SERVICE LEVEL IMPROVEMENT PLAN

FINAL

STORM WATER DRAINAGE

THIRUVANANTHAPURAM MUNICIPAL CORPORATION

1. Assess the Service Level Gap

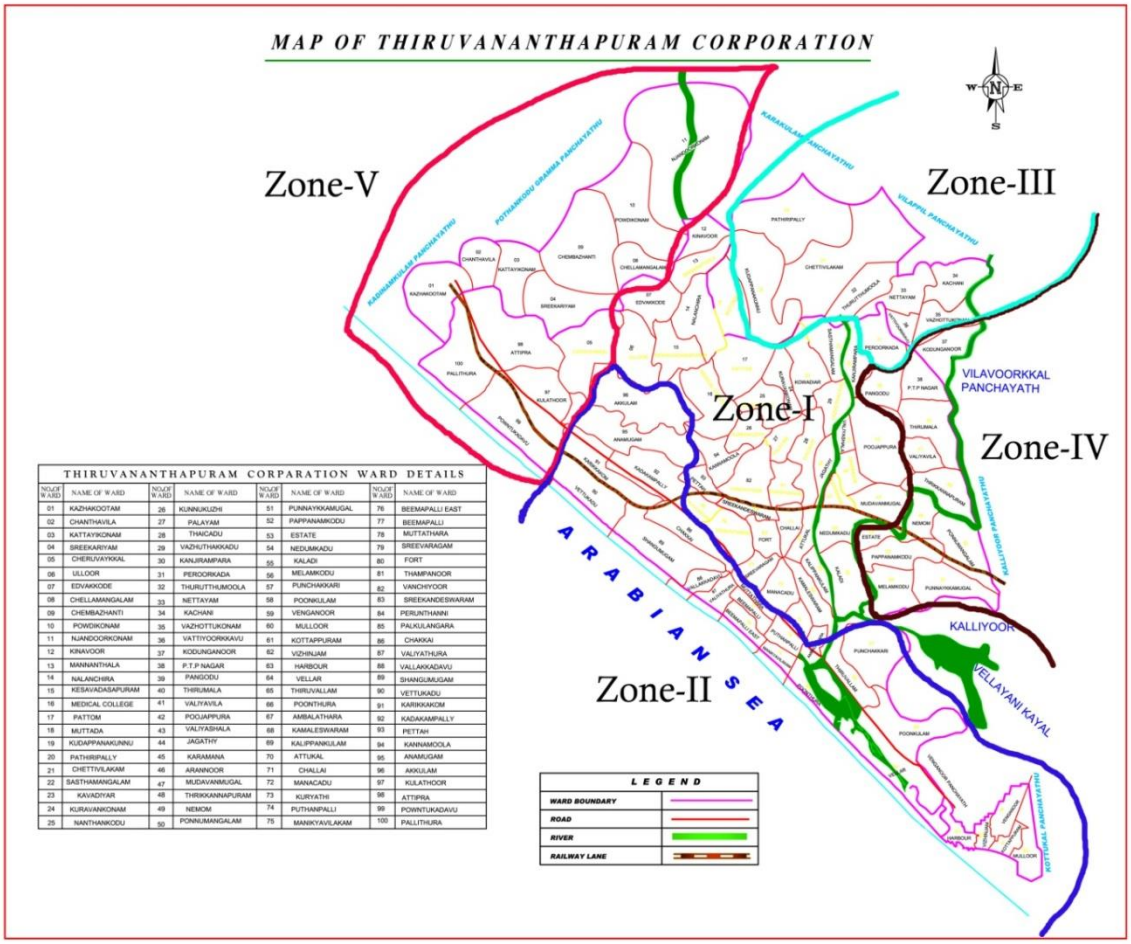
The first step is to assess the existing situation and service level gaps for Storm Water Drainage (AMRUT Guidelines; para 3 & 6). This will also include existing institutional framework for the sector. AMRUT is focused on improvement in service levels. The zone wise data shall be used in identifying the gaps. These zone-wise gaps will be added to arrive at city level service gaps. While assessing service level gap reply following questions not more than word indicated against each question.

- **What kind of baseline information is available for storm water drainage system of the city? Detail out the data, information, plans, reports etc related to sector. Is zone wise information available? (75 words)**

  Service Level Benchmark (2014-15), CDP 2006, DPR prepared by KSUDP, PWD-R&B & City Roads, Corporation asset register and census 2011 are the available data source related to the sector. The total length of storm water drain coverage in the city is 119775 meters. The city has topography with ground level rising from MSL up to about 80 mts at Mukkola. The city requires an additional drainage of 88303.10 m along 114 roads distributed in 27 wards of the Corporation.

  Drainage networks in the city are divided into five zones.

Zone 1 - Central Region	-	41 wards
Zone 2 – Coastal Region	-	25 wards
Zone 3 – North East Zone	-	9 wards
Zone 4 – South East Zone	-	12 wards
Zone 5 - North West Zone	-	13 wards
Total	**-**	**100 wards**



THIRUVANANTHAPURAM CORPARATION WARD DETAILS

NO.OF WARD	NAME OF WARD	NO.OF WARD	NAME OF WARD	NO.OF WARD	NAME OF WARD	NO.OF WARD	NAME OF WARD
01	KAZHAKOOTAM	26	KUNNUKUZHI	51	PUNNAYKKAMUGAL	76	BEEMAPALLI EAST
02	CHANTHAVILA	27	PALAYAM	52	PAPPANAMKODU	77	BEEMAPALLI
03	KATTAYIKONAM	28	THAICADU	53	ESTATE	78	MUTTATHARA
04	SREEKARIYAM	29	VAZHUTHAKKADU	54	NEDUMKADU	79	SREEVARAGAM
05	CHERUVAYKKAL	30	KANJIRAMPARA	55	KALADI	80	FORT
06	ULLOOR	31	PEROORKADA	56	MELAMKODU	81	THAMPANOOR
07	EDAVAKKODE	32	THIRUTTHUMOOLA	57	PUNCHAKKARI	82	VANCHIYOOR
08	CHELLAMANGALAM	33	NETTAYAM	58	POONKULAM	83	SREEKANDESWARAM
09	CHEMBAZHANTI	34	KACHANI	59	VENGANOOR	84	PERUNTHANNI
10	POWDIKONAM	35	VAZHOTTUKONAM	60	MULLOOR	85	PALKULANGARA
11	NJANDOORKONAM	36	VATTIYOORKKAVU	61	KOTTAPPURAM	86	CHAKKAI
12	KINAVOOR	37	KODUNGANOOR	62	VIZHINJAM	87	VALIYATHURA
13	MANNANTHALA	38	P.T.P NAGAR	63	HARBOUR	88	VALLAKKADAVU
14	NALANCHIRA	39	PANGODU	64	VELLAR	89	SHANGUMUGAM
15	KESAVADASAPURAM	40	THIRUMALA	65	THIRUVALLAM	90	VETTUKADU
16	MEDICAL COLLEGE	41	VALIYAVILA	66	POONTHURA	91	KARIKKAKOM
17	PATTOM	42	POOJAPPURA	67	AMBALATHARA	92	KADAKAMPALLY
18	MUTTADA	43	VALIYASHALA	68	KAMALESWARAM	93	PETTAH
19	KUDAPPANAKUNNU	44	JAGATHY	69	KALIPPANKULAM	94	KANNAMOOLA
20	PATHIRIPALLY	45	KARAMANA	70	ATTUKAL	95	ANAMUGAM
21	CHETTIVILAKAM	46	ARANNOOR	71	CHALLAI	96	AKKULAM
22	SASTHAMANGALAM	47	MUDAVANMUGAL	72	MANACADU	97	KULATHOOR
23	KAVADIYAR	48	THRIKKANNAPURAM	73	KURIYATHI	98	ATTIPRA
24	KURAVANKONAM	49	NEMOM	74	PUTHANPALLI	99	PONNTUKADAVU
25	NANTHANKODU	50	PONNUMANGALAM	75	MANIKYAVILAKAM	100	PALLITHURA

- **Have you collected data from census and other sources? Are you aware of baseline survey data of MoUD? Have you correlated data from these and other sources? (75 words)**

Yes. According to 2011 census, the study of storm water drainage in Thiruvananthapuram Corporation covers an area of 214.86 sq.km having 100 administrative wards with a population of 9, 55,494. Yes, correlated the data with MoUD baseline data.

- **What are the existing service levels for storm water drainage in the city? What is the coverage of drains? What are the no of incidence of sewerage mixing in the drains? How many times water logging incidence happens in the city? Provide comparative information of service levels (in tabulated form) with respect to the service level bench marks prescribed by MoUD and sustainable standards for service levels under the National Mission on Sustainable Habitat (NMSH) in table 1.1**

Table 1.1 Status of Storm Water Level service levels

Sl. No.	Indicators	Sustainable standards	Black (Caution for improvement)	Red (Immediate action for improvement)	Present Status
1	Coverage of Storm water drainage network	100%	<75%	<50%	60%
2	Incidence of sewerage mixing in the drains[1]	0%	<25%	<50%	30%
3	Incidence of water logging[2]	0%	<25%	<50%	21times

(Source of data: DPR for Storm Water Drainage in Thiruvananthapuram City prepared by KSUDP)

- **What are the gap in these service levels with regard to benchmarks prescribed by MoUD and sustainable standards for levels under the National Mission on Sustainable Habitat (NMSH)?(75 words)**

  The gap in the service level with regard to benchmark is 40%. The natural canals running through the city also drains out the storm water which prevents the city from heavy flooding.

- **What are the major challenge facing the city with regard to achieving these service level benchmarks?**

  - Poor condition of the existing natural drains resulting in over flow and flooding.
  - Due to reduced cross sectional area of rivers, flash floods have become common during rainy season.
  - Improper maintenance of the existing drains coupled with excessive runoff is the root cause of flooding in low lying areas.
  - Decreased carrying capacity of the drains due to the heavy silt deposition, discharge of solid waste and growth of vegetation.
  - Inadequate cross-section in culverts obstructs normal flow in the canals/drains.

[1] *Incidence of sewerage mixing in the drains are ratio of no of households discharging wastewater directly into the drains to the total no of households.*

[2] *No of times water logging is reported in a year, at flood prone points in the city*

- Lack of proper planning for connectivity and runoff of road side drains considering the total area of the town.
- Obstruction due to the utility lines, such as water mains, power and communication network cables etc crossing the drains.
- Irregular and inadequate maintenance of drains/canals;
- Connecting drains are not adequate to carry the runoff;
- Absence of drainage in low lying areas.
- Lack of awareness among the people in maintaining public drains and canals.
- lack of co-ordination by the parastatal/responsible agencies and lack of fund.

- **Identify the gaps in capacity for managing the services efficiently and also provide an innovative solution for efficiently managing these services.**

  Insufficient staffs, lack of co-ordination with parastatal agencies, lack of public awareness are the identified gaps in capacity for managing the services. A PPP model project implementation can be adopted along with creation of public awareness and responsibility to manage the services efficiently. Proper coordination within the departments is also required.

- **Brief the ongoing drainage projects in the city. The components included in these projects, how and up to what extent it will support to the drainage system of the city. Whether it addresses all the issues related to drainage?**

  The ongoing drainage project includes PWD – City roads, ADB, JnNURM, State and ULB funded projects.

  The components of the Projects involve the construction of new drains, cleaning and rehabilitation of the existing drains, desilting and rehabilitation of the major drains.

  The completion of these projects will lead to an increase in network coverage of the city. However these projects will not address all the issues related to drainage.

Coverage of drains

Please provide information in 150 words on the above responding to (however not limited to) following questions.

- **Describe how at present, the storm water of City is drained off? How many natural and manmade drains are existing and their coverage with respect to road network?**

Presently, natural sloped terrain of the city helps to drain off the storm water out of the city to natural canals and canals discharges to the lakes and to the sea. The drainage network of the city consists of two major rivers (Karamana River and Killi River), few canals, their feeders and lakes.

The Thekkenekara canal is one of the main flood water canals which start from Karimadom colony at East Fort and passes through the most populous areas like East Fort, Padamanabhaswamy Temple, Sreevaraham, Muttathara, N H bye pass and ends in Parvathy Puthanar near Puthenpalam. Thekkenekara canal is having a length of 2.5 km and an average width of 2.5m to 5m.

The important drains contributing storm water to the city canals are Pazhavangadi thodu, Amayizhanchan thodu (Kannamoola thodu), Ulloor thodu, Pattom thodu, Kariyil thodu, Choozhampala thodu, Edanada thodu, Arayalloor Elathodu and Thiruvallom Pallathukadavu thodu.

Tettiyar and Pangappara thodu are natural drains which drain out water from the marshy and waterlogged areas near Technopark and College of Engineering. The other natural drains are Kaimanam-Azhamkal thodu, Amathara thodu, Koori thodu and Vattakkayal thodu.

Major man made drain in the city is **Parvathy Puthanar (T S Canal)** and the discharge route of the two rivers into the sea are Edayar Island and Lanka Island.

- **What is the capacity and condition of these drains? Is this sufficient to carry the peak flow of the catchment/water shed?**

  Improper maintenance of the already existing drains and excessive run off is the root cause of flooding inside the city. Present condition of these drains is not sufficient to carry peak flow.

- **Does the city have separate storm water drainage network? If no, provide the information regarding locations of gray water mixes with the existing drains in table 1.2. In case of mixed drainage how it works in peak rainy days?**

Yes. The City has separate storm water drainage. But it covers only 60%. In some areas gray water mixes in the drainage lines.

Table 1: Detail of Locations where storm water get mixed with sewer

Sl.No.	Location	Merging with which sewer	Reason
1	Coastal areas	Waste from household and hotels	Lack of sewer network.
2	Thampanoor	Waste from hotels and shops	Lack of sewer network.
3	East Fort	Waste from hotels and shops	Lack of sewer network.
4	Chalai Bazar	Waste from market, hotels and shops	Lack of sewer network.

(source of data – ULB)

- **In case of mixed drainage how it works in peak rainy days?**

  Results in overflow of drains causing inconvenience to the public.

Water Logging

Please provide information in 150 words on the above responding to (however not limited to) following questions.

- **Presently how the problem of water logging is handled? Does it provide the satisfactory outcome?**

  Presently the problem is handled by preservation and environmental regeneration of water bodies, protection of coastal belt and cleaning of the drainage system at frequent intervals.

  Reduction in carrying capacity of the existing canals/ drains due to heavy silt deposition, discharge of solid wastes into the canals/drains, growth of vegetation in the canals/ drains and encroachments, inadequate cross-section in certain culverts that obstruct normal flow in the canals/drains are the major reasons for regional flooding. Efficient storm water drainage and 100% coverage is required to avoid the above issues.

- **Provide details of flood points/areas prone to frequent water logging with special focus on Key road intersections, along roads (50 mt length or more) and Locality (affecting 50 HH or more) in the Table 1.2.**

Table 1.2: Flood prone points in the city

S.No.	Area	No of points	No of times water logging reported in a year (stagnant water for more than four hours of a depth more than 6")
1	Key road intersection	21	3
2	Along roads (50 mt length or more)	21	3
3	Locality (affecting 50 HH or more)	16	3

(Source of data: ULB)

Chocking of drains

Please provide information in 150 words on the above responding to (however not limited to) following questions.

- **Are drains prone to chocking due to dumping of solid wastes in them? If yes, Provide details of locations prone to chocking of drains due to solid waste in the Table 1.2**

Yes, drains prone to chocking due to dumping of solid wastes in them.

Table 1.2: Detail of Locations prone to chocking of drains due to solid waste

Sl.No.	Location	Stretch Length Affected	Reason
1	Thampanoor	1000m	Chocking of drains due to discharge of solid waste and improper maintenance of the drains. Low lying area.
2	East Fort	1000m	
3	Chalai	500m	
4	Karamana	500m	
5	Manacaud-Kamalesswaram	500m	
6	Thiruvallam	300m	
7	Attakulangara Road	300m	
8	Kumarapuram-Poonthi Road	300m	
9	Ulloor	200m	
10	Vanchiyoor	100m	
11	Kannammoola-Med College one way	200m	

(Source of data:ULB)

- **How presently the problem is addressed?**

  Uncovered drains will lead to deposition of solid waste and other material into the drains which in turn will lead to reduction in carrying capacity of the drains. Presently the problem is addressed by periodical maintenance and covering of the drains using slabs.

Institutional Framework

Please provide information in 150 words on the above responding to (however not limited to) following questions.

- **Define roles and responsibilities in terms of O&M, policy planning, funding, service provision in table 1.3. Is it in accordance with the AMRUT guidelines (Clause 8.1)?**

Table 1.3: Functions, roles, and responsibilities

Planning and Design	Construction/ Implementation	O&M
Municipal Corporation, PWD, State Irrigation Department	Municipal Corporation PWD, State Irrigation Department	Municipal Corporation PWD, State Irrigation Department

- **How city is planning to execute the projects?**

  The city is planning to construct a network of road drains that collect the surface runoff and ensures proper channelization to the available natural drainage.

- **Shall the implementation of project be done by Municipal Corporation? If no, whether resolution has been passed by the Municipal Corporation and accordingly, a tripartite Memorandum of Understanding (MoU) between State Government, Municipal Corporation and Parastatal has been signed? Please refer para 8.1 of AMRUT guidelines.**

  Implementation of the Project will be done by the concerned departments ie City Municipal Corporation (corporation roads) and PWD–NH&R&B (major roads and national highways).

2. Bridge the Gap

Once the gap between the existing Service Levels is computed, based on initiatives undertaken in different ongoing programs and projects, objectives will be developed to bridge the gaps to achieve universal coverage. (AMRUT Guidelines; para 6.2 & 6.3, Annexure-2; Table 2.1). Each of the identified

objectives will be evolved from the outcome of assessment and meeting the opportunity to bridge the gap.

- **List out initiatives undertaken in different ongoing programs and projects to address these gaps. For this provide details of ongoing projects being carried out for sector under different schemes with status and when the existing projects are scheduled to be completed? Provide information in Table 1.4**

Table 1.4: Status of Ongoing/ Sanctioned

Sl. No.	Name of Project	Scheme Name	Cost (in lakhs)	Month of Completion	Status (as on 31/08/2015)
1	Reconstruction of damaged side drain in Perunellijn to NH Byepass in ManacaudPerunelli road from ch 1/400 to 1/700 in Muttathara ward.	PWD City Roads	10,00,000	14/10/2015	work started
2	Construction of side drain and foot path in front of SM Lock Mazjid in Ambalthara-Poonthura Road.	PWD City Roads	41,45,427	31/10/2015	80% Completed
3	Construction of RCC Box drain of inside size of 2.40 m x 2.05 m from AbhedananadaAshram am to Thekkinikaracanal road through Rajadhani PWD road	PWD City Roads (Flood relief work-Disatermanagenent flood mitigation work)	129,00,000	31/10/2015	60% Completed
5	Reconstruction of culvert and providing side drain in Arattukadavu road and pwd city roads section 1	Special Development Fund for MLA-2015	9,00,000	30/09/2015	99% Completed
6	Construction of drain work at DPI Junction in Poojapura Bakery road	PWD City Roads (Flood relief work-Flood damages 2013)	12,98,980	20/09/2015	75% completed

7	Side drain work to Krishnavilasam road and providing 40 mm chipping carpet to Jagathy NK Achari road adjoin to Easwaravilasam road	PWD City Roads	33,97,553	19/09/2015	75% completed
8	Storm water drainage	JnNURM	4039.00	31/01/2015	42% completed
9	Storm water drainage	ADB	1150.00	30/10/2015	94% completed

(Source – PWD City Roads section)

- **How much the existing system will be able to address the existing gap in storm water drainage system? Will completion of the above improve the coverage of network; eliminate the chocking of drains and water stagnation problem? If yes, how much. (100 words)**

  Existing system will not be able to address the existing gap. Completion of the above will improve the coverage by 10% and also will reduce chocking of drains and water stagnation. However, additional network is required for proper functioning.

- **Does the city require additional infrastructure to improve the services? What kind of services will be required to fulfill the gap?**

  Yes. The city requires an additional drainage of 88303.10 m along 114 roads distributed in 28 wards of the Corporation. Widening of the storm water network and rejuvenation of the natural canals will be required to fulfill the gap.

- **How does the city visualize taking the challenge to rejuvenate the projects by changing their orientation, away from expensive asset replacement programs, to focusing on optimum use of existing assets?**

  Focusing on optimum use of existing assets, prioritize and phase out the projects to be done accordingly.

- **Has city conducted assessment of O&M cost of drains and potable pumps? If yes, what is the cost incurred? Is city planning to reduce it?**

  Yet to be assessed.

- **Based on assessment of existing infrastructure and ongoing / sanctioned projects, calculate existing gaps and estimated demand by 2021 for Rejuvenation of existing drains, construction**

of new primary and secondary drains, construction of pump house with pumping machinery, covering of drains. Gaps in Storm water drainage service levels are provided as per Table 1.5.

Table 1.5.Demand Gap Assessment for Storm Water Drainage Sector - To be filled in

Components	2015			2021	
	Present	Ongoing projects	Total	Demand	Gap
Major Drains	119775m (including ongoing projects)	-	119775m	88303.10m	88303.10m
Network requirement to provide proper drainage to all identified water stagnant point/ flooding points up to the end discharge point (in Km)	-	Nil	-	Construction of 20% of new drainage Networks	Construction of 20% of new drainage Networks
Network length where households discharging wastewater directly into the drains	20 % of Network length where households discharging wastewater directly into the drains	Nil	20 % of Network	Desilting and cleaning	-
Rejuvenation of existing primary nallahs and primary drains including covering and installation of filter	Drains are blocked due to the deposition of garbage	Nil	-	Desilting and cleaning	-

(Source of data: DPR for Storm Water Drainage in Thiruvananthapuram City by KSUDP)

- **Whether the gaps presented are measurable/ executable considering all the ongoing projects? (75 words)**

  Yes, to a certain extent.

3. Objectives

Based on above, objectives will be developed to bridge the gaps to achieve universal coverage. While developing objectives following question shall be responded so as to arrive at appropriate objective.

- **Are the identified objectives evolved from the outcome of assessment?**

  Yes, each identified objectives evolved from the outcome of assessment

  done by the ULB and other departments.

- **Does each objective meet the opportunity to bridge the gap?**

  Yes

- **Does the objective clearly address all these gaps /solution to all the problems related to storm water drainage of the city?**

  Yes

List out the objectives to meet the gap in not more than 150 words.

- Rehabilitation of existing drains by providing covering slabs
- Desilting
- Capacity enhancement
- Construction of new drains
- Shifting of utilities causing blockage to the network
- Capacity enhancement of Culverts

4. Examine Alternatives and Estimate Cost

The objective will lead to explore and examine viable alternatives options available to address these gaps. These will include out of box approaches. (AMRUT Guidelines; Para

6.4 & 6.8 & 6.9).This will also include review of smart solutions. The cost estimate with broad source of funding will be explored for each. While identifying the possible activities, also examine the ongoing scheme and its solutions including status of completion, coverage and improvement in O&M. Please provide information on the above responding to (however not limited to) following questions.

- **Are all these gaps clearly identified and addressed? (75 words)**

Yes, Reduction in carrying capacity of the existing drains due to heavy silt deposition, discharge of solid waste, growth of vegetation and encroachments in the drains, inadequate cross-section in certain culverts that obstruct normal flow in the drains are the major gaps.

Gaps can be addressed by preservation of water bodies, environmental regeneration of water bodies, and by protection of coastal belt.

- **What are the possible activities and source of funding for meeting out the objectives? (75 words)**

Preservation and environmental regeneration of water bodies, protection of coastal belt and cleaning of the drainage system at frequent intervals are the possible activities to meet the objectives.

Source of funding: - AMRUT, State Fund and ULB fund.

- **How can the activities be converged with other programme like JICA/ ADB funded/SBM/Smart city mission projects in the city etc.? (i.e. convergence with other schemes)(100 words)**

Yes, it is converged with other schemes and projects.

- **What are the options (financial alternatives) of completing the ongoing activities especially ongoing JnNURM Projects? (75 words)**

No other financial alternative other than from Central/State Govt or external aids.

- **What are the lessons learnt during implementation of similar projects? (100 words)**

Requirement of co-ordination between the parastatal/responsible agencies and departments. Land issues and gradient of the roads/slopes to be designed in a proper way.

- **Have you analyzed best practices and innovative solutions in sector? Is any of the practice be replicated in the city?(75 words)**

  Yes. Best practices have been analyzed but yet to be replicated due to lack of fund.

- **What measures may be adopted to recover the O&M costs?(100 words)**

  The O&M cost could be borne by the concerned department and cannot be recovered from the public or agencies.

- **Whether reduction in O&M cost by energy efficient pumps etc can be applied?(75 words)**

  Yes. It can be reduced by using energy efficient pumps and other mechanized systems.

- **Are different options of PPP such as Design-build-Operate-Transfer (DBOT), Design Built Finance Operate and Transfer (DBFOT) considered?(100 words)**

  Yes. The options of PPP such as Design-build-Operate-Transfer (DBOT), Design Built Finance Operate and Transfer (DBFOT) are considered at later stage.

The alternative activities to meet these activities are defined as per Table 1.6

Table1.6 Alternative Activities to Meet Objectives cost

Sr. No.	Objective	Activities	Financing Source
111	To avoid flooding	Rehabilitation of existing drains by providing covering slabs Desilting Capacity enhancement Construction of new drains Shifting of utilities causing blockage to the network Capacity enhancement of Culverts Proper channelization of the drain to available natural drainage	AMRUT, State Fund, ULB Fund

5. Citizen Engagement

ULBs will organize and conduct city level citizen consultation and receive feedback on the suggested alternatives and innovations. Each alternative will be discussed with citizens and activities to be taken up will be prioritized to meet the service level gaps. ULB will prioritize these activities and their scaling up based on the available resources. (AMRUT Guidelines; Para 6.6, 6.7 & 7.2). Please explain following questions in not more than 200 words detailing out the needs, aspirations and wishes of the local people.

- **Have all stakeholders involved in the consultation?**

  Yes

- **Has ward/ zone level consultations held in the city?**

  Yes

- **Has alternative proposed above are crowd sourced?**

  Yes

- **What is feedback on the suggested alternatives and innovations?**

  Positive responses were arrived from various stake holders on the suggested alternatives and innovations. Suggestions include cleaningand removing the silt and debris from the existing drains, renovation and construction of drainage networks.

- **Is any new potential alternative received? If so, how it is addressed?**

  No.

- **Are the alternatives taken up for discussions prioritized on the basis of consultations?**

  Yes.

- **What methodology adopted for prioritizing the alternatives?**

  Analysis of the current and future urban conditions etc. has been considered.

6. Prioritize Projects

Based on the citizen engagement, ULB will prioritize these activities and their scaling up based on the available resources to meet the respective objectives. While prioritizing projects, please reply following questions in not more than 200 words.

- **What are sources of funds?**

  AMRUT, State, ULB and fund from external agencies.

- **Has the projects been converged with other program and schemes?**

  Yes

- **Has the projects been prioritized based on "more with less" approach?**

  Yes.

- **Has the universal coverage approach as indicated in AMRUT guidelines followed for prioritization of activities?**

  Yes.

7. Conditionalities

Describe in not more than 300 words the Conditionalities of each project in terms of availability of land, environmental obligation and clearances, required NOC, financial commitment, approval and permission needed to implement the project.

There is no issue with respect to land and environmental clearance.Construction of drainage networks require NOC/approval from various departments which can be obtained from concerned departments.

8. Resilience

Required approvals will be sought from ULBs and competent authority and resilience factor would be built in to ensure environmentally sustainable storm water drainage scheme. Describe in not more than 300 words regarding resilience built in the proposals.

Yes, required approvals will be sought from ULBs and competent authority and resilience factor would be built in to ensure environmentally sustainable projects.

9. Financial Plan

Once the activities are finalized and prioritized after consultations, investments both in terms of capital cost and O&M cost has to be estimated. (AMRUT Guidelines; para 6.5) Based on the investment requirements, different sources of finance have to be identified. Financial Plan for the complete life cycle of the prioritized development will be prepared. (AMRUTGuidelines; para 4, 6.6, 6.12, 6.13 & 6.14). The financial plan will include percentage share of different stakeholders (Centre, State and City) including financial convergence with various ongoing projects. While preparing finance plan please reply following questions in not more than 250 words

- **How the proposed finance plan is structured for transforming and creating infrastructure projects?**

  50% of the project cost as grant from GOI, 30 % as state fund and remaining 20% from ULB share under AMRUT scheme.

- **List of individual projects which are being financed by various stakeholders?**

  Nil.

- **Has financial plan prepared for identified projects based on financial convergence and consultation with funding partners?**

  Yes.

- **Is the proposed financial structure sustainable? If so then whether project has been categorized based on financial considerations?**

  Yes.

- **Have the financial assumptions been listed out?**

  Yes, the financial assumptions have been listed out as 50% of the project cost as grant from GOI, 30 % as state fund and remaining 20% from ULB share.

- **Does financial plan for the complete life cycle of the prioritized development?**

  Yes, financial plan for the complete life cycle of the prioritized development is phased out.

- **Does financial plan include percentage share of different stakeholders (Centre, State and ULBs)**

  Yes, financial plan include percentage share of different stakeholders. 50% of the project cost as grant from GOI, 30 % as state fund and remaining 20% from ULB share.

- **Does it include financial convergence with various ongoing projects?**

  Yes, it includes financial convergence.

- **Does it provide year-wise milestones and outcomes?**

  Yes, year-wise milestones and outcomes are provided.

Details in financial plan shall be provided as per Table 1.7,1.8,1.9,1.10 and 1.11. These tables are based on AMRUT guidelines tables 2.1, 2.2,2.3.1,2.3.2, and 2.5.

Table 1.7 Master Plan of Storm Water Drainage Projects for Mission period

(As per Table 2.1of AMRUT guidelines)

(Amount in Rs. Cr)

Sr. No.	Project Name	Priority number	Year in which to be implemented	Year in which proposed to be completed	Estimated Cost
1	Cleaning and removing the silt and debris from the existing drain	3	2018	2020	2.00
2	Rejuvenation of the existing drain	2	2018	2020	10.00
3	Coverage of drain network	1	2016	2020	280.00
Grand Total					**292.00**

Table 1.8 Master Service Levels Improvements during Mission Period

(As per Table 2.2 of AMRUT guidelines) **(Amount in Rs. Cr)**

Sl. No.	Project Name	Physical Components	Change in Service Levels			Estimated Cost
			Indicator	Existing (As-Is)	After (To-be)	
1.	Cleaning and removing the silt and debris from the existing drain.	Cleaning of the drainage system at frequent intervals.	Incidence of water logging	70%	30%	2.00
2.	Rejuvenation of the existing drain.	Rejuvenation and construction of drainage network.	Coverage of Storm water drainage network Incidence of sewerage mixing in the drains	80% 30%	100% <5%	10.00
3.	Coverage of Drain network.	Coverage includes proper channelization of the drain to available natural drainage.	Coverage of Storm water drainage network	60%	100%	280.00

Table1.9 Annual Fund Sharing Pattern for Storm Water Projects

(As per Table 2.3.1of AMRUT guidelines)

(Amount in Rs. Cr)

Sr. No.	Name of Project	Total Project Cost	Share				
			GOI	State	ULB	Others	Total
1	Cleaning and removing the silt and debris from the existing drain.	2.00	1.00	0.60	0.40	-	2.00
2	Rejuvenation of the existing drain.	10.00	5.00	3.00	2.00	-	10.00
3	Coverage of Drain network.	280.00	100.00	140.00	40.00	-	280.00
	Total	**292.00**	**106.00**	**143.60**	**42.40**	**-**	**292.00**

Table 1.10 Annual Fund Sharing Break-up for Storm Water Drainage Projects

(As per Table 2.3.2 of AMRUT Guidelines) **Year 2017-2018**

(Amount in Rs.Cr)

Sr. No.	Project	GoI	State			ULB			Convergence	Others	Total
			14th FC	Others	Total	14th FC	Others	Total			
1.	Cleaning and removing the silt and debris from the existing drain										
2.	Rejuvenation of the existing drain										
3.	Coverage of Drain network										
	Total										

Table 1.11Year wise Plan for Service Levels Improvements

(As per Table 2.5 of AMRUT guidelines)

Proposed Projects	Project Cost	Indicator	Baseline	Annual Targets (Increment from the Baseline Value)					
				FY2016		FY 2017	FY 2018	FY 2019	FY 2020
				H1	H2				
Storm Water Drainage									
Cleaning and removing the silt and debris from the existing drain	2.00	Incidence of water logging	58 nos				58 nos	45 nos	25 nos
Rejuvenation of the existing drain.	10.00	Coverage of Storm water drainage network. Incidence of sewerage mixing in the drains	80% 30%				90% <25%	95% <10%	100% <5%
Coverage of Drain network	280.00	Coverage of Storm water drainage network	60%	64%	68%	76%	84%	92%	100%