





TITLE SHEET : LAYOUT FOR AREA BASED DEVELOPMENT, BAREILLY

SMART CITY PROJECT CONSULTANTS







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3 DIMENSIONAL VISUALIZATION OF SMART CITY BAREILLY

EXISTING VILLA

MAHANAGR COLONY

LOW RISE HABITAT ZONE EDUCATIONAL CLUSTER UTILITY ZONE (SOLAR FARM)

HIGH RISE HABITAT

CYCLE AND PEDESTRIAN PATH URBAN FOREST WITH LAKE MULTI SPECIALITY HOSPITAL URBAN PLAZA SPORTS COMPLEX

EXISTING VILLAGE

NAKATIA RIVER

GREEN PARK COLONY

- EXISTING DEVELOPMENT BY B.D.A.

EXISTING VILLAGE

SKILL DEVELOPMENT CENTRE

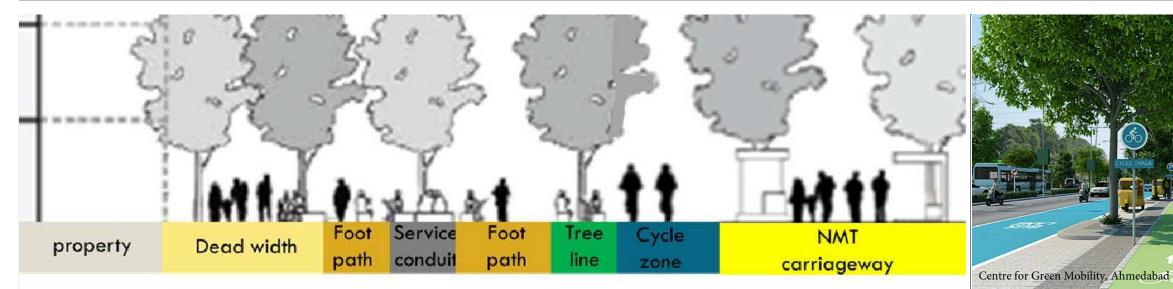
BAREILLY BYE PASS

AFFORDABLE HOUSING MIXED LAND USE ECONOMIC ZONE

UTILITY ZONE (SOLAR FARM) ECONOMIC ZONE



ILLSUTRATIVE DEVELOPMENT SYSTEM



AREA WIDE ROAD CROSS SECTION



SOLAR PV FARM FOR ENERGY GENERATION

POROUS PATHWAYS

ZARI-ZARDOSI INDUSTRIES

COMPONENTS OF PROPOSAL AREA BASED DEVELOPMENT PROPOSAL, SMART CITY BAREILLY.



1. Citizen engagement/consultation process:

Through workshops:

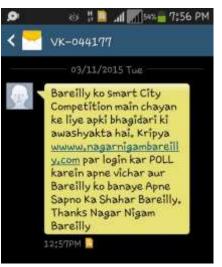


Tools used in consultations- offline:

- messages to 30000 people
- Drop box
- Google form







TECHNICAL ASSOCIATIONS

BAR association consultations



Addressing advocates about smart city and filling of the citizen feedback form.

35 advocates from all over the city present.

Consultations with Mayors, Doctors and important government officials



Consultations with the higher government officials including the Ex- Mayors of the city, doctors etc. at Dainik Jagran's office. **30** Stakeholders present in the group



Anchors and city commissioner on the review of smart city guidelines.

10 Stakeholders present

Consultations with various technical stakeholders like Doctors, Engineers and Chartered Accountants.



Stakeholders taking oath in Dainik Jagran office .Daily meeting with stakeholders from 14.10.2015 - 29.10.2015

Consultations with the finance expert for smart city funds



Understanding the issues that Bareilly has for funds.

Consultations with the government officials in different sectors



Government officials from different sectors addressing the issues and solutions to be a part of smart city proposal

20 people present further addressed in their offices.

Commissioner's address



Commissioner encouraging people to vote online for the city of Bareilly.

Schools And Colleges

Consultations with the District School Director to encourage students from school and colleges



Meeting to make students an integral part of the polling campaign with the District School Director. No. of students participating : **1200**



Meeting with the commissioner for area based development and pan city solutions

Business & Industrialists Groups

Sarafa bazar(Jewellers)



Meeting the stakeholders from the market association (jewellers) and understanding the issues with the city and solutions needed. Total

people present: 35



Meeting with the industrialist groups for area based and pan city solutions. Total

people present 60

NGO's consultations for smart city Bareilly

NGO's participated in consultations :

- 1. Nav Nirman Organization
- Women & Child welfare society
- Sujan Welfare
- Anusandhan Institute
- 5. Chhoti si Aasha
- 6. Ramganga Bachao
- 7. Saakar NGO

Citizens Groups

- Slums
- Communities and Bastis



Addressing young people about smart city program, asking the needs and issues in the areas. Encouraging for filling the citizen feedback form .



Stakeholders filling up citizen feedback from for Bareilly for the prioritization of the issues in the city



Workshop 2 with citizen participation for identifying the area based and pan city solutions in the city. **60** people participated.

Mygov.in online polling



Discussion: 28803 Essay competition: 32 Polling for ABD: 6025 Vote for Vision: 8082 Vote for Pan City Solution: 5117





Smart city page: Likes: 621





Bareilly Nagar Nigam Website :

Online Voting : 48,059 Votes

Workshops held In Bareilly for citizen engagement



Workshop held in Bareilly for formulating vision and priority sectors and issues in the city. 90 people in participation.



Workshop held in Bareilly for area base and pan city initiatives 60 people in participation.

women participation groups



Women as important stakeholders participating in issues. **40** present.

- 1. President of Vairshy Women Association
- 2. Social Workers
- 3. Housewives
- 4. Principal (College & School)
- 5. Students

Offline Citizens' Feedback Forms in schools and Idea camp

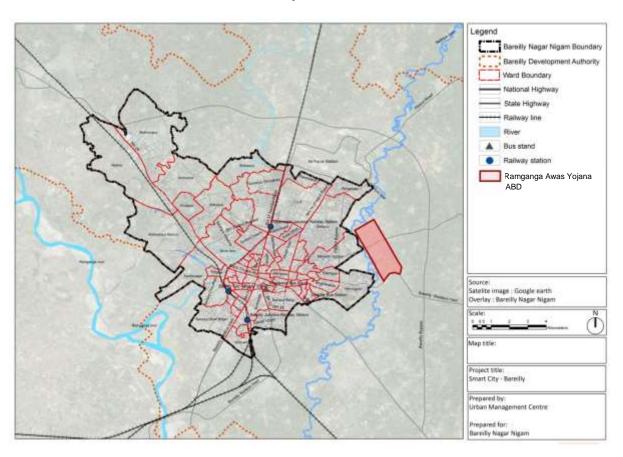


Offline Citizens' Feedback Forms: 1800



Drop box : 1800

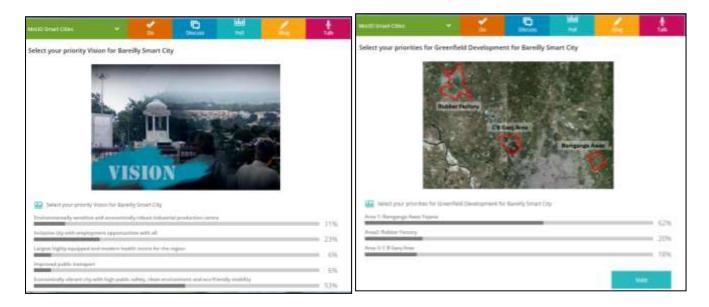
offline voting mediums: 1800



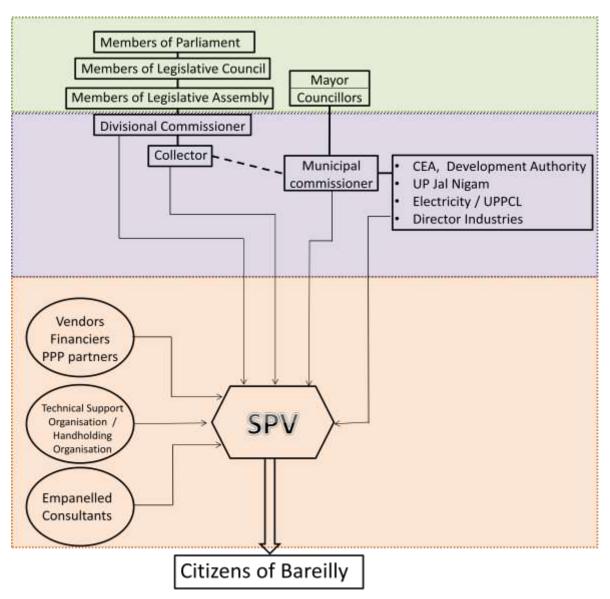
2. Location of Area Based Development site:

3. Polling on www.mygov.in on ABD, Pan City and Vision:

SMART CITY BAR	RILLEY
What would be your preferred Sector / Area for improving Smart City-Ba part in preparation of Smart City Proposal for Banelly	relly? Peake vote any preferred sector to take
Public turnport	5%
How supply	2%
Destricity	
Tollets and severage/ septic tanks	43%
	3%
Sold wette management	10%
Open specer, parks and cultural centres.	45
Privary alteriation	25
Housing for all	75
Egnerator/ H-governance services	78
	- 75
Education	5%
Health	1.1
Ar polation	19
	- 1%
Increase income provide	12%
Waikathitty	
	. 1%



4. Organogram:



5. Financial plan – summary, convergence with other sources of funding

a. Summary of the Proposal

S. No.	Component	Cost (INR in crores)
Α	Pan-city initiatives	114.87
В	Area based development	4,043.47
	TOTAL (A+B)	4,158.33

b. Summarised source-wise costs

S.					SPV as			
Ν		Private	Private		concessi		Private	
о.	Component	(PWC)	(ISP)	SPV	onaire	BDA	Investment	TOTAL
1	Pan-city initiatives	5.00	6.25	7.68	95.94	-	-	114.87
	Area based							
2	development	-	-	310.99	-	224.45	3,508.03	4,043.47
	TOTAL	5.00	6.25	318.67	95.94	224.45	3,508.03	4,158.33

c. Pan-City Intervention, Capex

s.				Rate (INR	Cost (INR	Source of
No	Project	Unit	Quantity	in crores)	in crores)	funding
Α	LED based Streetlighting				107.19	
	Replacement of existing poles and					SPV as
1	lights with Led lights		41,000.00	0.0020	82.00	concessionaire
	Cost of CCTV cameras on every					SPV as
2	tenth streetlight pole		4,100.00	0.0010	4.10	concessionaire
	digital signage and digital					
	information panel on every fifth					SPV as
3	pole		8,200.00	0.0012	9.84	concessionaire
	Control centre for CCTV					
4	surveillance		1.00	5.000	5.00	Private (PWC)
5	Bareilly Wifi zones		5.00	1.250	6.25	Private (ISP)
	Surveys, studies and project					
	reports preparation for SPV					
2	funded projects	%	3%		2.88	SPV
	Contingencies (only for SPV funded					
3	components)	%	5%		4.80	SPV
4	l Total					

d. Pan-City Estimated revenue Sources

PAN CITY REVENUES								
REVENUE SOURCE								
Advertisement on digital signboards								
total road length in km	620							
	Main roads							
road length across different category of roads	(arterials)	Sub-arterial roads	local roads					
% of digital sign boards	60%	30%	10%					
roadlength in km	124	186	310					
% of streetlights with advertisements	4,920.00	2,460.00	820.00					
Rent per pole per annum	3,600.00	2,000.00	1,600.00					
Advertisement revenue per year at 50%								
efficiency (INR crores)	1.24	0.34	0.09					

e. Area Based Development Capex

AREA	BASED DEVELOPMENT CAPEX			
S. No.	Essential feature	Projects	Unit Rate (INR crores)	Rate (INR in crores)
1	Assured electricity supply with at least 10% of the smart city's energy requirement coming from solar	On-grid solar farms	10 MW @ 7.00	70.00
2	Adequate water supply including waste water recycling and storm water reuse	Water supply	26 km @ 1.80	46.80
3	Smart Metering	СЕТР	0.43 MLD @ 1.00	0.43
	Deia Watan kamastina	Storm water drainage	26 km @ 1.00	26.00
4	Rain Water harvesting	Footpaths(porous pathways)	52 km @0.65	33.80
		Sewerage	26 km @ 3.45	89.70
	Conitation including colid wasta	Decentralised waste water treatment system	11,700 Nos. @ 0.0035	40.95
5	Sanitation including solid waste management	Solid Waste Management: Source segregation, dry waste segregator, bio methanation plant for wet waste processing and community kitchen, dry waste sold to recyclers	1,17,000 population @ 0.00015	17.55
6	Robust IT connectivity and digitalisation	Control centre for CCTV surveillance (include periphrels)	1 No. @ 5.00	5.00
7	Dedectrian friendly nothways	Street furniture (benches, dustbins)	260 Nos. @ 0.78	0.78
/	Pedestrian friendly pathways	Landscaping	45,000 sqm @ 0.0001	2.25
8	Encouragement to non-motorised transport (e.g. walking and cycling)	Dedicated cycling tracks	30km @ 0.5	15.00

9	Smart Parking			
10	intelligent traffic management		200.0	
11	Safety of citizens especially children, women and elderly	CCTV cameras on streetlights	300 @ 0.001	0.30
12	Non-vehicle street-zones	NA	-	-
13	Energy Efficient lighting	LED based Street lighting without CCTV surveillance	3000 @ 0.002	6.00
14	Innovative use of open spaces	Smart Community centre including training centre, skill development, creche facilities including equipments	1 @ 33.00	33.00
15	Visible improvement in the area	parks and forests	3,90,000 @ 0.00005	19.50
16	At least 80% buildings (in redevelopment and green-field) should be energy efficient and green buildings	NA	-	-
17	In green-field development, if housing is provided, at least 15% should be in 'affordable housing category'	Construction of affordable housing	8,112 @ 007	527.28
18	Additional 'smart' applications, if	Additional 'smart' applications, if Digital signage and information board on streetlights		0.72
	any	Public conveniences (e-toilets)	24 @ 0.01	0.24
		Modernisation of existing school: improve learning facilities, built environment as a learning system, smart classes with interactive teaching methods, etc.	1 No. @ 15.84	15.84
		Carriage-way	26km @ 1.5	39.00
		Development of the remaining housing units	12,970 @ 0.16	2,106.00
19	Other capital expenditure	Development of the Commercial zone	2,80,000 @ 0.003	842.40
		Construction of new school	1 No @ 15.84	15.84
		Construction of urban health centre	1 No. @ 1.00	1.00
		Construction of indoor sports academy includes national level indoor sports arena infrastructure	1 No @ 67.50	67.50
20	Miscellaneous	Surveys, studies and project reports preparation for SPV funded projects	-	6.10
20		Contingencies (only for SPV funded components)	-	14.52
			Total	4043.47

f. Area Based Development, O&M Expenditure

ARE	A BASED DEVELOPMENT OPERAT			NANCE					
S.			Rate/y	O&M					
No	Components	Qty	r	Agency	Year 1	Year 2	Year 3	Year 4	Year 5
1	ZONE 1: ECONOMIC DEVELOPM	/IENT ZOI	NE (cost oj	f provision	of basic se	rvices are c	alculated	in habitat z	one)
	Common Effluent Treatment								
	Plant	1	0.12	Private	0.12	0.126	0.132	0.139	0.146
2	ZONE 2: SPECIAL UTILITY ZONE		•						
	On-grid solar farms	10.00	0.12	SPV	1.20	1.26	1.32	1.38	1.45
3	ZONE 3: HABITAT ZONE	10.00	0.12	51 V	1.20	1.20	1.52	1.50	1.45
3A	Kanshiram Awas Yojana								
0/1	existing school (O&M for only								
i	smart components)	1	0.018	Private	0.02	0.019	0.020	0.021	0.022
ii	Smart community centre	1	0.15	SPV	0.15	0.158	0.165	0.174	0.182
3B	Infrastructure Provision	1	0.15	JFV	0.15	0.138	0.105	0.174	0.162
<u>эр</u> i	Sewerage								
ii	SWM			SPV	6.06	6.363	6.681	7.015	7.366
iii	Storm water drainage		0	NA	- 0.00	-			
	Decentralised waste water	1170	0	11/1		_	_	_	
iv	treatment system	0	0	SPV	_	_	-	_	_
		0	U	517	1	l	I	L	-
V	Street design	52	0.10	6017	4.25	2.04	2 55	F 4C	F 70
v-a	Footpaths(porous pathways)	52	0.10	SPV	1.35	2.84	3.55	5.46	5.73
v-b	Carriage-way	26	0.10	SPV	1.56	3.28	4.10	-	-
V-C	Dedicated cycling tracks	30	0.10	SPV	0.60	1.26	1.58	-	-
			INR7						
		30	50 per street						
v-d	LED based Street lighting	30 00	light	SPV	0.09	0.23	0.24	0.25	0.26
v-u	Street furniture (benches,	24	light	JFV	0.09	0.25	0.24	0.25	0.20
v-e	dustbins)	0	0.08	SPV	0.016	0.022	0.031	0.032	0.034
vc	dustansy	45	0.00	517	0.010	0.022	0.031	0.052	0.034
v-f	Landscaping	000	0007	SPV	0.32	0.331	0.347	0.365	0.383
• •	Control centre for CCTV	000	0007	5/1	0.52	0.331	0.547	0.303	0.505
	surveillance (include								
vi	peripherals)	1	0.6	SPV	-	0.60	0.630	0.662	0.695
vi-	CCTV cameras on	30							
а	streetlights	0	-	SPV	-	-	-	-	-
	Digital signage and								
vi-	information board on	60							
b	streetlights	0		SPV	-	-	-	-	-
vii	Water supply		1.88	SPV	1.88	1.974	2.073	2.176	2.285
	Public conveniences (e-								
viii	toilets)		0	Private	-	-	-	-	-
	Construction of affordable								
ix	housing		0	Private	-	-	-	-	-
х	Construction of new school		0	Private	-	-	-	-	-
	Construction of urban health		48000	Dept. of					
xi	centre		0	Health	0.05	0.05	0.053	0.056	0.058
	Construction of indoor sports								
	academy includes national		84000						
xii	level indoor sports arena		0	SPV	0.08	0.088	0.093	0.097	0.102

	infrastructure								
xiii	parks and forests	3900 00	0.10	SPV	-	-	-	-	-

g. Capital inflows and revenue sharing between SPV and BDA

Scenario	Capital Inflows and Revenue Sharing	Between SPV a	ind BDA		
		Year 1	Year 2	Year 3	Total(crores)
1a	Residential (BDA Current price: INR 12,000)	327.60	360.36	339.77	1,027.73
1b	Commercial (BDA Current price: INR 24,000)	131.04	144.14	135.91	411.09
	Total	458.64	504.50	475.68	1,438.82
2	Income from sale of capital assets @19 development charges by the SPV	5,000 and 30,0	00 with a base	eline markup o	f INR 3,000 as
2a	Residential	409.50	450.45	424.71	1,284.66
2b	Commercial	163.80	198.20	203.86	565.86
	Total	573.30	648.65	628.57	1,850.52
	Capital Inflows for the SPV	114.66	144.14	152.90	411.70

h. Internal Rate of Return for SPV (Area Based Development and Pan-city)

	Year 1	Year 2	Year 3	Year 4
Area Based Development Outflows	-82.5	-85	-77.29	-45.63
Area Based Development Inflows	114	144	152	8.75
Pan-city outflows	-46.276	-41.276	-20.638	0
Total	-14.776	17.724	54.072	-36.88

• All figure in INR crores

IRR = 131%

i. Assumptions for the financial proposal

Assumptions	Unit	Rate	Notes
Area based development			
Area	hectares	260	
Cost of Wi-Fi	per sqkm	1.25	
			195*600 persons per hectare (gross
Estimated population on site		1,17,000	density)
Estimated households on site		23,400	

Length of road	km	26	10% of site area with avg 15 mt width
			gross density of 600 persons per
			hectare over 34 hectares(0.4* 15% of
Affordable housing	Nos	4,080	total land for affordable housing)
Cost of one unit in affordable housing	Rs.	0.07	1,872
SCADA based monitoring system	Rs.	4.50	
Kanshi Ram Yojana			
Cost of construction of school per sq. ft			
(averaged out for including	Rs in		
playgrounds)	Crores	0.0015	
Area of one school	sqm	10,560	
			with 60 classes each asssuming one in
No. of schools		2.00	five children (total DUs=20280)
Area of Community Centre	sqm	10,000.00	
Cost of construction of community	Rs in		
centre per sq. ft (including equipment)	Crores	0.0032	
Cost of construction of urban health	Rs. In		
centre	crores	1.00	
Road length		2.00	
Area of Community Centre	sqm	15,000.00	
	lumpsum		
Equipments in the community Centre	in crores	1	
Cost of construction of sports centre per	Rs. In		
sq.ft. (including equipment)	crores	0.0045	
Residential Zone			
	No. of		estimated at 6 locations with 4 seats
Public Conveniences	toilet seats	24.00	each
	Rs in		
Cost of construction of one seat	Crores	0.01	
Cost of re-laying roads	per km		
Cost of road construction	per km	1.5	
cost of footpath construction	per km	0.65	
Cycle route length	Km	30.00	15 kms on both sides
Cost of cycle track	Km	0.40	
Cost of landscaping	per sq m	0.0001	
area under landscaping in mt along			
streets	per km	3,000	
total area under landscaping along			
streets		45,000	
Area of community parks	sq. mt	3,90,000	
no. of benches and dustbins		260	
cost of bench and dustbin	per pair	0.003	
Cost of laying sewer lines	per km	3.45	
Cost of SWM system (collection to	·		
disposal and treatment)	per capita	0.00015	
Cost of dewats per MLD	Per unit	0.0035	
Quantity of waste water generated on	_		
	1	12 626 000	
the site	litres	12,030,000	
		12,636,000 1.00	
Cost of laying storm water drains Cost of water supply distribution	litres per km	12,636,000	

LED LIGHTING			
			Includes street lights by the roadside
no. of streetlight poles required in ABD		3,000	and also parks and other public places
no.of streetlight poles regired pan-city		41,000	At 15 m
no. of poles with CCTV cameras in ABD		300	
no. of poles with digi sign and info panel			
in ABD		600	
no. of poles with CCTV cameras pan city		4,100	
no. of poles with digi sign and info panel		.,200	
pan city		8,200	
total number of LED lights per pole		2	
Cost of LED light without CCTV cameras		_	
plus pole	per pole	0.0020	
Cost of CCTV camera on streetlight	per camera	0.0010	
Cost of LED light with digi information	per contere		
board & digi sign	oer signage	0.0012	
	1 control		
CCTV control centre	centre	5	central facility for cctv surveillance
		-	
SOLAR PARK			
Cost per MW of power generation	Rs in		
without battery	Crores	7.00	
households supported by 1 MW	No.	200.00	
land required for 1 MW solar park	acres	5.00	
MW required for site	MW	10	
Energy generated	kWh	1.3	million
Unit charge	INR/kWh	7.0	
ZONE 1			
			assumed at 5000 people working in
Waste water and effluent generated	MLD	0.43	economic zone and 0.1 MLD effluent
	INR crores		
cost of CETP with tertiary treatment	per MLD	1.00	
	Crores per		
Cost of wifi hotspots	sq.km	1.25	

j. Estimation of number of dwelling units in the ABD

% break up of various	estimated	Total Area	Total Area	estimated	No. of Dus
categories of plots	%	in	in sq. mt	area per	with FSI 1.8
		hectares		plot	
Affordable housing/LIG 1	7%	6.83	68250	25	8190
LIG Housing 2	3%	2.93	29250	45	1950
MIG Housing	65%	63.38	633750	140	13580
HIG Housing 1	10%	9.75	97500	250	1170
HIG Housing 2	15%	14.63	146250	300	1463

k. User charges for services

	Water +Sewerage		SWM charge	
Revenue charges	charge per month		per month	
		total per		total per
	Rs/month	month	Rs/month	month
EWS+LIG	70	7,09,800.00	10	1,01,400.00
MIG	250	3,395,089.29	100	1,553,035.71
HIG	350	921,375.00	150	2,212,553.57
Total per year		60,315,171		46,403,871
No. of people who pay			Cost per	
membership fee to Indoor			houshold per	
Sports	30%		year	
EWS+LIG	,@30% h/hs	3,042.00	150.00	456,300.00
MIG	,@30% h/hs	4,074.11	500.00	2,037,053.57
HIG	,@30% h/hs	789.75	1,000.00	789,750.00
Total revenue per year				3,283,103.57

I. Total Annual Revenues

REVENUE SOURCES

Sr.no.	Component			Total (crores)
1	On-grid solar farms			8.75
2	Public services			
	Water + Sewerage (differential tariff for EWS			
2a	and MIG and HIG)			6.03
	SWM (differential tariff for EWS and MIG and			
2b	HIG)			4.64
3	Indoor sports arena fees per person per year			0.33
4	Street light poles with digital signage			
		Main roads	Sub-arterial	
	road length across different category of roads	(arterials)	roads	
	% of digital sign boards	60%	40%	
	No. of streetlights with advertisements	360	240	
	rent per pole per month	3600	2000	
	advertisement revenue per year	15,552,000	5,760,000	2.13
	Total revenue per year			21.88