

Annexure - 2

Chennai Smart City: Self Assessment

A	B	C	D	E	F	G	H	I	J	K
	Feature	Definition	Scenario 1 (BASE)	Scenario 2	Scenario 3	Scenario 4 (ADVANCED)	Self-assessment for the full city with regard to each feature	Basis for assessment and/or quantitative indicator (Optional - only if data exists)	Projection of 'where the city wants to be' with regard to the feature/indicator based on the city vision and strategic blueprint	Input/Initiative that would move the city from its current status to Advanced status (Scenario 4: Column G)
1	Citizen participation	A smart city constantly shapes and changes course of its strategies incorporating views of its citizen to bring maximum benefit for all. (Guideline 3.1.6)	The City begins identifies priorities and projects to pursue without consulting citizens.	City undertakes citizen participation with some select stakeholders. The findings are compiled and incorporated in some projects or programs. Very few major decisions are shared with -citizens until final projects are unveiled.	City conducts citizen engagement at city level and local area level with most stakeholders and in most areas. The findings are compiled and incorporated in projects or programs.	City constantly conducts citizen engagement with people at each Ward level to incorporate their views, and these shape priorities and development projects in the city. Multiple means of communication and getting feedback such, both face-to-face and online are utilised. The effectiveness of city governance and service delivery is constantly enhanced on the basis of feedback from citizens.	Scenario 3	1. Ward level Interactions 2. Online Engagement 3. Number of Stake holder Consultation 4. Seminars and Workshops	Scenario 4 Importance of total citizen participation is evident from the number of consultative meetings (15 nos) organised for the Smart City Proposal preparation. This approach of Smart City will be followed for all other development activities in the city.	1. Constant interaction with the citizens 2. Multiple interactions to discuss - decide and disseminate
2	Identity and culture	A Smart City has a unique identity, which distinguishes it from all other cities, based on some key aspect: its location or climate; its leading industry, its cultural heritage, its local culture or cuisine, or other factors. This identity allows an easy answer to the question "why in this city and not somewhere else?" A Smart City celebrates and promotes its unique identity and culture. (Guideline 3.1.7)	There are few architectural monuments, symbols, and festivals that emphasise the unique character of the city. Built, natural and cultural heritage is not preserved and utilised or enhanced through physical, management and policy structures.	Historic and cultural resources are preserved and utilised to some extent but limited resources exist to manage and maintain the immediate surroundings of the heritage monuments. New buildings and areas are created without much thought to how they reflect the identity and culture of the city.	Historic and cultural heritage resources are preserved and utilised and their surroundings are well-maintained. Public spaces, public buildings and amenities reflect the cultural identity of the city:-	Built, natural and intangible heritage are preserved and utilised as anchors of the city. Historical and cultural resources are enhanced through various mediums of expression. Public spaces, open spaces, amenities and public buildings reflect local identity and are widely used by the public through festivals, events and activities.	Scenario 4	Rich cultural and heritage value of the city dates more than 376 years with: 1. Numerous of historic and heritage places 2. Number of public buildings and locations 3. Entertainment places	Scenario 4 1 The Built, natural and intangible heritage will be preserved and utilized as anchors of the city. 2 Public spaces, open spaces, amenities and public buildings will reflect local identity and will be widely used by the public through festivals, events and activities. 3.Chennai wants to be first city in India to implement a Citywide "Non-Motorized Transport Policy" to making Chennai the most pedestrian and bicycle friendly tier 1 city in India.	1. T Nagar is the chosen for Area Based Development which is rich on shopping culture and famous for the mixed use development. For the Area Based Development an Urban Redevelopment Strategy shall be used, to maximize the cultural, historical and architectural importance of region's value. The successful implementation of the Area Based Urban Design and Redevelopment Strategy, can be rolled out at others areas of Chennai. 2. The Area Based Development will contain large scale pedestrianization, traffic calming, bicycle lane network and bikesharing scheme. Based on the successful implementation of the Area Based Non-Motorized Transport Policy, this can be rolled out at Pan City level.
3	Economy and employment	A smart city has a robust and resilient economic base and growth strategy that creates large-scale employment and increases opportunities for the majority of its citizens. (Guideline 2.6 & 3.1.7 & 6.2)	There are some job opportunities in the city but they do not reach all sections of the population. There are a high number of jobs in the informal sector without sufficient facilities.	There is a range of job opportunities in the city for many sections of the population. The city attempts to integrate informal economic activities with formal parts of the city and its economy.	There are adequate job opportunities for all sections of society. But skill availability among residents can sometimes be a challenge.	There are adequate opportunities for jobs for all sections of income groups and skill levels. Job-oriented skill training supported by the city and by industry. Economic activities are suited to and build on locational and other advantages of the city.	Scenario 4	One of the very few cities of the world with diversified economy. Employment opportunity from IT Sector, Manufacturing and automobile Industries, Health Care, etc. Major employment and business hub in South India	Scenario 4 Improve the business and employment opportunity. To go to place for work amongst young job seekers. Chennai - The Safest City in India should increase the job immigrants from other PAN india and abroad.	To promote incentives for start up companies. Involve the established organisation (IT Companies, Manufacturing Industries, etc) in promotion of NMT policy and there by ascertain Chennai as the first city to successfully implement the same. Retrofitting of T Nagar will reinforce Chennai citizens the fact that this is the best place to live, work, shop, dine, entertain, etc.
4	Education	A Smart City offers schooling and educational opportunities for all children in the city (Guideline 2.5.10)	The city provides very limited educational facilities for its residents. There are some schools but very limited compared to the demand. Many schools are in poor condition.	City provides adequate primary education facilities within easily reachable distance of 15 minutes walking for most residential areas of the city. The city also provides some secondary education facilities.	City provides adequate primary and secondary education facilities within easily reachable distance for most residential areas of the city. Education facilities are regularly assessed through - databases of schools including number of students, attendance, teacher - student ratio, facilities available and other factors.	City provides adequate and high-quality education facilities within easily reachable distance of 10 minutes walking for all the residential areas of the city and provides multiple options of connecting with specialised teaching and multi media enabled education. Education facilities are regularly assessed through database of schools including number of students, attendance, teacher-student ratio, facilities available and other factors.	Scenario 4	There is no dearth of good quality educational institutes in the city of Chennai which has some of the best schools, engineering colleges, medical colleges as well as arts & science colleges in India, not to mention very good universities. Students from not just Chennai but from the rest of Tamil Nadu and India flock to the higher-ed institutes in the capital city of TN.	Scenario 4 1) 100% literacy 2) 0% drop out 3) Quality Education for all 4) Skill Achievement	1) Activity based learning 2) Periodic monitoring and maintenance of schools by Corporation with dedicated team of experts 3) Corporation can tie up with IT Service provider to manage the functioning of schools as well as to monitor performance of students
5	Health	A Smart City provides access to healthcare for all its citizens. (Guideline 2.5.10)	Healthcare is difficult for citizens to access - demand for healthcare often exceeds hospitals' ability to meet citizen needs.	The city provides some access to healthcare for its residents but healthcare facilities are overburdened and far from many residents. Access to preventive health care is only easily available for some residents.	City provides adequate health facilities within easily reachable distance for all the residential areas and job centers of the city. It has an emergency response system that connects with ambulance services.	City provides adequate health facilities at easily accessible distance and individual health monitoring systems for elderly and vulnerable citizens which are directly connected to hospitals to prevent emergency health risks and to acquire specialised health advice with maximum convenience. The city is able to foresee likely potential diseases and develop response systems and preventive care.	Scenario 4	Hailed as India's Health Capital . Chennai attracts about 45 percent of health tourists from abroad arriving in the country and 30 to 40 percent of domestic health tourists. Multi- and super-specialty hospitals across the city bring in an estimated 150 international patients every day due to low cost and facilities offered in the city.	Scenario 4 1. Maintenance of Health Institutions 2. Maintenance of medical facilities such as hospitals, primary health centers 3. Outreach programmes	Promoting active lifestyle by transforming image of walking and cycling, making it a popular means of travel for the middle and upper classes. This can be done by redesigning streets to promote walking & cycling, creating a high-quality cycle sharing system to improve image of cycling as well as to encourage use of cycle for short trips, communicating with the public on the benefits of walking and cycling through various campaigns like car-free days .

Annexure - 2

Chennai Smart City: Self Assessment

A	B	C	D	E	F	G	H	I	J	K
	Feature	Definition	Scenario 1 (BASE)	Scenario 2	Scenario 3	Scenario 4 (ADVANCED)	Self-assessment for the full city with regard to each feature	Basis for assessment and/or quantitative indicator (Optional - only if data exists)	Projection of 'where the city wants to be' with regard to the feature/indicator based on the city vision and strategic blueprint	Input/Initiative that would move the city from its current status to Advanced status (Scenario 4: Column G)
6	Mixed use	A Smart City has different kinds of land uses in the same places; such as offices, housing, and shops, clustered together. (Guidelines 3.1.2 and 3.1.2)	The city has mostly separated uses and areas are focused either on residential, commercial, or industrial, with little co-existence of uses. The average resident cannot walk to the closest market or shops near his or her home. For almost everyone, going to work or going shopping for basic needs requires a journey by automobile or bus of more than 15 minutes. Land use regulations prevent putting commercial or office locations in residential neighborhoods and vice versa.	In some parts of the city, there is a mixture of land uses that would allow someone to live, work, and shop in close proximity. However, in most areas, there are only small retail stores with basic supplies near housing. Most residents must drive or use public transportation to access a shop for food and basic daily needs. Land use rules support segregating housing, retail, and office uses, but exceptions are made when requested.	Most parts of the city have housing, retail, and office buildings in close proximity. Some neighborhoods have light industrial uses within them (e.g., auto repair, craft production). Land use rules allow for mixed uses.	Every part of the city has a mix of uses. Everyone lives within a 15-minute trip of office buildings, markets and shops, and even some industrial uses. Land use rules require or encourage developers to incorporate a mixture of uses in their projects.	Scenario 3	Most of the locations with in the city are mixed use where residential and support activity of commercial or retail is interspersed. Chennai growth pattern and land use zoning	Chennai wants to adopt a Transit Oriented Development, with high density mixed use areas (of commercial and offices, retail) around nodes of public transportation, within easy reach of all residential areas.	By choosing the compact, mixed use area of T Nagar, which is served by multiple modes of public transportation (metro, train and bus station, smart bus feeders) as the Area Based Smart City Development, Chennai Corporation will have a the opportunity to create the City's first International Standard Transit Oriented Development . This pilot project for Compact Mixed Use development, can be replicated in other nodes of public transportation around the City. Apply appropriate built environment regulations to ensure that the pedestrian realm is active and vibrant in all of its own buildings and properties, as well as urge their adoption by concerned agencies (e.g. CMDA, MTC, and CMRL) and inclusion in documents such as the Chennai Master Plan, Detailed Development Plans, and Development Control Regulations. Adopt Vendors Policy to support street life. Identify locations where there is existing and potential demand for goods and services of street vendors, accommodate street vendors in on-street locations at mass rapid transit stations, railway stations, market areas, commercial centres, and other key destinations. Regulate street vending in locations that ensure the continuity of footpaths and cycle tracks and provide supportive infrastructure such as cooperatively managed water taps, electricity points, waste bins, and public toilets.
7	Compact	A Smart City encourages development to be compact and dense, where buildings are located close to one another and are ideally within a 10-minute walk of public transportation, forming concentrated neighborhoods. (Guidelines 2.3 and 5.2)	The city is expanding rapidly at its periphery into undeveloped land, rural or natural areas, or along industrial corridors - both formally and informally. Formal new development is occurring in a way that is "sprawling," meaning that the buildings spread across a wide area and are far from one another. Residents or tenants find it easier or safer to travel by automobile because it takes a long time to walk between destinations and there are busy roads separating buildings. Large pockets of land in the inner-city are vacant. New developments at the periphery tend to be large-scale residential developments, often enclosed with a gate and oriented to the automobile.	The city has one or two high density areas - such as the city center, or historic areas, where buildings are concentrated together and where people can walk easily from building to building and feel as though they are in center of activity. Most of the city consists of areas where buildings are spread out and difficult to walk between, sometimes with low-density per hectare. Regulations tend to favor buildings that are separated from one another, with lots of parking at the base and set-back from the streets. The city likely has some pockets of under-utilized land in the center. New formal developments at the periphery tend to be large-scale residential developments, often enclosed with a gate and oriented to the automobile.	The city has multiple high density clusters that are easy to walk around where buildings are close together. However, the city actively encourages development to occur on under-utilized parcels of land into high-density, walkable areas. When new formal large-scale development projects happen at the periphery, they are encouraged to be dense and compact, with buildings that are close together and line the streets. The city actively encourages or incentivizes re-development of under-utilized parcels in the inner-city, especially those located close to public transportation.	The city is highly compact and dense, making the most of land within the city. Buildings are clustered together, forming walkable and inviting activity centers and neighborhoods. Regulations encourage or incentivize re-development of under-utilized land parcels in the city center. Buildings are oriented to the street — and parking is kept to a minimum, located below ground or at the back of buildings. Public transport and walking connects residences to most jobs and amenities. Residential density is at an optimal with affordable housing available in most areas.	Scenario 2	Quantitative indicator: Rapid Transport Ratio (RTR) today: 1 km rapid transit per lakh population (This involves existing MRTS line, suburban rail corridors with headway of 20 min or less, Metro Ph 1 operational for CMA population) Persons near Transit (PNT): 15% of population live near rapid transit (Operational Metro + 79 km suburban rail) today. Additional data: - Chennai is a sprawling city where the City Corporation limits were expanded from 126 sq.km to 426 sq.km in 2012 - Chennai has high population density (498 PPH in corporation limits), but low built density with uniform base FSI of 1.5. Higher FSI is permitted based on road width, not transit-access. - Development regulations require minimum setbacks (high rise buildings require larger setbacks). - Development regulations mandate parking minimums.	Scenario 4 Chennai wants to adopt a Transit Oriented Development , with high density mixed use areas (of commercial and offices, retail) around nodes of public transportation, within easy reach of all residential areas. Metric: Rapid Transit Ratio (RTR) desired today: 2 km rapid transit per lakh population. Persons near Transit (PNT) desired today: At least 60% of metropolitan population lives within 500 m of a rapid transit station.	Especially low density, underutilized /vacant land and buildings around nodes of public transportation will have priority to be (re)developed. Retrofitting the public space in commercial areas, with an emphasis on pedestrian/cycle friendly space, in combination with high quality public transportation and feeder network, will allow for a much higher building densities, since the vehicular traffic load on the public space will be significantly reduced Create and implement framework for improving last mile connectivity to rapid transit through NMT improvements, provision of feeder services and improving transit infrastructure (bus stops, signages etc.) Improve delivery of urban services in existing transit-accessible urban areas to promote redevelopment. Work with other agencies in the city to encourage redevelopment of under-utilised parcels through appropriate modifications to Chennai Master Plan, Detailed Development Plans, and Development Control Regulations.

Annexure - 2

Chennai Smart City: Self Assessment

A	B	C	D	E	F	G	H	I	J	K
	Feature	Definition	Scenario 1 (BASE)	Scenario 2	Scenario 3	Scenario 4 (ADVANCED)	Self-assessment for the full city with regard to each feature	Basis for assessment and/or quantitative indicator (Optional - only if data exists)	Projection of 'where the city wants to be' with regard to the feature/indicator based on the city vision and strategic blueprint	Input/Initiative that would move the city from its current status to Advanced status (Scenario 4: Column G)
8	Public open spaces	A Smart City has sufficient and usable public open spaces, many of which are green, that promote exercise and outdoor recreation for all age groups. Public open spaces of a range of sizes are dispersed throughout the City so all citizens can have access. (Guidelines 3.1.4 & 6.2)	The city has very few usable public open spaces and very few usable green spaces. Available recreational spaces are located far away and are dispersed at long distances around the city. The few available public open spaces offer a limited variety of experiences for all sections of population and age groups such as places for sport, places for rest, and places for play.	A variety of public open spaces are available in some neighborhoods, but are not available in all the areas of the city or are located far away from residential areas -Many of the open spaces have access restrictions, or are not well-maintained. A variety of types of public open spaces may be lacking, such as natural areas, green areas, parks, plazas, or recreation areas.	Most areas of the city have some sort of public open space. There is some variety in the types of public spaces in the city. However, public spaces are sometimes not within easy reach or access of more vulnerable populations and are more restricted in poorer neighbourhoods.	Public open spaces are well dispersed throughout the city. Every residential area and work space has access to open space within 10 minutes walking distance. Open spaces are of various types - natural, green, plazas, parks, or recreation areas - which serve various sections of people. Public spaces tend to truly reflect the natural and cultural identity of the city.	Scenario 2	Quantitative indicator: Per capita open space in Chennai is 0.41 sqm per person as compared to WHO standards of 9 sqm (CMDA densification study) Basis for assessment: Along rapid transit-corridors currently under construction, share of parks is only 1% along Metro Corridor I and 2% in Metro Corridor II. (CMDA densification study)	Scenario 4 Chennai has several large green gardens and parks, public spaces with great opportunities to be retrofitted and reused as world class leisure destinations for all citizens and tourists alike.	Reinventing several gardens/parks/Open Spaces as attractive Public Spaces, by making them into 'recreational destinations' with a cultural dimension/theme, operated under the Smart City SPV can help to bring in new revenue to be invested in redesign/ maintenance/operations of these parks. By having NGO's, Museums or other Cultural/Educational Institutes participating under the umbrella of the SPV a 'theme/special events calender' could be added to make these spaces real destinations, e.g events related to Heritage protection, Art, Dance, Music, Theater, Yoga, Environment etc. Develop streets as public spaces by reclaiming space from motor vehicles. This can be in the form of permanent interventions like construction of pedestrian plazas or temporary interventions like car-free days. Develop streets abutting natural features like rivers & lakes as 'greenways' incorporating appropriate environmental planning and water management techniques. Repurpose excess street space not used for transportation as landscaped areas.
9	Housing and inclusiveness	A Smart City has sufficient housing for all income groups and promotes integration among social groups. (Guidelines 3.1.2)	Housing is very limited and highly segregated across income levels. Population growth far exceeds the creation of new housing. The poor live in informal settlements with limited to no access to basic services, and are concentrated in a few areas. The wealthy live in separate enclaves. Those in the middle have few , if any options.	Housing is available at most income levels but is highly segregated across income levels. Population growth slightly exceeds the creation of new housing. The wealthy and the middle class have housing that meets their needs at costs appropriate to their income. The poor live in informal settlements.	Housing is available at all income levels, but is segregated across income levels. The growth of supply of housing almost meets the rate of population growth. Increasingly, lower and middle-income people can find housing in areas that are conveniently located.	A wide range of a housing is available at all cost levels. The supply of housing is growing at pace with population. Affordable, moderate, and luxury housing are found clustered together in many areas of the city	Scenario 2	The number of Katcha housing has come down by 7% between 2001 and 2011. Chennai is ranked number one of the district in Tamil Nadu 1) about 77% of the housing roofs are made by concrete 2) 97% of the houses have bath,drainage facility. No of Homeless decreased. Tamil Nadu Housing Board has projects worth 18,796 units. TNSCB with 81,581 units and under housing for all scheme 249,971 units.	Scenario 4 1. Affordable, moderate and luxury housing clusters to be developed in the city 2. Housing for Economically Weaker Section to be fulfilled 3. Adequate infrastructure facilities to be provided for the upcoming housing projects 4. 100% efficiency in terms of Property tax collection to be achieved	1. Introduction of more number of affordable housing projects in the city 2. City's Real Estate Potential to be increased with introduction of more number of investments in the city 3. Facilitate plan approvals and property tax collection with efficient utilisation of e-Gov platform
10	Transport	A Smart City does not require an automobile to get around; distances are short, buildings are accessible from the sidewalk, and transit options are plentiful and attractive to people of all income levels. (Guidelines 3.1.5 & 6.2)	Personal automobile centric city with very few modal options. Long trip lengths for daily commute to work and education. Accessing various areas by walking or cycling is difficult. Women and vulnerable sections find it very difficult to move independently in the city. There is limited public transport. Vehicles cause high air and noise pollution levels in the city. Vehicles dominate public spaces and affect their effective functioning.	The street network system is elaborate but public transport choices are restricted. Public transport can be too expensive or unaffordable for the poor. Pedestrian infrastructure is only available in select areas. The majority of investments focus on reducing traffic congestion through the creation of more roads.	Network of streets are fairly complete. Public transport covers most areas of the city. However last mile connectivity remains incomplete -and affects transport options: Foot paths are accessible in most areas, whereas-concerns of safe crossings and security throughout the day remain. Parking zones are demarcated but absence of pricing increases over utilization of parking lots.	Street network is complete and follows a clear structure. Public transportation network covers the entire city and intensity of connection relates with the demand. Plenty of options of public transport are available and affordable for all sections of the society. There is multi-modal integration at all mass transit stations and organized-priced on street and off street parking. Walking and cycling is prevalent.	Scenario 3	Quantitative indicator: Mode share: NMT (28% walking + 6% cycling), public transport (26% bus, 5% rail), private vehicles (32%), IPT (7%) City bus availability: 42 buses per 1 lakh population (3798 buses for 89.17 lakh population (CMA 2011)) NMT infrastructure: Footpath improvements have been completed on 26 bus route roads and additional 20 streets under construction with min.clear width 1.8m, no cycle tracks present. Road safety: 16 deaths per lakh population per year (Source: 4 ppl die on Chennai roads everyday, of which a significant portion are NMT users - Transparent Chennai data for 2010-12. Per lakh figures based on CMA population (2011))	Scenario 4 Metrics: Mode share: NMT to be stabilised at current levels or increases in the future, public transport mode share to increase to 46% of all modes (ie. 70% of motorised modes) (CCTS 2008). City bus availability: 50 buses per 1 lakh population NMT infrastructure: 80% of bus-route roads to have footpaths with minimum clear width of 1.8m, RoW >=24m to have cycle tracks.	Reduce dependence on automobiles by shifting users to walking, cycling and public transport through creation of NMT infrastructure. Improve last mile connectivity to rapid-transit by providing alternate means of transportation through cycle-sharing systems, feeder services, bus stop improvements etc. Restrict private vehicle use by implementing a smart, IT-based on-street parking management system with demand-based pricing. Increase spending on sustainable transport in the city by setting up a dedicated Urban Transport Fund (UTF) under the Smart City SPV. Fund this UTF through various sources of revenue like revenue from parking management, value capture, and existing revenue sources. Create and adopt appropriate guidelines to utilise this fund to promote sustainable transport projects.

Annexure - 2

Chennai Smart City: Self Assessment

A	B	C	D	E	F	G	H	I	J	K
	Feature	Definition	Scenario 1 (BASE)	Scenario 2	Scenario 3	Scenario 4 (ADVANCED)	Self-assessment for the full city with regard to each feature	Basis for assessment and/or quantitative indicator (Optional - only if data exists)	Projection of 'where the city wants to be' with regard to the feature/indicator based on the city vision and strategic blueprint	Input/Initiative that would move the city from its current status to Advanced status (Scenario 4: Column G)
11	Walkable	A Smart City's roads are designed equally for pedestrians, cyclists and vehicles; and road safety and sidewalks are paramount to street design. Traffic signals are sufficient and traffic rules are enforced. Shops, restaurants, building entrances and trees line the sidewalk to encourage walking and there is ample lighting so the pedestrian feels safe day and night. (Guidelines 3.1.3 & 6.2)	The city is designed mainly for the automobile. Daily life without a car requires long bus rides. Walking is difficult and often dangerous; there are few pavements, existing pavements need repair and lack trees to provide shade for pedestrians, and marked pedestrian crossings are rare. New buildings have their main entrances set-back from the street, sometimes with large driveways or parking lots separating them from the street, and sometimes are enclosed by gates. Traffic signals are often disobeyed	Older areas of the city see a mix of pedestrians, cyclists, and vehicles but newer areas are focused mainly on the automobile. In the new areas, there are few pavements and main entrances to new buildings are not accessible from the front of the street. large driveways or parking lots often separating them from the street, and sometimes are enclosed by gates. In these areas, traffic signals are disobeyed.	The city has a good network of pavements and bike lanes. Buildings in most areas of the city are easily accessible from the pavement. However, traffic signals are sometimes disobeyed and it can feel difficult to cross the street.	The city is highly walkable. Pavements exist on every street and are maintained. Trees line many sidewalks to provide shade for pedestrians. Buildings in most areas of the city are easily accessible from the sidewalk. Traffic signals control the flow of automobiles and are enforced. A network of bike lanes exists to promote cycling as a means of transport. Traffic rules are followed and enforced with great seriousness.	Scenario 3	Quantitative indicator: NMT infrastructure: 5% (18km or 26 nos) of bus-route roads in the city have wide continuous footpaths (Additional 4% or 20 nos is under construction). Spending on NMT infrastructure by CoC: INR 2.5 crore to INR 3.0 crore per km Pedestrian & cyclist fatalities: 44 % of road deaths are pedestrians & cyclists (RADMS data, from Traffic Police) Additional data: Despite investments in 45km Metro network, 34% of the roads along the Metro corridor do not have any footpaths. Only 6% of major roads along Metro have footpaths of desirable width >=2.5 . Only 2% of access roads to metro stations have footpaths of width 2m or more. 19% of road network along metro corridors do not have streetlights . (CMDA densification study)	Scenario 4 Chennai aims to be a highly walkable and bicycle friendly city, with Pavements on every street and trees lining many sidewalks to provide shade for pedestrians and cyclists. Buildings in most areas of the city are easily accessible from the sidewalk. Traffic signals control the flow of automobiles and are enforced. A network of bike lanes exists to promote cycling as a means of transport. Traffic rules are followed and enforced with great seriousness. Quantitative indicator: 80% of all bus-route-roads will have wide continuous footpaths (NMT Policy) Spending on NMT infrastructure: City will invest 60% of its transport budget to NMT initiatives (NMT Policy) Pedestrian and cyclist fatalities: 0% (NMT Policy) Development Plan regulations may specify that that no front setbacks required in plots and shall disallow front compound walls.	The Area Based Development will be having all main street retrofitted with wide sidewalks and bicycle lanes, and pedestrian friendly squares and parks. A comprehensive and integral Urban design and Heritage Protection, Parking and Mobility plan will be adopted, to make the Area Based development a Walkable Area. Based on the successful implementation of the Area Based Pedestrian Focused Retrofitting, a Pan City NMT Policy (walking and cycling) will be developed. Build wide continuous footpaths along bus-route roads in the city. Standardize construction of footpaths by adopting and implementing an NMT masterplan for the city, detailing out standard street sections (based on street character, RoW, public transport/ NMT access, vehicular speeds), construction standards and processes, phasing and implementation of road works. Test this masterplan in the area-level proposal. Put in place effective institutional structures (a Public Space Management cell) to oversee street design, construction, infrastructure maintenance and operational management of streets. Hire professional urban designers, project management experts etc. to staff this cell. Improve safety in public spaces by installing LED street lights. Develop relevant urban design guidelines that contribute to creation of vibrant streets. Work with other agencies in the city to adopt these guidelines in the Chennai Master Plan, Development Regulations.
12	IT connectivity	A Smart City has a robust internet network allowing high-speed connections to all offices and dwellings as desired. (Guideline 6.2)	City has no major plans to bring increased high speed internet connectivity to the public.	The city has made plans to provide high speed internet connectivity through the existing framework.	The city makes has high speed internet connectivity available in most parts of the city.	The city offers free wifi services to provide opportunity for all the citizens to connect with high speed internet across the city.	Scenario 3 for Pan-city and area based development	• Chennai city has high speed internet access for most of its citizens through public and private service providers • Wi-Fi access in 21 public places • Major part of the area is under Overhead IT cables and some part has covered underground cables	Scenario 4 100% internet connectivity (wired and wireless) to all its citizens • Wi-Fi access in all public places • All overhead cables to be underground • Improved speed	Readiness of the city: • Has high speed internet access for citizens already • Plans are under way to provide Wi-Fi facilities at public spaces. Initiative to move the city from current status to advanced status: 1. Installing Wi-Fi zones in all public spaces 2. Improve average down time of internet and telephonic lines 3. Convert all overhead communication lines to underground

Annexure - 2

Chennai Smart City: Self Assessment

A	B	C	D	E	F	G	H	I	J	K
	Feature	Definition	Scenario 1 (BASE)	Scenario 2	Scenario 3	Scenario 4 (ADVANCED)	Self-assessment for the full city with regard to each feature	Basis for assessment and/or quantitative indicator (Optional - only if data exists)	Projection of 'where the city wants to be' with regard to the feature/indicator based on the city vision and strategic blueprint	Input/Initiative that would move the city from its current status to Advanced status (Scenario 4: Column G)
13	ICT-enabled government services	A Smart City enables easy interaction (including through online and telephone services) with its citizens, eliminating delays and frustrations in interactions with government. (Guidelines 2.4.7 & 3.1.6 & 5.1.4 & 6.2)	Essential Government services are not linked with online platforms. Paper intensive interactions with the local Government continues. Receiving services and response to citizen complaints take a long time. There is limited availability of data to monitor service delivery.	Some of the public services are provided online and infrastructure for total digitalization is not in place. Service delays occur regularly in some sectors. Responses to citizen inquiries or complaints are often delayed. No integration between services and billing.	Most of the services are provided online and offline. Data transparency helps monitoring. Systems and processes to better coordinate between various Government agencies are being developed.	All major services are provided through online and offline platforms. Citizens and officials can access information on accounting and monitor status of projects and programs through data available on online system. Robust data infrastructure system shares information and enhances internal governmental coordination.	Scenario 3 for Pan-City and area based	City has most of e-governance services as web based 1. Helpline no 1913 2. Online customer Complaint system 3. Online tax payment 4. Recording of solid waste details on mobile 5. SMS based Public Grievance Redressal System on mobile No: 9789951111 Interaction with municipal authorities Quantitative indicator: 23 charged on-street parking spaces per lakh population (~2000 parking spaces are currently managed by CoC)	Scenario 4 100% e-governance system 1. Implementation of Disaster management system including Emergency rescue operation plans 2. 24x7 customer care services 3. Integration of smart parking system and Integration of smart bus feeder system operation with the city mobility plan Improving multi-modal integration by providing seamless connectivity across different transport modes using customer-centric on-street parking & cycle sharing systems. These systems feature cashless transactions, real-time data available to customers through apps/ websites so that they can plan their trips better. Metrics: 400 charged on-street parking spaces per 1 lakh population, with IT-based customer-oriented parking management systems. Total parking supply (on-street and off-street) remains at 2015 levels or reduces in the future. Smart cycle sharing system with 200 cycles per 1 lakh population.	Readiness of the city: Has web & mobile based e-governance system in place. Initiative to move the city from current status to advanced status: Smart Chennai 1. All government services in a Single Window System; Web based and mobile apps based utility services, Public grievance redressal system using mobile app and SMS based systems 2. Personalised public services and transparency in public administrations 3. Capacity building process with government officials and citizens 4. GIS mapping of all utilities Improve public space management by creating a "Streets Portal" - an IT-based, geo-spatial project monitoring system to oversee design, construction and implementation of streets improvement projects. Create a unified payment portal/ e-wallet for citizens to pay for various public transport services. Such a portal must be linked to on-street parking management system and cycle-sharing system, so that citizens can access real-time data on available parking spaces, maps of the cycle-sharing systems, station locations, applicable rates etc. A citizen complaint redressal system can also be integrated with this app. CoC will work with other agencies to ensure relevant transit information and other services are also a part of this app.
14	Energy supply	A Smart City has reliable, 24/7 electricity supply with no delays in requested hookups. (Guideline 2.4)	There is only intermittent electricity supply with regular power shedding. Many residents have to plan their days around when power is available.	Electricity supply and loads are managed as per demand and priority for various functions with clear scheduling, with electricity being available in many areas for most hours of the day.	Electricity is available in most parts of the city for most hours of the day but some areas are not so well-served. Smart metering exists in some parts of the city but not all.	Electricity is available 24 x 7 in all parts of the city with smart metering linked to online platforms for monitoring and transparency.	Scenario 3 for Pan -city and area based	1. No scheduled power cuts 2. AT&C losses reduced to 17.61% 3. Power Supply through underground lines at most locations 4. Downtime is 3 hr for consumer service connection 5. Many initiatives to utilise renewable energy sources 6. Smart metering introduced for 55 customers as a pilot project. This is planned to be implemented at PAN city level	Scenario 4 Uninterrupted Power supply (24x7) with no outage • 100% power supply through underground cables • Average downtime of power supply in city to be less than 1 hr for consumer service connection • Implementation of Smart bi-directional net meters (100% in city) at consumer level • Micro grid based monitoring system • Minimum 10% of solar energy to be tapped	Readiness of the city: 1,02,495 Smart meters are already installed Initiative to move the city from current status to advanced status: Smart Energy Management 1. Use of solar power 2. Introduction of smart bidirectional net meters for 100% city households. 3. Introduction of Micro-grid based distribution management system 4. Convert all overhead lines to underground cables with RFID tagging.

Annexure - 2

Chennai Smart City: Self Assessment

A	B	C	D	E	F	G	H	I	J	K
	Feature	Definition	Scenario 1 (BASE)	Scenario 2	Scenario 3	Scenario 4 (ADVANCED)	Self-assessment for the full city with regard to each feature	Basis for assessment and/or quantitative indicator (Optional - only if data exists)	Projection of 'where the city wants to be' with regard to the feature/indicator based on the city vision and strategic blueprint	Input/Initiative that would move the city from its current status to Advanced status (Scenario 4: Column G)
15	Energy source	A Smart City has at least 10% of its electricity generated by renewables. (Guideline 6.2)	The city does not have any renewable sources of energy and there is no commitment to promote this for the foreseeable future.	The city is preparing plans for ensuring that it gets more energy from renewable sources and is in the process of making commitments in this regard.	Some energy consumed in the city is produced through renewable sources. There are long term targets for higher renewable energy capacities and the city is making plans to achieve these.	At least 10% of the energy used in the city is generated through renewable sources. The city is undertaking long-term strategic projects to tap renewable sources of energy in its region/beyond to increase the percentage of renewable energy sources.	Scenario 3 for Pan -city and area based	1. 95% Energy from non renewable sources 2. 5% Energy from renewable sources Solar - 358.26 MW Wind - 7,498.55 MW Biomass - 230 MW Bagasse based Cogen - 659.4 MW 3. Auto rickshaw/ public vehicles are operated predominantly on Diesel/Petrol 4. 23 Auto LPG Dispensing Stations 5. 2 STP plants providing energy Data from electrical authorities and websites	Scenario 4 1. 10% of power consumption through renewable energy sources 2. Conversion of all public vehicles into Electric/Battery operated vehicles 3. Solar power charging at all important locations for charging	Readiness of the city: • Households already opting for solar roof top system • Tamilnadu government is providing subsidy of Rs.20,000/- up-to 1kWp installation through TEDA • 30% subsidy offered by MNRE, Govt of India Initiative to move the city from current status to advanced status: 1. Clean Energy to all citizens 2. Citizen awareness for installing solar roof top system. 3. All STP's to be installed with power generation mechanism. 4. Landfill sites to be provided with waste to energy/ Bio-methanation plants
16	Water supply	A Smart City has a reliable, 24/7 supply of water that meets national and global health standards. (Guidelines 2.4 & 6.2)	The city has a poor water supply system with limited water availability. There are no clear targets to achieve higher quality and optimal quantity standards. Unaccounted water loss is above 40%	The city has intermittent water supply and availability. However it is setting targets and processes in place to try to improve its water supply. Unaccounted water loss is less than 30%.	The city has 24 x 7 water supply in most areas but the quality of water does not meet international health standards. Unaccounted water loss is less than 20%.	The city has 24 x 7 treated water supply which follows national and global standards and also available in sufficient quantity and affordable across all sections of the society. Unaccounted loss less than 15%.	Scenario 2 for pan city	1. Network coverage - 5275 km 2. Per Capita supply - 75.22 LPCD 3. Extent of UFW - 11.34% 4. Continuity of water supply - 2-3 hours 5. Efficiency in redressal of customer complaints- 87% 6. Quality of water -92.38% 7. Supply of tertiary treated water to industries - 36 MLD 8. Revenue Collectio - INR 350 crores with 86% efficiency Service Level Improvement Plans submitted to GoI for AMRUT	Scenario 4 Meet MOUD guideline in water supply system • 135LPCD supply • 24x7 supply • UFW to less than 5% • Efficiency in customer complaint redressal system - 95% • 100% metering • 100% quality water • Efficiency in collection of user charges - 95% • 24x7 customer helpline service • Pressure, flow and water quality monitoring- 100%	Readiness of the city • Water supply Master plan prepared in 2015 is in place with identified water supply components for the entire corporation areas. Initiative planned for achieving the advanced status • Smart Metering, DMA • Smart Water - Digital Solutions for Citizen Services • GPRS enabled payment collection system • Volumetric billing and online collection system. • Leak detection and reduction strategies; improved O&M practices. • Awareness campaign.
17	Water management	A Smart City has advanced water management programs, including smart meters, rain water harvesting, and green infrastructure to manage stormwater runoff. (Guideline 6.2)	The city does not measure all its supply. It does not recycle waste water to meet its requirements and rain water harvesting is not prevalent. Flooding often occurs due to storm water run-off.	The city has meters for all its water supply but lacks mechanisms to monitor. Water wastage is very high. Some, but not much, rainwater harvesting exists.	The has meters for all its water supply with some smart mechanisms to monitor. Rainwater harvesting systems are installed and storm water is collected and stored in water bodies. However, recycling of waste water and reusage of storm water is limited.	The city has meters for all its water supply. It includes smart mechanisms to monitor remotely. Rainwater harvesting systems are installed and utilised through the city and storm water is collected and stored in water bodies and treated for usage. Recycled waste water is supplied for secondary uses.	Scenario 3 for pan city and area based.	1. Present supply to city is 530 MLD 2. The city has 3.06% consumer meters. 3. UFW - 25% 4. Rain water harvesting system is mandatory for all new building approvals. 5. Supply of 36 MLD of Tertiary treated water to industries. 6. Drainage network coverage- 35%. 7. Flooding at 296 locations pan on city level. Service Level Improvement Plans submitted to GoI for AMRUT	Scenario 4 Sustainable water and waste water management • 100% metered connections. • Flow measurement 100% • Rain Water Harvesting System – 100% • Drainage Coverage 100% • Flooding locations - zero • 100% Sewer networks coverage with treatment and reuse options • Ban on ground water extraction • GIS Integrations	Readiness of the city • Master plan under preparation for water supply and sewerage system for the entire corporation area. Funding is expected to be made from Amrut Scheme. • 36 MLD of Tertiary treated water is in reuse already Initiative planned for achieving the advanced status • Smart Water - Digital Solutions for Citizen Services Integrated Water, Waste water and Storm water Management system • Complete network coverage for Water, wastewater and storm water system including system automation and monitoring of flows. • GIS based utility map; periodic updation of O&M aspects • Special emphasis on Rainwater harvesting Reduce stormwater runoff by increasing the permeable surface area through the planting of street trees and landscaping, and minimising unnecessary pavement and increasing permeability of parking areas. Increase coverage of storm-water drain network in the city. Design drain networks so that water drains off of NMT infrastructure into appropriate channels and catch pits. At no point will footpaths, cycle tracks, or other NMT facilities lie at the lowest level in the street cross section, except in the case of NMT-only streets. Storm water facilities will be maintained regularly to prevent flooding of streets.

Annexure - 2

Chennai Smart City: Self Assessment

A	B	C	D	E	F	G	H	I	J	K
	Feature	Definition	Scenario 1 (BASE)	Scenario 2	Scenario 3	Scenario 4 (ADVANCED)	Self-assessment for the full city with regard to each feature	Basis for assessment and/or quantitative indicator (Optional - only if data exists)	Projection of 'where the city wants to be' with regard to the feature/indicator based on the city vision and strategic blueprint	Input/Initiative that would move the city from its current status to Advanced status (Scenario 4: Column G)
18	Waste water management	A Smart City treats all of its sewage to prevent the polluting of water bodies and aquifers. (Guideline 2.4)	The city is unable to treat all its sewage. Many local sewer lines open on to water bodies and open ground and pollute the environment.	Most waste water is collected and treated before before disposal. However the treated water does not meet standards and is not recycled for secondary uses.	All the waste water is collected and treated before before disposal. It is also treated to a high standard and some is recycled.	The city has zero waste water because all the waste water is collected, treated and recycled. It meets standards an reduces the need for fresh water.	Scenario 3 for pan city and area based	1. Sewer network of 4816.84 km out of 5941.64 km road. 2. 6 STP's of 769 MLD 3. Quality of sewage treatment -100% 4. Extent of reuse – 7.6% 5. Electricity generation –42MWhr 6. Extent of cost recovery -60%. 7. Efficiency in redressal of customer complaints -60% 8. Efficiency in sewage charges- 60% Service Level Improvement Plans submitted to Gol for AMRUT	Scenario 4 100% collection and treatment of waste water including recycling- meet MOUD benchmark. • Network coverage- 100% • Collection efficiency - 100% • Adequacy of STP- 100% • Quality of sewage treatment - 100% • Extent of reuse - 100% • Extent of cost recovery -90%. • Efficiency in redressal of customer complaints -90% • Efficiency in collection - 90%	Readiness of the city • The city has waste water collection network covering about 67% of the area; the city has complete Master plan prepared for Waste water system already. The project is planned to be funded under AMRUT Scheme. • Automation of SPS and STP already implemented Initiative planned for achieving the advanced status Implementation of Integrated Waste water management system • 100% network coverage • Complete automation of sewage system. • Installation of flow / level sensors at strategic locations. • 100% reuse of waste water. • Recycled wastewater quality monitoring • GPRS enabled payment collection system • Efficiency in customer complaint redressal system
19	Air quality	A Smart City has air quality that always meets international safety standards. (Guideline 2.4.8)	City does not have plans, policies or programs to improve the air quality. Systems to monitor air quality are absent.	City has programs and projects to monitor air quality and spatialising the data to ascertain reasons for degrees of pollution in the air. A few strategies to decrease air pollution have been implemented.	City has programs and projects to monitor air quality and spatialising the data to ascertain reasons for degrees of pollution in the air. Pollution levels are acceptable.	The city has clean air by international standards. Live Air quality monitoring cover the entire city and data of air quality are mapped.	Scenario 2 for pan city and area based 1. Automobiles are the main source of air pollution. 2. Air quality doesn't comply with national & international standards. 3. Air monitoring stations have been established at 8 locations	Pollution control board standard Quantitative metrics: Vehicular pollution alone accounts for 71% of total pollution in the city followed by industrial pollution (20%). (CMDA Densification study) Noise levels exceed permissible norms at all locations in the city (CMDA densification study)	Scenario 4 Air quality meeting the national standards 1. The city has clean air by international standards. 2. Live Environmental Quality monitoring covering the entire city	Readiness of the city 1. Implementation plans in place for NMT policy 2. Metro rail is in operation already 3. Emphasis on public mass transportation system already 4. Traffic CCTV camera installation at important junctions Initiative planned for achieving the advanced status • Air monitoring stations at strategic locations including its display system; mapping on GIS. • Intelligent transportation / traffic management system • Comprehensive mobility plan • Effective communication to stakeholders • Emphasis on mass transportation system Reduce air and noise pollution by promoting non-motorised NMT modes (walking & cycling) through construction of footpaths, cycle sharing systems and improving transit access. Restrict vehicle use by implementing on-street parking management systems. Set up appropriate air-quality and noise pollution monitoring systems in the city. Work with the State Pollution Control Board/ others to monitor air quality levels at multiple locations.
20	Energy efficiency	A Smart City government uses state-of-the-art energy efficiency practices in buildings, street lights, and transit systems. (Guideline 6.2)	City has no programs or controls or incentive mechanisms to promote or support energy efficiency in buildings	The city promotes energy efficiency and some new buildings install energy efficiency systems that track and monitor energy use and savings.	Most new public buildings install energy efficiency systems and some older buildings are also retrofitted to be more energy efficient. Local government conducts counselling and outreach with developer, businesses and residents to adopt energy efficiency strategies	All the existing old and new public buildings employ energy efficiency principles in development and operation and apply for energy rating by national and international forums. Many non-public buildings are also energy efficient because the government promotes energy efficiency through incentives and regulations.	Scenario 3 for pan city and area based	Town planning authority has already given regulations for energy efficient systems in new upcoming buildings under corporation area. 1. Transmission & Distribution losses is reduced by 17.61% 2. Corporation has already converted 35,329 Sodium Vapour lamps to smart LED street lighting system Data from Municipal Corporation	Scenario 4 100% smart LED street lighting system at Pan-city level and energy efficient practices for buildings resulting in less power demand	Readiness of the city: Corporation has already converted 35,329 Sodium Vapour lamps to smart LED lights, 61,379 new LED lights installed and planned to install another 30,012 in the city. Initiative to move the city from current status to advanced status: Creation of 100% energy Efficient system 1. Energy audit of Pumping stations; replacement of non efficient pumps. 2. Convert all remaining 1,51,759 sodium vapour lamps to smart LED lighting. 3. Building approvals only after installation of energy efficient practices 4. Energy efficient lighting system at public spaces 5. Public awareness programs
21	Underground electric wiring	A Smart City has an underground electric wiring system to reduce blackouts due to storms and eliminate unsightliness. (Guideline 6.2)	City does not have plans for underground electric wiring system.	More than 40% of the city has underground electric wiring system.	More than 75% of the city has underground electric wiring system.	More than 90% of the city has underground electric wiring system.	Scenario 4 for pan city and area based	City has most of its power distribution as underground lines	Scenario 4 100% underground cabling system	Readiness of the city: At most areas in the city, the electrical cables for street lights are underground Initiative to move the city from current status to advanced status: 1. Conversion of existing 59.7km HT Overhead distribution lines and 187.5km LT Overhead distribution lines to underground cables with RFID tagging for effective monitoring and maintenance of electrical service lines

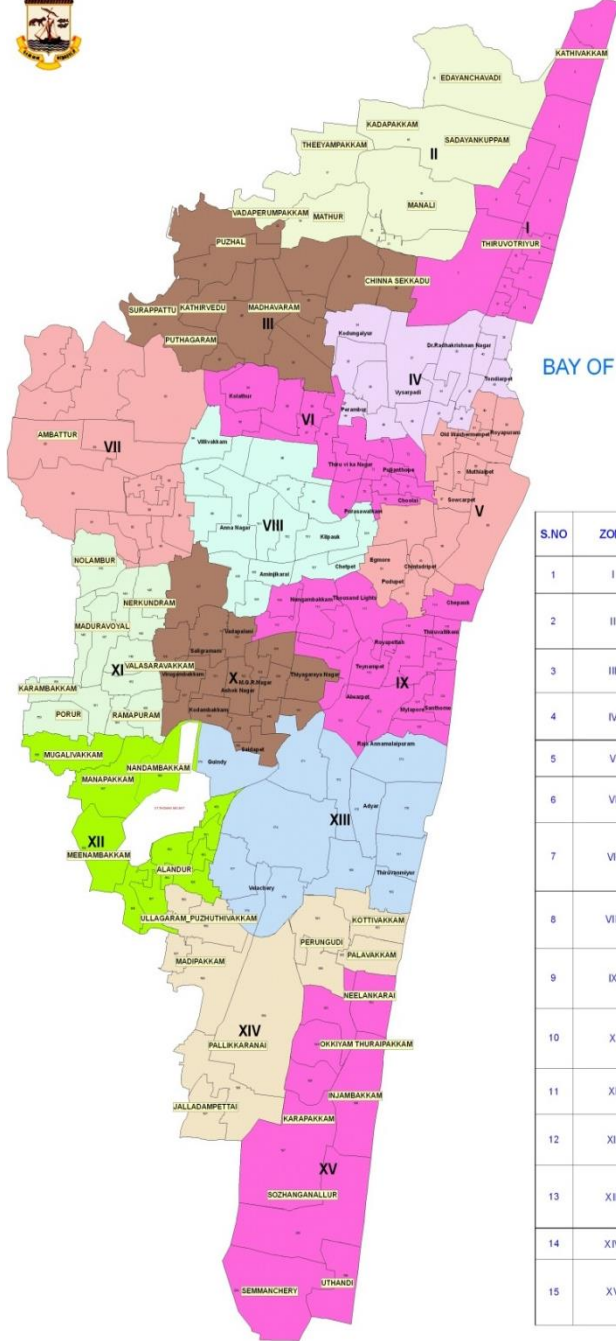
Annexure - 2

Chennai Smart City: Self Assessment

A	B	C	D	E	F	G	H	I	J	K
	Feature	Definition	Scenario 1 (BASE)	Scenario 2	Scenario 3	Scenario 4 (ADVANCED)	Self-assessment for the full city with regard to each feature	Basis for assessment and/or quantitative indicator (Optional - only if data exists)	Projection of 'where the city wants to be' with regard to the feature/indicator based on the city vision and strategic blueprint	Input/Initiative that would move the city from its current status to Advanced status (Scenario 4: Column G)
22	Sanitation	A Smart City has no open defecation, and a full supply of toilets based on the population. (Guidelines 2.4.3 & 6.2)	Many parts of the city do not have access to sanitation infrastructure and facilities.	Sanitation facilities are available to 70% of the city's population.	Sanitation facilities are available to 90% of the city's population.	Sanitation facilities are available to 100% of the city's population.	Scenario 2 for pan city and Scenario 4 for area based	<ul style="list-style-type: none"> The city has sanitation facilities coverage to 75% lavatories of the city population 66.99% of sewerage collection network Community toilets of more than 800 nos Site visit and data from Corporation of Chennai	Scenario 4 100% Clean and Hygiene city 1. Sanitation facilities to 100% of the population 2. Adequate public toilet facilities as per National Urban Sanitation Policy	Readiness of the city Work on Swachh Bharat Mission ongoing for addressing the issue of open-defecation by floating population Initiative planned for achieving the advanced status • Database of households that don't have sanitation facilities. • Providing 100% sewage facilities to all slums. • Installation of community toilets at all public places • Proper emphasis on O&M aspect.
23	Waste management	A Smart City has a waste management system that removes household and commercial garbage, and disposes of it in an environmentally and economically sound manner. (Guidelines 2.4.3 & 6.2)	Waste collection systems do not pick up waste on a frequent basis and waste often enters into water bodies.	Waste generated is usually collected but not segregated. Recycling is attempted by difficult to implement.	Waste is segregated, collected, recycled and disposed in an environmentally sound manner.	The city reduces land fill caused by waste so that it is minimal. All the solid waste generated is segregated at source and sent for recycling. Organic waste is sent for composting to be used for gardening in the city. Energy creation through waste is considered.	Scenario 2 for pan city and area based	1. Waste generated - 5099 MT. 2. Per capita generation - 700 g. 3. Collection efficiency - 100%. 4. Segregation at source - 5% 5. Transported using vehicles to landfill sites at Kodungayur and Perungudi 6. 36 composting plants handling 38.5 MT and 10 Waste-to-energy plants handling 7.75 MT Corporation of Chennai	Scenario 4 Scientific handling of waste- 4 R concept including Waste to Energy plants 1. Collection efficiency - 100% 2. Source Segregation - 100% 3. Scientific management of the landfill sites 4. MSW management process - as per global standards. 5. Door to door collection-100% 6. Organic composting Plant – 100% 7. Waste to energy Plants – 100%.	Readiness of the city • Reclamation of landfill sites at Kodungaiyur and Perungudi • Privatization of conservancy operations. • Geogencing of Bins Initiative planned for achieving the advanced status Implementation of effective waste management system • Implement 4R concept i.e Reduce, recycle, reuse and Refuse. • Introduction of 3bin system. • Pay as much you throw • GPS tracking of vehicles; Automatic Weigh bridges; System Integration • Surveillance system • Training of staff • Penalty aspects
24	Safety and security	A Smart City has high levels of public safety, especially focused on women, children and the elderly; men and women of all ages feel safe on the streets at all hours. (Guideline 6.2)	The city has low levels of public safety - most groups of residents feel insecure during most parts of the day in many parts of the city.	The city has medium levels of public safety - some more vulnerable groups feel insecure during some points of the day and in some parts of the city	The city has high levels of public safety - all citizens including women, children and the elderly feel secure in most parts of the city during most time in the day.	The city has very high levels of public safety - all residents feel safe in all parts of the city during all hours of the day.	Scenario 4 for pan city and area based	Voted as Best City in India twice by India Today - 2014 & 2015 Surveillance systems installed in most parts of the city and patrolling activity 1. Accidents - 9705 2. Fatal Incidents - 1247 3. CCTV Cameras installed at few locations State Transport Authority, Government of Tamilnadu	Scenario - 4 Safe and secure city (24 x 7) for all citizens (particularly women, children and elderly)	Readiness of the city: 1. Dial 100 implemented for citizen safety. 2. ongoing Safety measures taken by traffic department Initiative to move the city from current status to advanced status: Implementation of technology/ Web / App based Security system • Intelligent traffic management and Video Surveillance system for real time monitoring • Two way communication system from central command centre. • GPS based Public Vehicle Tracking system.



CORPORATION OF CHENNAI



S.NO	ZONE	NAME OF THE ZONE	WARD NUMBER
1	I	THIRUVOTRIYUR	1 TO 14
2	II	MANALI	15 TO 21
3	III	MADHAVARAM	22 TO 33
4	IV	TONDIARPET	34 TO 48
5	V	ROYAPURAM	49 TO 63
6	VI	THIRU-VI-KA NAGAR	64 TO 78
7	VII	AMBATTUR	79 TO 93
8	VIII	ANNA NAGAR	94 TO 108
9	IX	TEYNAMPET	109 TO 126
10	X	KODAMBAKKAM	127 TO 142
11	XI	VALASARAVAKKAM	143 TO 155
12	XII	ALANDUR	156 TO 167
13	XIII	ADYAR	170 TO 182
14	XIV	PERUNGUDI	188, 189 183 TO 191
15	XV	SOZHANGANALLUR	192 TO 200

Geographical Area of Chennai

Old City Corporation Area (155 wards)	176 Sq.km
New City Corporation Area (200 wards)	426 Sq.km
Chennai Metropolitan Area	1,189 sq.km

Chennai Factsheet

State	Tamil Nadu
Area	426 sq.km.
Population	6.5 million (2011)
Density	15,258 per sq.km
Time zone	GMT + 5:30
Climate	Tropical Wet & Dry Climate
Temperature	Max 40 °C / Min 15 °C

Demographic Indicator

Population	6.5 million (2011) – 6% of total population of TN
Decadal Growth Rate of Population	25.99 % (2001-2011)
Literacy Level	81.26% (2011)
Sex Ratio (Females for 1000 males)	989 (2011)
Human Development Index	0.817
Household Size	4.02

Source:
Second Master Plan,
CMA – 2026
Census of India

Chennai Advantage



INFRASTRUCTURES



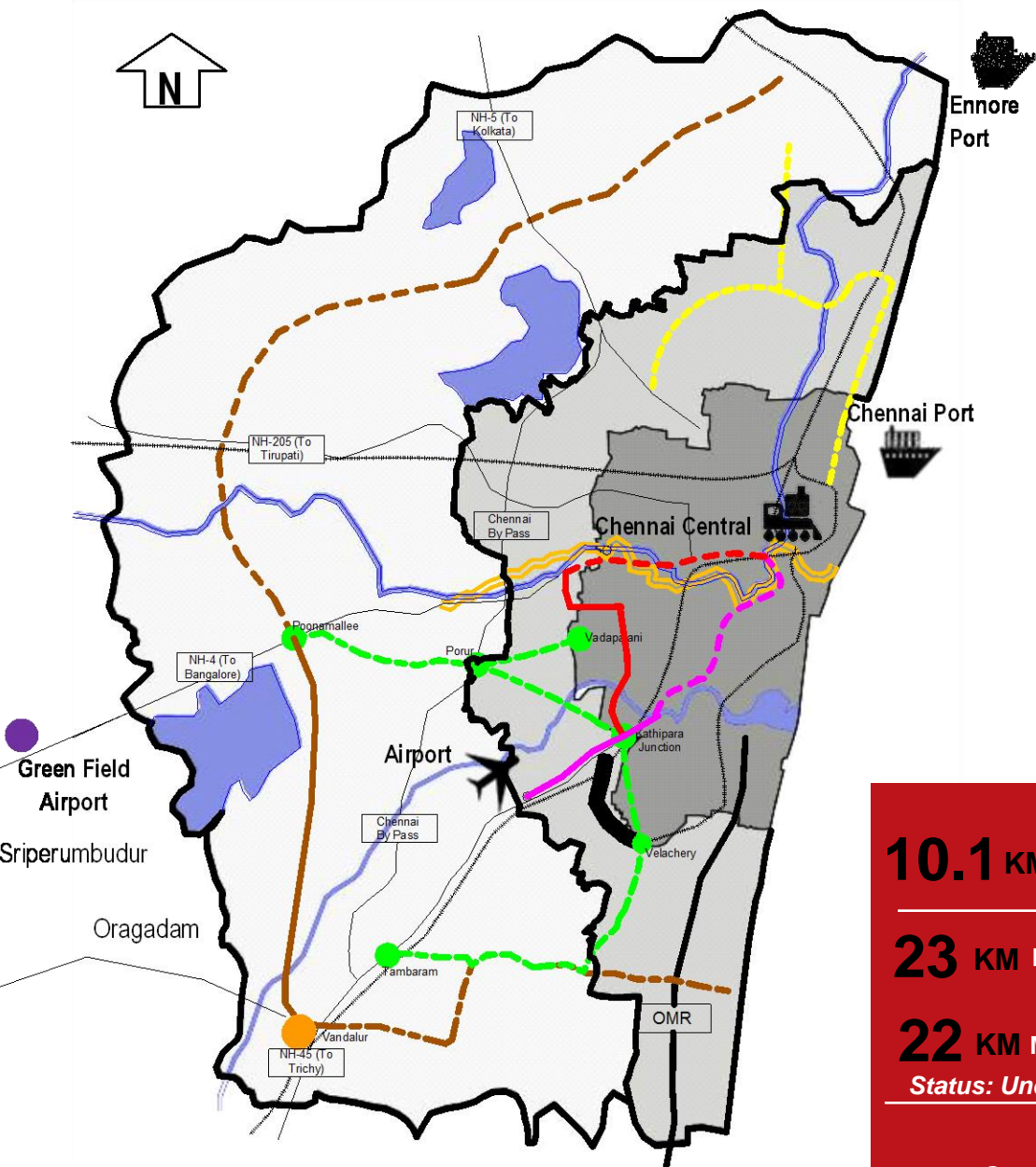
- Proposed infrastructure including a **45.1 kms of Metro Rail, Green Field Airport, 62 kms of Outer Ring Road, MRTS stretching 45 kms by 2015 and another 55 kms by 2020, 19 flyovers and underpasses, 15 BRTS corridors by 2020**
- Modern Port and Inland Port infrastructure



Automobile Industries



IT/ITeS Industries



LEGEND	
Infrastructure	Symbol
Metro Corridor II (Elevated)	Red solid line
Metro Corridor II (Underground)	Red dashed line
Metro Corridor I (Elevated)	Pink dashed line
Metro Corridor I (Underground)	Pink solid line
ORR (u/c)	Orange dashed line
ORR Operational	Orange solid line
MRTS-II Line (u/c)	Black solid line
EMRIP (u/c)	Yellow dashed line
Monorail (Proposed)	Green dashed line
NH & Major Roads	Grey solid line
Sub-urban Railway	Black line with vertical bars
Express way	Thick orange solid line
New CMBT	Orange circle
Greenfield Airport	Purple circle
District & Corporation Boundary	Black line
Water Bodies	Blue area
Chennai Corporation	Old (Grey)
Chennai Corporation	New (Light Grey)
Chennai Metropolitan Area	CMA (White)

Source: Various Sources

10.1 KM Operational Metro line in Phase 1

23 KM Metro Corridor I

22 KM Metro Corridor II
Status: Under construction

Greenfield Airport at Sriperumbudur
Second airport for Chennai city
Status: Proposal Stage

Monorail Phase-1 – Total length of 57.09 km

23 KM Monorail Corridor I (Vandalur to Velachery)

16 KM Monorail Corridor II (Poonamallee to Kathipara)

18 KM Monorail Corridor III (Poonamallee to Vadapalani)
Status: Bidding Process Stage

4 National Highways
NH-4, NH-5, NH-205, NH-45

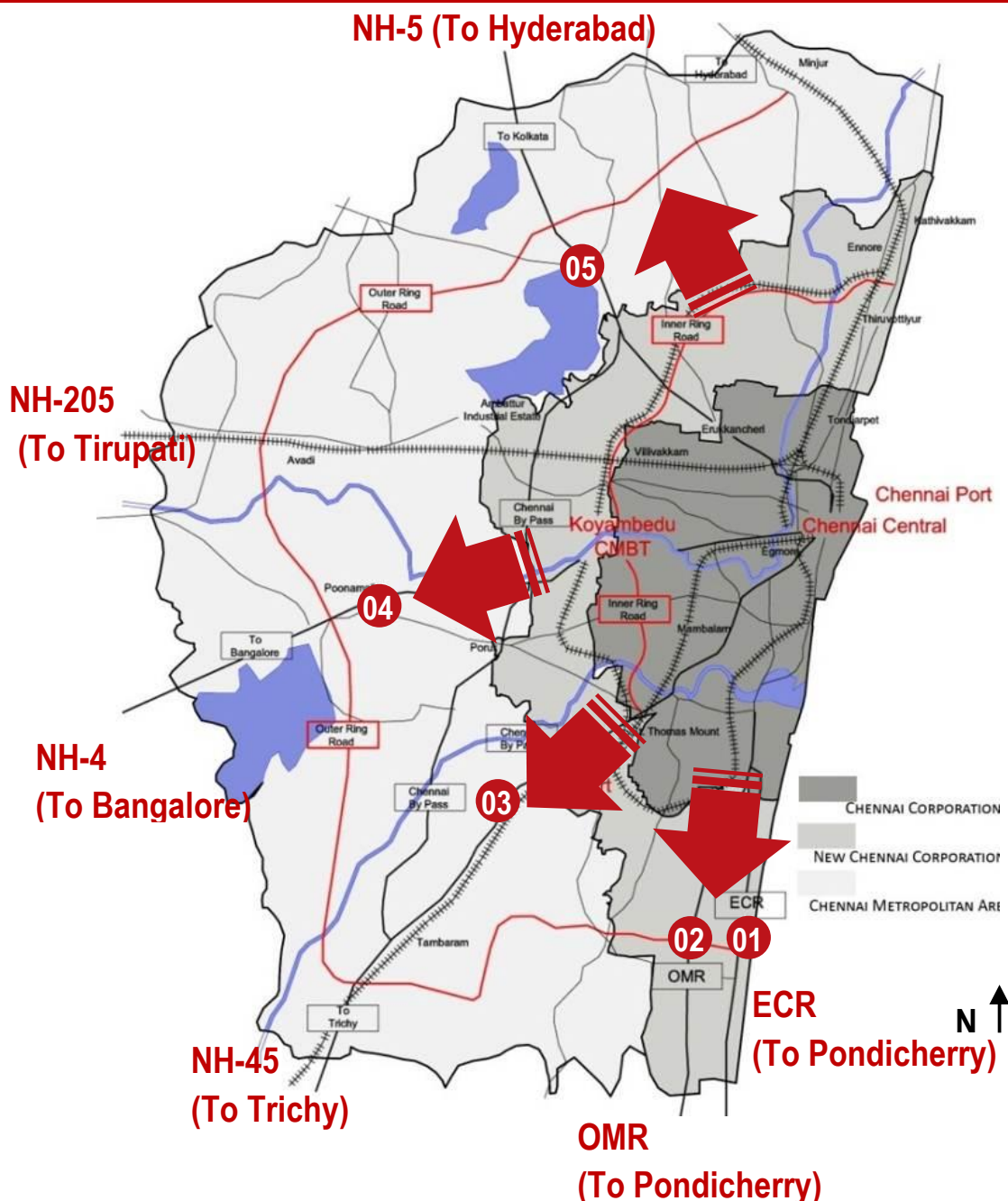
11 State Highways
SH-49 (Chennai-Pondicherry Road)
SH-55, SH-57, SH-104, SH-109
SH-110, SH-111, SH-112, SH-113
SH-114, SH-121 (Connecting the Thiruvallur & Kancheepuram Districts)

1 Expressway
Maduravoyal - Chennai Port Expressway – 19km
Status: Under Construction

Outer Ring Road
6 lane road of 62 kms of stretch runs from Minjur to Vandalur via Nemelichery.
PHASE 1 – 29.5 km (nearing completion)
PHASE 2 – 32.0 km (land acquisition under process)

Six Laning of Rajiv Gandhi Salai or IT Expressway
PHASE 1- 22 km (Six laning completed)
PHASE 2- 25km (yet to commence)

Ennore - Manali Road Improvement Project
Widening of roads like Manali Oil Refinery Road, T. P. P. (Tiruvottiyur - Ponneri - Panchetti) Road, Ennore Expressway and Inner Ring Road's northern part.



Southern Suburb	
01	ECR East Coast Road Entertainment & Leisure Corridor
02	OMR - Old Mahabalipuram Road IT/ITES Corridor
03	NH 45 (Chennai-Trichy Highway) Grand Southern Trunk SEZ Corridor

Western Suburb	
04	NH 4 (Chennai-Bangalore Highway) Industrial (Auto & Manufacturing)
Northern Suburb	
05	NH 5 (Chennai-Kolkata Highway) Industrial (Logistics & Warehousing)

Source: JLL

Map not to scale; Source: Jones Lang LaSalle

1. Transport Facilities

Services	Public Transport	Pedestrian Infrastructure	NMT	Usage of Integrated Transport System (ITS)	Travel speed along major corridors	Availability of Parking Spaces	Road Safety	Pollution levels	Integrated Land Use Transport System	Financial Sustainability of Public Transport
LoS(1-4)*	2	3	3	4	2	4	3	3	3	-

Implementation of NMT will address all the above parameterc (Cycle Sharing system, Parking Management, LED Street Lighting)

2. Water & Sewer Network

Indicator	Coverage old Water Supply network	Per Capita Supply of Water (Lpcd)	Continuity of Water Supply (Hrs per day)	Coverage of Sewerage Network	Extent of Reuse and Recycling of Sewage
Value*	100% (old city) 54.71% (extended limits)	107	3	100%	10%

Water management - Adopting latest treatment technologies, encouraging community participations. Desalination plant creates a reliable water source ensuring 24hours supply by reducing the existing system losses and improving operational efficiency

3. Solid Waste

Indicator	Efficiency in Collection of Solid Waste	Extent of Segregation of MSW	Extent of MSW Recovered	Extent of Scientific Disposal of MSW	Extent of Scientific Disposal of MSW
Value*	90%	30%	0%	0%	0%

Solid waste management - Encourage door to door collection, Segregation of waste at source, Improving operational efficiency, incentive schemes for staff, Community participation drives, Exploring options of Waste to Energy, Sale of Recyclable, composting yards and other recovery options

4. Storm Water

Indicator	Coverage Of Storm Water Drainage Network %	Incidence Of Water Logging / Flooding (Nos)
Value*	40%	200 locations

Sustainable storm water management, 100% collection drains with embedded surface rainwater harvesting

LoS: Service level bench marking of MoUD Guidelines



DISCUSS

Series of Consultation.
Collection of feedback



SUMMARISE

Narrow down suggestions
most preferred

Public Consultation
+
15 Zonal Consultation
+
Stakeholder Consultation
+
Mygov
+
Suggestion via email
+
Social Media Outreach
+
**Written Suggestions from
15 Zonal Offices**
+
Mass SMS



Pan City Solution
<ul style="list-style-type: none">• Traffic Management• Non Motorized Transport• Solid Waste Reduction• LED street lighting• Multi Modal Integration• BRTS• Transit Oriented Development• Parking Management• Storm Water Management
Area Based Development
<ul style="list-style-type: none">• George Town• Mylapore• T Nagar• Sholinganallur



ANALYZE

Finalize the feasible
suggestion

Pan City Solution
ICT for Non-Motorized Transport
Water Management – Flood Monitoring System & Smart Water
Area Based Development
T Nagar

Offline Engagement

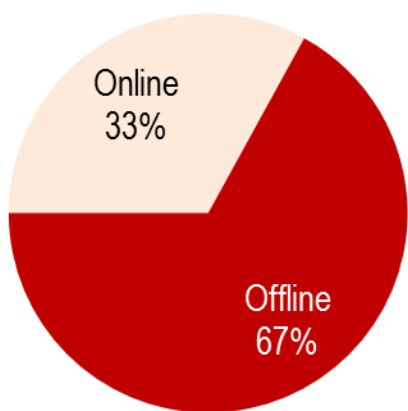
- Polling Booths at zonal offices
- Suggestion boxes at zonal offices
- Direct consultation program
- Radio program
- Consultation at each zonal office
- Mass SMS
- Print Media

Online Engagement

- Mygov
- Corporation Website
- Facebook
- Twitter
- LinkedIn
- Youtube
- Mass E-Mail

Citizen Outreach

Total = 9,67,850



T Nagar	Sholinganallur	George Town	Mylapore
55%	29%	9%	7%

Areas for Development – Voted by Citizens (ONLINE)

T Nagar	Sholinganallur	George Town	Mylapore
67%	24%	6%	3%

Areas for Development – Voted by Citizens (OFFLINE)

NMT	LED Street Lighting	Parking Management	Solid Waste Management
Online – 49%	Online – 12%	Online – 15%	Online – 8%
Offline – 52%	Offline – 10%	Offline – 6%	Offline – 15%

PAN City Solution – Voted by Citizens (Online & Offline)

Other solution has very minimal preference

Water Management (Flood monitoring and Smart Water) - need of the day

Senior Citizen	Children	Women	Men & Youth
8%	4%	11%	77%

Profile of Citizens Engaged

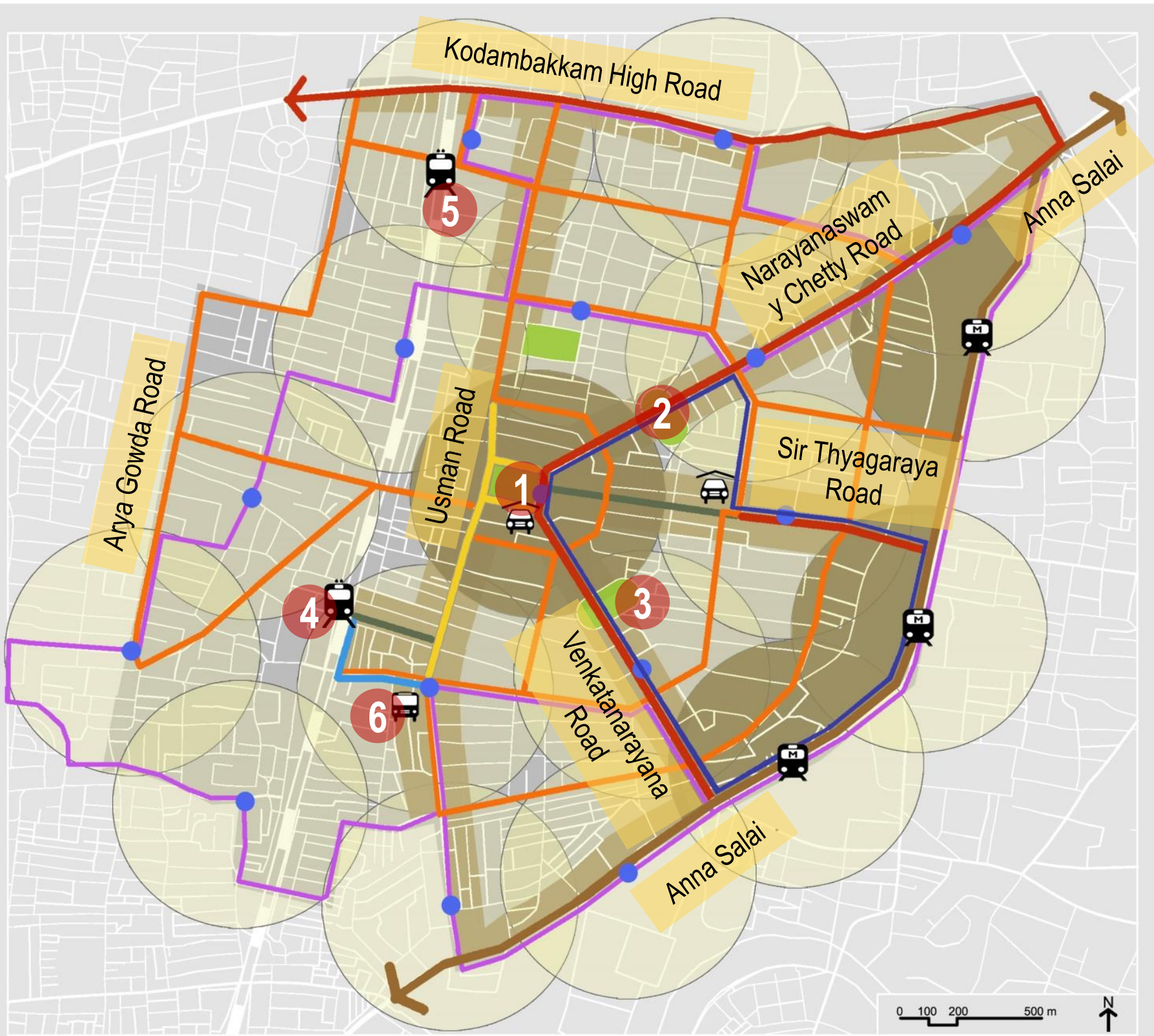


Key Issues

- Traffic congestion
- Unorganized parking
- Improper solid waste management
- Aging infrastructure
- Improper storm water management
- No waste water recycling
- Last mile connectivity
- Pollution
- Absence of use of renewable energy
- Pedestrian-vehicular conflict

Retrofitting Area	6.95 sq.km (1.63% of Total City Area – 426 Sq.km)
Population	2.26 lakhs Population (3.38% of City Population – 66.8 lakhs)

VISION: “An universal cultural hub for safe and sustainable living with enhanced mobility, smart urban infrastructure and become more resilient to the physical, social, and economic challenges “

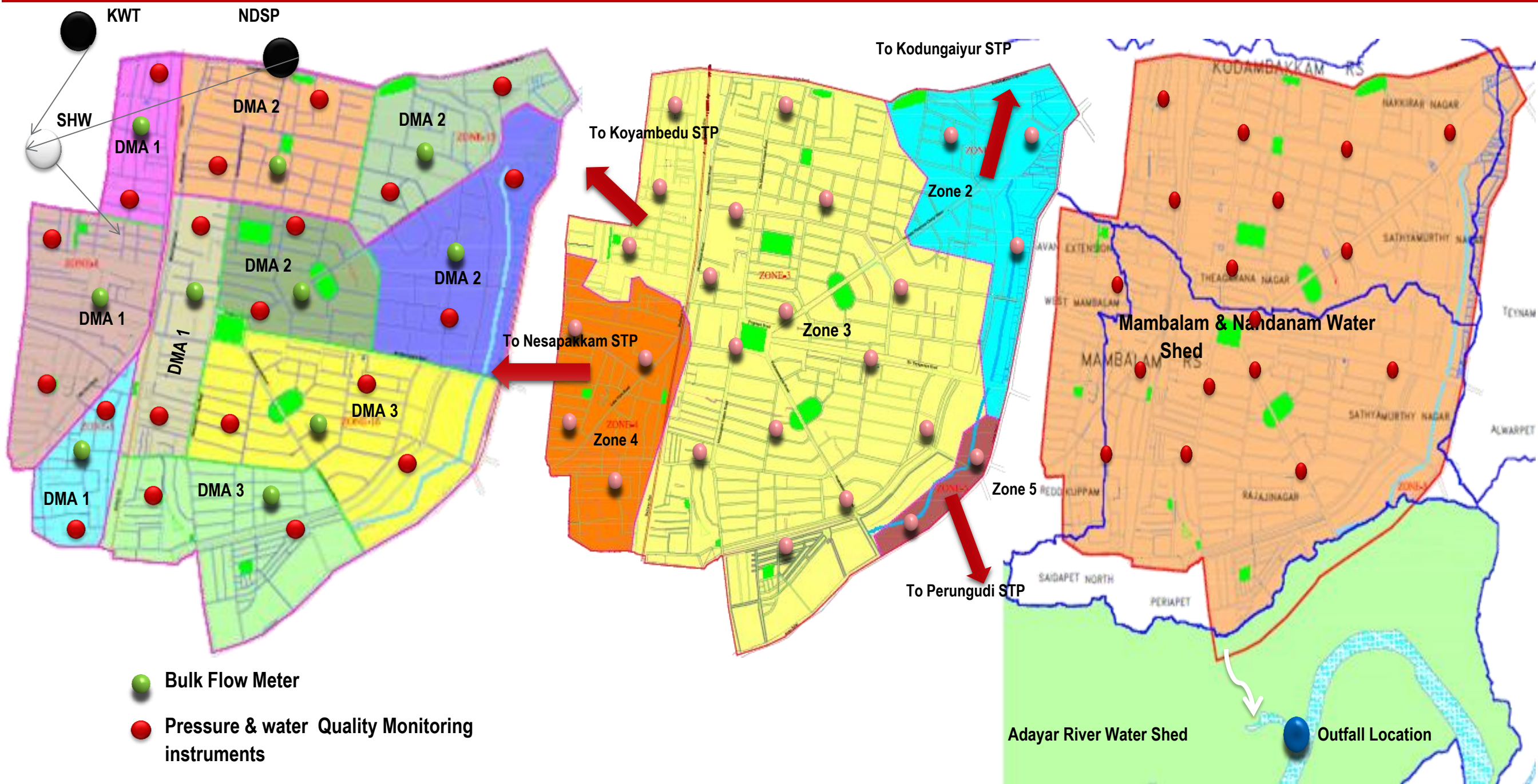


Legend

- Extra wide sidewalk & cycle lanes
- Wide sidewalk & cycle lanes
- Sidewalks
- Limited Vehicular Access
- Pedestrian Only Zone
- Pedestrian Bridge
- Park (Existing)
- Smart Bus Feeder - Route 1
- Smart Bus Feeder - Route 2
- Bus Stop
- Walking Radius Bus Stop - 40 meters
- 🚗 Multi Storey Car Park (Planned)
- 🚊 Metro Station (Planned)
- 🚉 Train Station (Existing)
- 🚌 Bus Station (Existing)

Important Landmarks

- 1 Pangal Park
- 2 Jeeva Park
- 3 Natesan Park
- 4 Mambalam Rly Station
- 5 Kodambakkam Rly Station
- 6 T Nagar Bus Terminus



- Bulk Flow Meter
- Pressure & water Quality Monitoring instruments

- KWT Kilpauk Water Treatment Plant
- NDSP Nemmeli Desalination Plant
- SHW Southern Head Works

● Flow Level indication Sensor

● Level Sensors

Chennai Smart City – ‘City for Everyone’

An universal cultural hub for safe and sustainable living with enhanced mobility, smart urban infrastructure and become more resilient to the physical, social, and economic challenges .

Key Issues Identified

- Pedestrian safety
- Unorganized parking
- Last mile connectivity
- Pollution
- Quality infrastructure for pedestrians
- Enforcement issues
- Traffic Management
- Energy Efficient Lighting
- City surveillance



Proposals

ICT in NMT

- Cycle sharing,
- Parking management,
- LED street lighting monitoring & automatic On/Off
- City Surveillance
- Intelligent Traffic Management



- Disaster Management like Flooding
- Water Management



- ICT for Flood & Tsunami monitoring and warning system
- Smart Water – Digital Services for Citizen Services

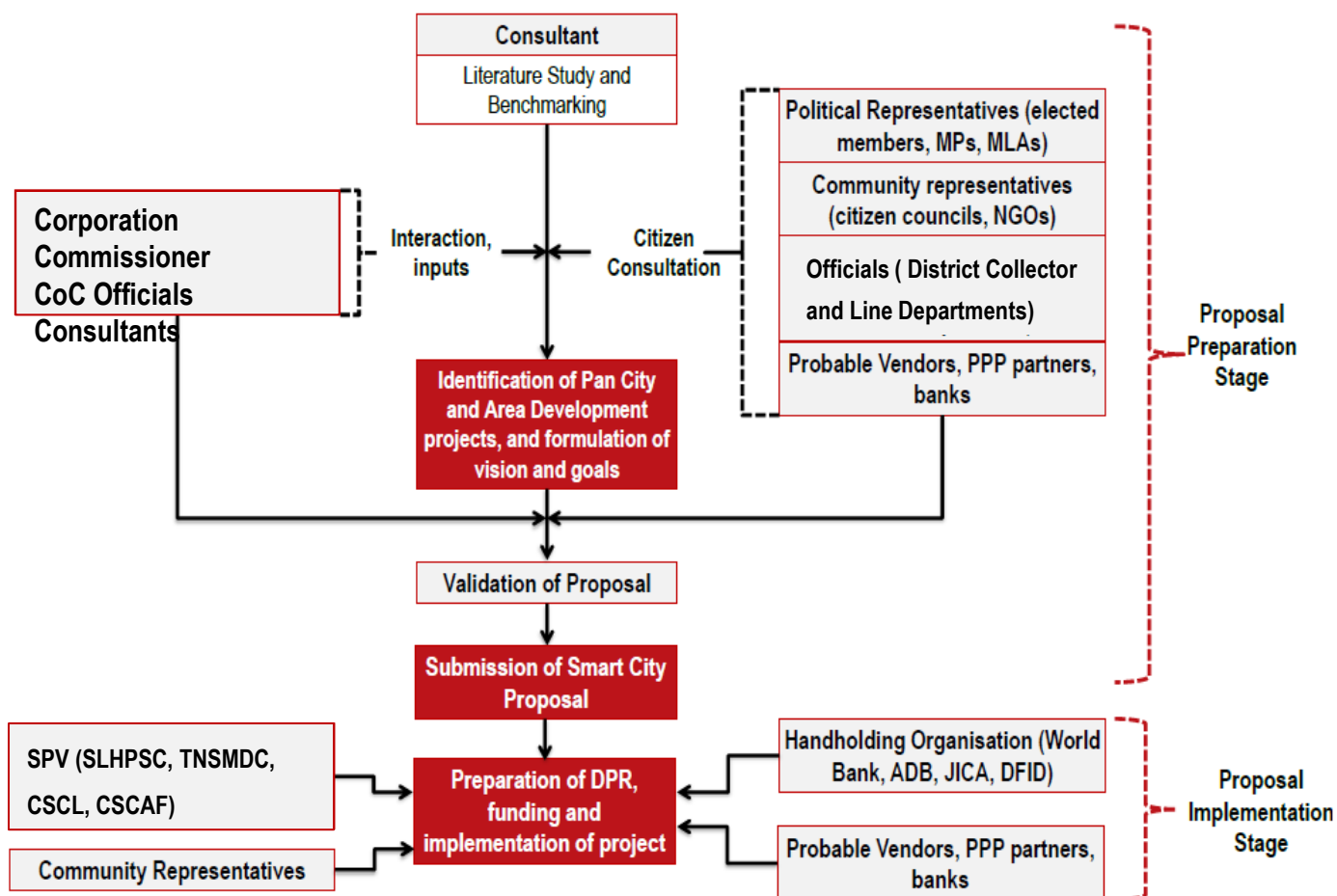
	Total	JNNSM	SBM	PPP	Debt	Smart City
	INR in Crore	INR in Crore	INR in Crore	INR in Crore	INR in Crore	INR in Crore
AREA BASED PROPOSAL						
Electrical	272.87	1.59	0.00	0.00	0.00	271.28
Water Supply	206.06	0.00	0.00	173.33	0.00	32.72
Sewerage	22.23	0.00	0.00	0.00	0.00	22.23
Sanitation	4.20	0.00	0.99	0.00	0.00	3.21
Solid Waste	11.16	0.00	2.63	0.00	0.00	8.52
Storm Water	122.00	0.00	0.00	0.00	0.00	122.00
IT Connectivity and Digitization	50.69	0.00	0.00	10.40	0.00	40.29
Pedestrian Friendly Pathways & Non-Motorised Transport	175.66	0.96	0.00	99.78	0.00	74.91
Intelligenet Traffic Management Systems	8.12	0.00	0.00	0.00	0.00	8.12
Retrofitting of Parks	4.95	0.00	0.00	0.00	0.00	4.95
Sub Total	877.93	2.55	3.62	283.52	0.00	588.23
PAN CITY PROPOSAL						
ICT for Non Motorized Transport	452.32	0.00	0.00	35.00	65.55	351.77
ICT for Water Management	36.00	0.00	0.00	0.00	0.00	36.00
Sub Total	488.32	0.00	0.00	35.00	65.55	387.77
Grand Total	1366.24	2.55	3.62	318.52	65.55	976.00

Life Cycle of the Proposal

S.No	PROPOSALS	COSTS (INR Crores)					IMPLEMENTATION PERIOD					
		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	
AREA DEVELOPMENT (RETROFITTING) - T. NAGAR												
1	Electrical	Capital Cost	17.60	60.39	54.63	140.25	0.00					
		O & M Cost	0.00	0.00	0.00	0.00	0.91	10.64	10.74	10.85	10.96	11.07
2	Water Supply	Capital Cost	20.51	48.52	48.52	49.52	39.00					
		O & M Cost	0.00	0.00	0.00	0.00	2.46	2.48	2.51	2.53	2.56	
3	Sewerage	Capital Cost	2.07	6.22	6.22	7.73	0.00					
		O & M Cost	0.00	0.00	0.00	0.00	5.18	5.23	5.28	5.34	5.39	
4	Storm Water	Capital Cost	5.85	55.58	60.58	0.00	0.00					
		O & M Cost	0.00	0.00	0.00	1.57	1.57	1.57	1.58	1.60	1.61	1.63
5	Solid Waste	Capital Cost	1.12	5.54	4.50	0.00	0.00					
		O & M Cost	0.00	0.00	1.31	2.63	2.63	2.63	2.66	2.68	2.71	2.74
6	IT Connectivity and Digitization	Capital Cost	0.00	20.90	20.90	8.89	0.00					
		O & M Cost	0.00	0.00	0.00	0.00	2.04	2.04	2.06	2.09	2.11	2.13
7	Sanitation	Capital Cost	0.00	0.00	0.00	4.20	0.00					
		O & M Cost	0.00	0.00	0.00	0.00	0.49	0.49	0.49	0.50	0.50	0.51
8	Pedestrian Friendly Pathways & Non- Motorised Transport	Capital Cost	14.45	65.64	72.29	11.64	11.64					
		O & M Cost	0.00	0.00	0.00	0.00	0.00	6.14	6.20	6.26	6.32	6.39
9	Intelligent Traffic Management Systems	Capital Cost	0.00	0.00	0.00	8.12	0.00					
		O & M Cost	0.00	0.00	0.00	0.00	0.82	0.82	0.83	0.84	0.84	0.85
10	Retrofitting of Green Open Spaces	Capital Cost	0.00	2.48	2.48	0.00	0.00					
		O & M Cost	0.00	0.00	0.00	1.74	1.74	1.74	1.76	1.78	1.79	1.81
PAN CITY - CHENNAI												
1	ICT for Non Motorized Transport	Capital Cost	0.00	127.67	127.67	146.98	50.00					
		O & M Cost	0.00	0.00	0.00	0.00	12.89	25.78	26.04	26.30	26.56	26.83
2	ICT for Water Management	Capital Cost	0.00	16.00	20.00	0.00	0.00					
		O & M Cost	0.00	0.00	0.00	5.72	5.72	5.72	5.78	5.83	5.89	5.95
PAY BACK PERIOD												
1	Estimated gross annual revenue for SPV	0.00	0.00	0.00	52.85	70.47	176.17	177.93	179.71	181.51	183.32	
2	Capital Expenditure	61.59	408.92	417.77	377.32	100.64	0.00	0.00	0.00	0.00	0.00	
3	O&M Cost	0.00	0.00	1.31	12.57	46.17	65.20	65.85	66.51	67.17	67.84	
Payback = 17 Years		-61.59	-470.51	-889.60	-1,226.63	-1,302.98	-1,192.00	-1,079.92	-966.71	-852.38	-736.90	

LIFE CYCLE OF CHENNAI SMART CITY PROPOSAL												
S.No	PROPOSALS	IMPLEMENTATION PERIOD										
		Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	
AREA DEVELOPMENT (RETROFITTING) - T. NAGAR												
8	Electrical	Capital Cost										
		O & M Cost	11.18	11.29	11.40	11.52	11.63	11.75	11.87	11.98	12.10	12.23
h	Water Supply	Capital Cost										
		O & M Cost	2.58	2.61	2.64	2.66	2.69	2.72	2.74	2.77	2.80	2.83
0	Sewerage	Capital Cost										
		O & M Cost	5.44	5.50	5.55	5.61	5.66	5.72	5.78	5.84	5.89	5.95
4	Storm Water	Capital Cost										
		O & M Cost	1.64	1.66	1.68	1.69	1.71	1.73	1.75	1.76	1.78	1.80
2	Solid Waste	Capital Cost										
		O & M Cost	2.76	2.79	2.82	2.85	2.88	2.90	2.93	2.96	2.99	3.02
6	IT Connectivity and Digitization	Capital Cost										
		O & M Cost	2.15	2.17	2.19	2.21	2.24	2.26	2.28	2.30	2.33	2.35
7	Sanitation	Capital Cost										
		O & M Cost	0.51	0.52	0.52	0.53	0.53	0.54	0.54	0.55	0.56	0.56
0	Pedestrian Friendly Pathways & Non- Motorised Transport	Capital Cost										
		O & M Cost	6.45	6.51	6.58	6.64	6.71	6.78	6.85	6.91	6.98	7.05
0	Intelligent Traffic Management Systems	Capital Cost										
		O & M Cost	0.86	0.87	0.88	0.89	0.90	0.90	0.91	0.92	0.93	0.94
10	Retrofitting of Green Open Spaces	Capital Cost										
		O & M Cost	1.83	1.85	1.87	1.89	1.91	1.92	1.94	1.96	1.98	2.00
PAN CITY - CHENNAI												
0	ICT for Non Motorized Transport	Capital Cost										
		O & M Cost	27.10	27.37	27.64	27.92	28.20	28.48	28.76	29.05	29.34	29.63
0	ICT for Water Management	Capital Cost										
		O & M Cost	6.01	6.07	6.13	6.19	6.26	6.32	6.38	6.45	6.51	6.57
PAY BACK PERIOD												
1	Estimated gross annual revenue for SPV	185.16	187.01	188.88	190.77	192.67	194.60	196.55	198.51	200.50	202.50	
2	Capital Expenditure	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
3	O&M Cost	68.52	69.21	69.90	70.60	71.30	72.02	72.74	73.46	74.20	74.94	
Payback = 17 Years		-620.26	-502.46	-383.48	-263.31	-141.94	-19.36	104.45	229.50	355.80	483.36	

LIFE CYCLE OF CHENNAI SMART CITY PROPOSAL												
S.No	PROPOSALS	IMPLEMENTATION PERIOD										
		Year 21	Year 22	Year 23	Year 24	Year 25	Year 26	Year 27	Year 28	Year 29	Year 30	
AREA DEVELOPMENT (RETROFITTING) - T. NAGAR												
0	Electrical	Capital Cost										
		O & M Cost	12.35	12.47	12.60	12.72	12.85	12.98	13.11	13.24	13.37	13.50
0	Water Supply	Capital Cost										
		O & M Cost	2.85	2.88	2.91	2.94	2.97	3.00	3.03	3.06	3.09	3.12
0	Sewerage	Capital Cost										
		O & M Cost	6.01	6.07	6.13	6.19	6.26	6.32	6.38	6.45	6.51	6.58
4	Storm Water	Capital Cost										
		O & M Cost	1.82	1.84	1.85	1.87	1.89	1.91	1.93	1.95	1.97	1.99
0	Solid Waste	Capital Cost										
		O & M Cost	3.05	3.08	3.11	3.14	3.18	3.21	3.24	3.27	3.31	3.34
6	IT Connectivity and Digitization	Capital Cost										
		O & M Cost	2.37	2.40	2.42	2.44	2.47	2.49	2.52	2.54	2.57	2.60
7	Sanitation	Capital Cost										
		O & M Cost	0.57	0.57	0.58	0.58	0.59	0.60	0.60	0.61	0.61	0.62
0	Pedestrian Friendly Pathways & Non- Motorised Transport	Capital Cost										
		O & M Cost	7.12	7.19	7.27	7.34	7.41	7.49	7.56	7.64	7.71	7.79
0	Intelligent Traffic Management Systems	Capital Cost										
		O & M Cost	0.95	0.96	0.97	0.98	0.99	1.00	1.01	1.02	1.03	1.04
10	Retrofitting of Green Open Spaces	Capital Cost										
		O & M Cost	2.02	2.04	2.06	2.08	2.10	2.13	2.15	2.17	2.19	2.21
PAN CITY - CHENNAI												
0	ICT for Non Motorized Transport	Capital Cost										
		O & M Cost	29.93	30.23	30.53	30.84	31.15	31.46	31.77	32.09	32.41	32.73
0	ICT for Water Management	Capital Cost										
		O & M Cost	6.64	6.71	6.77	6.84	6.91	6.98	7.05	7.12	7.19	7.26
PAY BACK PERIOD												
1	Estimated gross annual revenue for SPV	204.53	206.57	208.64	210.73	212.83	214.96	217.11	219.28	221.47	223.69	
2	Capital Expenditure	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
3	O&M Cost	75.69	76.45	77.21	77.98	78.76	79.55	80.35	81.15	81.96	82.78	
Payback = 17 Years		612.19	742.32	873.75	1,006.49	1,140.56	1,275.97	1,412.73	1,550.86	1,690.37	1,831.28	



S.No	ITEMS	Unit	Quantity	Rate (INR Lakhs)	Soft Cost (INR Crores)	Hard Cost (INR Crores)	Total Cost (INR Crores)
Area Development, Retrofitting - T Nagar							
1	Electrical Network						
a	Microgrid management system at primary distribution substations	LS	1.00	80.00	-	0.80	0.80
b	Electrical & ICT utility Corridor	km	115.00	150.00	-	172.50	172.50
c	Smart metering	nos	88,500.00	0.10	88.50	-	88.50
d	Installing roof top solar system in public buildings	nos	15.00	35.40	5.31	-	5.31
1a	Energy Efficient LED Street Lighting						
a	Converting 250W HPSV luminaires on Main roads to 120W LED luminaries	nos	538.00	0.49	-	2.64	2.64
b	Converting 40W FTL luminaires on Main roads to 20W LED luminaries	nos	1,561.00	0.20	-	3.12	3.12
	Sub Total				93.81	179.06	272.87
2	Water Supply						
a	Water supply network augmentation / rehabilitation	km	47.87	60.00	-	28.72	28.72
b	Electromagnetic Flow meter for water supply network	nos	10.00	10.00	1.00	-	1.00
c	Reliable source augmentation (Desalination Plant) for 24 X 7 water supply	MLD	20.00	866.67	-	173.33	173.33
d	Augmentation of existing pump stations including future requirement	MLD	40.00	5.00	-	2.00	2.00
e	Water pressure and quality monitoring meter	nos	20.00	5.00	1.00	-	1.00
	Sub Total				2.00	204.06	206.06
3	Sewerage						
a	Sewerage network augmentation / rehabilitation	km	15.12	100.00	-	15.12	15.12
b	Installation of sensors at strategic Location	LS	1.00	151.20	1.51	-	1.51
d	Waste water recycling (Parks, medians, gardens, etc)	nos	4.00	100.00	-	4.00	4.00
c	Augmentation of existing pump stations	MLD	32.00	5.00	-	1.60	1.60
	Sub Total				1.51	20.72	22.23
4	Storm Water Drainage						
a	Augmentation of existing storm water network	km	65.00	180.00	-	117.00	117.00
b	Installation of level sensors at strategic locations along storm water drains	nos	200.00	0.50	1.00	-	1.00
c	Rain Water Harvesting @ every 30 mts intervals	nos	40.00	10.00	-	4.00	4.00
	Sub Total				1.00	121.00	122.00
5	Solid Waste Management						
a	Collection bins including sensors	nos	270.00	0.30	0.27	0.54	0.81
b	Vehicle monitoring system	nos	50.00	0.15	0.08	-	0.08
c	Geofencing of collection bins	nos	270.00	0.10	0.27	-	0.27
d	Modernisation of transfer station	nos	1.00	1,000.00	-	10.00	10.00
	Sub Total				0.62	10.54	11.16
6	IT Connectivity and Digitization						
a	WiFi zones and hot spots	nos	3,800.00	1.00	38.00	-	38.00
b	City surveillance system	nos	32.00	1.25	0.40	-	0.40
c	Digital signages and billboards	nos	80.00	3.00	2.40	-	2.40
d	Website for e-Governance features	LS	1.00	100.00	1.00	-	1.00
e	Integration of all utilities using GIS	LS	1.00	889.06	8.89	-	8.89
	Sub Total				50.69	-	50.69
7	Sanitation						
a	Modular e-toilets	nos	60.00	7.00	-	4.20	4.20
	Sub Total				-	4.20	4.20
8	Pedestrian Friendly Pathways & Non- Motorised Transport						
a	Pedestrianised streets	sqm	30,000.00	0.033	-	9.90	9.90
b	Traffic calming streets	sqm	22,500.00	0.033	-	7.43	7.43
c	Differently-abled footpath	sqm	48,000.00	0.033	-	15.84	15.84
d	Bicycle lanes	sqm	48,000.00	0.033	-	15.84	15.84
e	MLCPs with ICT application	Cars	1,200.00	10.00	-	120.00	120.00
f	On-Street Parking Management system with ICT application	nos	30.00	1.00	0.30	-	0.30
g	Cycle Sharing system with ICT Application	docks	30.00	0.50	0.05	0.11	0.15
h	Installation of solar charging stations for e-Rickshaws	nos	10.00	62.00	1.86	4.34	6.20
	Sub Total				2.21	173.45	175.66
9	Intelligent Traffic Management Systems						
a	Smart signalling	nos	32.00	16.00	5.12	-	5.12
b	Intelligent transport system	LS	1.00	1,000.00	3.00	-	3.00
	Sub Total				8.12	-	8.12
10	Retrofitting of Green Open Spaces						
a	Hard landscape	sqm	9,000.00	0.033	-	2.97	2.97
b	Soft landscape	sqm	15,000.00	0.013	-	1.98	1.98
	Sub Total				-	4.95	4.95
Total					159.95	717.97	877.93

S.No	ITEMS	Unit	Quantity	Rate (INR Lakhs)	Soft Cost (INR Crores)	Hard Cost (INR Crores)	Total Cost (INR Crores)
PAN City - Chennai							
1	ICT for Non Motorized Transport						
a	Cycle Sharing system with ICT application	nos	3,000.00	0.50	15.00	-	15.00
b	City surveillance system	kms	619.76	10.00	61.98	-	61.98
c	On-Street Parking Management with ICT application	nos	2,000.00	1.00	20.00	-	20.00
d	Street light monitoring system	nos	248,467.00	0.10	248.47	-	248.47
e	Automatic ON / OFF with timer	nos	1,718.00	0.40	6.87	-	6.87
f	Intelligent Traffic Management System	LS	1.00	10,000.00	100.00	-	100.00
	Sub total				452.32	-	452.32
2	ICT for Water Management						
a	Disaster Management: Flood & Tsunami monitoring and warning system	LS	1.00	2,000.00	20.00	-	20.00
b	Smart Water: Digital solutions for citizen services	LS	1.00	1,600.00	16.00	-	16.00
	Sub total				36.00	-	36.00
	Total				488.32	-	488.32

AT&C	Aggregate Technical and Commercial
CBD	Central Business District
CCTS	Chennai Comprehensive Traffic Study
CCTV	Closed Circuit Tele Vision
CMA	Chennai Metropolitan Area
CMBT	Chennai Mofussil Bus Terminus
CMWSSB	Chennai Metro Water Supply and Sewerage Board
CoC	Corporation of Chennai
DMA	District Meter Area
EDP	Electronic Data Processing
ERP	Enterprise Resource Planning
GIS	Geographic Information System
GPS	Global Positioning System
HT	High Tension
ICT	Information & Communication Technology
IPT	Intermediate Public Transport
km	Kilometer
LED	Light Emitting Diode
MIS	Management Information System
MLCP	Multi Level Car Park
MLD	Million Liters per Day
MRTS	Mass Rapid Transit System
MW	Mega Watt
NCRB	National Crime Records Bureau
NGO	Non Governmental Organisation
NH	Nationa Highway
NMT	Non-Motorized Transport
NRW	Non Revenue Water
O&M	Operation and Maintenance
OSR	Open Space Reservation
PGR	Public Grievance and Redressal
PNT	Persons near Transit
PPH	Persons per Hectare
PT	Public Transport
RADMS	Road Accident Data Management System
R-APDRP	Restructured Accelerated Power Development and Reforms
RE	Renewable Energy
RFID	Radio Frequency Identification
RoW	Right of Way
RTR	Rapid Transport Ratio
SEZ	Special Economic Zone
SH	State Highway
STP	Sewage Treatment Plan
TANGEDCO	Tamil Nadu Generation and Distribution Corporation
TNHB	Tamil Nadu Housing Board
TNSCB	Tamil Nadu Slum Clearance Board
UFW	Unfactored Water
UTF	Urban Transport Fund

Most Immediate



Municipal Administration
and Water Supply (MAII)
Department, Secretariat,
Chennai- 600 009.

Letter No.29870/MA.II/2015 - 4, dated 23.12.2015

From

Thiru.K.Phanindra Reddy, I.A.S.,
Principal Secretary to Government

To

The Mission Director, Smart Cities Mission/
Additional Secretary to Government of India,
Ministry of Urban Development,
New Delhi - 110 011.

Sir,

Sub: Smart Cities Mission - Smart City
Proposals of the 12 Cities of Tamil Nadu -
Forwarded - Reg.

I am directed to inform that, the second meeting of the State Level High Powered Steering Committee of the Smart Cities Mission of the State of Tamil Nadu under the Chairmanship of the Chief Secretary to Government, held on 21.12.2015 reviewed the Smart City Proposals of the Mission Cities of the State, viz., 12 City Municipal Corporations and resolved to forward the said proposals for participation in the Stage II National level Challenge. Accordingly, the proposals are forwarded.

Yours sincerely,

for Principal Secretary to Government

Copy to

The Chairperson and Managing Director,
Tamil Nadu Urban Finance and Infrastructure
Development Corporation Limited, Chennai-35.



Municipal Administration
and Water Supply (MAI)
Department, Secretariat,
Chennai- 600 009.

MINUTES OF THE SECOND STATE LEVEL HIGH POWERED STEERING COMMITTEE MEETING HELD ON 21.12.2015 AT 5.30 P.M FOR SMART CITY MISSION

The Second meeting of the **State Level High Powered Steering Committee for Smart City Mission** was held in the Chief Secretary Conference Hall, Secretariat on 21.12.2015 at 5.30 P.M under the Chairmanship of **Thiru K. Gnanadesikan, I.A.S.**, Chief Secretary to Government.

The following members attended the meeting:

- | | |
|--|------------------|
| 1. Thiru K Shanmugam IAS.
Principal Secretary to Govt,
Finance Department, Secretariat
Chennai-600 009 | Member |
| 2. Thiru K.Phanindra Reddy IAS.
Principal Secretary to Government.
Municipal Administration and
Water Supply Department
Secretariat, Chennai-600 009 | Member |
| 3. Thiru S.Krishnan IAS.
Principal Secretary to Government.
Planning, Development and
Special Initiatives Department,
Secretariat, Chennai-600 009 | Member |
| 4. Thiru.Vikram Kapoor, I.A.S.
Principal Secretary/Commissioner,
Corporation of Chennai,
Chennai-600 003. | Member |
| 5. Dr. S. Swarna, I.A.S.
Chairperson and Managing Director,
TUFIDCO, Nandanam,
Chennai - 600 035. | Member-Secretary |

- | | |
|--|--------|
| 6. Dr.B.Chandra Mohan, I.A.S.,
Managing Director,
Chennai Metropolitan Water Supply
and Sewerage Board,
Chennai- 600 002 | Member |
| 7. Thiru. Vijayaraj Kumar, I.A.S.
Managing Director,
TamilNadu Water supply & Drainage Board,
Chepauk,
Chennai-600 009. | Member |
| 8. Thiru G. Prakash, I.A.S.
Director of Municipal Admin.
Chepauk,
Chennai-600 005. | Member |
| 9. Tmt. Kakarla Usha, I.A.S.
Managing Director,
TNUIFSL,
Chennai. | Mentor |
| 10.Thiru M. Kathiravan, I.A.S
Commissioner,
Madurai Corporation | Member |
| 11.Dr.Vijaya Karthikeyan, I.A.S
Commissioner,
Coimbatore Corporation | Member |
| 12.Tmt M.Vijayalakshmi
Commissioner,
Trichy Corporation | Member |
| 13.Thiru N.Manohar
Commissioner,
Dindugul Corporation | Member |
| 14.Thiru P.Kumar
Commissioner,
Thanjavur Corporation | Member |
| 15.Thiru S.Sivasubramanian
Commissioner,
Tirunelveli Corporation | Member |

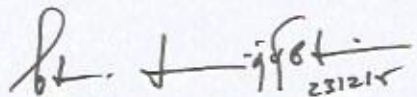
- | | |
|---|---|
| 16.Thiru K.R.Selvaraj
Commissioner,
Salem Corporation | Member |
| 17.Thiru R.Mohan
Commissioner,
Erode Corporation | Member |
| 18.Tmt P.Janaki Ravindran
Commissioner,
Vellore Corporation | Member |
| 19.Thiru A.Laxmanan
City Engineer,
Thoothukudi Corporation | Representing
Thoothukudi Corporation |
| 20.Thiru M.V.D.Tamilselvan
Executive Engineer,
Tiruppur Corporation | Representing
Tiruppur Corporation |

The Chairperson and Managing Director, TUFIDCO elaborated the process adopted such as Citizen Engagement, Impact on the population, the rationale behind selection for Area based Development and PAN city Development Strategy by the Corporations for finalizing the 12 Smart Cities proposals before the Committee.

The Committee reviewed the Proposals presented by the 12 Corporations and deliberated in detail. The Committee accepted the rationale behind the strategy adopted by all the 12 Cities. The committee also directed that the technological options presented would have to be evaluated in detail for their technical feasibility and financial sustainability during projectisation stage. On discussion, the committee directed that the proposals be forwarded to Ministry of Urban Development, Government of India on-time.

K.GNANADESIKAN
CHIEF SECRETARY & CHAIRMAN OF HPSC

//True Copy//


23/2/15
Section Officer

VIKRAM KAPUR, I.A.S.
Principal Secretary / Commissioner
Corporation of Chennai



Ripon Building,
16, E.V.R. Periyar Salai,
Chennai - 600 003.

Off. No. : +91-44-2561 9200/2538 1330
Fax No. : +91-44-2538 3962
commissioner@chennaicorporation.gov.in

Lr. No.S.P.C.No.B1/490/2015, Dt.26.12.15

To

The Mission Director
Smart Cities Mission,
Ministry of Urban Development,
Government of India,

Dear Sir,

Subject: Submission of Chennai Smart City Proposal: TN_12_CNN

We are pleased to submit herewith the five hard copies and one soft copy in
CD of Chennai Smart City Proposal for your kind perusal.

Yours sincerely,

A handwritten signature in blue ink, appearing to read 'Vikram Kapur', with a long vertical line extending downwards from the end of the signature.

(Vikram Kapur)

Encl. as above

S.P.C.No.B1/490/2015
As per the note of the Principal Secretary / Commissioner dt.22.12.2015



Resolution No.706/2015

Subject No:01


Council, Corporation of Chennai has approved the initiative to take up smart city in Chennai vide council resolution 321/2015 dt.06.07.2015 M/s. Jones Lang LaSalle Property Consultants India Pvt. Ltd. in association with Townland Consultants Pvt. Ltd., and Tata Consulting Engineers Ltd has been appointed as consultant for preparing Smart City Proposal (SCP) for Chennai.

As per the G.O.(Ms)No.112 dt.31.07.2015 from MA&WS (MA2) Department , Tamilnadu Government, it has been recommended to form city level Special Purpose Vehicle for Smart City as a limited company under the Companies Act, 2013 and will be promoted by the state and the Corporation of Chennai (ULB) jointly, both having 50:50 equity share holding.

The consultant has prepared Smart City Proposal for Chennai city. As a part of Smart City Proposal based on the outcome of citizen's participation T.Nagar has been selected for Area Based Proposal. Under PAN City initiative, ICT for Non Motorised Transport, disaster management under flood monitoring and warning system and digital solutions for citizen services under smart water has been selected based on outcome of citizen's participation (polling).

It is informed that the Smart City Proposal and formation of Special Purpose Vehicle for Chennai city is agreed and placed vide Subject No.1 and Council Resolution No/706/2015.




Mayor
Corporation of Chennai

Corporation of Chennai



NON MOTORISED TRANSPORT POLICY

CORPORATION OF CHENNAI

SPECIAL PROJECT

Index

S.No	Clause	Page
1	Definition	2
2	Vision	2
3	Goals	2
4	Corporation Leadership	2
5	Performance measurement	3
6	Principles of Street design and Management	3
7	Street Design	6
8	Street Network	12
9	Built Environment Regulation	12
10	Street Management, Maintenance and	13
11	Special Services	15
12	Public awareness	16
13	Funding Development and Infrastructure	17
14	Planning, Implementation and Evaluation	17
	Approval of Corporation of Chennai Council	22

Corporation of Chennai Non-Motorised Transport Policy

1. Definition

- 1.1. Non-motorised transport (NMT): walking, cycling, cycle rickshaws, pushcarts, and other forms of mobility that are powered by humans.

2. Vision

- 2.1. Chennai will be a city with a general sense of well-being through the development of quality and dignified environment where people are encouraged to walk and cycle; equitable allocation of public space and infrastructure; and access to opportunities and mobility for all residents.

3. Goals

- 3.1. The Corporation of Chennai (COC) aims to increase the use of cycling and walking by creating a safe and pleasant NMT network of footpaths, cycle tracks, greenways, and other facilities to serve all citizens in the COC area. The designs of Chennai streets will be consistent with best practices in pedestrian-oriented, multi-modal street design. They will also incorporate appropriate environmental planning and water management techniques. Together, these measures will achieve the following:
 - 3.1.1. Improved access and mobility for all residents.
 - 3.1.2. Social and economic empowerment through the provision of improved low-cost mobility.
 - 3.1.3. Gender equity through the provision of NMT facilities that are safe for women to use.
 - 3.1.4. Social inclusion in creating NMT facilities that follow principles of universal design and are usable to the greatest extent possible by everyone, regardless of his or her age, ability, or status in life.
 - 3.1.5. Reduced local and global environmental impacts of COC's transport system through expanded use of zero pollution modes.
 - 3.1.6. A changed culture that accepts the use of cycling and walking as acceptable and aspirational means to move around in the city.
 - 3.1.7. Participation of local residents, businesses, and other stakeholders in the preparation of designs and standards in order to foster the community's active use and sense of ownership of these spaces.

4. Corporation Leadership

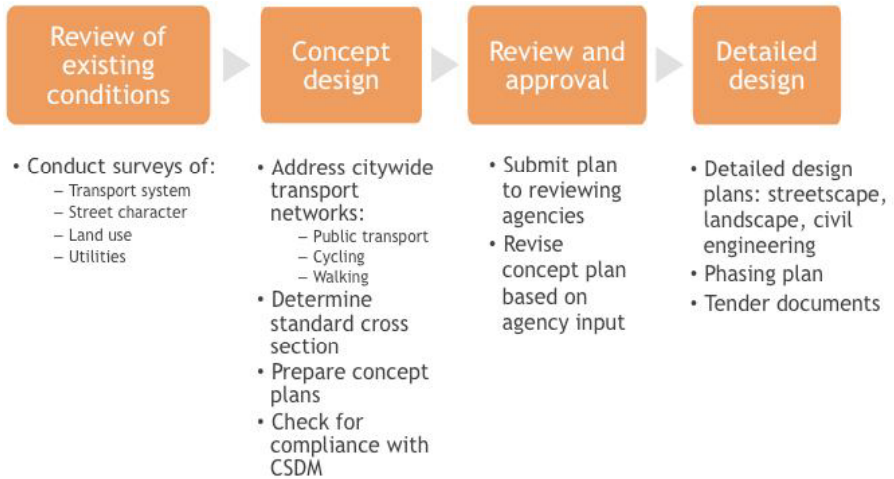
- 4.1. COC will provide the necessary leadership by emphasising a paradigm shift from current urban transport planning methods to the new focus on NMT and public transport.
- 4.2. COC will proclaim NMT as priority modes and will issue policy guidelines and instructions to professionals regarding priorities in the design of transport facilities.
- 4.3. COC will conduct extensive training and outreach to COC engineers, administrators, and elected officials on NMT user needs, design principles, and promotion strategies.

Schedule A: NMT goals

COC will strive to meet and urge concerned agencies to take action to meet by 2018 the following goals related to the performance measurement indicators set above (Section 5.1):

- A. Increase the mode share for pedestrians and cyclists to at least 40 per cent.
- B. Reduce the number of pedestrian and cyclist fatalities to 0 per annum.
- C. Ensure that at least 80 per cent of streets have footpaths.
- D. Ensure that at least 80% of streets with a right-of-way (ROW) of over 30 m have unobstructed, segregated, continuous cycle track of 2m width.
- E. Increase public transport mode share to at least 60 per cent of motorised trips.
- F. Stabilise private motor vehicle kilometres travelled (VKT) so that there is 0 per cent annual growth in VKT.

Schedule B: Design process



All projects related to road with a value over Rs. 5,00,000 are subject to design review:

- The Department or Zone office submits detailed design drawings to the Superintending Engineer, Roads and Bridges Department.
- If the designs comply with the CSDM, the Superintending Engineer, Roads and Bridges Department, can approve or reject the designs.
- If the submitting department seeks an exception to the CSDM, the Superintending Engineer, Roads and Bridges Department, can approve or reject the exception.

Schedule C: Draft Chennai Street Design Manual (CSDM) contents

1. Introduction
 - 1.1. Purpose and need
 - 1.2. Goals
 - 1.3. Coordination with other efforts and agencies
 - 1.4. How to use the manual
2. Street design principles
 - 2.1. Safety
 - 2.2. Mobility
 - 2.3. Pedestrian accessibility
 - 2.4. Liveability
 - 2.5. Sensitivity to local context
 - 2.6. Creative use of street space
3. Priority networks
 - 3.1. Modal hierarchy
 - 3.2. Public transport network
 - 3.3. Cycling network
 - 3.4. Pedestrian network
4. Typologies
 - 4.1. Land use typologies
 - 4.2. Transport typologies
 - 4.3. Street character typologies
 - 4.4. Typology tables
 - 4.5. Typology protocols
5. Standard sections according to typologies
6. Design standards for street elements
 - 6.1. Footpaths
 - 6.2. Cycle tracks
 - 6.3. Carriageway
 - 6.4. Bus rapid transit
 - 6.5. Medians and pedestrian refuges
 - 6.6. Pedestrian crossings
 - 6.7. Landscaping
 - 6.8. Bus stops
 - 6.9. Spaces for street vending
 - 6.10. Street furniture and amenities
 - 6.11. On-street parking
 - 6.12. Service lanes
 - 6.13. Traffic calming elements
 - 6.14. Street lighting
 - 6.15. Storm water drainage
 - 6.16. Other underground utilities
7. Intersections
 - 7.1. Geometric and operational policies
 - 7.2. Standard intersection designs
8. Design process
 - 8.1. Surveys
 - 8.2. Design preparation
 - 8.3. Design review
 - 8.4. Implementation oversight
9. Evaluation

Approval of Corporation of Chennai Council

Non-Motorised Transport Policy was approved by Corporation of Chennai Council vide Resolution No 518/2014 dated 30.09.2014

படி / சிறப்பு திட்டம்/ந.ச.எண்/93/3296/2014
முன்மைய செயல் மற்றும் ஆலோசனை அலுவலகின் 22.09.2014 நாள்/இ. குறிப்பு



30.09.2014 அன்று நடந்த மன்றத்தின் சாதாரண கூட்டத்தின் நடவடிக்கையின் கருக்கம்

தீர்மான எண்.518/2014
சிறப்புத் திட்டங்கள் துறை - சென்னை ஒருங்கிணைந்த நகர்ப்புற போக்குவரத்து ஆணைக்குழு (CUMTA) கீழ் மேட்டூர் வாகனரிவலா போக்குவரத்து கொள்வனவு (NMT Policy) தயார் மற்றும் ஆங்கிலத்தில் வெளியிடவேண்டுக அனுமதி

செருள் எண்.45

அரசு வந்தமையானி எண்.346ன்படி சென்னை ஒருங்கிணைந்த நகர்ப்புற போக்குவரத்து ஆணைக்குழு அமைக்கப்பட்டது. இக்குழுவின் முதலாவது கூட்டம் 16.07.2012 மற்றும் 26.07.2012 நடைபெற்றது. இக்கூட்ட நடவடிக்கையின் படி மூன்று துறைக்குழு அமைக்க பரிந்துரைக்கப்பட்டது. அதில் ஒரு குழு "மேட்டூர் வாகனரிவலா போக்குவரத்து கொள்வனவு (NMT Policy) துறைக்கமிட்டி" ஆகும் இத்துறைக்குழுவின் சென்னை மாநகராட்சி/சிபிசி, முன்மையச் செயலாளர் / ஆணையர் அலுவலக தலைவராகவும், காவல் துறை துணை ஆணையர் போக்குவரத்து, நிர்வாக இயக்குநர் / மாநகராட்சி போக்குவரத்துக் கழகம், தலைமை பொறியாளர் நெடுஞ்சாலைத் துறை, மாநகராட்சி தலைமை திட்ட அமைப்பாளர் (போக்குவரத்து) சென்னை பெருநகர் வளர்ச்சிக் குழுவும், இயக்குநர் சென்னை சிட்டி கலெக்டர் அலுவலகமும் உறுப்பினர்களாக இருப்பார்கள் என முடிவு செய்யப்பட்டது.

மேட்டூர் வாகனரிவலா போக்குவரத்து கொள்வனவு (NMT Policy) துறைக்கமிட்டி பரிந்துரைப்படி பல்வேறு சிறப்பு திட்டங்கள் வாகனரிவலா போக்குவரத்தை ஊக்குவிக்கும் வகையில் பல்வேறு திட்டங்கள் மேற்கொள்ளப்பட்டு வருகிறது. சிறப்பு திட்டங்களான உலகத் தரத்திலான நடைபாதைகள், பெருந்துறைகளில் மிதிவண்டிக்கான பிரத்யேக தடங்கள் அமைத்தல், நடைபாதை பிளாசாக்கள், பகுதி வரை படங்களுடன் கூடிய நவீன பெருந்துறை நிறுவுகைகள், பெருந்துறை நிற்கும் பிரத்யேக இடங்கள் (Bus Bay), அனைத்து பொது சேவை போக்குவரத்து நிறுவனங்களான சென்னை மேட்டூர் இரயில், மரகதம் இரயில், மேட்டூர் இரயில், பெருந்துறை ஆகியவற்றை ஒருங்கிணைத்து அமைக்க வேண்டிய சாலைகள் அமைப்பது திட்டமிட்டு நடைமுறைக்கு கொண்டுவரப்படுகிறது.

மேற்கூறிய சிறப்புத் திட்டங்களான மேற்கொள்ள வழிக்கட்டிடப்பாக "சென்னை மாநகராட்சி மேட்டூர் அல்லாத போக்குவரத்துக் கொள்வனவு" (Corporation of Chennai Non-Motorised Transport Policy) வரையறுக்கப்பட்டுள்ளது. இதில் மேட்டூர் அல்லாத போக்குவரத்தான நடப்பது ஊக்கின் ஒட்டுவது மற்றும் மனிதராளம் இயக்கப்படும் மேட்டூர் அல்லாத போக்குவரத்து சாதனங்களை பயன்படுத்துவதற்கு ஏதுவாக உள்ளகட்டமைப்பு மேற்கொள்வதற்கான வழிவகைகள் வகுக்கப்பட்டுள்ளது.

சென்னை மாநகராட்சி சாலைகளின் வடிவமைப்பு பாதுகாப்பின் மற்றும் அனைத்துமகை போக்குவரத்து வசதிகளும் உள்ளடக்கிய சிறந்த நடைமுறைகள் மேற்கொள்வதன் மூலம் ஒருவரின் வயது அல்லது வறங்கை அந்தஸ்து வித்தியாசமாகவும் பாதுகாப்பான மேட்டூர் அல்லாத போக்குவரத்து வசதியை வழங்குவதற்கான வழிவகுத்தலை "சென்னை மாநகராட்சி மேட்டூர் அல்லாத போக்குவரத்து கொள்வனவு" என வகுத்துள்ளது.

எனவே, சென்னை மாநகராட்சி மேட்டூர் அல்லாத போக்குவரத்து கொள்வனவை தயார் மற்றும் ஆங்கிலத்தில் வெளியிட நினைக்குழு (பணிகள்) மற்றும் நிலைக்குழு (வரி விதிப்பு மற்றும் நிதி) கற்றின் முடிவாக மன்றத்தின் அனுமதி வேண்டி சமர்ப்பிக்கப்படுகிறது.

"ஏற்கனவே நிலைக்குழு (பணிகள்) கூட்டம் 19.09.2014 அன்று முடிவடைந்த நிலையில் இப்பொருளின் அவசரம் மற்றும் அவசியத்தன்மையை கருத்தில் கொண்டு 29.09.2014 அன்று தீர்மான எண்.421/2014-ன்படி நிலைக்குழு (பணிகள்) வின் கற்றின் மூலம் பெருநகர்வாணை உறுப்பினர்களின் பரிந்துரையை பெற்று நிலைக்குழு (வலியுறுத்தல்)வின் மூலமாக மன்றத்தின் அனுமதி வேண்டி சமர்ப்பிக்கப்படுகிறது".

"ஏற்கனவே நிலைக்குழு (வலியுறுத்தல்) வின் கூட்டம் 19.09.2014 அன்று முடிவடைந்த நிலையில் இப்பொருளின் அவசரம் மற்றும் அவசியத்தன்மையை கருத்தில் கொண்டு 29.09.2014 அன்று தீர்மான எண்.429/2014ன்படி நிலைக்குழு(வலியுறுத்தல்)வின் கற்றின் மூலமாக பெருநகர்வாணை உறுப்பினர்களின் பரிந்துரையை பெற்று மன்றத்தின் அனுமதி வேண்டி சமர்ப்பிக்கப்படுகிறது."

"இதற்கு மன்றம் அனுமதி அளிக்கின்றது"

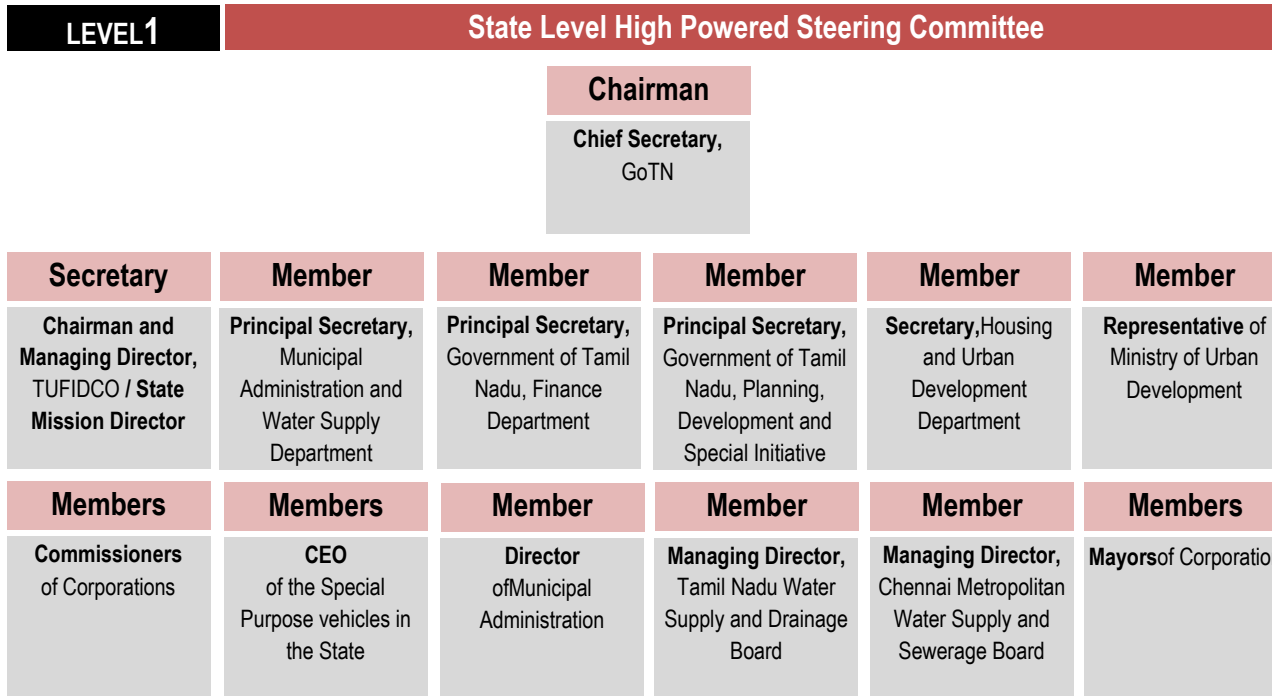
//ச.எம்.செ. கருக்கம்//

கொடி: பணித்துறை/சிறப்பு திட்டம்
நகல்: நி.ஆ.தபி & மு.க.கு.1) அ.செ-18.

மன்றச் செயலாளர்

18/09/2014

SPV STRUCTURE



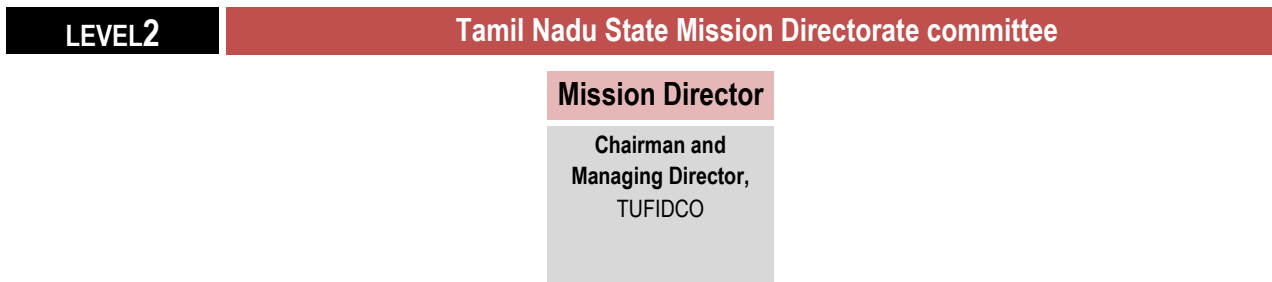
Roles, Responsibilities & Relationship

All the stake holders have been made part of the State Level High Powered Steering Committee

Key Responsibilities

- (i) To provide guidance to the mission
- (ii) Oversee the process of first stage Intra-State Competition
- (iii) Review the smart city proposals and forward to the Ministry of Urban Development

Once the Smart City project takes off, then this committee will have all the powers on the matters that require the approval of the State Government.



Roles, Responsibilities & Relationship

- Ensure effective coordination, and to steer ahead the smart city programme
- Assist the State Level High Powered Steering Committee
- Guide the Urban Local Bodies / Smart City Special Purpose Vehicles for planning, mobilization of funds and for implementation of the smart city programme

SPV STRUCTURE

LEVEL 3

Chennai Smart City Limited (CSCL)

Chairman

Commissioner,
Corporation of
Chennai

Director 2

Representative from
Ministry of Urban
Development

Director 3

Representative from
Finance Department
of Government of
Tamil Nadu

Director 4

Managing Director,
CMWSSB

Director 5

Deputy
Commissioner
(Works), Corporation
of Chennai

Director 6

CEO, Chennai Smart
City Limited

Director 7 & 8

**Two Independent
Directors.** If none of
the directors 1-6 are
women member, then
one of the
Independent directors
will be a Women
Director

Roles, Responsibilities & Relationship

CSCL will be a public limited company with limited liability under the Companies Act, 2013

The authorized share capital of the company is proposed to be Rs 250 crore, while the issued and subscribed capital is planned at Rs 120 crore.

Initially the share holding pattern of the SPV will be 50:50 by the Government of Tamil Nadu, and Corporation of Chennai.

The Board of Directors of the Chennai Smart City Limited will have all the approval / decision making powers in its command area, equivalent to the powers available to the Municipal Administration Department.

LEVEL 4

Inter Departmental Task Force

Chairman

Commissioner,
Corporation of
Chennai

Convener

Deputy
Commissioner
(works), Corporation
of Chennai

Member

CEO of Chennai Smart
City Limited

Member

Engineering Director,
CMWSSB

Member

Superintending
Engineer, Tamil Nadu
Generation and
Distribution
Corporation Limited

Member

Superintending
Engineer / Divisional
Engineer, Highways

Member

Senior Planner /
CMDA

Member

Executive Engineer of
the respective
command area of
Tamil Nadu Housing
Board

Member

Executive Engineer of
the respective
command area of
Tamil Nadu Slum
Clearance Board

Member

District Information
Officer, National
Informatics Centre

Member

Deputy Commissioner
of Police / Traffic
Planning

LEVEL 5

Chennai Smart City Advisory Forum

Chairman

Commissioner,
Corporation of
Chennai

Co-Chairman

Member of
Parliament

Member

Member of
Legislative
Assembly

Member

Mayor

Member

Chief Executive
Officer of Chennai
Smart City
Limited

Member

Local Youth

Member

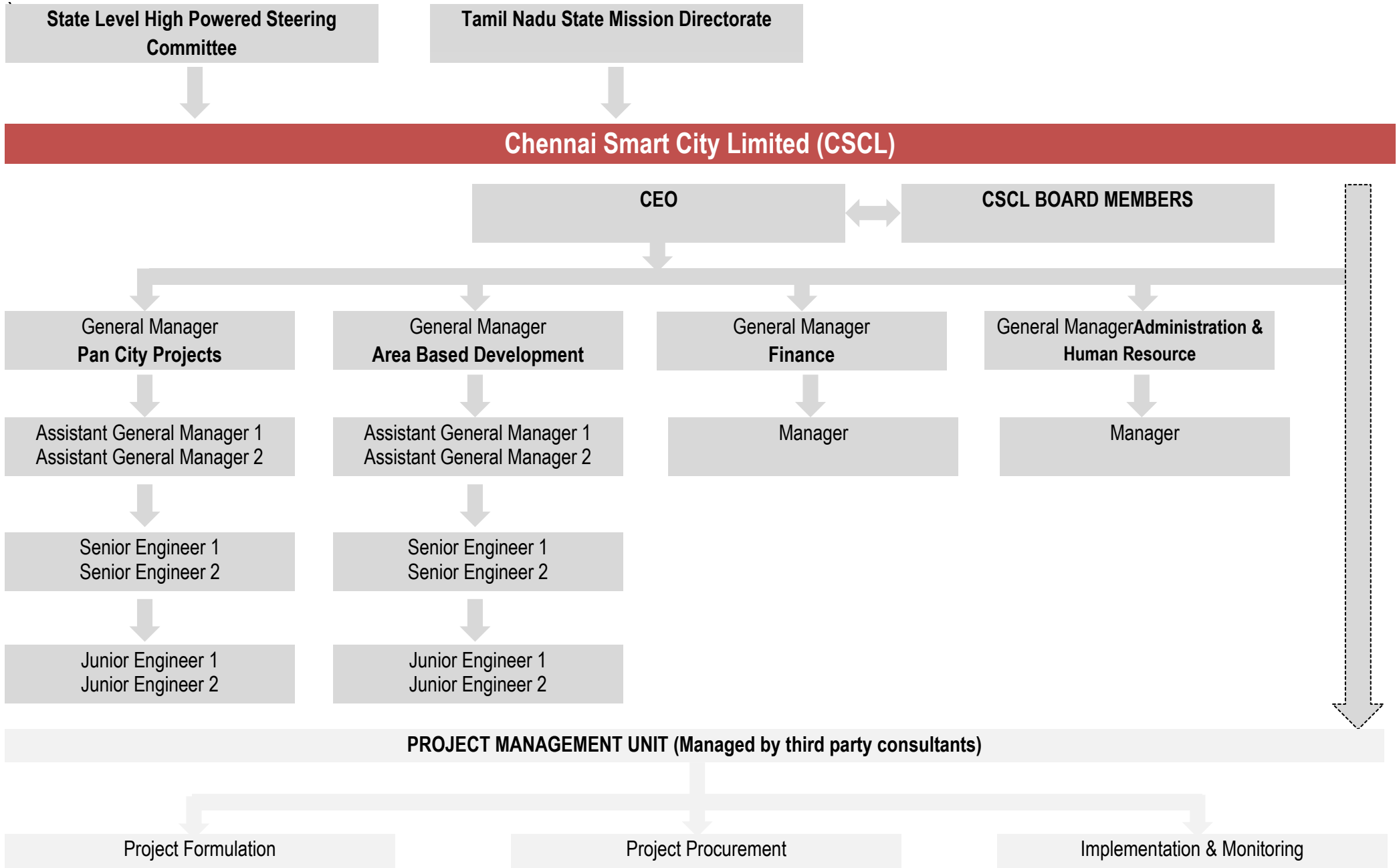
Technical Expert/
Consultants.
Representative
from Institute for
Transportation &
Development
Policy (ITDP)

Member

Non Government
Organization.
Representative
from Chennai City
Connect (CCC)

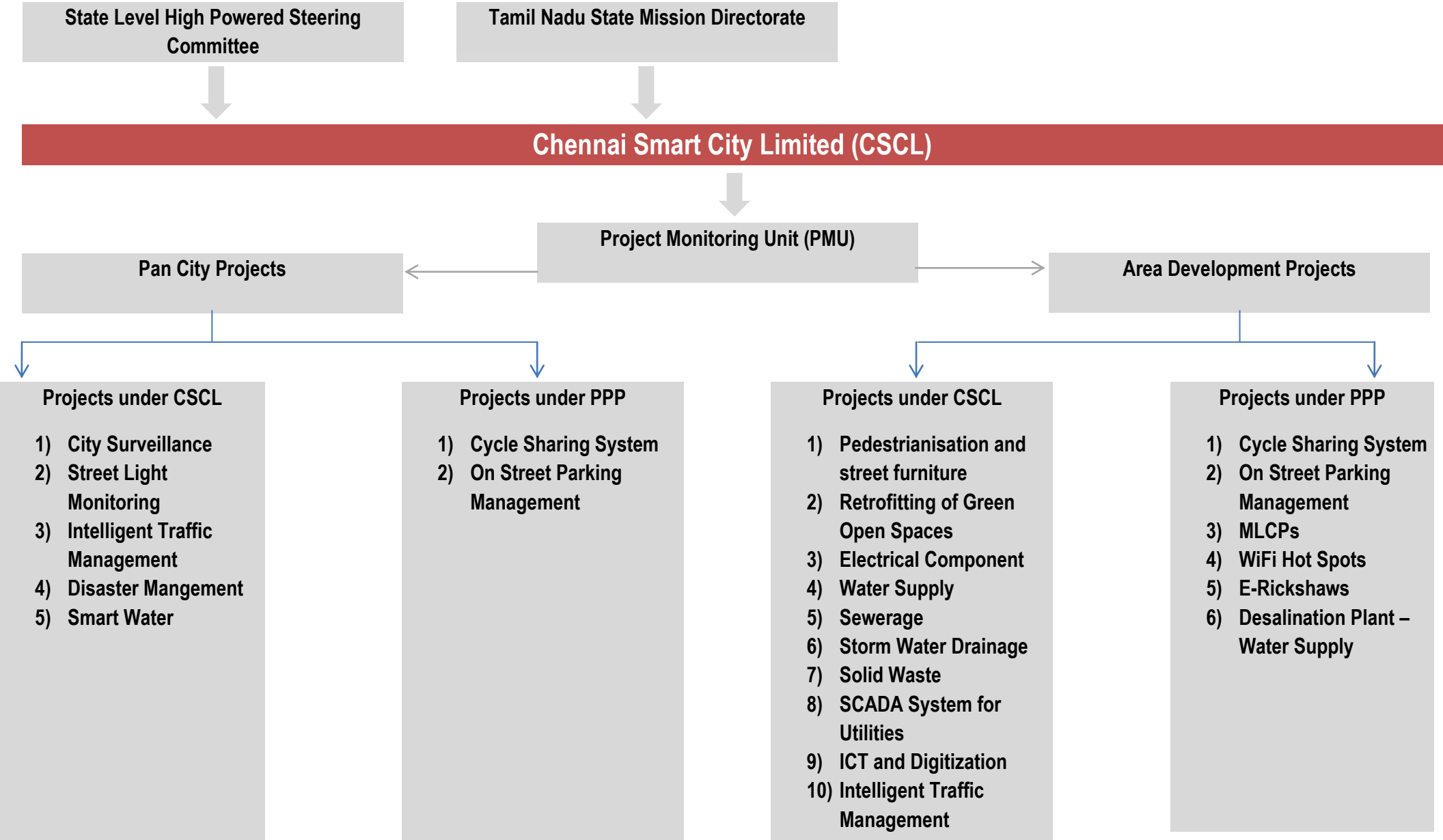
HUMAN RESOURCE PLAN

Chennai Smart City Limited (CSCL)



PROJECT STRUCTURE

Chennai Smart City Limited (CSCL): Project Structure





CHENNAI METROPOLITAN WATER SUPPLY AND SEWERAGE BOARD
No. 1, Pumping Station Road, Chintadripet, Chennai-600 002.

MANAGING DIRECTOR

Lr. No. CMWSSB/P&D/ Smart City/2015, Dt. 14.12.2015.

To

The Deputy Commissioner,
Corporation of Chennai,
Ripon Building,
Chennai – 600 003.

Sir,

Sub: CMWSSB – P&D – Smart City Mission – Preparation of Smart City
proposal – Concurrence required for Smart City proposal – Reg.

Ref: Lr.No.SPC No.B1/490/2015, Dated 11.12.2015.

---o0o---

With reference to above, CMWSSB hereby confirms its participation on the Smart
City Proposal for Chennai City.


MANAGING DIRECTOR.

Tamil Nadu Generation and Distribution Corporation Limited

From

Er.M.A.Helen,M.E.,
Chief Engineer/Planning & RC
144, Anna Salai,
Chennai – 600 002.

To

The Deputy Commissioner (Works),
Corporation of Chennai,
Ripon Building,
Chennai-600 003.

Lr.No SE/Plg/EE/GP/AEE 1/F.Details /D.247 /2015 dt 18.12.15

Sir,

Sub: Smart City Mission–Corporation of Chennai-Concurrence for Smart City
Proposal –Reg

Ref: Lr No.S.P.C No:B1/490/2015 dated 11.12.2015

Adverting to the above reference, it is informed that TANGEDCO concurs to be a part of smart city proposal of Chennai provided financial assistance is given by GoTN/GoI for all the required initiatives of TANGEDCO.



Yours faithfully,

Omom 18/12

Chief Engineer/Planning & RC

2/2

Kakarla Usha, I.A.S.,
Managing Director

18 December 2015

Tamil Nadu Urban Infrastructure Financial Services Limited operates three externally aided projects for funding urban infrastructure projects implemented in Tamil Nadu as detailed below:

i) KfW assisted Sustainable Municipal Infrastructure Financing in Tamil Nadu – Phase-II – Part-1 (SMIF-TN-II-1) Program with an outlay of Euro 80 mn (equivalent to about Rs.578.16 crores). The entire amount is allotted for investment in urban infrastructure projects.

ii) KfW assisted Sustainable Municipal Infrastructure Financing in Tamil Nadu – Phase-II – Part-2 (SMIF-TN-II-2) Program with an outlay of Euro 107.75 mn (equivalent to about Rs.877.39 crores). Of the above Euro 100 mn (equivalent to about Rs.814.30 crores) is allotted for investment in urban infrastructure projects.

iii) World Bank assisted Tamil Nadu Sustainable Urban Development Project (TNSUDP) with an outlay of US \$ 600 mn (equivalent to about Rs.3831 crores) of which the World Bank financing is US \$ 400 mn (equivalent to about Rs.2554 crores). Of the above US \$ 384 mn (equivalent to about Rs.2451.84 crores) is allotted for investment in urban infrastructure projects.

Further, resources may also be mobilized from the capital markets on pooled finance mechanism for funding urban infrastructure projects. A sum of Rs.222.30 crores has already been mobilized and utilized for implementing urban infrastructure projects within the State. Further resources under the pooled finance mechanism will be mobilized based on the requirement for implementing urban infrastructure projects by the Urban Local Bodies in Tamil Nadu.



Kakarla Usha
Managing Director

WINNER SUSTAINIA AWARD

CORPORATION OF
CHENNAI

INSTITUTE FOR TRANSPORTATION & DEVELOPMENT POLICY
AND CHENNAI CITY CONNECT FOUNDATION



The Sustainia Award honors outstanding performance within sustainability. Your solution has been awarded for its ability to make a positive social, environmental and economic impact on societies, contributing to a more sustainable future.

THE WINNER OF THE SUSTAINIA AWARD IS SELECTED BY THE SUSTAINIA AWARD COMMITTEE:



ARNOLD SCHWARZENEGGER
Honorary Chairman of the Sustainia Award Committee and Former Governor of California



CHRISTIANA FIGUERES
Executive Secretary of the UN Framework Convention on Climate Change (UNFCCC)



CONNIE HEDEGAARD
Former European Commissioner for Climate Action



DR. RAJENDRA PACHAURI
Nobel Laureate and former Chair, Intergovernmental Panel on Climate Change (IPCC)



a part of
MONDAY MORNING
Global Institute


Global Water Awards 2015

Global Water Intelligence

Water Leaders Award

Chennai Metropolitan Water Supply And Sewerage Board

'Has fast-tracked its innovative resilience plan amidst acute water scarcity'


Christopher Gasson
Publisher, Global Water Intelligence

www.globalwaterintel.com

WINNER
Global Water Awards
2015



Chennai Metropolitan Water Supply and Sewerage Board was awarded the prestigious **“Water Leaders Award – 2015”** at the **Global Water Awards Ceremony** held on 27th April, 2015 at the Nasioutzik Museum, Athens, Greece. The award was given by Mr. Jose Manuel Barroso, President of the European Commission (2004-2014) and Prime Minister of Portugal (2002-2004).

The Water Leaders Award is the only non profit Global Water Award which rewards exemplary performance & improvements in public water utilities in the developing world over the past year (2014). The Global Water Leaders group is a CEO level nonprofit organization that brings together leaders from the water sector – Utility Directors, Water Ministers, Mayors, and Regulators to face world’s water challenges.

CMWSS Board was given the Global water leaders award for the various initiatives taken to manage the acute water scarcity brought in by two years of successive drought in the year 2014.

During the year 2014, Chennai received deficit rainfall for the second consecutive year and reservoir levels were very low at 25% of the capacity.

The Hon’ble Chief Minister reviewed the situation and took many decisions to meet the situation. The decisions taken by the Hon’ble Chief Minister were immediately implemented on a war footing by CMWSSB. These were coupled with necessary field inspections and monitoring which ensured that the drought was managed successfully during the year 2013-14

The various decisions of the Hon'ble Chief Minister are:

1. Commissioning of 100 MLD Desalination Plant at Nemmeli on 22.02.2013.
2. Creation of new ground water sources in the well fields at Tamaraipakkam, Minjur and Poondi.
3. Creation of facilities for tapping water from Neyveli Lignite Mines at Paravanar and Mine IA.
4. Rain Water Harvesting.
5. Supply of treated water to industries.
6. Approval for establishment of two 45 MLD Tertiary Treated Reverse Osmosis Plants at Koyambedu and Kodungaiyur.
7. Water supply through GPS enabled water tankers.
8. Modernized SMS based 24x7 Call Centre for grievance redressal.

These decisions of the Hon'ble Chief Minister have now been globally recognized. The efforts by CMWSSB resulted in successfully managing the drought in Chennai city during the year 2013-14. For this achievement, CMWSSB has been awarded the **"Global Water Leaders Award-2015"**.



சென்னை
மாநகராட்சி

Corporation of Chennai

- ◆ Newsletter
- ◆ Flood Relief Center
- ◆ Official Login
- ◆ About COC
- ◆ Who's Who
- ◆ Council
- ◆ Departments
- ◆ Online Civic Services
- ◆ Community Hall
- ◆ Rules/Procedure
- ◆ Right to information act
- ◆ Photo Gallery
- ◆ News & Events
- ◆ Road Works



Document No. 13



இயற்றலும் ஈட்டலும் காத்தலும் காத்த
வகுத்தலும் வல்ல தரக.

News

ப்ளீச்சிங் பவுடர் வழங்குதல்,
புகை அடிப்பான் மூலம் புகை
அடித்தல் 200 வார்டுகளிலும்
மருத்துவ முகாம்கள் நடத்துதல்
போன்ற அனைத்து
பணிகளையும் சென்னை
மாநகராட்சி போர்கால
வாழ்வுப் பணியில் செயல்பட விரை...

▶ more...

தமிழ்ப்பதிப்பு Home நமது மேயர் Campaigns Links Feedback

Online
Civic Services

Direct Recruitment - AE / SI

Direct Recruitment Correction

Online Tax Payment

Birth/Death Certificates

Building Plan Submission

Online Public Grievance

Aadhaar Centres

Parking Slot

மூவலூர் திருமண நிதியுதவி திட்டம்

Citizen Portal

Online Services for
VOTERS



Welcome to
Corporation of Chennai

The Chennai Corporation is the civic body that governs the city of Chennai,
India. It is headed by Mayor, who presides over 200 councillors each of whom
represents one of the 200 wards of the city.

▶ [more...](#)

Media

Flood Relief





Tamil Nadu Police Citizen Portal

Document No. 14



- HOME
- QUICK MENU ▾
- ONLINE SERVICES ▾
- KNOW YOUR POLICE ▾
- PUBLIC ADVISORY ▾
- HELPLINES ▾
- FAQ

MISSING PERSON



ABARNA (17)
369/2015)
GUDALUR NORTH (PS)
THENI (Dt)
(04554-231213)



FOUND BY NGO



CRIME PREVENTION TIPS

JOB RACKET TAMILNADU POLICE

Apply for overseas jobs advertised through newspapers/magazines only after verifying with the office of the Protector of Emigrant by dialing 044-24891337

KANDHU VATTI (USURY) TAMILNADU POLICE

Kandhu Vatti is collection of exorbitant interest rates in violation to the rates stipulated under section VII of the Money Lenders act 1957 & Exorbitant Interest Act 2003 .

KNOW THE STATUS OF

- F.I.R
- C.S.R
- ONLINE COMPLAINTS
- VEHICLE

TRACK CHILD



UN-ID BODY



ONLINE COMPLAINT



- DOWNLOADS
- APPLICATIONS FOR LICENCES
- ARMS
 - BROWSING CENTER

NEWS

- Tender TNPHC
- Application invited for Home Guard
- Posting and Promotion of Senior Officers
- Commemoration Day

GOOD WORK DONE

RIGHT TO INFORMATION

RECRUITMENT

RECRUITMENT SECURITY AGENCY

e-PAYMENT - TN FINGER PRINT BUREAU



From
Dr.R.Palaniswamy, IAS.,
Managing Director,
Tamil Nadu Slum Clearance Board,
No. 5, Kamarajar Salai,
Chennai-600 005.

To
The Deputy Commissioner (Works),
Ripon Building,
Corporation of Chennai,
Chennai - 600 003.

Lr. No. M1 / 11463 / 2015

Date: 21.11.2015

Sir,

Sub : Corporation of Chennai - Special Projects Department -
Smart City Mission - Information to be collected from line
Department Officials - requested - reg:

Ref : D.C. (works),CoC ,S.P.C. No. B1 /Spl /2015 dt:5.10.2015

I invite your kind attention to the reference cited above and report as follows.

Tamil Nadu Slum Clearance Board has been constructing tenements in alternate locations to resettle the slum families living in objectionable areas like river margin, road margin etc. It is programmed to make Chennai City Slum Free under "Vision 2023". Under this programme houses with infrastructure and land tenure will be provided for all the slum families. The details of tenements constructed and resettlement schemes taken up in Chennai city and Housing programmes proposed for implementation in Chennai City under Housing for All are furnished in the annexures - I and II enclosed.

Tamil Nadu Slum Clearance Board has not provided community toilets under Swatch Bharath.

Encl: Annexure - I & II.


23.11.15
for **Managing Director**


21/11

ANNEXURE - I A

TAMIL NADU SLUM CLEARANCE BOARD

TENEMENTS CONSTRUCTED DURING 2011 - 2012 TO 2014 - 2015

Year	Zone	Private Sector		Government Initiative TNSCB	
		Approved Units (Nos)	Supply of Units ready for occupation (Nos)	Approved Units (Nos)	Supply of Units ready for occupation (Nos) (+)
2011 - 2012		-	-	-	21200
2012 - 2013		-	-	-	1500
2013 - 2014		-	-	-	3531
2014 - 2015		-	-	-	19242
				Total	45473


for Managing Director


21/14

ANNEXURE - I B

TAMIL NADU SLUM CLEARANCE BOARD

REHABILITATION AND RESETTLEMENT SCHEMES IN CHENNAI CITY

Sl. No	Location	Name of the Schemes	No. of slum tenements
1.	South Chennai	Okkium Thoraipakkam	23904
2.	South Chennai	Semmencherry	6764
3.	North Chennai	Thiruvottiyur AIR land	5440
	Total		36108

G. S. S. S. S.
23/11/11
Chief Engineer

G.
21/11

Tamil Nadu Slum Clearance Board

Slum Free City Plan

Chennai

Housing for All - Houses proposed for constructions during 2015-2023

Sl. No	Description	No of slums surveyed	No of households surveyed	No of households proposed for intervention	Cost (Rs. In lakhs)
	Tenable	896	243150	115484	13561.23
	Untenable	235	61830	61830	8418.84
I	Curative Strategy	1131	304980	177314	21980.07
II	Preventive Strategy			72657	10389.9
	Total	1131	304980	249971	32369.97

[Handwritten Signature]
23/1/21
Chief Engineer

[Handwritten Signature]
21/11

Tamil Nadu Slum Clearance Board
Details of Slum Free City Plan of Action (SFCPoA)
Investment Requirement

Rs. in Crores

S. No	Name of the City	No of Slums surveyed	No of slum households surveyed	No of HHs proposed for intervention	Tenable							Untenable						
					No of slums	No of HHs	No of HHs proposed for intervention	Housing Cost	Infra structure Cost	other Cost	Total Cost	No of slums	No of HHs	No of HHs proposed for intervention	Housing Cost	Infra structure Cost	other Cost	Total Cost
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1	Chennai	1131	304980	177314	896	243150	115484	10281.64	628.75	2650.84	13561.23	235	61830	61830	5529.14	1244.04	1645.66	8418.84

Tamil Nadu Slum Clearance Board

Details of Slum Free City Plan of Action (SFCPoA)

(Contd.....)

S. No	Name of the City	Curative Strategy						Preventive Strategy					Total Cost				
		No of HHs	No of HHs proposed for intervention	Housing Cost	Infra structure Cost	other Cost	Total Cost	No of HHs proposed for intervention	Housing Cost	Infra structure Cost	other Cost	Total Cost	No of HHs proposed for intervention	Housing Cost	Infra structure Cost	other Cost	Total Cost
		20	21	22	23	24	25	26	27	28	29	20	31	32	33	34	35
1	Chennai	304980	177314	15810.78	1872.79	4296.50	21980.07	72657	6823.61	1535.32	2030.97	10389.90	249971	22634.39	3408.11	6327.47	32369.97

Gr. S. Chelvanathan
Chief Engineer

2/11

Tamil Nadu Generation and Distribution Corporation Limited

No. 1481

From
Er.M.Pandi,
Director /Distribution
144, Anna Salai,
Chennai – 600 002.

Handwritten initials

To
The Principal Secretary/Commissioner,
Tamilnadu Urban Finance and
Infrastructure Development
Corporation Limited
No.490/1-2 Anna Salai, Nandanam
Chennai-600 035.

TUFIDCO
11 DEC 2015
CHENNAI-35

Lr.No SE/Plg/EE/GP/AEE 1/F.Details /D.235/2015 dt 9 .12.15

Sir,

Sub: Smart city Mission– Details -Furnished-Reg

Ref:Lr No.TUFIDCO/Smart City/44/AM(B)/2015 dated 16.11.15

Adverting to the above reference, the details for the smart city mission
for Corporation of Chennai are furnished.

AM (S)

Yours faithfully,

*AM(B)
N/A.*

Handwritten signature

(M.A.Helen)
Chief Engineer/Planning &RC
for Director/Distribution

2/2

Encls: as above

1. Non conventional Energy sources

i. Existing RE generation capacity against total power demand (MW) for Chennai city.

RE Installed capacity in Tamil Nadu (As on 31.10.2015)

1. Wind – 7498.555MW
2. Solar – 358.26MW
3. Bagasse based Cogen – 659.4MW
4. Biomass – 230MW

ii. Details of existing RES in Chennai :

- a) Rooftop Solar PV system based power generation – Installation status and future planning

TANGEDCO is encouraging establishment of HT/LT grid – interactive roof top solar power plants for captive use. So far 20 MW capacity solar rooftop SPV plants have been energized. Many proposals are being received for commissioning of rooftop solar PV power plants in Chennai.

- b) Biomass / Biogas based power generation - Installation status and future planning

The potential of Biomass fuel in the state is 500MW. At present, the installed capacity of Biomass/ Biogas power plants is 230MW. There are NO proposals under pipeline since the potential of Biomass fuel has already been exploited in the State.

- c) Any other RES already installed or planned for.

The other sources of renewable energy are Wind & Bagasse based cogeneration plants. At present, the installed capacity of bagasse based cogeneration power plants and Wind Electric Generator (WEG) is 659.4MW and 7498.555MW. 183 MW capacity of Cogeneration power projects is under pipeline.

iii. Status of installation of rooftop solar PV system: So far 20 MW capacity solar rooftop SPV plants have been energized. Many proposals are being received for commissioning of rooftop solar PV power plants in Chennai.

2.RESTRUCTURED ACCELERATED POWER DEVELOPMENT & REFORMS PROGRAMME

The objectives of the R-APDRP Scheme are to provide quality and reliable power supply to the consumers and to bring down the Aggregate Technical & Commercial losses (AT&C) below 15%. The project is implemented in two parts, Part-A & Part-B . Funds allotted by Ministry of Power / GoI for implementation of R-APDRP Scheme and measures taken by TANGEDCO are detailed as below.

Details of projects covered under R-APDRP :

Part A

An amount of Rs.417 Crores towards Part-A (Information Technology) implementation in 110 towns (with 30,000 population as per 2001 census) and Rs.182.17 Crores for SCADA / DMS implementation in 7 towns (having a population of 4 Lakhs consumers and annual consumption of 350 Million units) have been sanctioned and the works are expected to be completed by June 2016.

IT Implementation is being carried out in Chennai MA :

1. IT Implementation i.e., Setting up of common Data Centre with 17 application modules like Metering, Billing, Collection, New Service connection, Disconnection and Dismantling, Customer care, Asset and Maintenance Management, Energy Audit, Meter Data Management etc.
2. Setting up of a Centralized Customer Care Centre to cater to the needs of nearly 32.77 lakhs consumers of Chennai & nearly 60 lakh consumers of another 109 towns spread across Tamilnadu.
3. Provision of Common Automatic Meter Reading modems in nearly 22,100 Distribution Transformers, 1600 HT Services & 25 Ring fencing points
4. Setting up of IT infrastructure viz., Router, Switches, PC, Printers etc in 387 offices (Section office, Sub-Division office, Division office etc)
5. Setting up of Data Concentrator Unit & connecting up of all meters in the Sub-stations (149 nos) and sending the meter data to Data Centre at Chennai.
6. **GIS (Geographical Information System)**

Baseline data of Chennai MA is created in GIS platform. DGPS survey of Chennai MA is nearing completion and Consumer Indexing asset mapping is expected to be completed by June 2016. The cost of survey and mapping in PGDB is alone Rs 5 cr. On completion of survey the CMA GIS data as a single town will be loaded in Production server and will be accessible to TANGEDCO personnel through a web portal.

Using the base data it will be possible to query Geographical attributes of a specified location or specified network. Existing Consumers connected to a Distribution Transformer / No of Distribution Transformers in a specified area. It shall be possible to Zoom in and zoom out of a particular consumer to obtain the relevant information.

Chennai Metropolitan Area : 1204 Sq.Km

Satellite Imagery	: World View-02,1:1000 scale
Total no of Distribution sections	: 244
Total no of High Tension Feeders	: 1243
Total no of Distribution Transformers	: 23891
Total no of Consumers	: 32,77,224

The GIS data will be utilised by Centralised Customer Care Services to locate the called consumers, visualising the area of outages and will be customer friendly. Management information reports can be generated from any part of the network. GIS data will be utilised for network management which includes Network planning, Network Construction, Network Operations, Maintenance and attending to outages.

The Base line AT&C loss now for Chennai UA is at 17.61%, which expected to be less than 15% on completion of the project.

Cost involved (approx) 183.67 Crores (for above works in Chennai)

Works completed (approx) 101 Crores.

SCADA (Supervisory Control and Data Accuisition) in Chennai UA:

Benefits of SCADA :

- Real time Supervision & Control of Network encompassing all Distribution Transformers with complete 33/22/11 KV network in the Project areas
- By Providing feeder RTUs(FRTU) & Fault Passage Indicators (FPI) in the network faults will be located quickly & the healthy circuits energised by isolating the fault from the remote Control centre
- Provides SCADA automation to distribution networks for more observability
- Improves operational efficiency through user interface consolidation (DMS/SCADA/OMS)
- Improves reliability indices and customer satisfaction through faster and more predictable outage restoration
- Reduces energy losses and network operational costs with coordinated Volt/VAR management
- To reconfigure control centre operations dynamically and leverage Distributed Automation devices for closed-loop self healing networks
- Supports Demand Response and Distributed Generation

The following works are being implemented in Chennai U.A :

1. Setting up of Control Centre at Chennai HQ.
2. Setting up of Remote Terminal Units in 200 Sub-Stations in Chennai and connecting the same to feeders, Transformers etc and sending real time data to Control Centre.
3. Setting up of 1784 nos Ring Main Units for Distribution Transformers and 121 nos Sectionalizer in the feeders
4. Provision of 2851 nos FRTU (Field Remote TerminalUnits) for remote control of Ring Main Units and Sectionalizer.

Cost involved (approx) 77.94 Crores (for above works in Chennai)

Works completed (approx) 20 Crores.

Details on Part-B schemes covered in Chennai U.A

Part-B scheme covers Renovation, modernization and strengthening of 11 KV level Substations, Transformers/Transformer Centres, Re-conductoring of lines at 11KV level and below, Load Bifurcation, feeder separation, Load Balancing, High Voltage Distribution System (HVDS) (11KV), Aerial Bunched Conductoring in dense areas, replacement of electromagnetic energy meters with tamper proof electronics meters, installation of capacitor banks and mobile service centers etc. In exceptional cases, where sub-transmission system is weak, strengthening at 33 KV or 66 KV levels is considered.

Towns eligible for Part-B schemes are the R-APDRP towns with the Aggregate Technical & Commercial (AT&C) losses of more than 15%.

Towns eligible under Part-B scheme are required to reduce the AT&C losses from present level to 15% or below every year for 5 years starting at the latest one year after the year in which the Part A of project area concerned is established and verified by the independent agency appointed by Ministry of Power / Government of India.

Up-to 50% loan against Part-B projects will be converted into grant in equal tranches for 5 years if the AT&C losses in the town is reduced and maintained at 15% or below for every year.

Also, utility staff are eligible for incentive scheme for successful implementation of Part-B schemes.

In this regard, Chennai U.A (Urban Agglomeration) is sanctioned with Part-B schemes for Rs. 1473.74 Crores.

The timelines for completion of Part-B schemes in Chennai has been stipulated as 30.06.2016 by MoP.

Chennai U.A has to bring down the AT&C losses from present level of 17.61% to 15% or below on successful completion of the scheme.

If the AT&C losses are brought down to 15%, approximately 320 Million Units of Energy will be saved per year in Chennai.

Accordingly, an amount of Rs. 160 Crores (@ Rs.5/unit) savings will be secured every year due to the loss reduction in Chennai.

The technical loss reduction as well revenue savings will be available on a sustained basis in future.

The following works have been sanctioned under R-APDRP Part-B schemes in Chennai U.A

R-APDRP PART-B SCHEMES SANCTIONED IN CHENNAI U.A.				
S. No	Description of Works	Unit	Quantity	Value (Rs. Cr.)
1	Installation of new 33/11KV Sub-stations	No.	27	80.09
2	Erection of additional Power Transformers in existing 33/11KV Sub-stations	No.	3	4.63
3	Capacity enhancement of Power Transformers in existing 33/11KV Sub-stations	No.	55	56.66
4	Extension of new 33KV Overhead Lines	Km	13.00	0.42
5	Laying of new 33KV Underground (UG) Cables	Km	142.50	87.40
6	Strengthening of existing 33KV Underground cables with higher size cables	Km	44.45	26.67
7	Conversion of existing 33KV Overhead Lines into Underground Cables	Km	29.50	17.70
8	Bay Extension for new 33KV feeders at existing Sub-stations	No.	16	1.56
9	Extension of New 11 kV Overhead Lines	Km	691.50	21.69
10	Laying of new 11KV Underground Cables	Km	634.59	130.50
11	Strengthening of conductor in existing 11 kV Overhead Lines	Km	78.50	16.84
12	Strengthening of existing 11KV Underground cables with higher size cables	Km	15.52	3.08
13	Conversion of existing 11KV Overhead Lines into Underground Cables	Km	265.49	2.58

S. No	Description of Works	Unit	Quantity	Value (Rs. Cr.)
14	Conversion of existing 11KV Overhead structure into automated Ring Main Units (RMUs) for implementation of SCADA/DMS	No.	1784	242.26
15	Installation of new automated 11 kV Sectionalisers for implementation of SCADA/DMS	No.	121	5.18
16	Bay Extension for new 11KV feeders at existing Sub-stations	No.	124	6.93
17	Installation of new 11KV/433V Distribution Transformers	No.	3349	166.50
18	Strengthening of conductor in existing Low Tension (LT) Overhead Lines	Km	269.25	3.02
19	Conversion of existing LT Overhead Lines into Underground Cables	Km	224.62	62.56
20	Installation of 11KV Capacitor Banks in Sub-stations for improvement of Power Factor	No.	3	0.74
21	Extension of new 11KV / LT Overhead Lines with Aerial Bunched Cables	Km	329.40	14.04
22	High Voltage Distribution System (HVDS) to improve HT : LT ratio	No.	2194	27.63
23	Replacement of existing Consumer Electro-mechanical Energy Meters with tamper proof Static Meters	No.(in Lakhs)	8.35	401.80
24	Other Works	LS		93.26
	Grand Total (in Rs. Crores)			1,473.74
	Completed so far (in Rs. Crores)			600.00

3.Smart meters

In respect of smart energy meters, a study has been made by IT wing by conducting Proof of Concept(POC) on smart metering with AMI solution by installing 30 nos of single phase and 25 nos of three phase meters with DCU (Data Concentrator Unit) in the selected LT services in Chinthadripet area, Pudupet section under Chennai Electricity Distribution Circle /Central and the features of smart metering such as power quality monitoring, demand side management, data transfer & collection for analysis on real time basis & billing, remote connection & disconnection,tampering alerts and disconnection,pre-payment facility, generation of reports,etc., have been tested.

Now, the preparation of technical draft specification for smart meters is under progress.

4. Status of Consumer helpline and average response time for power outage inside Chennai city:

The Chennai city consumers can easily register their fuse of calls of electricity failure by dialing the call centre helpline number 1912 from both landline and mobile phone customers of all service providers. Almost, all the service providers have already activated the BSNL number bearing short code 1912 for registering the complaints of Fuse Off Calls of their customers as mandatory service based on TANGEDCO's request.

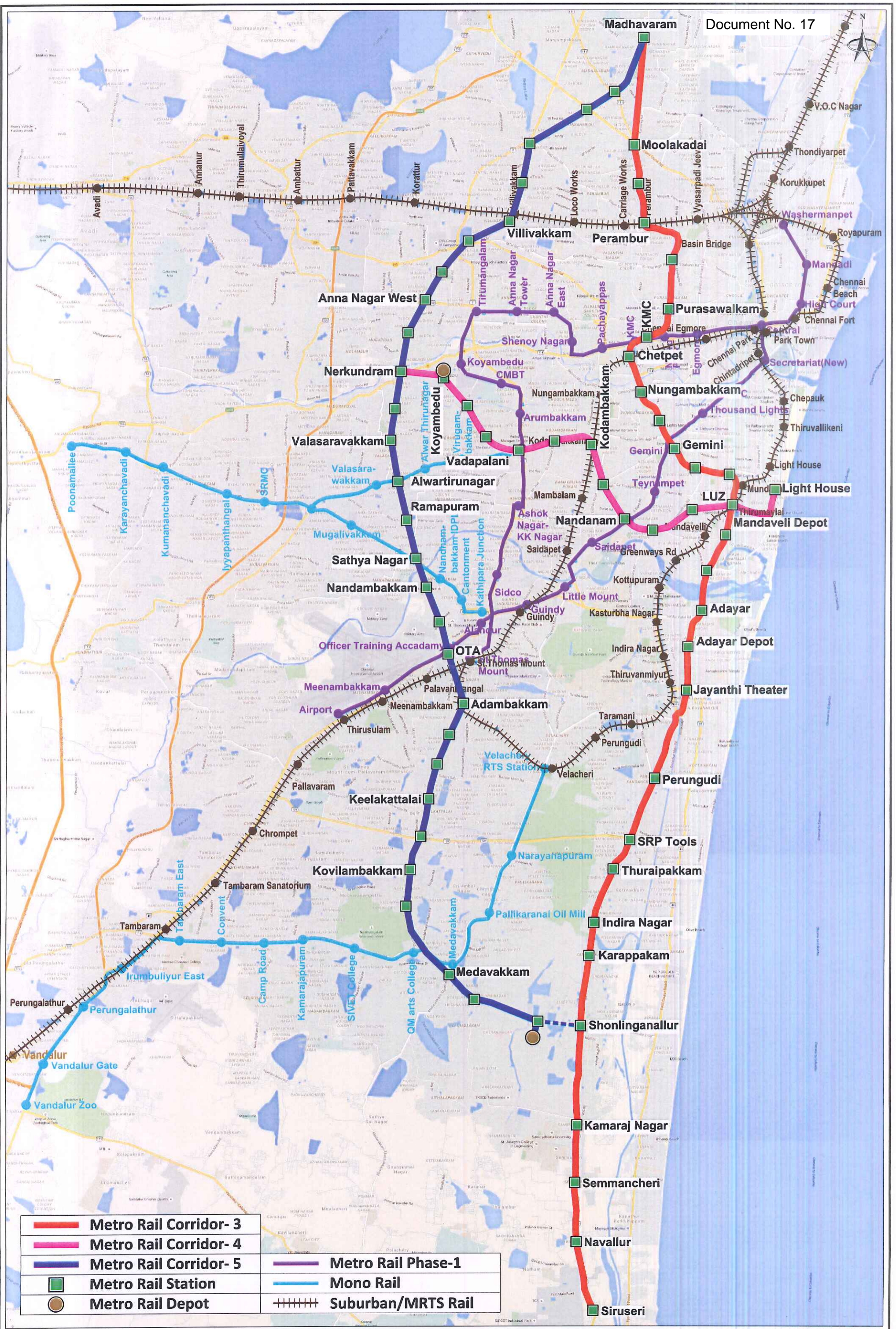
This TNEB call centre at Chennai has also provided the flexibility to the consumers of the Chennai city to lodge their complaints on electricity from outside the Chennai Regions by dialing the call centre of 1912 with prefix of Chennai STD code number 044. Since the short code 1912 has not been activated as Toll-free number for freeing of calls received at the TNEB call centre, the consumers have to pay the charges according to the duration of conversation in registering their complaints, depending on the tariff rate fixed by their Access providers.

In case of interruptions to the consumers, average power restoration (response) times are scheduled below:

Sl. No.	Interruption due to	Power restoration time
1.	High Tension supply failure	1 hour
2.	Fault in pillar boxes or transformer structures	2 hours
3.	Failure of distribution transformer	24 hours
4.	Individual service connection faults	3 hours

DURATION IN (HRS) OF UNSCHEDULED POWER OUTAGES IN CHENNAI CITY-PAST 5 YEARS

SL. NO	YEAR	MONTHS											
		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	2010	147.08	101.01	153.02	197.38	332.46	282.16	337.06	351.16	251.05	284.38	353.03	338.07
2	2011	137.06	200.00	169.18	201.25	304.07	344.41	263.16	510.36	552.06	421.38	634.45	511.00
3	2012	379.31	282.09	360.31	352.09	471.55	611.03	607.09	517.23	789.53	1031.00	544.56	835.13
4	2013	263.31	279.25	278.51	391.56	454.03	557.02	459.31	385.03	582.48	437.36	463.03	383.06
5	2014	199.36	355.21	215.00	219.02	444.58	566.51	371.41	420.06	400.28	711.01	349.00	436.26
6	2015	187.03	157.41	253.35	324.21	291.18	319.03	518.35	463.13	323.13	319.15		



	Metro Rail Corridor- 3		Metro Rail Phase-1
	Metro Rail Corridor- 4		Mono Rail
	Metro Rail Corridor- 5		Metro Rail Depot
	Metro Rail Station		Suburban/MRTS Rail

MTC Data

Source: <http://mtcbus.org/> (under the menu Strength> Performance)

Sl No.	Item	2009 - 2010	2010 - 2011	2011 - 2012	2012 - 2013	2013 - 2014
1.	TOTAL FLEET	3280	3421	3497	3637	3750
2.	AVERAGE AGE OF BUS	2.23	2.72	3.44	4.29	5.12
3.	NEW BUSES PUT ON	774	326	183	143	129
4.	SCHD SERVICES	3057	3140	3189	3365	3531
5.	EFFECTIVE KMS (in lakhs)	3329.29	3471.52	3511.49	3442.74	3600.43
6.	KM/BUS/DAY	308	316	315	309	307
7.	F.U. %(INCL HNR)	92.11	88.09	88.35	85.09	87.56
8.	KM EFFICIENCY %	101.08	98.75	98.81	93.91	96.48
9.	% OF OCCUPANCY	80.22	87.20	84.35	75.83	74.50
10.	B.D./10,000 KMS.	0.00	0.00	0.00	0.01	0.00
11.	ACCT/1,00,000 KM	1.27	1.05	0.70	0.53	0.60
12.	TYRE LIFE IN KM(in lakhs)	1.73	1.62	1.56	1.63	1.73
13.	PASSENGERS/DAY (in lakhs)	52.05	55.19	54.01	48.07	49.50
14.	MEN/BUS	7.01	6.88	6.33	6.47	6.40
15.	ABSENTEEISM %	7.29	7.40	7.45	7.49	7.01
16.	KMPL	4.46	4.39	4.35	4.34	4.33

- 2 additional depots formed at Besant Nagar & Adambakkam on 19/02/2014

Final Report



Chennai Metropolitan
Development Authority



Chennai Comprehensive
Transportation Study



TABLE OF CONTENTS

EXECUTIVE SUMMARY E-1

CHAPTER 1 INTRODUCTION 1

1.1 Preamble..... 1

1.2 Study Objectives..... 2

1.3 Urban Transport Issues 3

1.4 Chennai Tomorrow 8

1.5 Approach..... 9

1.6 Report Layout 10

CHAPTER 2 CHENNAI - TODAY 11

2.1 Profile of Chennai Metropolitan Area 11

2.1.1 Overview of Urban Transport Systems 12

2.2 Data Collection 15

CHAPTER 3 TRAVEL DEMAND FORECAST 26

3.1 Calibration of Transport Model..... 26

3.1.1 Calibrated functions 32

3.1.2 Validation 35

3.2 Land Use Growth and Future Demographics 38

3.2.1 Travel Demand Forecast 42

CHAPTER 4 TRANSPORTATION STRATEGIES 47

4.1 Vision and Goals 47

4.2 Review of Transport Policies 48

4.2.1 National Urban Transport Policy..... 49

4.2.2 Second Master Plan for CMA..... 50

4.2.3 Chennai City Development Plan (CDP)..... 53

4.2.4 World Bank Strategy..... 53

4.2.5 London Transport Strategy 55

4.3 Strategy Concepts 57

4.4 Transport Strategies 59

4.4.1 Land use and Transport Strategy 59

4.4.2 Road Network Strategy..... 66

4.4.3 Public Transport Strategy..... 69

4.4.4 Non Motorized Transport Strategy 73

4.4.5 Freight Management Strategy..... 74

4.4.6 Demand Management Strategy..... 74

4.4.7 Traffic Management Strategy 75

4.5 Transport Proposals 75



CHAPTER 5 LONG TERM PROPOSALS	78
5.1 Public Transport Proposals	78
5.1.1 Mass Transit Systems	78
5.1.2 Inter-modal Stations	87
5.1.3 Inter-city Bus Terminal	88
5.2 Freight Transport Proposals	89
5.2.1 Freight corridors	89
5.2.2 Truck Terminals	91
5.3 Demand Management Proposals	91
5.4 Road Network Improvement Proposals	92
5.4.1 New Links	94
5.4.2 Road widening	95
5.5 Block Cost Estimates	98
5.6 Economic Analysis	98
5.6.1 Approach	98
5.6.2 Analysis of Alternatives	99
5.6.3 Analysis Period	99
5.6.4 Estimation of Costs	99
5.6.5 Estimation of Benefits	99
5.6.6 Economic Analysis for Highway Projects	100
5.6.7 Economic Analysis for BRTS projects	102
5.6.8 Economic Analysis for LRT/Monorail projects	103
5.6.9 Economic Analysis for Metro projects	105
5.6.10 Economic Analysis for all long term-term projects	106
CHAPTER 6 MEDIUM TERM PROPOSALS	109
6.1 Off-street Parking Facilities	109
6.2 Grade Separation at Intersections	110
6.3 Pedestrian Subways	116
6.4 RoBs/RuBs	121
6.5 Traffic Management Systems	121
6.6 Block Cost Estimates	125
6.7 List of Committed Flyovers	126
6.8 List of Committed ROB/RUBs	127
CHAPTER 7 SHORT TERM PROPOSALS	139
7.1 Introduction	139
7.2 Pedestrian Facilities	139
7.3 Provision of Cycle tracks	142
7.4 Traffic Management	144
7.4.1 Parking Regulation	144
7.4.2 Signal Optimization	149
7.4.3 Junction Improvements	151



7.4.4 Road Markings and Signage 157
7.4.5 One - way Streets 157
7.5 Block cost estimates 158

CHAPTER 8 IMPLEMENTATION PLAN..... 160

8.1 Phasing of investments 160
8.2 Financial Investment Strategy 181
8.2.1 Present Investment Schedule 181
8.2.2 Investment Requirements 183

CHAPTER 9 INSTITUTIONAL ARRANGEMENTS 191

9.1 Introduction 191
9.2 Case Studies 192
9.2.1 Hong Kong and Singapore 192
9.2.2 Greater Vancouver 195
9.2.3 London 197
9.2.4 United States of America 199
9.2.5 Summary of Transport Organizations around the Globe 202
9.2.6 Case Studies from India 202
9.3 Diagnosis of the current Institutional set up in Chennai 206
9.4 Recommended Institutional Framework 207

CHAPTER 10 CONCLUSIONS 210

and Manali Oil Refinery Road. Off-street multi-level parking lots are yet to get implemented despite earlier studies also recommending the same.

- The average trip length of Intermediate Public Transport (IPT) mode that includes auto rickshaw and taxis has increased three fold over the years, while there is an increased occupancy in either mode.
- Among the three locations where survey was conducted at trucks focal point, it was found that maximum number of truck trips is from Koyambedu and Madhavaram.
- Analysis of household survey data has revealed significant increase in household income, per capita trip rate, vehicle ownership, trip lengths by all modes, share of trips performed by motorized two wheelers & cars, while the drastic reduction in the percentage share of trips by bicycles and more particularly by public transport mode is a cause for grave concern.
- A higher per capita trip rate with 1.60 is observed in 2008 as compared to 1.44 in 2005, 1.28 in 1992-95, 1.14 in 1984 and 0.86 in 1971 study. The observed trip rate in 2008 is higher than the predicted trip rate (1.50) for 2011 from CTTS (1992 - 95).
- Trips by Non-motorized transport decreased from 42% in 1970 to 34% in 2008.
- Significant increase in the percentage of trips by two wheeler is observed; 25% in 2008 when compared with previous studies (2% in 1970, 3% in 1984 and 7% in 1992-95).
- Substantial decrease in the percentage of trips by public transport (bus & train) as per house hold survey is observed viz; 31% in 2008 when compared with previous studies that indicated 54% in 1970, 55% in 1984 and 42 % in 1992-95.
- Trip lengths for all trip purposes and modes, as could be expected have increased when compared to the previous CTTS of 1992-95.

The findings of several other surveys find place in appropriate sections of the report.

Travel Demand Forecast

24. The process of replicating the “real world” transportation system and forecasting the state of the system at some future time is the crux of transport demand modeling adopted in the Study. This is done by the use of advanced state of the art computer package “CUBE”. The general four-step modeling framework has been adopted for Chennai Urban Travel Demand Model (CUTDM) that encompasses:

- Trip Generation - estimating number of origins and destinations for each zone.
 - Trip Distribution - attaching the origins and destinations for each trip to complete trips.
 - Mode Choice - determining the mode of travel for each trip (car, auto rickshaws, public transit).
 - Assignment - establishing routes and transit paths.
25. The arterials, sub arterial and major collector road are considered in the development of the network. The transit network represents different public transport modes along with their routes, frequency, connectivity, speeds, capacity and accessibility to support estimation of travel times on individual links and passenger volumes on individual transit lines and links. The public transit network comprises of the Bus system, MRTS, and Suburban rail modes and their corresponding routes operated in the study area.
26. Household and roadside passenger interview data were used to develop the observed mode-wise trip matrices. The external trips were constructed based on the O-D survey conducted at the Outer Cordon. The mode wise and purpose wise matrices have also been developed for peak and off peak hours. Data obtained concerning zone-to-zone movements were used to develop travel desire lines illustrating traffic corridors.
27. Model focuses on peak period conditions because these conditions include the most important recurrent congestion period and tend to guide transportation system design. Peak period models provide more accurate indications of directional travel patterns during design conditions. An off-peak model was calibrated to understand the differential behavior during that time period essentially for the purpose of improved accuracy for evaluation of schemes.
28. The observed highway and public transport matrices were assigned on the base year network. The assigned traffic volume has been compared with the observed traffic counts on screen lines and found to be within acceptable range.
29. Trip generation models were built to forecast the number of person trips that begin from or end in each travel analysis zone with in the region for a typical day of the target year. Separate trip- generation models were developed for work, education, business and other purposes. A correlation matrix of trip production to various land uses was done based on which trip production models have been developed.
30. The present study combines the trip distribution and mode choice to form a combined Trip Distribution and Modal Split phase using a conventional doubly constrained gravity model. Synthetic trip matrices were developed by the calibrated

distribution cum mode choice parameters. These synthetic matrices were compared with the observed matrices. Checks were done to examine the validity of the synthetic matrices against the observed matrices and forecast made.

31. The model parameters that have been used to evaluate the scenario are Per Capita Trip Rate, Trips, Modal Split, Vehicle-km, Vehicle-Hours, Passenger-km, Passenger-Hours, Network Speed, Trip Length and Cost.
32. It has been observed that the PCTR (all modes) has been doubled during 1971-2008 period and expected to grow to 2.14 by the horizon year.
33. The growth in daily demand in the past three decades and in the planning period is estimated. The demand has been increased more than four times 1971-2008 period and will be nearly doubled by 2026. The trips assigned in horizon years are 11.13 lakh motorized trips in 2016 and 17.1 lakh motorized trips in 2026.
34. The average trip length for car is 14.17 km and for motorized two wheelers is 10.37 km. The average trip length has been steadily increasing over the years and by the horizon year the average trip length is expected to increase by 1 km from the current levels scenario.
35. Commuter's desire to travel is readily related to travel speeds on the network. The average network speed estimated for the base year 2008 is 25 kmph and for the Do minimum scenario for the year 2026 is 19 kmph.
36. Kilometer of travel represents the extent and availability of transport network. Passenger Kilometers of Travel & Vehicle Kilometers of travel are expected to be 37.4 lakhs and 25.6 lakhs by 2026.
37. Hours of travel represents the extent and presence of congestion of transport network. Passenger Hours of Travel (PHT) and Vehicle Hours of travel (VHT) are presented for the peak hour in the base year and for the year 2026.

Travel Characteristics	2008			2026		
	PV	PT	IPT	PV	PT	IPT
Average Trip length (km)	10.7	11.71	8.6	10.38	13.37	11.37
Modal split (%)	48	42	10	43	44	13
Passenger/Vehicle kilometer (in lakhs)*	22	37.4	3.6	40.4	99.4	13.3
Passenger/Vehicle hours (in lakhs)*	0.7	2.13	0.12	2.50	6.66	0.99

* For PV and IPT the numbers are in vehicle km and vehicle hours, for PT the numbers are in passenger km and passenger hours.

Vision

38. Considering the challenges that the CMA is facing, the direction of the urban transport is likely to take its course with appropriate interventions. With the inputs from NUTP and past studies, the following vision is established for the CMA:

“Provide safe, efficient, affordable and modern transport choices to people and businesses integrating economic, land use and transport concerns of Chennai Metropolitan Area to be fully prepared to take on the transport challenges of Chennai - the Megapolis.”

39. This vision is also consistent with the Vision 2026 envisaged in the Second Master Plan by the Chennai Metropolitan Development Authority (CMDA) - “to make Chennai a prime metropolis which will be more livable, economically vibrant and environmentally sustainable and with better assets for the future generations”

Goals

40. The present situation in Chennai will only continue to worsen if nothing is done. Do minimum (considering the committed schemes like Metro rail, MRTS, Commuter rail, Outer Ring Road, bypass, Elevated freight corridor etc.) forecasts also show low network speeds in 2026 (inside the core area).

41. The Goals have been defined based on the vision and the objectives. The goals were set in consultation with CMDA that took the inputs of the Stakeholders in preparing the SMP and approved by the committees constituted for CCTS. The mobility strategies developed are aimed at attaining the goals. On duly obtaining the values of modal share for the year 2008 from the model outputs, the goals set for this study are given below:

Category	Index	2008	Goal (2026)
Modal Shares (all trips)	Public Transport	27% (41%)	46% (70%)
	IPT	7% (11%)	5% (8%)
	Private Transport	32% (48%)	15% (22%)
	NMT	34%	34%

(The number in bracket indicate modal share of motorized modes)

42. A set of performance indicators has been developed as goals to be achieved in 2026 for the City. The mobility strategies developed aim at attaining the goals.

Benchmarks	Goal
Public Transit Share	46% (70%)*
Walkability (Footpath length /Road length	70
Cyclability (Cycle path length /Road length	10
Fatality Index (Fatalities/Lakh Population)	Reduce by 50%
On Street Parking Index	0-5%
Non-Motorized Travel Index	35
Emissions(Tonnes/Day)	Reduce by 50%
Average Journey Speed	30

* motorized modes only

Strategies

43. The strategies proposed to meet the various goals set for Chennai are

- Land use and transport strategy
- Roadway network strategy
- Public transit strategy
- Non motorized transport strategy
- Freight management strategy
- Demand management strategy
- Traffic management strategy

Alternate network strategies were tested and the alternative that helped in achieving the objective of efficient transportation chosen.

44. The projects that emerge out of the strategies, when implemented, shall fulfill the goals and objectives of the CCTS.

Proposals

45. The transport strategies, when applied scientifically in tandem, have resulted in a number of schemes. These schemes are essential for the efficient operation of the transport system in the whole of the CMA. The individual proposals are widely different from each other in terms of their cost, period at which to be taken up for implementation, construction time and finally the duration up to which their usefulness will last. Accordingly, the transport proposals are categorized into short, medium and long-term measures.

46. A number of medium and long-term proposals have also emerged through the Second Master Plan (SMP) and the Mobility study (MoB). The CCTS reviewed in detail, the list of schemes identified in both SMP and MoB studies. Barring a few, most of the critical schemes listed in the SMP/MoB studies have also been recommended in the current CCTS on being justified as schemes to be taken up for implementation.
47. Some proposals more particularly for the NMT by provision of grade separated pedestrian crossing facilities and foot over bridges have been additionally included ensuring the worthiness of the same based on safety considerations judged by the link volumes and travel speeds. Schemes for pedestrians such as skywalks at major attracting and generating centres, pedestrian subway network, provisions of ramp / escalators to existing subways, lift facility to pedestrian foot over bridges, pedestrian connectors across water courses, exclusive pedestrian crossing facilities bridging the rivers are looked into outside the ambit of modeled output.
48. The long-term, medium-term and the short-term schemes (proposals) have been developed for the CMA through the current CCTS study. The long term proposals comprise Mass Transit Systems (MRTS, Metro, Mono Rail, LRT, Suburban Rail and BRT), Intermodal Stations, Truck Terminals, Intercity Bus Terminals, Elevated Roads, Freight Corridors, Missing Roadway Links and Major Road Widening. The medium term proposals comprise Pedestrian Subways, Multi-level Parking Facilities, Grade Separators (Flyovers), ROBs and RUBs, Traffic Management Centers and Skywalks. The medium term improvements would blend with contemplated long term improvements and the total estimated cost to implement these long term and medium term schemes is Rs 81830 crores. The short term proposals comprise Pedestrian Facilities (footpaths), Bicycle Network, Traffic Management, Parking Regulation, Signal Optimization, Junction Improvements, Road Markings and Signage and One way Streets. The estimated cost to implement these schemes is Rs 290 crores. The total cost of implementing all these measures up to the year 2026 is estimated at Rs.82,120 crores.
49. The highlights of the recommendations of the CCTS are
- The total shelf of schemes estimated at a cost of Rs.82,100 crores recommended for implementation in phases up to 2026 is expected to help realize 66% which is close to the stated objective of the Second Master Plan of achieving a public transport modal share of 70%.
 - The major investment proposals include:
 - ❖ Development of additional network of metro rail for another 28 km including the extension from Washermanpet to Wimco Nagar segment.
 - ❖ Development of a network of Monorail/LRT for a length of about 110 km.
 - ❖ Development of a network of BRTS for a length of about 150 km including a stretch of Jawaharlal Nehru Salai from Padi to Madhavaram.

- ❖ Development of additional network of suburban rail for a length of over 200 km. This includes the 4th line from Chennai Beach to Athipattu and 5th and 6th line from Chennai Central to Avadi.
- ❖ Development of inter-modal interchanges at 13 locations including at St. Thomas Mount, Porur and Saidapet.
- ❖ Construction of multi-level parking at 6 locations. This includes the construction of multi-level parking by Corporation of Chennai at Wallace Garden, Greams Lane.
- ❖ Construction of RoBs / RuBs at over 35 locations. This includes the locations at L.C.No. 16 on MKT Road @ Minjur Station, L.C.No. 32 & 33 (Near Standard Motors) and LC 14 in between Tirunindravur - Tiruvallur. (Near Sevvaipet Railway Station).
- ❖ Construction of grade separators at over 50 locations. This include the locations at Taramani road x MBI road, Nelson Manickam road x Periyar EVR Salai x Anna Nagar 3rd Avenue, LB road x Tiruvanmiyur road, Arcot road x Jawaharlal Nehru Salai etc. in the first phase.
- ❖ Construction of the Outer Ring Road for a length of 62 km as a multi-modal corridor. The first phase of development for a length of 30 km is under way.
- ❖ Construction of pedestrian subways at over 80 locations. This includes about 10 locations in the suburban area. The schemes recommended to be taken up in the first phase include Thiruvanmiyur bus stand junction, additional subway opposite Central Station, MEPZ on GST Road, Ashok Pillar on Jawaharlal Nehru Salai, GST road near Chrompet bus stand etc.
- ❖ Construction of truck terminal at 9 locations. The limited truck terminal at Koyambedu Wholesale Market Complex and Manjambakkam and a full-fledged truck terminal at Karunakaracheri are proposed in the first phase.
- ❖ The other investments include major missing links (14), road widening (over 150 road stretches), elevated roads (7), skywalks and cycle ways.
- ❖ A regional network of road (about 190km) and rail (about 160km) to serve the immediate surroundings of the CMA covering Mammallapuram, Chengalpattu, Kancheepuram, Arakonam, Uthukottai and Gummidipoondi has also been proposed.

Implementation of the Plan

50. Development costs for the several schemes of the recommended plan have been computed based on current values and only generalization can be made regarding the land acquisition and costs seventeen years into the future. The cost of proposed plan is of such magnitude as to require construction to be carried out by stages also keeping in view the period at which it would be required enabling funds spread throughout the design period. The total cost has been estimated to be Rs. 82,120 crores. The cost includes proposals from the SMP/MoB studies also.

Category	Index	2008 Values	Goals Set 2026	Achievable Goals 2026
Modal Shares (all trips)	Public Transport	27% (41%)	46% (70%)	43% (66%)
	IPT	7% (11%)	5% (8%)	5% (8%)
	Private Transport	32% (48%)	15% (22%)	18% (26%)

Conclusions

61. The city has indeed been, slowly strangling itself because of the unrestrained use of personalized modes of transport, over-crowding of public transport and its inability to respond to the challenges of ever-increasing traffic. In the light of persistent and vexatious transport problems, CMDA has commissioned this Chennai Comprehensive Transportation Study during the year 2008.
62. The Comprehensive Transport Study has focused on making Chennai a vibrant global metropolis city by proposing a series of new transport initiatives. The goal of the study is to come up with a transport system that places people at the centre and realizes the 2026 vision, that is to make Chennai a prime metropolis which will be more livable, economically vibrant and environmentally sustainable and with better assets for the future generations.
63. With the objective of achieving a balanced modal mix and to discourage personalized transport, the study has proposed to introduce mass transport by massive investments. The focus, therefore, is on introducing robust mass transport options by providing adequate, accessible and affordable modes that are people-centered. With limited land availability and the need to serve a larger and more diverse population, and to protect our environment, the need to make public transport system a choice mode is imperative. The proposed transit plan will represent the evolution of transit policy in the region and contribute to a quality and livable environment. The benefits of this plan include increased mobility options for residents through new routes and new technologies; a strengthened economy as a result of connecting cluster towns around CMA; and an improved environment from reducing the necessity for use of cars, motorized two wheelers and the ensuing air pollution produced. There will be a gamut of options like BRTS, Metro, MRTS and Commuter Rail systems to meet the different needs of different sections and needs of the people. A high quality integrated public transport is the need for the future and has been suggested.
64. Given the constraints on road expansion, travel demand management will remain a priority. The proposed travel demand management schemes will ensure that the

usage of private vehicles is discouraged and consequently, a shift towards public transport is anticipated.

65. The increasing specialization of motor freight transportation and their tremendous growth, with two major ports within CMA, warrants truck terminal facility besides a seamless corridor of travel that has been proposed.
66. From an objective appraisal of estimated travel desire lines, eight corridors were identified in the MATS 1971 based on the trip potential for the design year 1991 of which the Outer Circular Corridor on the periphery of CMA catering to 1.6 lakh trips per day for the year 1991 was one and a road based mass transit system was then recommended. This CCTS of 2008 also proposes a road based system for the horizon year 2026 for the Outer Ring Road. Having conceived the ORR even as early as 1971 in the Madras Area Transportation Study to aid urban sprawl, not planning for adequate road connectivity and development in the environs of the alignment has resulted in this CCTS also proposing a road based mass transit system even over half a century later (1971 to 2026). The lesson learnt is that merely proposing a Mass Transit System in the study report, to be built at a future date would not suffice. It is only the beginning for planning transit oriented developments and associated activities so that system is functional and gets the expected ridership for its optimal use and the scarce resources are rightly expended.
67. A number of proposals have been suggested together with phasing for implementation. Some of the transportation related schemes that have been identified in the SMP and replicated in the CMP with few additional ones have been duly considered and although separate studies from the point of view of obtaining data from primary surveys was not made at this point in time, nevertheless, the schemes as deemed relevant duly considering the modeled traffic flows obtained on the network is included and cost provided for.
68. Some proposals more particularly for the NMT by provision of grade separated pedestrian crossing facilities and foot over bridges have been additionally included ensuring the worthiness of the same based on safety considerations judged by the link volumes and travel speeds, reconnaissance and experience of the Consultants. Schemes for pedestrians such as skywalks at major attracting and generating centres, pedestrian subway network at Central, provisions of ramp / escalators to existing subways, lift facility to pedestrian foot over bridges etc. are looked into outside the ambit of modeled output.
69. Additional facilities by way of providing cycle tracks and footway along the banks of Adyar, Cooum and Buckingham canal apart from some roads envisaged for widening under SMP are contemplated.

70. The proposals need to be viewed holistically and whenever capital intensive projects are taken up for implementation at the appropriate stage, the possibility of dovetailing and the redundancy of some, needs to be examined. A case in point is the provision of pedestrian crossing facilities as subways or foot over bridge in the vicinity of Metro stations. These need not be duplicated although the individual projects could fall under the purview of different agencies and it is prudent to facilitate the optimal utilization of facility though with an associated added marginal cost to one agency.

71. The road widening proposed as per the SMP is taken into the network building exercise and as such needs to be pursued forthwith. Except in respect of higher order MTS that could be taken under ground, all other PT Systems that need dedicated right of way occupy road space to varying degrees and even dense bus corridors need additional road space that facilitates movement of buses. On roads, wherein mass transit systems are contemplated, these need to be widened on priority. While an exclusive bus lane facility would enable conversion to a higher order facility like BRTS, stage construction to other higher order systems is difficult due to the differing requirements in terms of right of way, station dimensions and other geometric considerations such as turning radius, super elevation, turn round etc.

72. Transit Oriented Developments need to be encouraged on corridors proposed as mass transit corridors to have captive public transport ridership. With emphasis on meeting travel demand of the future by public transport, the first step would be to increase bus ridership ensuring adequate supply with a view to ensure people do not resort to privatized modes for want of a transit facility or the inadequacy of it. At the appropriate stage of implementation of the higher order MTS proposed, the established PT clientele would be easily accommodated into the new system and with UMTA hopefully in place, the smooth transfer from one system to another would be ensured.

73. To conclude, the CCTS has drawn up the transport improvement roadmap for Chennai for the future, including transport investment program containing short, medium and long term projects. The Plan has focused on the mobility of the people, and encouraging systems that maximize the throughput of people.

All the plans and strategies emerging out of this study will have a significant impact in alleviating the traffic woes of the CMA in the future years.



Interim Report
Revised City Development Plan for Chennai city
September 2014



ICRA Management Consulting Services Limited

Contents

1. INTRODUCTION	1
1.1. ABOUT CORPORATION OF CHENNAI (CoC)	1
1.2. NEED FOR A REVISED CITY DEVELOPMENT PLAN (CDP) FOR CHENNAI CITY	1
1.3. GUIDING PRINCIPLES	2
1.4. CDP FORMULATION PROCESS	3
1.5. PLANNING FRAMEWORK FOR CDP PREPARATION	10
1.6. REPORT ORGANIZATION AND CONTENT	13
2. CITY OVERVIEW	14
2.1. HISTORY AND SIGNIFICANCE	14
2.2. REGIONAL SETTING	18
2.3. PHYSICAL ENVIRONMENT	18
2.4. ECONOMIC BASE AND GROWTH DRIVERS	19
2.5. SUMMARY	24
3. GOVERNANCE AND INSTITUTIONAL FRAMEWORK	25
3.1. CHENNAI METROPOLITAN AREA.....	25
3.2. GOVERNMENT OF TAMIL NADU AND ITS AGENCIES	30
4. DEMOGRAPHICS, POPULATION TRENDS AND PROJECTIONS	33
4.1. POPULATION TRENDS.....	33
4.2. OTHER FINDINGS FROM CENSUS.....	36
4.3. POPULATION PROJECTIONS	39
5. REVIEW OF PAST CDPS/PLANS AND RECENT INITIATIVES	41
5.1. VISION EXERCISES, CDPS AND OTHER CITY-LEVEL PLANS.....	41
5.2. PROJECTS UNDER JNNURM	46
5.3. SHELF OF DPRS AND ONGOING PREPARATORY STUDIES.....	48
6. ASSESSMENT OF URBAN SERVICES MANAGED BY CORPORATION OF CHENNAI	51
6.1. ROADS AND ALLIED INFRASTRUCTURE.....	51
6.2. STORM WATER DRAINAGE.....	58
6.3. SOLID WASTE MANAGEMENT.....	67
6.4. PARKS & PLAYGROUNDS.....	74
6.5. HEALTH AND SOCIAL WELFARE	76
6.6. EDUCATION.....	81
7. FINANCIAL POSITION OF COC	86
8. REVIEW OF ORGANISATION AND E-GOVERNANCE	92
8.1. ORGANIZATION STRUCTURE OF CoC	92
8.2. STAFFING IN CHENNAI CORPORATION	96
8.3. E-GOVERNANCE	98
9. CAPITAL INVESTMENT NEEDS AND FINANCIAL PLAN – INITIAL ASSESSMENT	101
9.1. ASSUMPTIONS FOR FINANCIAL & OPERATING PLAN	101
9.2. CAPITAL INVESTMENT PLAN	102



9.3.	DRAFT FINANCIAL AND OPERATING PLAN	103
10.	NEXT STEPS	104
	ANNEXURES	105
	ANNEXURE I INCEPTION PRESENTATION MADE TO CoC ON 30 APRIL 14	106
	ANNEXURE II INTERIM PRESENTATION MADE TO CoC ON 11 SEPTEMBER '14	115
	ANNEXURE III SANCTIONED VS. EXISTING POSITION IN CoC	151
	ANNEXURE IV DETAILED FINANCIAL OPERATING PLAN- TILL 2026.....	154

4.2.3. Age structure

In the CMA, the proportion of primary school going children percentage has reduced from 12.39% in 1961 to 7.97% in 2001 and the proportion of Secondary school going age group has also reduced from 10.64 in 1961 to 8.95 in 2001. The proportion of old age group has increased from 4.36 to 7.81%. A large percentage of population, 63%, is under the age of 35 years in 2001. Exhibit 4.12 gives the detailed age structure for years 1961 and 2001

Exhibit 4.12 Age structure in CMA in %

Sl. no	Age (Years)	Percentage	
		1961	2001
1	0 to 5	13.2	7.31
2	5 to 9	12.39	7.97
3	10 to 14	10.64	8.95
4	15 to 19	8.66	9.55
5	20 to 24	10.73	10.47
6	25 to 29	10.21	10.33
7	30 to 34	7.98	8.46
8	35 to 39	6.69	8.04
9	40 to 44	5.49	6.19
10	45 to 49	4.15	5.5
11	50 to 54	3.65	4.37
12	55 to 59	2.1	3.1
13	60 to 64	2.06	2.83
14	65 to 69	1.1	1.96
15	>70	1.2	3.02
16	not stated		1.93
17	Total	100	100

Source: Second Master Plan

4.2.4. Slum Population

Slum population in the Chennai city is 16.14 lakhs with 83% in Chennai erstwhile area. The slum population grew 63.7% in the erstwhile area from 8.2 lakhs in 2001 to 13.42 lakhs in 2011. Around 24% of the total population of Chennai live in slums. Exhibit 4.13 gives the slum population and households in the Chennai city. The number of Slum households in the city is 4 lakhs accommodating 4.05 per household.

Exhibit 4.13 Slum population in Chennai city—Census 2011

Sl. no	Area	Area (sq.km)	Slum households (Nos.)	Slum Population
I	Chennai Erstwhile area	176	329827	1342337
Municipalities				
1	Alandur	8.1	7,947	30,105
2	Ambattur	37.8	14,154	55,085
3	Kattivakkam	4.8	5,039	19,944
4	Madhavaram	17.4	2,743	10,966
5	Maduravoyal	4.8	1,190	4,868
6	Manali	8.6	780	2,968

Sl. no	Area	Area (sq.km)	Slum households (Nos.)	Slum Population
7	Tiruvottiyur	21.4	21,258	83,800
8	Ullagaram-Puzhuthivakkam	3.6	-	-
9	Valasaravakkam	2.9	1,090	4,314
	Total	109.3	54201	212050
Town Panchayats				
1	Chinna Sekkadu	1.7	1,802	6,874
2	Puzhal	6.7	4,985	20,071
3	Porur	3.7	733	2,988
4	Nandambakkam	2.6	137	553
5	Meenambakkam	3.0	-	-
6	Perungudi	4.6	5,262	21,096
7	Pallikaranai	17.4	881	3,400
8	Sholinganallur	15.4	1,019	4,242
	Total	55.2	14,819	59,224
II	Extended areas	254	69,020	271,274
III	Total	430	398,847	1,613,611

Source: Census India 2011. IMaCS Analysis

4.3. Population Projections

The population projection has been done by various methods and the discussions are underway with CMDA to review and validate the projections for a homogeneous view.

4.3.1. Projections by various methods

The proposed developments were considered while doing the population projection for CoC. Population Projection was done using various methods such as Arithmetic Increase method, Geometric progression method and Incremental increase method. Refer Exhibit 4.14 for population projection of the whole city by various methods.

Exhibit 4.14 Population Projection by various methods

Year	Census Population	Arithmetic Increase method	Incremental Increase method	Geometrical Progression method
1991	4,844,688			
2001	5,663,267			
2011	6,678,550			
2021		7,776,303	7,559,432	8,060,961
2031		8,874,055	8,531,973	9,852,820
2041		9,971,808	9,596,171	12,204,182

Source: IMaCS analysis

4.3.2. Population Projection adopted for CDP

Methodology: Considering the growth drivers and in order to arrive at future population for CoC, population projection was done for core area and extended areas separately using various methods. The past growth trend was considered to arrive at a method for projection

of population in both the areas. The Core area is expected to grow very less and hence incremental increase method is used for the projection and in case of extended area average of the three methods is used which gives higher values based on the past trends of population growth. Refer *Exhibit 4.15* for a summary of historical population trends and projected population of core area and extended area

Exhibit 4.15 Population growth of Core Area and Extended Area projected separately

Year	Core Area			Extended Area			Total CoC		
	Population	Average CAGR	Density	Population	Average CAGR	Density	Population	Average CAGR	Density
1991	3841398	1.0%	218	1003290	3.6%	40	4844688	1.6%	113
2001	4343645		247	1319622		52	5663267		132
2011	4646831		264	2031719		80	6678550		155
2021	5168743	0.9%	294	2630156	2.7%	104	7798899	1.5%	181
2031	5663343		322	3422940		135	9086283		211
2041	6133121		348	4457599		176	10590720		246

Source: Census, IMAcS analysis

Population of CoCis obtained by summation of the population projected for both the areas. Thus the population is expected to grow at least at a CAGR of 1.5%. In 2041, population density in the core area goes to 348 persons per hectare whereas in extended area it goes to 176.

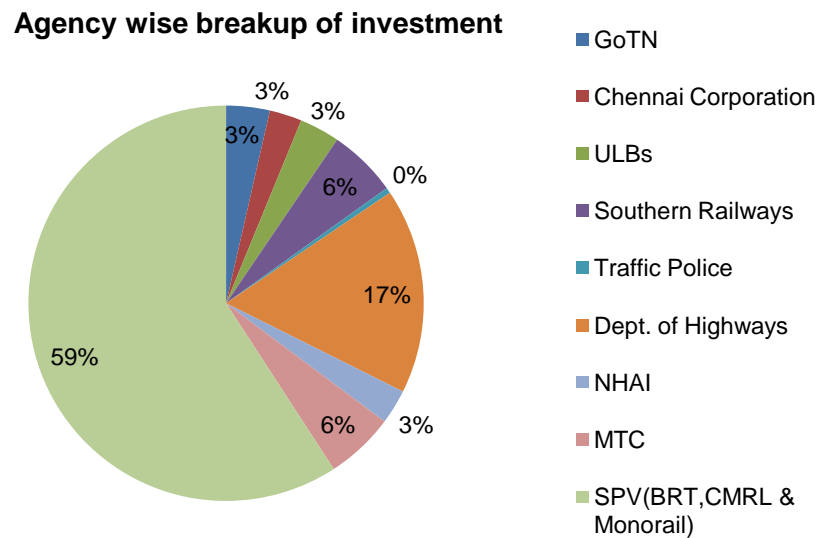
The density of the extended areas is low and hence there is availability of land for future development. With the proposed investments and availability of Land for development in the extended areas, the city could potentially grow faster and it is important to factor this possibility while planning infrastructure for future growth.

4.3.3. Summary

The population of the core area of the city is assumed to grow at an average CAGR of 0.9% whereas the extended area at CAGR of 2.7%. The whole area is expected to grow at an average CAGR of 1.5% and the density of the area to reach 246 persons per hectare.

traffic management are different projects considered for estimating the total investments. The Chennai Corporation has to fund projects of Rs. 2170 crore (2.6% out of the total). Refer *Exhibit 5.5* for the agency wise breakup of fund requirement.

Exhibit 5.5 Fund Requirement as envisaged in CCTS 2010



Source: CCTS, CMDA, 2010. IMaCS Analysis

5.1.5. T. Nagar Re-development Plan

The study was initiated in 2009 by Chennai Corporation to formulate a redevelopment plan for T. Nagar, the major commercial area of Chennai, to ensure smooth traffic flow and integrated commercial activities. The Plan will suggest ways and means of property aggregation, effective use of space, specific infrastructure requirement and also methods to integrate them. The study is envisaged to cover an area of 6.85 sq.km, bounded by Arcot Road in the north, Nandanam in the south, Teynampet in the east and Arya Gowder Road in the west.

The study adopted a holistic approach aiming at segregation of formal and informal activities, smooth movement of pedestrians and vehicles through designated zones, provision of parking arrangements and use of land to a minimum extent. It will also emphasize the need for enhanced environmental quality through urban design, green zoning, parks and roadside landscape. The measures suggested in the study for T. Nagar makeover are

1. Pedestrianization of Thyagaraya Road, South Usman Road and areas around Panagal Park
2. Dedicated hawker zones in pedestrian areas
3. Elevated skywalk connecting Mambalam railway station and T. Nagar bus terminus
4. Redesigning of Panagal Park

5. Traffic signals in the area to be integrated
6. Multilevel car parks to be set up at four locations
7. Existing flyovers across three roads to be extended
8. Two additional bus terminus to be built near Valluvar Kottam and Saidapet
9. Storm water network to be improves
10. Public conveniences to get a facelift

The above proposals will help in increasing the pedestrian circulation space from 8,000 sq.m to 28,000 sq.m. The estimated investment for the complete redevelopment of T. Nagar is envisaged to be Rs. 563 crore and the Corporation has applied to the World bank seeking partial funding of Rs. 50 crore for the various aspects of T. Nagar redevelopment.

5.1.6. Integrated Cooum river Eco-Restoration Plan

Cooum is a river traversing 16km within the city limits which originated from the Cooum tank in Tiruvallur and runs east for a distance of 65 km and confluences into Bay of Bengal. It supports substantial irrigation and additional rain fed agriculture in its upper part and also water supply to Chennai city and adjoining areas and also a major floor carrier of Chennai city. The river was clean before 1960 and was used for various activities like bathing, boating and fishing. As of today, the river is highly polluted as the river receives the municipal and industrial waste and refuse from slums in the city. The pollution has a direct impact on public health, odour concerns and secondary groundwater pollution.

The study is initiated by the Chennai River Restoration Trust, formed as Adyar Poonga Trust in 2006, which is government of Tamil Nadu owned trust primarily entrusted with the restoration of the rivers. The plan for eco-restoration of the river is prepared with the following objectives:

1. Effective abatement of pollution and protection of river through comprehensive planning and management
2. Maintain minimum ecological flows in the river to ensure water quality and sustainable development.
3. Create a River Front Development within urban areas
4. Explore possibilities of navigation purpose and use of the river post restoration.

5.2. Projects under JNNURM

JNNURM is a Government of India initiative launched on 3rd December 2005 to fund identifies cities for developing urban infrastructure services. JNNURM came to a closure on 31st March 2014. The aim of the program was to encourage reforms and fast track planned development of identifies cities.

In Tamil Nadu, three cities were identified as mission cities based on JNNURM guidelines and Chennai city is one of the three cities and the funding pattern for Chennai is 35% from Gol, 15% from GoTN and 50% from local body. Exhibits 5.6 to 5.8 show the analysis of the JNNURM projects for Chennai city.

Exhibit 5.6 JNNURM-Sanctioned and Completed number of projects

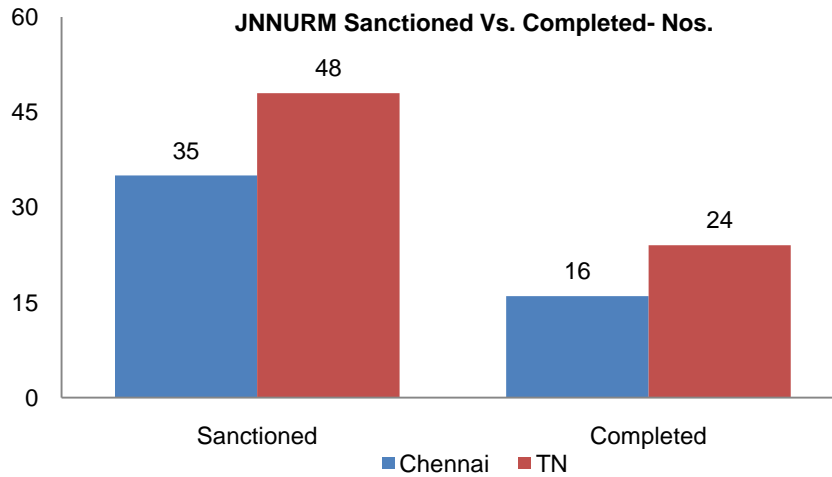


Exhibit 5.7 JNNURM Approved cost and total expenditure incurred

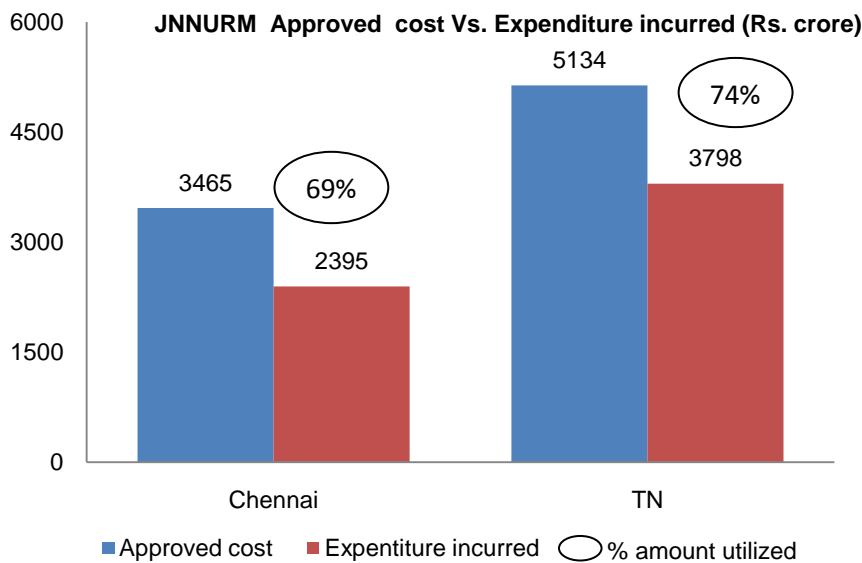
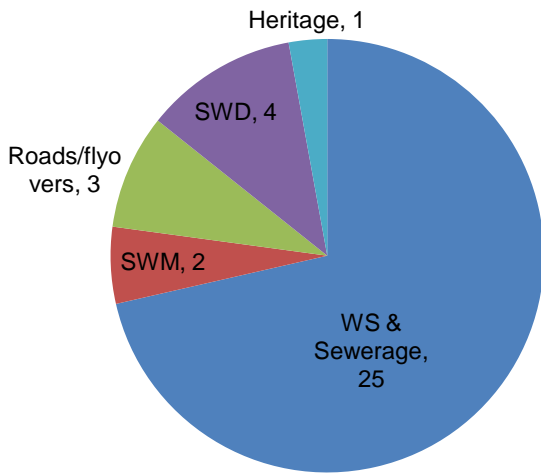


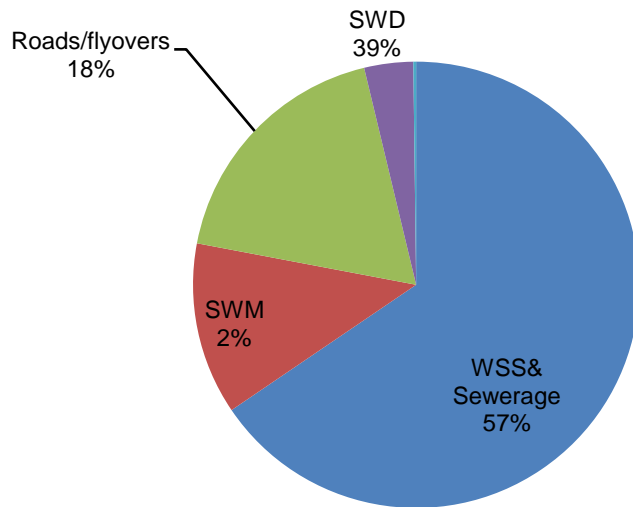
Exhibit 5.8 JNNURM- Year and sector wise sanction of projects in Chennai

Sl.No	Year	No. of projects sanctioned	Approved cost (Rs. In crore)
1	FY 07	9	625.6
2	FY 08	9	509.1
3	FY 09	16	2,214.3
4	FY 10	0	-
5	FY 11	1	116.1
	Total	35	3,465.1

JNNURM- Sector wise no. of projects



JNNURM- Sector wise Cost of projects



Source: JNNURM implementation status. IMaCS Analysis

- Chennai Vs. Tamil Nadu:** The number of projects sanctioned under JNNURM in Chennai is 35 (73% of the total number in Tamil Nadu) of Rs.3465.2 crore approved cost which 67.5% of the State’s approved cost.
- Sanctioned Vs. Completion:** Out of the 35 sanctioned projects, 16 projects have been completed. Fund utilization of 69% has been achieved whereas the State has achieved 74% fund utilization by August 2014.
- Sector-wise breakup:** 57% of the total amount approved is toward water supply & sewerage projects and 39% towards improvement of storm water drains in core city.

Some of the important projects under JNNURM are Improvement to Micro and Macro Drainage system in Chennai core city, Improvements to water supply system in Chennai, Comprehensive Water Supply System and sewerage schemes in the parts of extended areas, and Sea Water Desalination Plant in Minjur.

5.3. Shelf of DPRs and ongoing preparatory studies

5.3.1. Shelf of DPRs and Consultancy Works

A number of Details Projects reports (DPRs), consultancy works have been completed or under progress. The DPRs/ studies completer or under preparation are listed below.

- Feasibility study and DPR for Planning and Construction of
 - Grade separators along 5 routes
 - Rail under Bridge/ Rail under bridge at 3 locations
 - Pedestrian subways at 5 locations

- DPR for Integrated Storm Water Drainage System in the Extended areas
- Study on the Construction of Multi Level Car Parking at Nungambakkam High Road
- DPR for the Pedestrian Plaza at Theayagaraya Road
- DPR for Paving with Granite foot path to International Standard at Walaja Road
- Architectural design for the beautification of Palavakkam, Kottivakkam and Neelankarai beaches
- DPR for 2 skywalks at T. Nagar and Parrys corner.
- DPR for Construction of Link road connecting Kasturibai nagar, Indra nagar and Thiruvanmiyur MRTS stations.

5.3.2. Key proposals/announcements in core Urban Services

A number of Key announcements were made by the Hon'ble Mayor for Chennai city to meet the vision formulated in Vision 2023 which is **“to become India’s most prosperous and progressive State with no poverty, and where its people enjoy all the basic services of a modern society and live in harmonious engagement with the environment and with the rest of world.”**

Infrastructure services

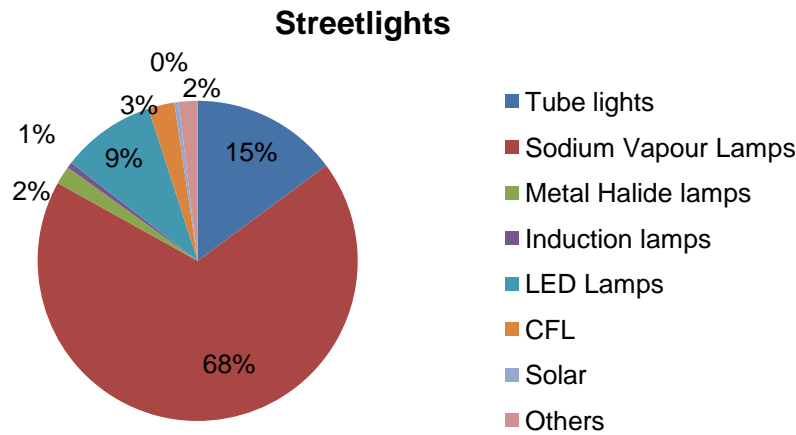
- Linking urban greenery with building plan approvals
- Concrete surfacing of all Bus route roads and BT / CC surfacing of all roads
- World-class roads in select corridors; pilot in Ashok Nagar
- 2 Waste Processing facilities at Minjur and Kuthambakkam
- Remediation and reclamation of Kodungaiyur and Perungudi dumping yards
- Providing facilities for firefighting at dumping grounds.
- Waste to energy projects (bio-degradables) at zonal level
- Formation of a Model park using the segregated recyclable waste materials
- Demarcation of Perungudi dumping ground and Pallikaranai Marsh Land by providing fencing.
- Formation of Green belt in dumping grounds
- Creation of awareness for better environment in solid waste management.
- Conversion of all street lights to Energy efficient street lighting which can save 80% of the energy costs.

Zone	Corporation road	Total	Distance between
XIII	377	20,776	18
XIV	367	12,603	29
XV	334	10,633	31
Total	5,317	2,29,626	23
Core	2,828	1,35,312	21
Extended	2,489	94,314	26

Source: CoC. IMaCS Analysis

The coverage of streetlights is around 1 streetlight for every 23 metres of road length, which is higher than the envisaged norms of a streetlight per 25 metres. However, a majority of the streetlights are not energy efficient adding to the O&M burden of the department. As shown in the exhibit below, around 68 per cent of the lamps are sodium vapour lamps, followed by tube lights (15 percent). Only 13 per cent of the streetlights use energy efficient lights.

Exhibit 6.6 Type of streetlights



The CoC has undertaken/ initiated capital expenditure to achieve the following objective:

1. Increase coverage in extended areas
2. Move towards energy efficient technology
 - LED streetlights
 - Automatic on-off technology for energy saving

The city plans to convert all the streetlights in the city to LED lights over the medium term resulting in considerable cost saving and reduction in carbon footprint of the city. A Detailed Project Report for the same has been prepared and implementation of the project is currently underway.

6.1.8. Institutional perspective

The Highways department is responsible for the maintenance of district roads, highways including arterial roads in the city. The CoC is responsible for the management of Bus route

roads, Bridges, footpaths and streetlights. The roles and responsibilities allocated to each department with respect to construction of maintenance of infrastructure of are as follows:

- Interior roads is delegated to the Zones
- Bus route roads in the city is delegated to the Regions
- Major works in Bridges department are handled at the Headquarters while the routine maintenance has been delegated to the zone
- Streetlights are handled at the headquarters by the Electrical department

The department is headed by a Superintending Engineer supported by Executive Engineers at the Headquarters and also at a region and zonal level followed by Assistant Executive Engineers and Junior Engineers/ Asst Engineers.

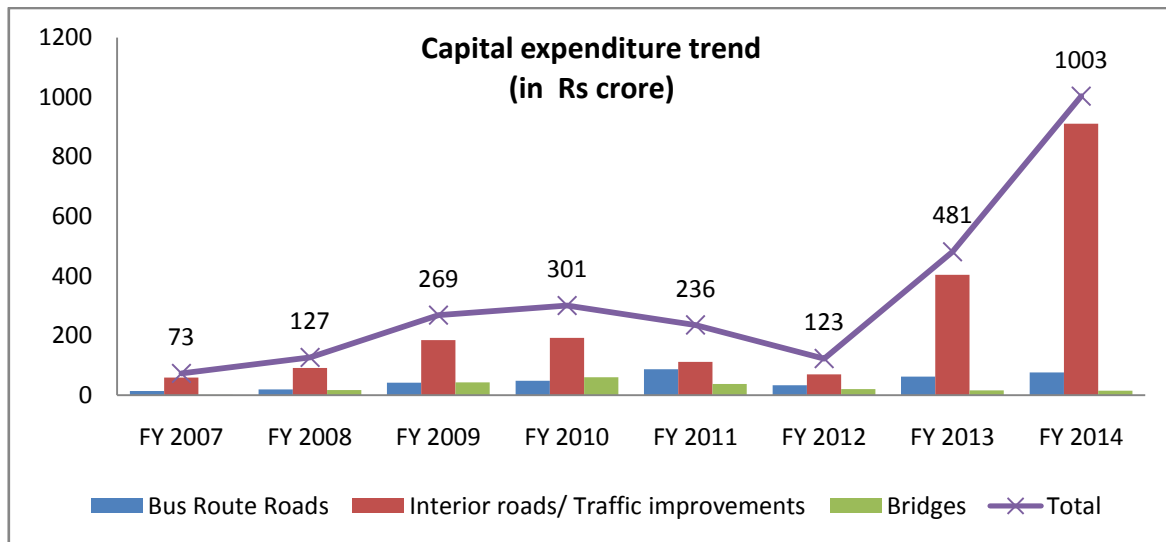
6.1.9. Financial Analysis

The services provided by the department are capital intensive with minimal revenue expenditure. Based on budgetary figures, the revenue expenditure towards BRR, IR, Footpath and Bridges together contribute only Rs 15 – 20 crore in 2013-14. Against this, the estimated revenue generation from road cut charges was around Rs 10 crore for the period. The annual capital expenditure for the period 2013-14 towards the three departments was around 1000 crore out of which 91 percent was towards Interior roads and traffic improvements. The investment on interior roads contributed 65 per cent of the total capital expenditure of the Corporation. The capital expenditure on BRR, Interior roads and bridges grew almost 9 times in the last 3 years from Rs 123 crore in FY 2012 to Rs 1003 crore in FY 2014.

Exhibit 6.7 Capital outlay 2013-14

Department	Capital investment (in Rs crore)	Capital investment per capita (in Rs)
Bus Route Roads	77	115
Interior roads/ Traffic improvements	912	1,360
Bridges	15	22
Total	1003	1,497

Exhibit 6.8 Capex trend



Source: CoC. IMAcS Analysis

6.1.10. SWOT Analysis

Strengths	Weaknesses
<ul style="list-style-type: none"> High coverage in core area Improved quality of roads and strong connectivity Strong focus on quality – A separate QC department 	<ul style="list-style-type: none"> Road density saturated in the core area High cost for road reforming and relaying Encroachments in roads/ footpaths Management of multiple contractors
Opportunities	Threats
<ul style="list-style-type: none"> Focus on Non-motorised transport – Pedestrianisation, Cycle tracks and cycle sharing schemes Move towards concretization of roads – Lower life cycle cost Land pooling and other innovative methods for Land development Scope for rationalization of packages and work contracting 	<ul style="list-style-type: none"> Higher initial cost associated with Concretization Low land availability in the core city area Proliferation of hawkers in roads/ footpaths

6.1.11. Issues/ Challenges

Some of the issues associated with the provisioning of services are:

1. Continuous investment to maintain quality of roads: The continuous damage to the BT roads in the city drives the need for continuous investment towards relaying which adds to the cost of the transportation
2. The city roads also face challenges due to the absence of adequate footpaths, and areas for non-motorized transport like cycles. However, focused initiatives have been taken up to address the same.

3. Moderate coverage in the extended areas: The road density in the extended area for IR as well as BRR is low when compared to the projected population in 2020
4. Low availability of land for infrastructure projects especially in the core area leading to delay in land acquisition or escalation of land acquisition cost impacting the feasibility of the projects
5. Encroachments in roads/ footpaths by Hawkers
6. Absence of energy efficient streetlights

Another major gap in the service would be with respect to the operation and maintenance of the network. Apart from the continuous work on road relaying undertaken annually, the CoC also has to shell out significant resource towards patchwork. Additionally, there are operational challenges arising at a zonal level due to management of high number of packages and contractors will constrain the monitoring of the project.

6.2. Storm Water Drainage

An effective surface and storm water drainage network is essential in improving the public health and environmental conditions as well as population mobility of the city. Surface water or Storm water management encompasses all methods to handle the precipitation available for the city. It may be either transferred towards temporary storage/ groundwater recharge (Rainwater harvesting) or towards a canal/ river/ sea (storm water drains). The storm water drain network includes the drainage basins, major and macro drains, arterial drains, collector drains. The storm water serves as a channel for transporting the rainwater in the impervious areas across the city to the drainage basins.

6.2.1. Chennai city characteristics

The geographic and topographic characteristics of the city drive the need for an effective storm-water drain network. Although the city lies 2.5 metres above sea level, the problem of storm water drainage is affected by the city's flat terrain, absence of proper storm water drain network.

The city also receives an average annual rainfall of 140 cm spread across the two monsoon seasons. The city gets most of its seasonal rainfall from the north–east monsoon winds, from mid–October to mid–December. The highest annual rainfall recorded is 257 cm in 2005. Cyclones in the Bay of Bengal sometimes hit the city leading to flooding and other concerns. Major Flood Events in Chennai City were experienced during 1943, 1976, 1985, 1996 and 2005.

6.2.2. The Waterways

In the Chennai City, there are 49 Waterways extending to a total length of 372 KM. Among them, 31 Waterways to a length of 103 KM are maintained by CoC and 18 Waterways to a length of 269 KM is maintained by PWD. Out of the 31 canals Chennai Corporation maintains, 16 canals are in the core city and 15 canals are in the extended areas.

Exhibit 6.28 Requirements to meet the NUHM norms

Infrastructure and manpower requirement	Total Required (nos)	Core area		Extended area	
		Available	Required	Available	Required
Total UPHC	140	100	0	0	40
Total No. of U-CHC	15	0	7	0	8
Medical Officer (2/UPHC)	280	200	0	0	80
Staff Nurse (4/UPHC)	560	90	310	0	160
Pharmacist (1/UPHC)	140	100	0	0	40
Lab Technician (1/UPHC)	140	65	35	0	40
Public Health Nurse	140	0	100	0	40
ANM (1/10,000 Population)	750	0	550	0	200
Secretarial/Ministerial Staff	280	0	200	0	80
Support Staff (3/UPHC)	420	93	155	52	120
Community Health Volunteers	3,750	0	2,750	0	1,000
Mahila Arokkia Samiti (MAS)	15,000	0	11,000	0	4,000
Local Health Visitor (LHV)	140	70	20	10	40

Source: CoC

Scale up of Amma canteens

The CoC plans to increase the number of canteens to 1000 translating into 5 canteens per ward. As a first step it is planning to increase the number of canteens to 400 by 2015 (2 per ward). The CoC is also planning to integrate the operations of the Amma canteens into a single department so as to improve monitoring and control.

Management of Public toilets

The CoC plans to add 350 more Public conveniences. The CoC has initiated a process to privatize the management of public toilets. The project plans for to outsource the management of Public toilets to private players under DBFOT contract. The contractors are expected to raise funds through advertisement revenue. CoC will be responsible for monitoring private contractors with monthly/ quarterly review.

6.5.4. Institutional perspective

The Health and social welfare service of CoC is headed by the Deputy Commissioner (Health).

The Health department is headed by the City Health Officer who is supported by an additional health officer followed by officers at a zonal level. The public health department has around 11 zonal health officers, 74 Medical officers, 52 sanitary officers, 129 sanitary inspectors, and 223 Basic health workers.

The Family welfare department is headed by the District Project co-ordinator officer who is supported by District family welfare Medical officers, followed by officers at the zonal level. The EOCs, Maternity centers and Health posts are governed by the Medical officer.