<b>105</b>			<b>246</b>
<b>4</b>	<b>Depot</b>							
4.1	Thaltej & Indroda circle Depot	Each	LS		35.00	LS		120.00
	Sub Total (4)				<b>35.00</b>			<b>120.00</b>
<b>5</b>	<b>P-Way</b>							
5.1	Ballastless track for elevated alignment	R. Km.	4.95	10.90	53.96	4.95	32.65	161.62
5.2	Ballasted track for At-grade alignment	R. Km.				2.97	0.30	0.89
	Sub total (5)				<b>53.96</b>			<b>162.51</b>
<b>6</b>	<b>Traction and power Supply</b>							
6.1	Traction & power supply incl. OHE, ASS etc. Excl. lifts & Escalators, & VAC							
	a) Elevated & atgrade section	R. Km.	5.25	10.90	57.23	5.25	32.95	172.99
6.2	Lifts	Each	0.20	33.00	6.60	0.20	78.00	15.60

S. No.	Item	Unit	Rate without Taxes (In Crores)	Qty.	Amount (In Crores)	Rate without Taxes (In Crores)	Qty.	Amount (In Crores)
6.3	Escalators	Each	0.80	22.00	17.60	0.80	56.00	44.80
	Sub total (6)				<b>81.43</b>			<b>233.39</b>
<b>7</b>	<b>Signalling and Telecom.</b>							
7.1	Sig. & Telecom.	R. Km.	11.50	10.90	125.35	11.50	32.95	378.925
7.2	Automatic fare collection	Stn.						
	Elevated & at-grade Station		2.00	11.00	22.00	2.00	26.00	52.00
c)	Central Computer System and interface with existing AFC system		LS		4.00	LS		10.00
d)	Smart cards/Tickets		LS		3.00	LS		5.00
	Sub Total (7)				<b>154.35</b>			<b>445.93</b>
<b>8</b>	<b>R &amp; R hutments</b>		LS		<b>25.00</b>	LS		<b>28.00</b>
<b>9</b>	<b>Misc., utilities, roadworks, other civil works such as median, station signages, envtl. Protection</b>	R. Km.	3.00	10.90	<b>32.7</b>	3.00	32.95	<b>98.85</b>
<b>10</b>	<b>Rolling Stock</b>	Each	4.25	33.00	<b>140.25</b>	4.25	87.00	<b>369.75</b>
11	Total of all items except Land				<b>875.68</b>			<b>2389.27</b>
12	General Charges @ 3 % on all items except land				<b>26.27</b>			<b>71.68</b>
13	Total of all items including G. Charges				<b>918.45</b>			<b>2496.64</b>
14	2 % design charges on item 13				<b>18.37</b>			<b>49.93</b>
15	Total of all items				<b>936.82</b>			<b>2546.58</b>
16	Contingencies @ 3 % on all items				<b>28.10</b>			<b>76.40</b>
17	Gross Total				<b>964.92</b>			<b>2622.97</b>
								<b>3587.90</b>

Note: Depot land at Indroda circle and Thaltej will be provided free of cost by State Government.

9.1.5 Details and methodology of arriving at these costs are discussed in paras hereinafter.

## 9.2 CIVIL ENGINEERING WORKS

### 9.2.1 Land

9.2.1.1 Land requirements have been kept to the barest minimum and worked out on area basis. Out of total requirements of 69.89 ha, 60.24 ha is Govt. land. For elevated alignment, no land is proposed to be acquired permanently, except small areas for locating entry/ exit structures, traffic integration, etc. Elevated alignment is proposed to be located on the road verge and whenever, this is out side the road alignment minimum land area about 20m width is proposed for acquisition.

- Cost of Govt. land has been ascertained from the civil authorities and costs adopted accordingly.
- Private land rates adopted are also based on the local prevailing rates for Residential, Commercial, and vacant land, as ascertained from local authorities, by enquiries, for each location.
- Provision towards boundary wall at stations has been made under the head miscellaneous, boundary wall etc in land cost estimates.

### 9.2.2 Formation & Alignment

- Elevated Section** : Major length of alignment involved is in elevated section. Rate adopted is based on accepted rates for Delhi Metro works duly updated.
- At Grade Section** : Small stretch of alignment is at grade. Rate adopted is based on cost of similar works under progress with Delhi Metro duly updated.

### 9.2.3 Stations

- Elevated Stations** : Provisions towards elevated stations costs, is in addition to the viaduct cost, which is considered under alignment. This rate cover cost of station structures, platforms, coverings and electrical and mechanical works, excluding lifts and escalators, provision for which has been made separately under electrical estimates.

### 9.2.3 Permanent way

For underground and elevated alignment ballast less track has been planned. Rates adopted are based on accepted rates for similar works, with DMRC at Delhi. Ballasted Track will be provided in the depot.

### 9.3 DEPOT

Mother Depot is planned at Indroda Circle other depot at Thaltej is provided with stabling, routine maintenance only. All the stabling and major maintenance facilities are proposed to be provided in Indroda Circle depot.

### 9.4 UTILITY DIVERSIONS, ENVIRONMENTAL PROTECTION, MISCELLANEOUS OTHER WORKS

Provisions has been made to cover the cost of utility diversions, miscellaneous road works involved, road diversions, road signages etc. and environmental protection works on route km basis, based on the experience gained from the works in progress.

**9.5 REHABILITATION AND RESETTLEMENT**

Provision has been made on lump-sum basis, to cover cost of relocation of Jhuggies, shops, residential Houses on private land etc.

**9.6 TRACTION AND POWER SUPPLY:**

Provision has been made to cover the cost of traction & power supply, Auxiliary sub stations for elevated and at grade alignments, service connection charges, miscellaneous items.

Provision made is based on Route km. Cost of similar works under DMRC. For R.S.S. provision has been made separately. Provisions towards cost of lifts and escalators for elevated and at-grade stations has been made under electrical estimates.

Provision for cost of elevators and lifts for elevated stations are also taken in the cost estimate.

**9.7 SIGNALLING AND TELECOMMUNICATION WORKS**

Rate adopted are based on accepted rates of N.S. and rail corridors for Delhi Metro. These rates include escalation during manufacturing and supply of equipment and their installation at site, but exclude CD & WT.

**9.8 AUTOMATIC FARE COLLECTION**

Adopted rates are based on accepted rates for similar works in progress are adopted in consultation with DMRC. These also exclude CD & WT, but include escalation during period of equipment manufacture and their supply, including installation.

**9.9 ROLLING STICK**

Adopted rates are based on assessment done by DMRC considering likely indigenisation.

**9.10 GENERAL CHARGES AND CONTINGENCIES**

Provision @ 3% has been made, towards general charges on all items except cost of land and 2% design charges have also been provided.. Provision for contingencies has been made @ 3% on all items including general charges.

**9.11 CAPITAL COST ESTIMATES**

The overall capital cost of the project estimated on June 2004 price level, based on the above considerations is shown in **Table 9.1**. As already mentioned in para **9.1.4** capital cost of the project works out to Rs. 3588 crores excluding element of import Duty and Works Tax.

Table 9.2

Details of Taxes and Duties							
	Total cost without Taxes & duties	Taxes and duties					Total with taxes & Duties
		Custom duty	Excise duty	Sale tax	Works tax	Total	
<b>Land</b>	52.2						52.2
<b>l) Boundary wall</b>	0.00	0.00	0.00	0.00	0.00	<b>0.00</b>	0.00
<b>Alonment &amp; Formation</b>							
Elevated & At Grade section	932.85	0.00	37.31	6.69	4.46	<b>48.46</b>	981.31
<b>Station Buildings</b>							
Elevated station	351.00	0.00	14.04	2.75	1.84	<b>18.63</b>	369.63
<b>Depot</b>	155.00	17.62	2.11	2.36	2.81	<b>24.90</b>	179.90
<b>P-Way</b>	216.47	89.77	8.98	2.42	1.61	<b>102.78</b>	319.25
<b>Traction &amp; power supply</b>							
a) Traction and power supply	230.22	25.55	13.81	3.98	9.02	<b>52.38</b>	282.60
b) Lifts & Esclators	84.60	9.86	8.87	0.78	0.20	<b>19.71</b>	104.31
<b>S and T Works</b>							
a) S & T	504.28	113.46	3.98	1.01	20.17	<b>138.63</b>	642.91
b) AFC & Smart card	96.00	21.60	7.68	1.92	3.84	<b>35.04</b>	131.04
<b>R &amp; R hutments</b>	53.00	0.00	0.00	0.00	2.12	<b>2.12</b>	55.12
<b>Misc.</b>	131.55	0.00	0.00	0.00	5.26	<b>5.26</b>	136.81
<b>Rolling stock</b>	510.00	155.45	81.60	31.82	0.00	<b>268.87</b>	778.87
<b>Total</b>	<b>3317.17</b>	<b>433.31</b>	<b>178.39</b>	<b>53.73</b>	<b>51.33</b>	<b>716.77</b>	<b>4033.94</b>
<b>Total Taxes &amp; Duties</b>					<b>SAY</b>	<b>717 Crores</b>	