

**CHAPTER IV**  
**PERFORMANCE AUDIT**  
**(URBAN LOCAL BODIES)**



## CHAPTER IV

### PERFORMANCE AUDIT

This Chapter contains findings of Performance Audit of Chennai Mega City Development Mission.

#### MUNICIPAL ADMINISTRATION AND WATER SUPPLY DEPARTMENT

#### GREATER CHENNAI CORPORATION AND CHENNAI METROPOLITAN WATER SUPPLY AND SEWERAGE BOARD

#### 4.1 Chennai Mega City Development Mission

##### *Executive Summary*

*Government of Tamil Nadu (GoTN) launched in October 2011 the “Chennai Mega City Development Mission” (CMCDM) for Chennai and its Added Areas with an objective to improve the infrastructure facilities and basic amenities such as roads, water supply, sewerage and sanitation, storm water drains (SWDs) and street lights, in an integrated manner. The main thrust of the Mission was to bring Added Areas at par with erstwhile Chennai Corporation i.e., the Core City. The Performance Audit on the execution of the Scheme for the period from 2011-12 to 2015-16, conducted between February and August 2016, revealed the following:*

*As against the projected requirement of ₹ 9,228.51 crore by the implementing agencies, GoTN sanctioned only ₹ 2,500 crore thereby limiting the scope of activities taken up under CMCDM. Though SWDs were to be designed based on topographical, meteorological and hydrological study, they were executed without such a study, which resulted in construction of inadequate size of SWDs and required reconstruction of 51 of these at an estimated cost of ₹54.33 crore. Further, the SWDs were not ultimately linked to natural waterways/water bodies for efficient storm water runoff. Road works were executed without integrated SWDs, in contravention of the instructions of the Project Sanctioning Committee (PSC). There were delays ranging from 60 to 223 days in award of contracts in respect of Water Supply Scheme (WSS) and Under Ground Sewerage Scheme (UGSS), which resulted in non-completion of six WSS and five UGSS. Use of Cast Iron pipes instead of Ductile Iron pipes resulted in avoidable expenditure/liability of ₹35.97 crore. Entrustment of road works without calling for tenders resulted in excess expenditure of ₹ 4.69 crore. Lack of effective monitoring by PSC resulted in post facto sanction of 1,946 unapproved works.*

#### **4.1.1 Introduction**

The Local Bodies (LBs) around Chennai Corporation had experienced rapid growth in population<sup>1</sup>, making it imperative to provide suitable infrastructure to keep pace with the growing demand. It was felt by the Government of Tamil Nadu (GoTN) that the capacity to effectively deliver these services could be catered better only by an organised Urban Local Body like a Municipal Corporation, instead of a cluster of Municipalities, Town Panchayats and Village Panchayats. Hence, Corporation of Chennai area was expanded by GoTN in September 2011 by merging 42 LBs. These merged LBs were called as Added Areas<sup>2</sup> and erstwhile Chennai Corporation, termed as Core City. Chennai Corporation was renamed as Greater Chennai Corporation (GCC) in October 2015.

GoTN had launched in October 2011 the “Chennai Mega City Development Mission” (CMCDM) with a view to improve the infrastructure facilities and basic amenities such as roads, water supply, sewerage and sanitation, storm water drains (SWDs) and street lights in an integrated manner in Chennai and its Added Areas. The main thrust of the Mission was for Added Areas.

The scheme was designed for implementation over a period of five years from 2011-12 to 2015-16, which was later extended for another year up to 2016-17. GoTN appointed (January 2012) Tamil Nadu Urban Infrastructure Financial Services Limited (TNUIFSL), a public limited company promoted by GoTN, as the nodal agency for implementation of the scheme. The GCC was the implementing agency for laying of roads with integrated SWDs, street lighting system, cable ducts and Solid Waste Management (SWM) and Chennai Metropolitan Water Supply and Sewerage Board (CMWSSB) was responsible for provision of water supply and sewerage system. TNUIFSL was mandated to appraise the projects of GCC and CMWSSB and put up the proposals to the Project Sanctioning Committee (PSC)<sup>3</sup> for obtaining administrative sanction from GoTN. As against the projected requirement of ₹ 9,228.51 crore by GCC and CMWSSB, GoTN sanctioned only ₹ 2,500 crore. As such, the scope of the CMCDM was confined to the activities to be undertaken within the financial resources amounting to ₹ 2,500 crore only.

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<sup>1</sup> Population in Core City and Added Areas was 46.81 lakh and 18.19 lakh respectively as per 2011 Census

<sup>2</sup> The Added Areas consist of nine Municipalities, eight Town Panchayats and 25 Village Panchayats, which were situated in four basins *viz.* Adyar, Cooum, Kosasthalaiyar and Kovalam

<sup>3</sup> The Committee comprised of Additional Chief Secretary to Government, Municipal Administration and Water Supply Department; Managing Director, CMWSSB; Secretary to Government (Expenditure), Finance Department of GoTN; Chairperson and Managing Director, TNUIFSL and Principal Secretary and Commissioner, Corporation of Chennai

### 4.1.2 Organisational setup

The Principal Secretary to GoTN, Municipal Administration and Water Supply (MAWS) Department was the Head of the Department at Government level. The Commissioner, GCC and the Managing Director, CMWSSB were the respective executive heads for implementing the scheme. Both the implementing agencies functioned under the administrative control of MAWS Department. The works in GCC relating to Bus Route Roads (BRR), SWDs and street lights were carried out by the Superintending Engineers under the control of Chief Engineer (General). The works relating to SWM were carried out by the Superintending Engineer (Mechanical) under the control of Chief Engineer (Buildings and Bridges). The overall control vested with the Deputy Commissioner (Works). In CMWSSB, water supply and sewerage works of CMCDM were carried out by five construction wings, headed by Superintending Engineers under the control of four Chief Engineers. Procurements were made by Superintending Engineer (Contracts and Management) and Planning and Design aspects were handled by the Superintending Engineer (Planning and Design).

### 4.1.3 Audit objectives

Audit objectives were to assess whether:

- urban infrastructure projects/works were efficiently planned in accordance with guidelines;
- financing pattern for projects/works were approved, funds were released in time and utilised economically;
- procurements and execution of projects/works were carried out economically and as per plan;
- monitoring mechanism was in place and effective.

### 4.1.4 Audit criteria

Audit findings were benchmarked against the following criteria:

- Guidelines and Procedures for the Operation and Management of Chennai Mega City Development Fund;
- The Tamil Nadu Transparency in Tenders Act, 1998;
- Indian Roads Congress (IRC) guidelines and Ministry of Road Transport and Highways (MORTH) specifications;
- Central Public Health and Environmental Engineering Organisation (CPHEEO) Manuals for Water Supply and Sewerage;
- GCC Council resolutions and CMWSSB resolutions on CMCDM;
- Government orders, executive instructions and circulars issued from time to time.

#### **4.1.5 Scope and methodology of Audit**

The Performance Audit was conducted between February and August 2016 covering the period 2011-16 in respect of grant of ₹ 2,500 crore sanctioned by GoTN. Records were test checked in the Secretariat, head office of GCC and its Zonal offices and head office of CMWSSB and its area offices by adopting simple random sampling method.

In GCC, works were sanctioned only during the years 2011-12 and 2013-14 in Added Areas i.e., eight zones, of which three zones (30 *per cent* packages from each zone) were selected. Similarly, during 2012-13 and 2015-16, the works sanctioned in five out of 15 zones (30 *per cent* packages from each zone) were selected for test check.

In CMWSSB, only improvement works were carried out during 2011-12, being the year of commencement of CMCDM. Thirty *per cent* of improvement works, valuing less than ₹ 5 crore and all works above ₹ 5 crore were fully (100 *per cent*) selected. As Water Supply Scheme (WSS) and Under Ground Sewerage Scheme (UGSS) packages only were sanctioned during the period 2012-14, 30 *per cent* packages were selected<sup>4</sup>. Further, procurement of machineries and vehicles made under all 13 contracts by GCC and CMWSSB were scrutinised by Audit. Entry conference for the Performance Audit was conducted on 05 July 2016 with the Principal Secretary, MAWS Department to discuss the audit objectives, scope, criteria and methodology. The Exit conference was held on 16 November 2016 with the Principal Secretary, MAWS Department along with the officials of CMWSSB, GCC and TNUIFSL and the audit findings were discussed. Replies wherever received have been incorporated with suitable rebuttal by Audit.

#### **Audit Findings**

The main objectives of the Mission could not be achieved within the scheduled period. Deficiencies noticed in planning, financial management, programme implementation and monitoring are brought out in the succeeding paragraphs.

#### **4.1.6 Planning**

##### **4.1.6.1 Coverage of infrastructure facilities/basic amenities**

The main objective of the Mission was to improve the infrastructure facilities and basic amenities in the city in an integrated manner and to bring these facilities in the Added Areas at par with the Core City. As against projected requirement of ₹ 9,228.51 crore, GoTN sanctioned only ₹ 2,500 crore, thereby limiting the scope of activities taken up under the CMCDM. Details of various infrastructure facilities/basic amenities planned, taken up and completed under the reduced scope of the Mission during the period 2011-16 are given in **Table 4.1**.

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<sup>4</sup> No projects were sanctioned to CMWSSB by GoTN for the period 2014-16

**Table 4.1: Details of infrastructure facilities/basic amenities planned, taken up and completed under CMCDM**

Infrastructure facilities/basic amenities	Planned (Nos./length in kms.)	Amount (₹ in crore)	Taken up under CMCDM	Amount (₹ in crore)	Completed under CMCDM
Roads	4,651 (Kms.)	5,555.25	1,138	1,244.44	974
Storm Water Drains (SWDs)	790 (Kms.)	1,077.23	169	174.60	168
Street Lights	82,000 (Nos.)	82.82	12,041	26.18	12,041
Solid Waste Management vehicles	490 vehicles	152.39	198	42.33	198
Water Supply Schemes (WSS)	32 (Nos.)	641.00	26	526.38	1
Under Ground Sewerage Schemes (UGSS)	32 (Nos.)	1,165.63	11	428.41	2
Sewage vehicles	Not Available	19.18	201	39.19	201
WSS and UGSS Improvement works	150	535.01	96	162.14	96
<b>Total</b>		<b>9,228.51</b>		<b>2,643.67*</b>	

\* As against the project cost of ₹ 2,643.67 crore, GoTN sanctioned only ₹ 2,500 crore as grant and the remaining cost was to be borne by implementing agencies.

(Source: Details worked out based on the Detailed Project Reports, Progress Reports of GCC and CMWSSB and Policy Note 2016-17 of MAWS Department)

It may be seen that due to restriction of sanction to ₹ 2,500 crore by GoTN there was shortfall in coverage of infrastructure facilities/basic amenities for which the implementing agencies had to depend on alternative sources for funding which postponed the overall achievement of the objective of the Mission. Though there was marginal shortfall in respect of road works completed by GCC, the WSS and UGSS works taken up by CMWSSB remained incomplete in respect of 25 and four LBs respectively, even after the due dates of completion were over, as discussed in Paragraph 4.1.8.2.

During the Exit conference, the Managing Director, CMWSSB admitted that there was limited allocation of funds under CMCDM and they were in touch with other funding agencies for implementing the works in Added Areas.

#### **4.1.6.2 Construction of Storm Water Drains in the Added Areas without conducting topographical, meteorological and hydrological studies**

As per CPHEEO Manual and IRC guidelines, the SWDs were to be designed based on topographical, meteorological and hydrological data. Developing a SWD design plan was essential to ensure that storm water runoff could be discharged from the catchment area in an efficient and timely manner with ultimate linkage to natural waterways/water bodies.

It was contemplated under CMCDM to execute 532 SWDs in the Added Areas in an integrated manner along with road works. However, only 446 SWD works were executed in the Added Areas at a cost of ₹ 169.22 crore during the period 2011-14. Audit scrutiny revealed that topographical, meteorological

and hydrological data, essential for construction of SWDs, were neither available in the Detailed Project Report (DPR) of CMCDM nor from the records made available to Audit. Further, SWDs under CMCDM were not planned based on ultimate linkage to natural waterways/water bodies for efficient disposal of storm water runoff.

In this regard, Audit observed that during the course of execution of CMCDM, a DPR for another comprehensive scheme (not a part of CMCDM) viz., “Integrated Storm Water Drain System (ISWDS)” covering the same Added Areas was formulated at an estimated cost of ₹ 3,531.43 crore during March 2014<sup>5</sup> by adopting basin concept i.e., ultimate linkage to four basins viz., Adyar, Cooum, Kosasthalaiyar and Kovalam. In the DPR of ISWDS, the proper size of the drains (width and depth) to be adopted for efficient discharge of storm water at different locations was arrived at from the data collected from topographical, meteorological and hydrological studies conducted in Added Areas. However, under CMCDM, SWDs were constructed adopting standard type designs (i.e., 0.60m x 0.75m and 0.90m x 0.90m), without conducting such study.

In the DPR of ISWDS, certain deficiencies were pointed out in the existing SWD system in the Added Areas, for example, the SWDs were not sufficient and adequate, and there was no proper connectivity and ultimate linkage of SWDs with natural waterways/water bodies resulting in flooding and water stagnation.

Further, comparison of the size of 446 SWDs constructed under CMCDM in the Added Areas with the DPR of ISWDS for same Added Areas, by Audit, revealed the following deficiencies:-

- In 51 locations, the size of SWDs constructed under CMCDM were inadequate. Six out of 51 SWDs constructed at a cost of ₹ 2.46 crore by GCC under CMCDM in Cooum Basin were approved for reconstruction, as observed from the reconstruction list of the DPR of ISWDS, as detailed in **Appendix 4.1**.
- The remaining 45 SWDs constructed under CMCDM at a cost of ₹ 18.12 crore (Kovalam and Kosasthalaiyar basins : ₹ 7.37 crore and Adyar and Cooum basins: ₹ 10.75 crore) also required reconstruction, as observed from the list of new construction works approved in the DPR of ISWDS, as detailed in **Appendices 4.2 and 4.3**.

Thus, execution of SWDs under CMCDM without topographical, meteorological and hydrological study and without ultimate linkage to natural waterways/water bodies had resulted in construction of SWDs with inadequate size, which would ultimately result in inundation of roads. Based on the DPR of ISWDS, the estimated reconstruction cost of 51 SWDs worked out approximately to ₹ 54.33 crore.

GoTN stated (November 2016) that the SWDs under CMCDM were constructed in the Added Areas of Adyar and Cooum Basins in the same

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<sup>5</sup> Final DPR in March 2014 and Draft DPR in July 2012



alignment, inverts and networking as existed in the erstwhile Municipalities under the road network concept. Further, the basin concept for Added Areas was conceptualised only in 2012 under ISWDS and the survey and other works completed by 2014. However, before the survey was conducted under ISWDS, SWDs were constructed under CMCDM to provide relief to the people.

The reply was not tenable as construction of SWDs on basin concept was not new to GCC as the SWDs in the Core City had been executed under Jawaharlal Nehru National Urban Renewal Mission (JNNURM) during March 2010 to March 2013 adopting basin concept. The fact remains that the SWDs constructed under CMCDM were inadequate in size and lacked linkage to water bodies, requiring reconstruction of 51 SWDs subsequently under the newly proposed ISWDS.

#### **4.1.6.3 Provision of Sodium Vapour Lamps instead of Light Emitting Diode**

Street lighting is a basic amenity and one of the most important responsibilities of a local body. The implementation of uniform measures to increase energy efficiency and to reduce maintenance cost as well as to simultaneously deliver better service to the public is a major priority for all Urban Local Bodies. Light Emitting Diode (LED) lamps consume 45 *per cent* less power than Sodium Vapour Lamps (SVLs). The concept of providing LED lamps was introduced in GCC as early as in August 2011 under ‘Basic Services to the Urban Poor Scheme’. The GCC had also included the LED lamps in their Electrical Schedule of Rates (SoR) in 2011-12.

CMCDM provided for installation of 12,952 SVLs during the years 2011-12 to 2013-14 at an estimated cost of ₹ 31.95 crore against which ₹ 26.18 crore was incurred towards installation of 12,041 SVLs.

Audit scrutiny revealed that GCC subsequently replaced 1,327 SVLs installed under CMCDM with LED lamps between November 2015 and April 2016 at a cost of ₹ 36.72 lakh. As such, GCC could have provided LED lamps under CMCDM instead of SVLs to save electricity. Failure to properly plan the provision of street lights resulted in avoidable expenditure of ₹ 36.72 lakh on SVL and fittings.

GoTN replied (November 2016) that LED street lighting was a new technology introduced in 2011-12. At the time of preparation of DPR for CMCDM, LED installation were only under trial, hence, it was not included in the large scale project like CMCDM. Further, when compared to SVL street light fittings, the cost of LED street light fittings was very high due to which LED street lights were used extensively after their study with effect from 2013-14.

The reply was not tenable as the Electrical Department of GCC had included the item “Supplying, fixing and maintenance for seven years of LED fittings” in their SoR for the years from 2011-12, which indicated that this technology was known to GCC during 2011-12 itself. As such, GCC could have provided LED street lights under CMCDM from 2011-12 itself to enhance energy efficiency.

#### 4.1.7 Financial Management

GoTN sanctioned a project cost of ₹ 2,643.19 crore during 2011-16 (which was revised to ₹ 2,643.67 crore in February 2016) for CMCDM and allocated a grant of ₹ 2,500 crore. The differential cost was to be borne by the implementing agencies.

GoTN created (March 2012) a separate fund called Chennai Mega City Development Fund (CMCDF) for implementing CMCDM to be maintained by TNUIFSL. The Corpus for the fund would be provided through budgetary provision every year by GoTN. The year-wise details of grants sanctioned by GoTN, funds disbursed to implementing agencies by TNUIFSL and expenditure incurred by implementing agencies are detailed in **Table 4.2**.

**Table 4.2: Details of grants sanctioned by GoTN, funds received by TNUIFSL and expenditure incurred by implementing agencies**

(₹ in crore)

Year	Implementing Agency	Project Cost	CMCDM Grant sanctioned by GoTN	Agency contribution	Grant released to TNUIFSL by GoTN	Grants released to implementing agencies by TNUIFSL	Expenditure
2011-12	GCC	333.89	308.00	25.89	-	-	-
	CMWSSB	175.93	175.93	-	-	-	0.01
	<b>Sub Total</b>	<b>509.82</b>	<b>483.93</b>	<b>25.89</b>	<b>-</b>	<b>-</b>	<b>0.01</b>
2012-13	GCC	403.98	403.98	-	-	144.51	130.98
	CMWSSB	452.77	390.20	62.57	-	28.17	25.89
	<b>Sub Total</b>	<b>856.75</b>	<b>794.18</b>	<b>62.57</b>	<b>500</b>	<b>172.68</b>	<b>156.87</b>
2013-14	GCC	373.35	280.01	93.34	-	245.93	407.95
	CMWSSB	513.33	513.33	-	-	230.16	199.85
	<b>Sub Total</b>	<b>886.68</b>	<b>793.34</b>	<b>93.34</b>	<b>500</b>	<b>476.09</b>	<b>607.80</b>
2014-15	GCC	-	-	-	-	313.37	391.24
	CMWSSB	-	-	-	-	125.32	174.71
	<b>Sub Total</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>500</b>	<b>438.69</b>	<b>565.95</b>
2015-16	GCC	322.99	242.24	80.75	-	361.56	376.96
	CMWSSB	-	-	-	-	214.93	186.93
	<b>Sub Total</b>	<b>322.99</b>	<b>242.24</b>	<b>80.75</b>	<b>200</b>	<b>576.49</b>	<b>563.89</b>
<b>Total</b>	<b>GCC</b>	<b>1,434.21</b>	<b>1,234.23</b>	<b>199.98</b>	<b>1,700</b>	<b>1,065.37</b>	<b>1,307.13</b>
	<b>CMWSSB</b>	<b>1,142.03</b>	<b>1,079.46</b>	<b>62.57</b>		<b>598.58</b>	<b>587.39</b>
<b>GCC: Grant for Integrated Roads</b>		53.34	40.01	13.33	-	-	-
<b>CMWSSB: Grant for excess expenditure incurred in FY 2011-12 for procuring sewage vehicles</b>		5.92	5.92	-	-	-	-
<b>CMWSSB: Grant for excess expenditure incurred in FY 2012-13 for procuring sewage vehicles</b>		8.17	8.17	-	-	-	-
<b>Grand Total</b>		<b>2,643.67</b>	<b>2,367.79*</b>	<b>275.88</b>	<b>1,700</b>	<b>1,663.95</b>	<b>1,894.52</b>

\* Out of ₹ 2,500 crore grant allocated to CMCDM, the balance grant of ₹ 132.21 crore was allocated for meeting the Urban Local Bodies' share for five water supply and two sewerage projects taken up under JNNURM/Metropolitan Infrastructure Development Fund for ₹ 119.31 crore; Sustainable Water Security Mission for ₹ 5 crore and Fees, technical assistance grant and other expenditure for ₹ 7.90 crore.

As against the sanction of ₹ 2,500 crore, GoTN released only ₹ 1,700 crore mainly due to pendency in completion of WSS and UGSS works by CMWSSB which are discussed in Paragraph 4.1.8.2.

The deficiencies noticed in management of finance are discussed in the succeeding paragraphs.

#### **4.1.7.1 Financial deficiencies**

##### **(i) Incorrect booking of expenditure**

The expenditure incurred towards street lights was booked by GCC under CMCDM Head of Account for respective years. Whenever recoveries were made from the contractors' bills for the unused materials supplied by the contractors, the same had to be credited back to the scheme account. However, it was observed that in three Zones (Zones 2, 3 and 5), the recoveries were incorrectly credited into Roads and Buildings Maintenance Account and under Miscellaneous Income instead of crediting to the CMCDM account. This incorrect booking had resulted in scheme expenditure getting inflated to ₹ 11.41 lakh.

GoTN accepted the audit observation (November 2016) and stated that the amounts would be rebooked to the proper accounts by instructing the concerned officials of the Zones/Department.

##### **(ii) Expenditure incurred without sanction**

As per the guidelines for the operation and management of CMCDF, all the eligible projects were to be approved by the PSC. The work of "Supply and installation of 101 six metre lamp posts at various places in Zone-2 of GCC" entrusted (June 2013) to a contractor for ₹ 35.54 lakh were completed (September 2013) at a cost of ₹ 35.50 lakh. This expenditure was booked under CMCDM 2011-12. Audit observed that the work was not approved by the PSC.

GoTN while accepting the audit observation (November 2016) stated that the works were approved by the competent authorities and taken up under CMCDM after following tender procedure. It was further stated that approval of PSC would be obtained.

##### **(iii) Non-disclosure of interest earned**

As per guidelines and procedure for operation and management of CMCDF, interest from investments and any other income earned or accrued to the fund should form part of its Corpus and should be applied for the objective for which the fund was created.

Scrutiny of bank statements of the four Savings Bank accounts operated separately by GCC for the years 2011-12, 2012-13, 2013-14 and 2015-16

revealed that the interest earned to the tune of ₹ 4 crore<sup>6</sup> was credited in Savings Bank account as of March 2016. However, the interest earned out of CMCDM funds was not disclosed in the Utilisation Certificates furnished by GCC to TNUISL. The details of interest earned by CMWSSB out of CMCDM funds called for by Audit was not furnished (November 2016).

GoTN replied (November 2016) that the interest earned by GCC would be brought to the notice of PSC and in the case of CMWSSB, the interest received for CMCDM was deposited in a common Capital Works Account and calculation of interest pertaining to CMCDM would be worked out and reported. The reply was not convincing as the interest amount still remained to be credited back to CMCDF.

**(iv) Diversion of interest earned out of CMCDM funds**

The bank reconciliation statements were prepared by GCC upto March 2015 for CMCDM accounts. On a review by Audit, it was noticed that a Real Time Gross Settlement (RTGS) payment of ₹ 81.86 lakh in November 2014 was debited to Savings Bank account of CMCDM 2012-13 and kept unreconciled as of 31 March 2015. On being asked by Audit, the GoTN replied (November 2016) that the amount related to the Savings Bank interest earned in the said CMCDM account had been transferred to GCC General Fund account and accounted for as Interest from Bank Accounts.

The reply was not tenable since as per guidelines, interest from investments earned or accrued to CMCDM Fund should form part of its Corpus and should be applied for the objective for which the fund was created and hence, transfer of interest of ₹ 81.86 lakh earned out of CMCDM Fund to GCC General Fund account was not in order.

In the Exit conference, the Principal Secretary, MAWS Department stated that the implementing agencies would be directed to propose new works with the interest earned out of CMCDM funds after getting PSC approval.

**4.1.8 Programme Implementation**

As per the Policy Note 2012-13 of MAWS Department, GoTN had contemplated integrated development of roads with SWDs, cable ducts, street lights and street furniture to bring the newly Added Areas of Chennai City at par with Core City under CMCDM.

The works sanctioned under CMCDM for GCC during the years 2011-12, 2012-13, 2013-14 and 2015-16 were termed as Grids of the respective years. Road works with integrated components viz., SWDs, footpath, cable duct and street lights were proposed by respective Zones. Grid - 1 and Grid - 3 were specifically for Added Areas of eight Zones and Grid - 2 was executed in all the 15 Zones, including the Core City and Added Areas. Grid - 4 was proposed (without integration) for execution by the BRR Department of GCC.

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<sup>6</sup> 2011-12: ₹ 169.58 lakh; 2012-13: ₹ 136.44 lakh; 2013-14: ₹ 67.22 lakh and 2015-16: ₹ 26.92 lakh **Total: ₹ 400.16 lakh (or) ₹ 4 crore**

Deficiencies noticed in execution of works with reference to the above, are discussed in the succeeding paragraphs.

#### 4.1.8.1 Non-integration of SWDs with road works

As per the scheme guidelines, projects envisaged should be executed by following the integrated approach. The Secretary to Government (Expenditure), Finance Department while examining the proposal of GCC for 2011-12 had also emphasised in the PSC meeting held during February 2012 that, if SWDs were not constructed simultaneously, it would result in incomplete execution of roads and would defeat the entire purpose of funding under CMCDM. Hence, only those roads in which SWD work would be taken up simultaneously should be taken up under CMCDM. The GCC was also asked to ensure that proposed roads should not be opened up for SWD works in near future. Accordingly, GCC had submitted a revised proposal to PSC in February 2012 (Grid - 1) duly including the SWDs and other components.

The proposals for 2011-12 to 2013-14 (Grid - 1, Grid - 2 and Grid - 3) were sanctioned for execution of 2,666 road works at a cost of ₹ 892.61 crore under CMCDM, which included integration of 558 SWDs with road works.

Audit observed that there were savings of ₹ 219.77 crore in 2011-12 and 2012-13 works due to dropping of other components viz., SWDs, streetlights, cable ducts etc. Out of the savings, additionally 1,946 road works were taken up at a cost of ₹ 215.82 crore without integrating other components. Further, these road works were not proposed for approval of PSC and GCC obtained only *post facto* sanction from Government (January 2015).

The compliance of the scheme guidelines and the directions of PSC were further examined by Audit by comparing the road works executed under CMCDM without SWD with the DPR of ISWDS<sup>7</sup> in which SWDs were proposed for Added Areas of GCC. Audit comparison revealed that in respect of 913 road works<sup>8</sup> executed during 2011-14, SWDs were feasible under CMCDM but not constructed. Execution of road works under CMCDM without SWD component would result in cutting of roads while taking up SWD works under ISWDS, entailing additional expenditure.

GoTN replied (November 2016) that the existing roads were normally narrow and the side drains were also very small in size and these were unsewered areas. SWD works could not be taken up in these areas till completion of works by CMWSSB and all these roads had now been provided with street lights whereas SWDs would be taken up under ISWDS.

The reply was not tenable since GCC was aware of the fact that the WSS/UGSS works were pending execution by CMWSSB and that the road works could not be integrated with SWDs as emphasised by the Secretary to Government (Expenditure), Finance Department. As such, the GCC should not

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<sup>7</sup> In the ISWDS DPR, 1,172 SWDs in Adyar and Cooum Basins and 2,384 SWDs in Kosasthalaiyar and Kovalam Basins were proposed

<sup>8</sup> 372 road works out of 2,666 in original sanctions of Grid - 1, Grid - 2 and Grid - 3 and 541 road works out of 1,946 in savings

have proposed those works while submitting the proposals to PSC. Further, instead of bringing the fact of execution of works without integration to the notice of PSC, the GCC had executed 1,946 road works out of savings and obtained only *post facto* sanction.

#### **4.1.8.2 Delay in implementation of WSS and UGSS**

There were 31 and 20 erstwhile LBs in the Added Areas which were devoid of water supply and sewerage facilities respectively. WSS and UGSS had been sanctioned during 2012-14 under CMCDM to improve the inadequacies in water supply and sewerage infrastructure facilities. Seven WSS works (covering 25 LBs<sup>9</sup>) and seven UGSS works (covering 10 LBs<sup>10</sup>) were taken up under CMCDM during 2012-14. Out of the seven contracts for WSS, one contract was terminated in August 2015 due to slow progress of work by the contractor and the balance work was re-tendered and entrusted to another contractor in September 2016. The remaining six contracts were under progress with delays ranging from one month to one year as of August 2016. Similarly, out of the seven UGSS covering 10 LBs, one scheme (covering one LB) had been completed and one scheme (covering one LB) was at tender stage and remaining five UGSS (in eight LBs) were under progress. Out of five schemes under progress, three schemes (in four LBs - Kathivakkam, Ramapuram, Sholinganallur and Karapakkam) were already overdue and delays were up to six months as of August 2016. The remaining two schemes were scheduled to be completed in August-September 2017.

Since there were no norms in CMWSSB for tender processing, the timelines for finalisation of tender in respect of WSS and UGSS executed by CMWSSB were reviewed with reference to the norms prescribed by Public Works Department (PWD). In PWD, the time allowed for technical sanction was 90 days from the date of administrative sanction and the time limit for finalisation of tender was 52 days from the last date for receipt of tender. It was noticed that in respect of four WSS, the time taken from the date of administrative sanction to technical sanction was 102 days and the time taken for finalising the tender in respect of seven WSS ranged between 60 and 223 days. Similarly, in respect of three UGSS, the time taken from the date of administrative sanction to technical sanction was 137 days and the time taken for finalising the tender in respect of six UGSS ranged between 119 and 223 days. Time taken from the date of administrative sanction to award of works in respect of WSS and UGSS works are detailed in **Appendices 4.4 and 4.5** respectively. As a result of these delays, the intended objectives remained largely unachieved.

GoTN replied (November 2016) that delay in execution was due to delay in obtaining road cut permission by CMWSSB from GCC during monsoon period (three months for each year). As regards delay in tender processing, it was stated that the minimum time taken for a particular activity varied with

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<sup>9</sup> Refer Appendix 4.4 for the list of 25 LBs

<sup>10</sup> Annai Sivagami Nagar in Thiruvottiyur, Karapakkam, Kathirvedu, Kathivakkam, Mugalivakkam, Nolambur, Puthagaram, Ramapuram, Sholinganallur and Surapattu



the work load of the section and there was shortage of man power in CMWSSB. During Exit conference, Principal Secretary, MAWS Department stated (November 2016) that the WSS and UGSS works were collectively monitored for all schemes including CMCDM. In regard to delay in tender process, it was stated that the matter would be examined and CMWSSB would come out with suitable norms as is done in PWD. The reply was not tenable as the activities relating to WSS and UGSS were not completed within the time frame prescribed for the purpose.

**4.1.8.3      *Non-consideration of availability of equipment and key personnel before entrustment of work***

As per the General condition No.4.5(B)(a) and (b) of the bid document of CMWSSB, each bidder should demonstrate the availability (either owned or leased or by procurement against mobilisation advances) of critical equipment required for the work specified therein and should also demonstrate the availability of a Project Manager with minimum 10 years experience in a project similar to the present work and other key personnel with adequate experience as indicated in the Contract Data for this work. Three<sup>11</sup> water supply works were awarded (March 2014) to a contractor for ₹ 194.10 crore under CMCDM 2013-14 and the works were scheduled to be completed by May 2016. The physical progress (July 2016) was only 34.67 *per cent* and 63.15 *per cent* in respect of two works and the third work was terminated (August 2015) due to slow progress of work.

Scrutiny of records revealed that the contractor had furnished the list containing the same critical equipment and personnel to be engaged for all the three works. As all the above three tenders were evaluated during January 2014, the aggregate requirement of equipment should have been considered before awarding the tender as the works involved deployment of equipment at various locations.

Non-consideration of actual requirement of equipment and personnel for all the three works before entrusting the works to the same contractor had resulted in slow progress of two works and termination of one work, resulting in postponement of the objective of providing safe drinking water supply.

GoTN replied (November 2016) that the bids submitted by the bidders for the three works had been evaluated for each bidder based on the conditions given in the bid document and that there was no mention in the bid documents regarding evaluating the aggregate requirement of equipment and personnel. In the Exit conference, the Principal Secretary, MAWS Department stated that the condition regarding aggregate requirement of equipment and personnel would be considered for inclusion in the bid documents.

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<sup>11</sup> (i) Providing Comprehensive Water Supply Scheme to Edayanchavadi, Sadayankuppam, Kadapakkam, Vadaperumbakkam, Theeyambakkam, Chinnasekadu and Manali in Chennai City; (ii) Providing Comprehensive Water Supply Scheme to Kottivakkam, Palavakkam and Perungudi in Chennai City and (iii) Providing Comprehensive Water Supply Scheme to Pallikaranai and Mugalivakkam in Chennai City

#### **4.1.8.4 Avoidable expenditure on usage of Cast Iron (CI) pipes**

Paragraph 3.12 of Manual on Sewerage and Sewage Treatment Systems, 2013 of CPHEEO, read with Appendix A.3.10 deals with the suitability and limitations of various pipe materials for usage in sewerage mains. As per Paragraphs 3.12.6 and 3.12.8 of the Manual, both CI and Ductile Iron (DI) pipes could be used in sewerage pipe lines with cement mortar linings to protect against the high corrosive nature of the sewages. The cost of DI pipe was lesser than that of CI pipes.

The Indian Standards (CI pipes - IS 1536:2001; DI pipes - IS 8329:2000) specified minimum standards for CI (Class LA) and DI S/S (Class K9) pipes as given in **Table 4.3**.

**Table 4.3: Details of Indian Standards for CI pipes and DI pipes**

Description of standard	Standards prescribed	
	CI Pipes	DI Pipes
Tensile Strength (Minimum)	200 for pipes cast in metal moulds; 180 for pipes cast in sand lined moulds	Minimum 420
Hydraulic working pressure including surge (Maximum allowable)	1.0 (diameter 80 to 1,050 mm)	(i) 3.9 to 7.7 (diameter 80 to 750 mm)
		(ii) 3.6 to 3.8 (800 to 1,000 mm)
		(iii) 3.1 to 3.5 (1,100 to 2,000 mm)
Site test pressure (Maximum allowable)	(i) 1.6 (diameter 80 to 600 mm)	(i) 4.4 to 9.6 (diameter 80 to 750 mm)
	(ii) 1.5 (diameter 700 to 1,050 mm)	(ii) 3.6 to 4.3 (diameter 800 to 2,000 mm)

(Source: IS 1536:2001 and IS 8329:2000)

It may be seen from the above table and from the CPHEEO Manual that DI pipes have some inherent advantages over CI pipes as they are more tensile and lighter which would result in less brittleness and easiness in laying and jointing. Further, DI pipes would withstand higher working pressures as compared to CI pipes. Audit scrutiny of DPRs and agreements for the UGSS works, taken up by CMWSSB under CMCDM, revealed that CI pipes were provided in sewerage works instead of DI pipes, without considering these factors. Thus, usage of CI pipes instead of DI pipes resulted in an avoidable expenditure of ₹ 26.40 crore and liability of ₹ 9.57 crore in 12 test checked UGSS works as detailed in **Appendix 4.6**. Further, it was noticed that DI pipes were used in the Avadi and Thirumazhisai UGSS formulated by CMWSSB in October 2007 and December 2008 and the Tamil Nadu Water Supply and Drainage Board which was executing sewerage schemes in the entire State of Tamil Nadu, except Chennai Metropolitan area was adopting DI pipes for pumping and gravity main in sewerage schemes.

GoTN in its reply (November 2016) while justifying the usage of CI pipes had stated in the Exit conference that action would be taken for evolving a piping policy for CMWSSB.



#### 4.1.8.5 *Entrustment of new road works without calling for tender*

According to Section 3(1) of Tamil Nadu Transparency in Tenders Act, 1998, no procurement should be made by the procuring entity except by tender. Further, as per PWD Circular dated 19 April 2010, before sending proposals for entrusting additional items/additional quantities to the main contractor, the Engineers in charge of the work should examine thoroughly whether the same were “fairly contingent to the main contract” and could be executed only through the main work contractor due to exigencies of the work or on economic consideration or due to time overrun in selecting fresh agency.

Scrutiny of records relating to execution of road works in test checked Zones of GCC revealed that in respect of eight out of 24 selected packages, 70 road works for ₹ 18.96 crore were entrusted between September and December 2015 to the original contractors treating the works as additional quantities. As the works taken up were new road works at different locations and were different from original works entrusted to existing contractors, tenders should have been invited treating them as new works. However, GCC had not called for tenders and entrusted these new road works to the existing contractors in contravention to Tamil Nadu Transparency in Tenders Act, 1998.

The above works were executed at a cost of ₹ 17.66 crore. As the works taken up were new works, GCC should not have entrusted the works at the agreement rates of original works which were based on SoR 2014-15. The GCC should have entrusted the works by calling for tenders instead of treating the work as additional quantity since the rates for works involving bitumen were lesser as per the SoR 2015-16. This had resulted in excess expenditure of ₹ 4.69 crore (**Appendix 4.7**).

GoTN replied (November 2016) that as per the Tamil Nadu Transparency in Tenders Rules, 2000, the Tender Accepting Authority shall be ordinarily permitted to vary the quantity finally ordered to the extent of 25 *per cent* either way of the requirement indicated in the tender documents. If the tendering process was initiated, it would have further delayed the road laying by six months since the roads were in damaged condition.

The reply of GoTN was not factually correct as the additional works executed were not incidental to the main works and were executed at different locations. Further, if the works were of emergency nature, the GCC should have adopted the SoR 2015-16 due to reduction in the rate of bitumen and should have entrusted the works as an additional item at reduced rates instead of additional quantity at higher rates as the roads taken up were new works.

Thus, due to entrustment of work to original contractors at the agreement rates of original works instead of calling for new tender or to entrust the work as additional items had resulted in excess expenditure of ₹ 4.69 crore for which responsibility needs to be fixed for violation of Tamil Nadu Transparency in Tenders Rules, 2000, etc.

**4.1.8.6 Excess expenditure on Camber correction work**

The work of strengthening and relaying of seven BRR - Package 10 was entrusted (March 2015) to a contractor for ₹ 21.42 crore and work was completed (August 2016) at a cost of ₹ 16.62 crore. Scrutiny of tender documents revealed that the tender schedule included an item viz., “Providing and laying Dense Bituminous Macadam (DBM) upto 100 mm thickness Camber correction” for a total quantity of 2,396 cu.m. and the contractor quoted ₹ 7,000 per cu.m. for that item. After negotiation, the contractor reduced the rate to ₹ 6,000 per cu.m. However, agreement was entered (June 2015) into with the contractor for an amount of ₹ 20.92 crore after deleting the above item. Audit noticed that, in lieu of the deleted item, another item viz., “Camber correction work using Bituminous Macadam (BM) 50 mm thickness” was entrusted to the contractor as non-tendered item at the rate of ₹ 8,369.84 per cu.m. for a total quantity of 1,120 cu.m. As the contractor had quoted ₹ 6,000 per cu.m. for Camber correction with DBM during tender which was higher specification than BM<sup>12</sup>, the GCC could have executed the Camber correction using the above item without deleting the same from the agreement. However, Camber correction for a total quantity of 1,440.241 cu.m. was executed using BM as a non-tendered item. Failure of GCC to make use of the lesser rates quoted by the contractor in Camber correction work had resulted in excess expenditure of ₹ 34.13 lakh<sup>13</sup>.

GoTN replied (November 2016) that the excess expenditure of ₹ 34.13 lakh would be recovered from the contractor while making final payment.

**4.1.8.7 Non-fixing of Global Positioning System (GPS) by CMWSSB for effective monitoring of sewage vehicles**

GPS installed in vehicles facilitates timely delivery of service and also payments based on performance. The GCC, which outsourced operation and maintenance of its vehicles for SWM works, adopted a real-time vehicle tracking system using GPS for the purpose of effective monitoring of movement of vehicles. Payments to the contractors for the services rendered were made based on the GPS data.

It was noticed that CMWSSB procured 201 sewage vehicles for desilting work at a cost of ₹ 39.19 crore under CMCDM during 2011-13 and sewer maintenance works were outsourced. Though provision for installation of GPS in desilting machines and jet rodding machines was made at a cost of ₹ 56 lakh, yet CMWSSB did not procure and install GPS in these vehicles. Thus, the best practice adopted by GCC was not followed by CMWSSB for ensuring effective monitoring of movement of these vehicles.

GoTN replied (November 2016) that though there was provision for installation of GPS in the original proposal, funds were not provided under CMCDM. However, the Managing Director, CMWSSB stated in the Exit conference that proposal for installation of GPS was under consideration.

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<sup>12</sup> 1 cm. of BM = 0.7 cm. of DBM

<sup>13</sup> ₹ 2,369.84 per cu.m. (difference in rates) x 1,440.241 cu.m. (quantity executed) = ₹ 34.13 lakh

#### 4.1.8.8 *Inadequate size of cable ducts causing damage to roads*

In order to avoid frequent road cutting by the user departments, provision for cable laying by using PVC pipes and inspection chamber were made in the roads under CMCDM.

Audit scrutiny of records revealed that though the eight roads in Zones 3 and 14 were provided with cable duct at a cost of ₹ 69.62 lakh, GCC had issued road cut permission during 2012-14 to Bharat Sanchar Nigam Limited (BSNL) and Tamil Nadu Electricity Board (TNEB) for laying cables. Though restoration charges for road cut were collected from the user departments, frequent road cuts would cause damage to roads, besides leading to public inconvenience.

GoTN replied (November 2016) that due to the population growth in the area most of the vacant lands were converted into residences, because of which the requirement for service connections was more than anticipated. Therefore, the provision of cable duct with 160 mm diameter was not adequate and hence, permission for road cut for laying cable was issued to BSNL and TNEB. The reply was not tenable as GCC had not assessed the requirements based on the population growth and development of the areas and made provision accordingly.

Thus, due to provision of inadequate size of cable ducts, the roads had to be cut which caused damage to roads and inconvenience to public.

#### 4.1.9 **Monitoring**

As per the scheme guidelines, PSC should review and monitor the project implementation and the periodicity of the meeting to be decided by PSC. However, no periodicity was fixed by PSC and during 2011-16, only 10 meetings were held. Review of the minutes of the meetings revealed that the meetings were held mainly for sanctioning of works and the progress of individual works were not monitored. Lack of monitoring resulted in the following deficiencies as also pointed out in the preceding paragraphs.

- Though PSC observed that SWDs, if not constructed simultaneously with road works would result in incomplete execution of roads and would defeat the entire purpose of funding under CMCDM, this was not monitored by PSC which had resulted in execution of 913 road works by GCC without SWDs.
- GCC had taken up 1,946 additional road works at a cost of ₹ 215.82 crore from the savings of CMCDM 2011-12 and 2012-13. *Post facto* sanction was obtained (November 2014) by GCC from PSC after a lapse of 19 and 31 months respectively. Deficient monitoring by PSC had resulted in savings being utilised by GCC for the road works not approved by the PSC and which were not also proposed at the time of submitting the initial proposal by GCC.

During Exit conference, Principal Secretary, MAWS Department stated (November 2016) that WSS and UGSS works were monitored collectively for all schemes including CMCDM and in respect of road works it

would be monitored in the PSC meetings and an Annual Report would be prepared for effective monitoring.

There is, thus, a need for strengthening of monitoring by PSC for effective implementation of the scheme.

#### **4.1.10 Conclusion**

As against the projected requirement of funds of ₹ 9,228.51 crore by the implementing agencies, GoTN sanctioned only ₹ 2,500 crore thereby limiting the scope of activities taken up under CMCDM. Execution of SWDs without topographical, meteorological and hydrological study resulted in construction of inadequate size of SWDs and required reconstruction of 51 of these at an estimated cost of ₹ 54.33 crore. Further, the SWDs were not ultimately connected to natural waterways/water bodies for efficient storm water runoff. Road works were executed without integrated SWDs, in contravention of the instructions of the PSC. There were delays ranging from 60 to 223 days in award of contracts in respect of WSS and UGSS, which resulted in non-completion of six WSS and five UGSS. Aggregate requirement of equipment and personnel were not considered for inclusion in the bid documents. Use of Cast Iron pipes instead of Ductile Iron pipes resulted in avoidable expenditure/liability of ₹ 35.97 crore due to absence of piping policy. Entrustment of road works without calling for tenders resulted in excess expenditure of ₹ 4.69 crore. Lack of effective monitoring by PSC resulted in *post facto* sanction of 1,946 unapproved works.

#### **4.1.11 Recommendations**

Government/implementing agencies may consider:

- Identification of funding sources at the planning stage for timely completion and overall achievement of the project objectives.
- Taking up of Storm Water Drain works after conducting proper topographical, meteorological and hydrological studies for efficient storm water runoff.
- Integration of road works with other components like SWDs, street lights, cable ducts to avoid cutting of roads.
- Fixing of timelines for sanctioning of estimates and finalisation of tenders in line with PWD norms to avoid unwarranted delay in execution of works.
- Inclusion of suitable clause regarding aggregate requirement of equipment and personnel in the bid documents.
- Evolving a uniform piping policy for WSS and UGSS for adoption by various implementing agencies in the State.