

CHAPTER III
**Planning, execution and operation of Mass Rapid Transit System,
Chennai**

3.1 Highlights

- **The project was financially unviable right from inception, as rate of return worked out to only (-)1.68 per cent against the prevailing norm of 14 per cent.**
(Para 3.7.1)
- **Risks involved in aligning the Mass Rapid Transit System route along a canal passing through a number of slum clusters and on the periphery of a marsh were not assessed adequately. As a result only two per cent of the designed capacity of the Mass Rapid Transit System was being utilised.**
(Paras 3.7.2 and 3.10)
- **Shifting of the pre-decided alignment in the marshy areas without carrying out necessary fresh soil tests resulted in repeated embankment failures. The soil improvement works carried out at a cost of Rs.12.19 crore were rendered infructuous and assets created at a cost of Rs.12.57 crore have not been utilised due to sinkages. Completion of the project has also been delayed.**
(Para 3.8.1)
- **Although the project was financially unviable ab-initio, the project authorities undertook construction of nine large station buildings in Phase II with floor areas 12 to 29 times over the norm at a total cost of Rs.129.86 crore despite inadequate scope for commercial exploitation.**
(Para 3.7.3)
- **Extra cost of Rs.10.33 crore (approx.) incurred on providing additional strength to foundations and pillars of station buildings on the request of State Government was not worked out and recovered from the State Government.**
(Para 3.9.7)

3.2 Recommendations

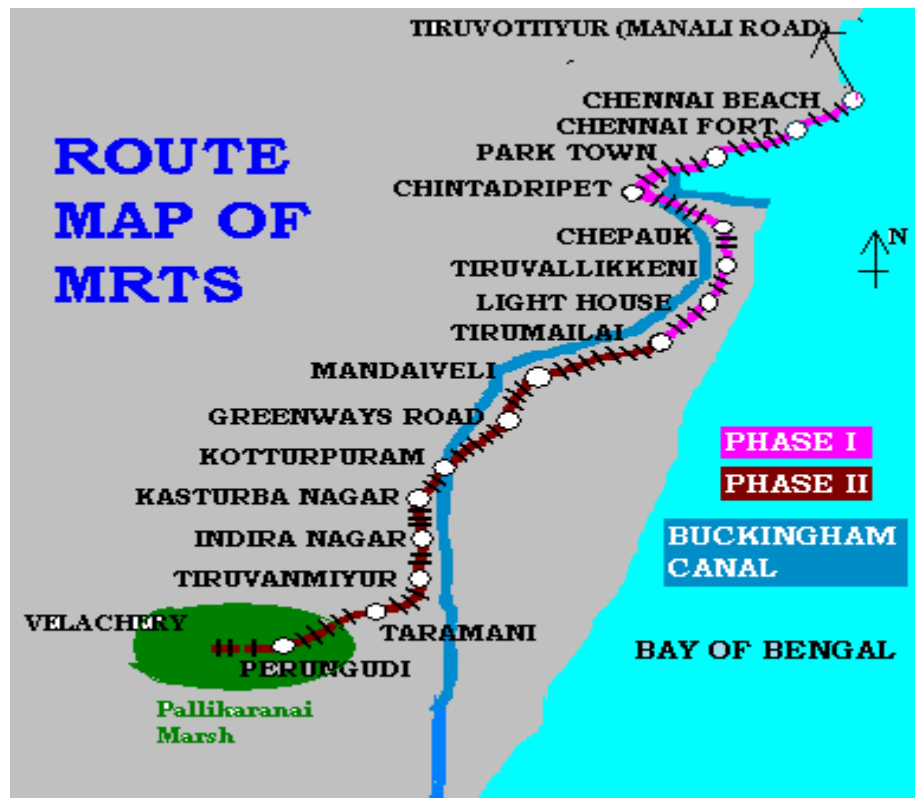
- Railways should ensure that norms/ codal provisions established for judging the financial viability of projects are not disregarded. Where investment on a project is to be shared between Railways and other organisations/ government departments, rate of return should be worked on the full investment and not only on the Railway's share in the capital investment.
- Recommendations of technical/ feasibility studies with regard to design, alignment and other technical parameters should be kept in view while taking decisions relating to the project implementation.

Deviations, if any required, should be fully supported with fresh technical studies.

- Where cost of some work is agreed to be borne by a body other than Railways, full accounts of such expenditure should be maintained in a verifiable form and costs assessed and claimed expeditiously.

3.3 Introduction

The Planning Commission set up a Study Team on Metropolitan Transport in 1965 to assess the adequacy and limitation of existing transport facilities in the cities of Calcutta, Bombay, Madras and Delhi to determine the feasibility of different modes of transport and recommend phased programmes for development of transport facilities. In pursuance of these objectives, the Town Planning Department of the Government of Tamil Nadu identified eight major transportation corridors in Chennai (then Madras) in 1971. Of these eight corridors, the heaviest concentration of travel trips was identified in the North-South-East (NSE) and the study suggested a rail-based mass transit system in this corridor. The Planning Commission recommended, on the basis of this study report that Railways should take up a Techno Economic feasibility study. The Railways thereafter set up the Metropolitan Transport Project (Railways) in July 1971 to carry out the initial Techno Economic feasibility study. This was submitted in 1975, suggesting a rail-based mass transit system between Kasturba Nagar and Manali Road. The alignment of the MRTS was mostly along the Buckingham Canal, which runs through Chennai city.



First phase of the MRTS project, sanctioned in 1983, was limited to 8.660 km. from Chennai Beach to Tirumailai as against the target length of 24.900 km. from Thiruvottiyur to Kasturba Nagar due to constraints of funds. The Ministry of Railways funded the entire estimated project cost of Rs.268.87 crore and the Government of Tamil Nadu gave the land required for the project free of cost. Train services were introduced in the section between Chennai Beach and Chepauk on 16 November 1995 and from Chepauk to Tirumailai on 19 October 1997.

Based on the study conducted by RITES during 1987 and 1994 and taking into account population growth and the capacity of public transport system, Phase II of the project was taken up. Railway Board accorded sanction (1998) for Phase II of the project from Tirumailai to Velacheri (11.166 km.) partly on elevated track from Tirumailai to Taramani and the remaining on earthen embankment from Taramani to Velacheri. Out of this, 7.850 km track was completed (September 2005) and the route between Tirumailai and Tiruvanmiyur was opened for traffic during January 2004.

The cost of Phase II of project, sanctioned during 2002, was Rs.691.04 crore. Railways and Government of Tamil Nadu agreed to share this cost in a ratio of 33:67. State Government and Railway Administration allotted Rs.456.93 crore and Rs.225.93 crore respectively upto March 2005. Out of this total allotment of funds, Rs.571.97 crore (83.76 per cent) were utilized upto March 2005 in completing 7.850 km. track out of the 11.166 km.

3.4 Audit objectives

Audit took up a performance review of the planning, execution and operation of the Mass Rapid Transit System (MRTS), Chennai in order to ascertain whether

- the project was properly planned after necessary evaluation of risks and with proper sequencing of activities and operations in order to achieve the physical and financial targets of the project.
- the management established appropriate systems and procedures and used resources economically and efficiently.
- the assets created/ physical achievements made were commensurate with the investments and value for money realised.

3.5 Audit methodology and scope

Examination of files in Metropolitan Transport Project (MTP) organisation and in field offices was carried out through analysis and comparison of data, interaction with personnel and through questionnaires. Secondary analysis of files available in Chennai Metropolitan Development Authority (the nodal agency for Government of Tamil Nadu) was also made. A macro study of MRTS project as a whole and a detailed study of MRTS Phase II covering the period from 1997-2005 were carried out. Records relating to Civil Engineering, Signal and Electrical Branches together with the records of field offices were taken up for review.

3.6 Acknowledgment

The intention to carry out performance audit of MRTS was communicated to the Chief Administrative Officer/MTP during March 2005. The details of Audit plan, scope of Audit, Audit coverage, Audit objectives and criteria were discussed in the entry conference with the Chief Engineer/MTP and the Financial Advisor and Chief Accounts Officer/MTP. The cooperation of the MTP Organisation and Chennai Metropolitan Development Authority during the period of audit is acknowledged with thanks.

3.7 Lapses in Planning

A study of the records of justification, planning and approval of the project indicated that the project was financially unviable from inception and that adequate risk assessment was not carried out before deciding on the alignment of the route; this also affected utilization of the assets created. The project administration also incurred avoidable expenditure on construction of unnecessary floor area in station buildings and unavoidable procurement of material despite changed track specification.

3.7.1 Rate of return

Codal provisions for Railway investment require a yield of not less than ten per cent under Discounted Cash Flow method (14 per cent from July 1992) for judging the viability of a new line project. For Phase II of MRTS project, a Rate of Return (ROR) of 6.37 per cent was arrived at based on the investment made by the Railways alone and included in the Project Report forwarded by the MTP organisation in July 1996 to the Railway Board. Since Railways and Government of Tamil Nadu shared the project cost in the ratio of 33 per cent: 67 per cent, the entire capital investment should have been taken into account for a realistic projection of ROR. Even the ROR of 6.37 per cent projected indicated that the project was not financially viable. If the entire investment is taken into account then the ROR becomes negative i.e., (-) 1.68 per cent establishing the project as a potentially loss-making investment.

3.7.2 Non-assessment of risks involved in the execution of the project

The MRTS project was aligned to the Buckingham Canal, which runs through Chennai city upto Thiruvanmiyur. This alignment passed through a number of slum clusters all along the canal. The alignment suggested by the Government of Tamil Nadu beyond Thiruvanmiyur i.e., from Taramani to Velacheri was located on the peripheral edge of the Pallikaranai marsh. Subsequently on the request of the Collector of Chennai the alignment was further shifted into the marsh. The alignment of MRTS through a number of slum clusters was decided as this route was expected to experience the maximum trip load. The Project Administration, however, failed to assess the risks involved on account of the canal alignment with slum clusters, unhygienic and unsafe station approach, which had resulted in poor passenger occupancy and grossly inadequate commercial exploitation of the mammoth station buildings constructed. The alignment through marshy area with adverse soil conditions also had a bearing on the structure of the track.

3.7.3 Avoidable expenditure on huge station buildings on large floor areas

In Phase I of MRTS, the MTP organization had constructed five station buildings¹⁶ at a total cost of Rs.42.83 crore in contravention of the prescribed norms for suburban station buildings. Total floor space thus created was 63,870 square metre out of which Railway could utilize only nine per cent (5,512.526 square metres). The rest has been lying unutilized for eight years. After the construction of large station buildings, the Administration tried to utilise the floor space for commercial purposes but efforts have not borne fruit. The inadequate commercial exploitation of the floor area of two stations of Phase I was commented upon in paragraph No.5.18 of the Report No.8 of 2005 of the Comptroller and Auditor General of India – Union Government (Railways).

Despite the experience of Phase I, Railway Administration continued to plan and build mammoth structures of nine station buildings¹⁷ in Phase II as well, and a total floor area of 2,11,099 square metre was being created at these stations at a total cost of Rs.129.86 crore. Floor area provided for these nine stations ranged between 17,817 square metres and 43,104 square metres. Audit observed that the floor space provided was 12 to 29 times the norm for normal suburban stations (Group ‘C’ category). Construction of unnecessary extra space, particularly with such short inter distances, has resulted in extra expenditure on this unviable project.

The Administration stated that with the proposed formation of a separate corporate body for the assessment and management of the available space, the buildings constructed would be utilised for generation of revenue. The reply of the Administration itself indicates that there was no advance plan for the utilisation of massive structures created.

3.7.4 Procurement of material for conventional ballasted track even after approval for ballast-less track

While conventional railway track is laid on ballast and sleepers, ballast-less track is laid on a concrete surface. A proposal for the provision of ballast-less track was made by the MTP organisation in November 1998 and the formal approval was also accorded by the Railway Board in December 1998. Even though the Project Administration was aware of the Board’s formal sanction for the provision of ballast-less track, they procured track materials for conventional track at the cost of Rs.12.31 crore during 2000-01 and 2001-02. Due to this defective planning, material procured had been lying unutilised for the last four years.

¹⁶ Chintadripet, Chepauk, Tiruvallikeni, Lighthouse and Tirumailai
¹⁷ Mandaveli, Green ways Road, Kotturpuram, Kasturba Nagar, Indira Nagar, Tiruvanmiyur, Taramani, Perungudi and Velacheri.

3.8 Sinkages due to shifting of alignment without conducting necessary soil tests

A surface track was planned from Taramani to Velacheri in Phase II of MRTS project due to cost considerations and also because there was no compelling reason to go in for elevated structure since the alignment avoided heavily built up area. In order to avoid acquisition of private lands for the project, Chennai District Administration approached (July 1999) the project authorities to shift the originally proposed alignment between Taramani and Velacheri by 30 to 60 meters southward. The original alignment, which was already on the periphery of Pallikaranai marsh, was shifted still further in the marshy land. Detailed soil investigation, including field and laboratory tests, had been carried out during 1996-98 on the earlier alignment through a geo technical consultant. The soil investigation report had indicated that the soil had very poor bearing capacity. In order to speed up the process of settlement of the soil the consultant had suggested ground improvement work. Project Administration did not conduct a fresh soil test after shifting the alignment but relied upon the earlier soil test. Moreover, the geo technical consultant was asked to give recommendations for embankment height varying from four metres to six metres whereas during actual execution, maximum height of embankments crossed even 10 meters. The extra embankment height resulted in extra load intensity on the already poor soil. The Project Administration, while deciding to go in for higher embankment, did not take this factor into account appropriately. The risks associated with the formation of embankment were noticed by the Administration at the time of initial stage of ground improvement work. Soil improvement measures such as drilling of sand piles and sand blanketing were carried out between August 1999 and April 2002. During the execution of this work, the contractor faced difficulties in driving sand columns and sand piling work due to very soft clay soil. Railway Administration, however, proceeded with the embankment work without adequately settling the critical issue. As a result, during the ensuing period, there was repeated embankment failure between Taramani and Velachari due to sinkage of bank.

A comment on the infructuous expenditure on account of incorrect execution of earth work in the stretch between 18.00 kilometres and 18.85 kilometres (between Perungudi and Velacheri) i.e., a part of the area where repeated sinkages had occurred, was also included as para No.3.3.10 in the Report No.8 of 2005 of the Comptroller and Auditor General of India.

The initial error of the Administration in shifting the alignment without conducting necessary soil tests, not taking into account the correct height of embankment to assess load intensity and delays in taking decision for remedial measures for embankment failure as suggested by technical consultants led to both time and cost overrun. The target date of completion was extended periodically with the last extension upto June 2006, as against the original completion date of March 2002. Expenditure amounting to Rs.12.19 crore towards contractual payment for ground improvement work and earthwork also remained unfruitful.

- Moreover the repeated sinkages of bank led to non-completion of civil engineering works in station buildings and delay in formation of alignment between Taramani & Velacheri. As a result, Signalling and Telecommunication arrangements including Audio Frequency Track Circuit works between Tirumailai and Velacheri stations provided at a cost of Rs.2.58 crore during 2002-03 and Optic fibre communication network between Chennai Beach and Velacheri' provided at a cost Rs.1.54 crore could not be commissioned. Owing to non-commissioning of these two signalling works, 'one-train-only' system has been followed in Tirumailai –Tiruvanmiyur section from 26 January 2004, thus, hampering the flow of benefit for investment made on the project.
- Similarly, escalators supplied for the project at a cost of Rs.7.28 crore could also not be installed due to non-availability of site for installation and power supply because of sinkage and, hence, the assets procured at a cost of Rs.7.28 crore were lying at site for the last ten months (September 2005).
- Electrical department of the Project awarded (December 2001) a contract to M/s. L&T Ltd, Chennai for design, supply, erection, testing and commissioning of traction over head equipment (OHE) for surface level track portion between Taramani and Velacheri for Rs.2.77 crore. This contract was awarded before the completion of Civil works like earthwork and formation of alignment and its date of completion was kept as 18 August 2002. Though the contractor had supplied OHE material and received payment of Rs.1.17 crore, OHE work could not progress due to sinkage of formation in two sections Perungudi-Velacheri and Taramani-Perungudi. As the extended contract period expired on 10 January 2004, M/s L & T, Chennai declined to extend it further on the plea that the administration could not hand over clear site. The administration was left with no other option but to take over the material valuing Rs.1.17 crore supplied by the contractor.

3.9 Deficiencies in project implementation

Audit also observed deficiencies in project implementation such as incorrect assessment of power requirement, excess procurement of imported rails, steel rods etc., and excess deployment of staff, which affected optimal use of resources on the project. Additional expenditure was incurred due to failure of project administration to provide site and drawings in time, non-finalisation of risk purchase orders within prescribed time and execution of works not pertaining to MRTS. Non-provision of anti-corrosive treatment to steel used in structures and incorrect provision of pile liners was also noticed.

3.9.1 Deficiencies in estimations

- A traction sub-station at Chintadripet was established during 1998 to cater to the power requirement of MRTS. As per the regulations of the Tamil Nadu Electricity Board (TNEB), the minimum monthly charges were to be based on the demand actually recorded in a month or 90 per

cent of the contracted demand, whichever was higher. Contracted demand for this sub station was originally fixed at 5,200 KVA, which was subsequently reduced to 2,500 KVA with effect from February 1999. However, audit observed that the recorded actual consumption was generally much below the contracted demand during the period February 1999 to April 2005. Incorrect assessment of power requirement resulted in an excess payment of Rs.1.49 crore to TNEB for the period from May 1999 to April 2005.

- As per the specifications 240 MTs of 60 kg rails (class I) were required for laying one kilometre of track. Accordingly 2680 MTs rails were estimated for 11.166 km. of track. However, against this estimated quantity, 3,405 MTs were imported from China during 1999-2000. This resulted in excess procurement of 725 MTs of imported rails valuing Rs.2.23 crore.
- Steel rods of 12 mm, 16mm and 20 mm dia (5850 MT) valuing Rs.8.09 crore required for MRTS phase – II were procured from Rashtriya Ispat Nigam Ltd, Vizag (RINL) during the year 2000. Out of this, only 2432.865 MTs of TMT rods could be utilised. Balance quantity (3417.135 MTs) valuing Rs.4.67 crore had been lying in the stock for the last five years as unutilised.
- It was observed by audit that as against the percentage prescribed by Railway Board for establishment charges to be booked to the project in respect of Civil Engineering department and Signal and Telecommunication department which was 6.1 per cent and 8.9 per cent of the project cost respectively, the actual booking was to the extent of 7.09 per cent and 17.12 per cent respectively. This indicates wrong estimation/ deployment of staff in these departments.

3.9.2 Additional expenditure on account of failure of project administration to provide site and drawings in time

- All the contracts with period of completion more than a year under MRTS Phase II project were awarded with price variation clause (PVC). As per General Condition of Contract and Railway Board orders of January 1987, PVC is applicable up to the scheduled date of completion of work. In the case of extensions granted due to delay in completion of contract by the contractor, PVC is not applicable for the extended period. However, PVC is applicable upto the actual date of completion of work including the extended period of completion wherever the extension is on departmental account. As the Administration had not ensured timely supply of drawings and site etc., extensions granted in 13 high value contracts were considered on administrative grounds. This necessitated payment of Rs.0.71 crore towards price variation for the extended period, which was avoidable.
- Guidelines/ instructions issued by Railway Board during 1980 require railways to take up work for execution only after site investigations have been completed and detailed plans and drawings have been

approved. However, during execution of MRTS Phase II works, the MTP organisation delayed the handing over of sites and drawings in seven civil contracts. These contracts were later foreclosed and fresh tenders were called for in three cases and contracts awarded at higher costs. Administrative lapses in awarding the contacts before making the site free from all encumbrances and before ensuring the availability of drawings had thus resulted in increase in the project cost to the extent of Rs.1.55 crore.

3.9.3 Avoidable loss due to non-finalisation of risk purchase orders within the prescribed time limit

The Project Administration placed seven purchase orders on Rashtriya Ispat Nigam Limited, Visakapattinam (RINL) in February 2000 for the procurement of 18,590 MT of steel rods for a total value of Rs.25.66 crore, with due date of delivery as 31 March 2000. RINL supplied 4,243.2 MT of steel rods costing Rs.5.77 crore within the delivery date against full quantity in respect of one purchase order and part quantities in respect of two other purchase orders. For the supply of balance quantity of 14,346.8 MT through remaining six purchase orders, the RINL approached the Project Administration during March 2000 for extension of delivery date up to 30 June 2000. The Project Administration extended the delivery period provisionally up to 30 June 2000 for these six purchase orders duly reserving the Railway's rights, which was not accepted by RINL. Without settling the issue, the Project Administration placed risk purchase orders on the same firm (RINL) between January 2001 and May 2001 for the balance quantity. Against these fresh orders RINL supplied the total ordered quantity. However, the Project Administration recovered Rs.1.06 crore from the bills of RINL as risk and cost. Subsequently, RINL referred the matter for arbitration and the Arbitrator pronounced the award in favour of RINL on the grounds that RINL had not accepted the provisional extension of delivery period for the unsupplied quantity up to 30 June 2000 and, therefore, the last agreed delivery date should be taken as 31 March 2000. Since the risk purchase orders were placed during January 2001 to May 2001, i.e., beyond the period of nine months from the originally agreed delivery date of 31 March 2000, the risk action was not tenable. The Arbitrator concluded that the risk purchase orders on RINL should be treated as fresh purchase orders and directed the MTP Administration to pay back the recovered amount of Rs.1.06 crore together with interest amount of Rs.28.51 lakh.

Non-adherence to the correct procedure to be followed for risk purchases within the prescribed time and unnecessary granting of provisional extension resulted in loss of Rs.1.34 crore.

3.9.4 Non-provision of anticorrosive treatment to 28,341 MTs of reinforcement steel affecting the longevity of concrete structure.

The correction slip No.1 dated 26 April 2000 to Indian Railway Concrete Bridge Code requires that Cement Polymer Composite Coating (CPCC) or

Fusion Bonded Epoxy Coating (FBEC) must be given to the reinforcement rods in severe environment conditions for major structures.

As the MRTS work was carried out in the coastal area, the Project Administration decided to provide anti-corrosive treatment for plain rods/TOR/TMT¹⁸ bars as per the methodology of cement slurry coating developed by Central Electrochemical Research Institute/Karaikkudi. Initially, the Administration estimated a quantity of 30840 MTs of reinforcement steel to be given anticorrosive treatment. This quantity was involved in the contracts for the execution of works pertaining to sub-structure, super structure and station buildings. Project Administration fixed an agency on contract basis for cement slurry coating for a quantity of 2,000 MTs only. As against the estimated quantity of 30,840 MTs, the agency treated 2,499 MT of steel at a cost of Rs.0.41 crore under the option clause. The Project Administration proposed for CPCC/FBEC treatment for the remaining quantity of steel. As the new method would cost Rs.6,000/- per MTs for CPCC and Rs.9,000/- per MTs for FBEC (against Rs.1,300/- per MT for cement slurry coating) and would necessitate a material modification Associate Finance recommended for the matter to be taken up with the Railway Board (November 2000). Board's final decision was still awaited (September 2005). As a result, anti-corrosive treatment was not carried out for the balance quantity of steel used in the concrete structure.

On this being taken up by Audit, Project Administration contended that TMT rods were utilized for re-inforcement, which did not require anti corrosive treatment. This is not acceptable since the Administration had originally planned for anti corrosive treatment of 30,840 MTs of reinforcement steel and also proposed for CPCC/FBEC for the balance quantity (28,341 MTs). They had also approached the Railway Board for this purpose.

3.9.5 Incorrect provision of Pile Liners to partial depths

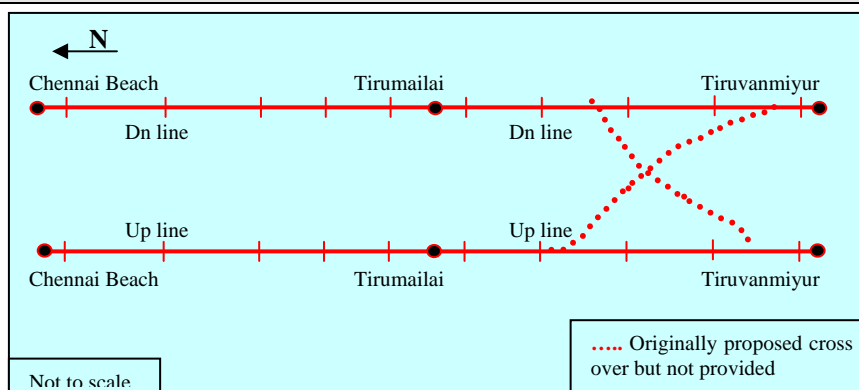
The principal cause of deterioration of concrete in foundation is the presence of harmful ingredients like sulphates, chlorides etc in soil and water. A pile is a cylindrical RCC foundation driven or bored in the soil. The Indian Bridge Manual provides that a pile liner, which is a steel shell would be required to be provided in the bore hole before concreting so as to provide corrosion protection, if soils contain chlorides and sulphates.

As per the Techno Economic feasibility survey of 1975 carried out by MTP, the presence of chlorides and sulphates in the Buckingham canal region was alarmingly high. Audit observed that pile liner was not provided for the full depth of the pile during the execution of pile foundation work. On the matter being taken up, Project Administration claimed that pile liners were provided not to protect the concrete from harmful chemical contents, but to avoid the soil getting into the bore holes before concreting. This contention cannot be accepted as Para 411 of Indian Railway Bridge Manual provides for steel shells in cast-in-situ piles to offer corrosion protection to concrete in soils containing chlorides and sulphates. The provision of pile liners to full depth

¹⁸ TMT – Thermo mechanically treated

was also duly provided for in the estimates and tenders, which goes to validate the Audit contention. The provision of pile liners to partial depths of pile at a cost of Rs.11.14 crore was, thus, against the codal provision and would also not be effective in preventing deterioration to the concrete structure.

3.9.6 Failure to provide cross over near Tiruvanmiyur as per sanctioned estimate and consequent non utilisation of assets worth Rs.185 crore



A cross over at Tiruvanmiyur station connecting Up and Down line was essential and was accordingly provided for in the originally sanctioned estimate. Although the foundation work was carried out, the proposed cross over was not provided as the Project Administration failed to include this requirement in the revised proposal for ballastless track. The up and down lines between Tirumailai and Tiruvanmiyur (a station before Velacheri) were completed during 2003. Execution of the balance portion of work beyond Tiruvanmiyur had been delayed due to the sinkage of earth. The EMU trains moving in the 'Up' direction from Thirumailai to Thiruvanmiyur are required to be moved to the 'Down' line for the return trip as the operation of EMU trains on both 'Up' and 'Down' lines without cross over would create confusion for commuters. Moreover, the operation of both lines, without the cross over, is likely to affect safety. Due to non-provision of cross over only 'Up' line has been opened for traffic between Tirumailai and Tiruvanmiyur (January 2004) and the 'Down' line created at a cost of Rs.185 crore has been idling for a period of more than 18 months.

3.9.7 Non-assessment and non-recovery of extra cost involved in construction of foundations and structures below the platform roof level of the station buildings

In terms of clause 11 of the Memorandum of Understanding (MOU) between Railways and Government of Tamil Nadu, the right to construct extra floors over the station buildings rests with the Government of Tamil Nadu in order to augment the supply of urban built-up space. Clause 17.4 further stipulates that the additional cost of foundation and structures necessitated by the above said provision shall be borne by the Government of TamilNadu. Maintenance of separate accounts in this regard was also required as per clause 17.17 of MOU. However, no separate accounts were maintained by the Project Administration to assess the extra cost towards additional strength provided to

the foundations and structures. Failure to do so has resulted in non-assessment of extra cost on this account even after a lapse of about two years since completion of foundations and structures of station buildings. The Administration in January 2004 assessed the difference in cost involved in foundations, RCC columns etc, with commercial block and without commercial block at Indira Nagar and Tiruvanmiyur stations as Rs.0.98 crore for Indira Nagar and Rs.1.97 crore for Tiruvanmiyur Station. FA & CAO/MTP, however, did not vet the amount involved. As regards Kasturba Nagar station, the consultant viz Larson & Toubro Ltd., Chennai was asked in August 2004 to work out the extra cost but they have not yet assessed the amount. No action had so far been taken for other stations also.

The failure to have a mechanism to arrive at the extra cost towards the additional foundations and structural components provided had resulted in additional cost to the Railway Administration. Based on the average extra cost assessed by the Administration for the two stations as mentioned above, audit assessed the extra cost involved on additional foundations and structural components in respect of the seven stations as Rs.10.33 crore approximately.

When the matter was taken up with the Project Administration, they stated that extra cost involved on additional foundation and structural components due to extra floors above the station buildings would be worked out and collected from the Government of Tamil Nadu. However, in the absence of the required details, the likelihood of early recovery of the extra cost of Rs.10.33 crore as assessed by Audit is low.

3.9.8 Execution of work not pertaining to MRTS

A contract for providing ISDN electronic telephone exchange at four stations was executed by CSTE/ construction/Southern Railway. However, out of four stations included in the contract, only one station pertained to MRTS. Nevertheless, the MTP organisation agreed to accept debit of Rs.0.43 crore towards the provision of ISDN electronic telephone exchange at Chennai Egmore, even though the same was not connected with the MRTS working. Extra expenditure amounting to Rs.0.43 crore debited to the Project has resulted in the increase of the project cost.

3.10 Physical and financial achievements

Audit also observed the following deficiencies in the achievement of physical targets, control over available financial resources by the Project Administration and utilisation of the created assets.

- The Phase I of the project, originally scheduled to be completed by 1989, was actually completed only in 1997. Similarly, Phase II of the project commenced in March 1998 was originally scheduled to be completed in March 2002 but has now been targeted for completion by June 2006.
- Against the total track length of 19.826 km. from Chennai Beach to Velacheri, the phase I of MRTS from Chennai Beach to Tirumailai (8.660 km.) was opened on 19 October 1997. However, out of 11.166 km. track taken up in MRTS phase-II, only 7.850 km. could be

completed upto September 2005. The remaining portion is now scheduled to be completed by June 2006. The expected traffic in MRTS (phase I and phase II) as per project report was about 6 lakh passengers per day. Based on this projection, MRTS was designed to carry about 6,00,000 passenger trips per day for Phase I and Phase II. As against this, the current level is 12,395 passenger trips per day. Thus, utilization of MRTS is only two per cent of the designed capacity.

- A study carried out by Southern Railway in July 2003 attributed the poor patronage to location of stations in slum area and unhygienic and insecure area around the stations, absence of feeder service/inter-modal shift, short length of MRTS facility, low frequency of trains, very short (less than one km.) inter-station distance, high fare structure compared to other modes of public transport, lack of parking facilities and non-connection to the existing suburban lines etc.,



Entry to Park Town station from Chennai Central

Thirumailai station adjacent to slum clusters and canal



- Audit calculated that on an investment of Rs.266 crore for Phase I and Rs.572 crore for Phase II, the expected return per annum should have been Rs.11.57 crore and Rs.36.43 crore respectively. However, the actual revenue earnings during 2004-05 were seen to be only Rs.1.22 crore and Rs.0.56 crore for Phase I and Phase II. Thus, the annual loss

was computed by audit as Rs.10.36 crore and Rs.35.88 crore respectively for the two phases.

The Chief Transportation Planning Manager/Southern Railway in his letter of 02 November 2001 had also indicated that the likely loss to be incurred by MTP at the end of Phase-II would be around Rs.153.30 crore per annum.

3.11 Conclusion

Mass Rapid Transit System, which was financially unviable right from inception, was burdened with additional risk due to alignment of its route through a number of slum clusters and inside a marshy area. Consequently, only two per cent of the designed capacity was being utilised. The project has been already delayed by nine years in completion of Phase I and Phase II is also likely to suffer time and cost overrun.

The Project is already incurring considerable losses, which are likely to increase further in the near future.