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Case 182 of 2014

12.08.2015



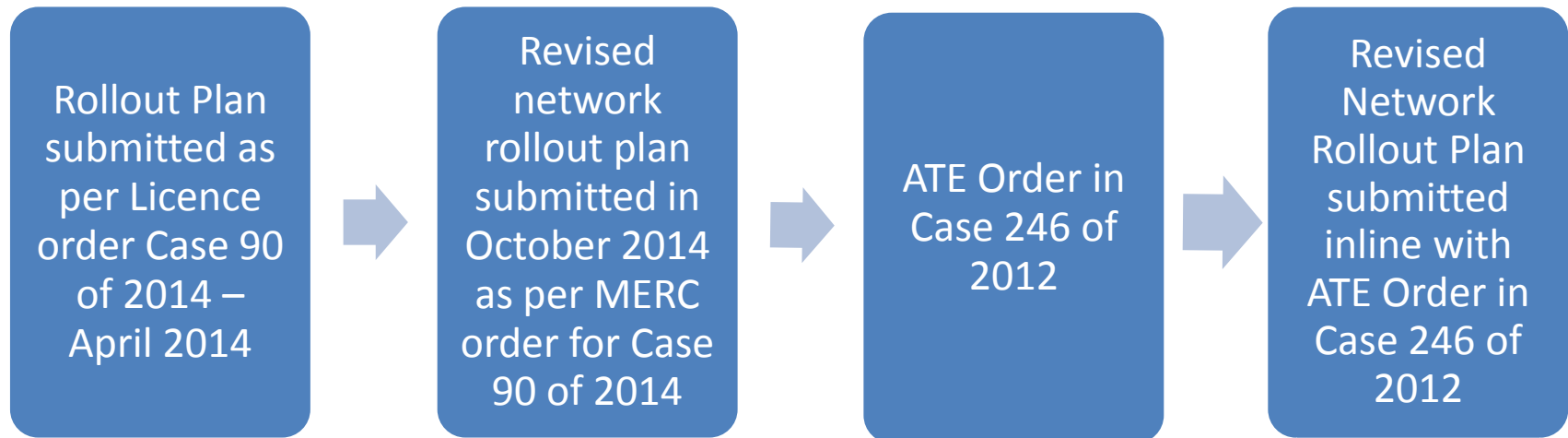
Agenda

- Background
- Network Rollout Plan –Basis and Approach
- Load Projections
- Ward wise Rollout Plan –Mumbai Suburbs and City
- Summary
- Compliance's to Daily Order
- Prayers

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Background

Background of Network Rollout Plan



The Network Rollout Plan submitted by Tata Power is for its entire Licence Area broadly comprising of (i) Mumbai City – Licence Area common to Tata Power & BEST and (ii) Mumbai Suburban Area & Mira Bhayandar Municipal Corporation – Licence Area common to Tata Power & R-Infra

Relevant Orders/Judgments

- Relevant Judgments for the Network Rollout Plan
 - ✓ Order of the Hon'ble Commission in Case 90 of 2014
 - ✓ Judgment of the Hon'ble ATE in Appeals 229 of 2012 and 246 of 2012
 - ✓ Judgment of the Hon'ble Supreme Court in CA No. 4223 of 2012

The Network Rollout Principles with respect to Tata Power as a Distribution Licensee have undergone significant changes since 2008 and shaped the way the network has been developed by Tata Power in its Licence Area.

Network Rollout Principles laid out in Judgments –

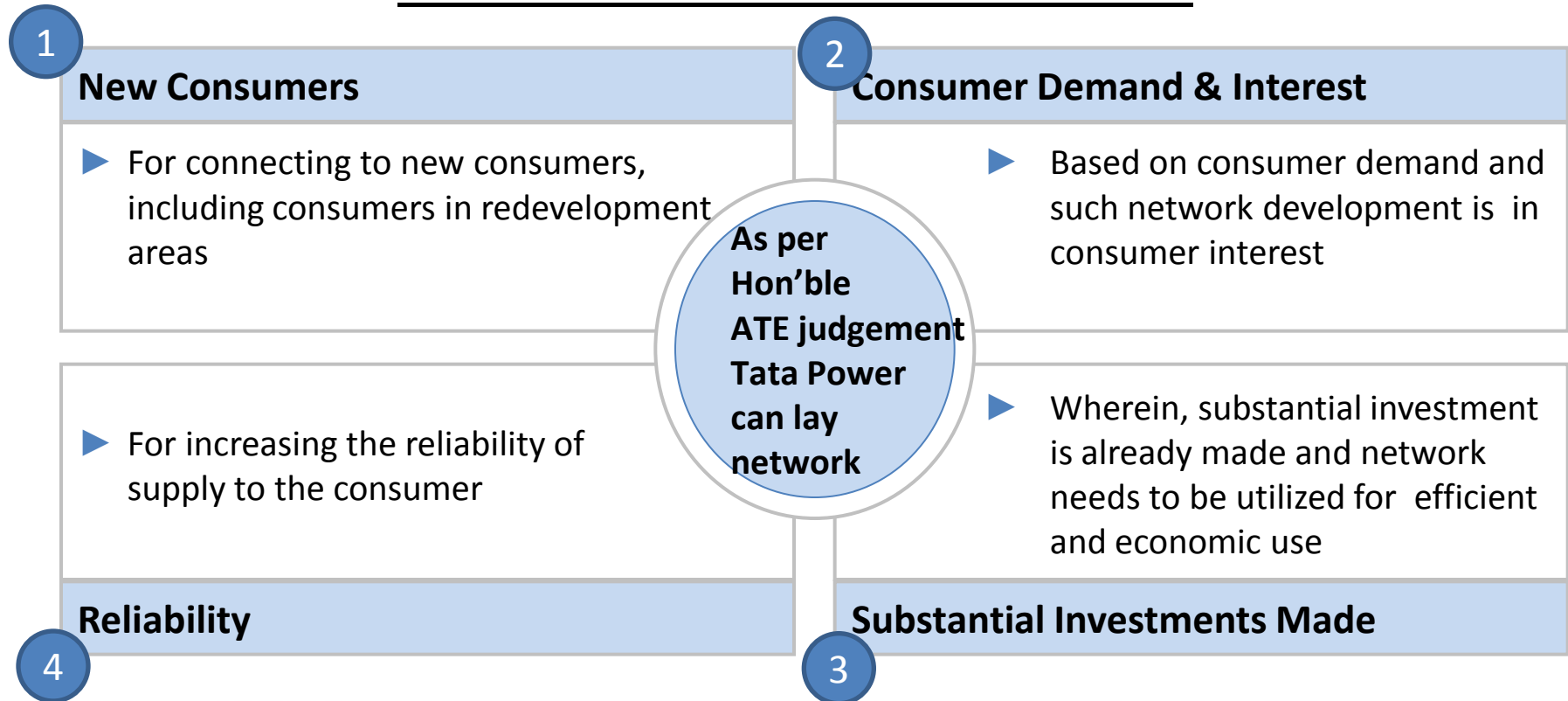
Based on Supreme Court's (May14) & ATE's judgements (Nov'14)



Licence Area common to Tata Power & BEST

- ✓ Tata Power can cater to consumers' demand by laying its network in the Licence Area overlapping with BEST

Licence Area common to Tata Power & R-Infra



Major modifications - based on ATE Judgment

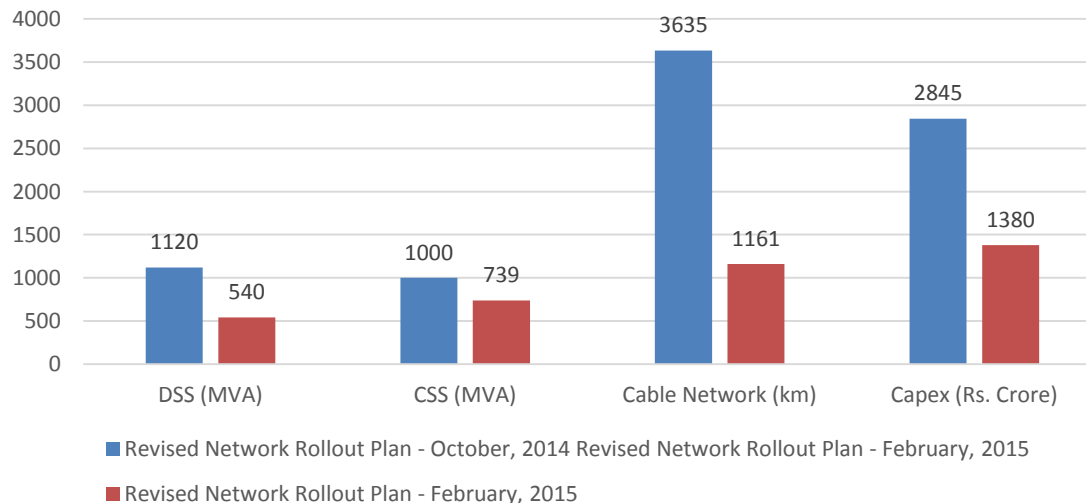
Principles of Network Rollout Plan – Oct, 2014

- Backbone network planned to cater to 50% of the load of License Area
- Last Mile Network was planned such that a reach and LT Network density was created to reach to about 50% of the consumer load in the Licence Area

Principles of Network Rollout Plan – Feb, 2015

- Backbone network planned as per the estimate load from new consumers and improving reliability in an area
- Last Mile Network is planned for catering to the estimated load from new consumers and loading of existing network wherein substantial investment has been made

Comparison of Network Rollout Plan

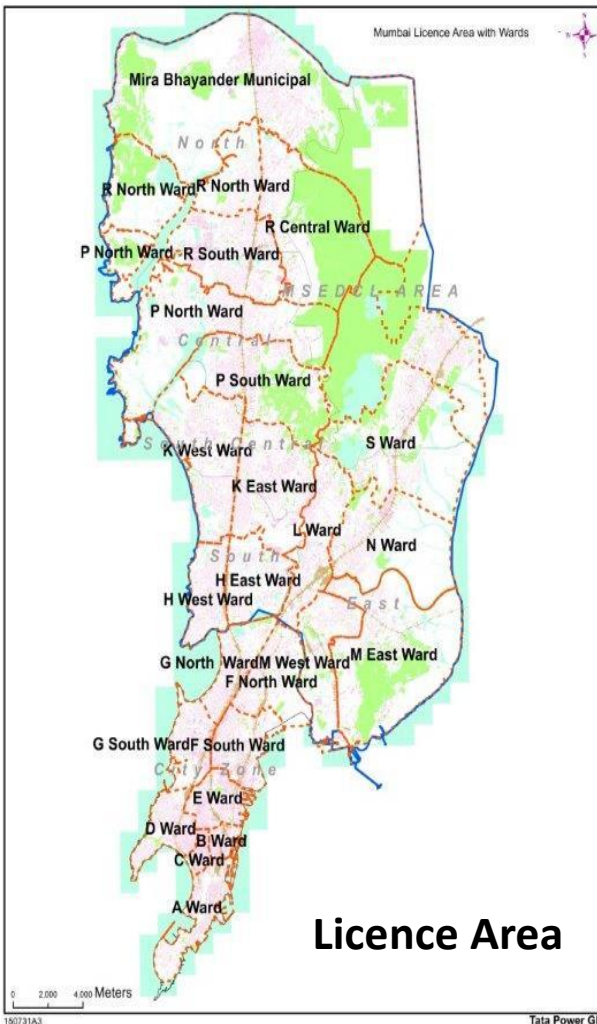


- Network Rollout Capex planned in FY 2015-16 has been pruned down from ~ Rs. 400 crore to about Rs. 218 crore

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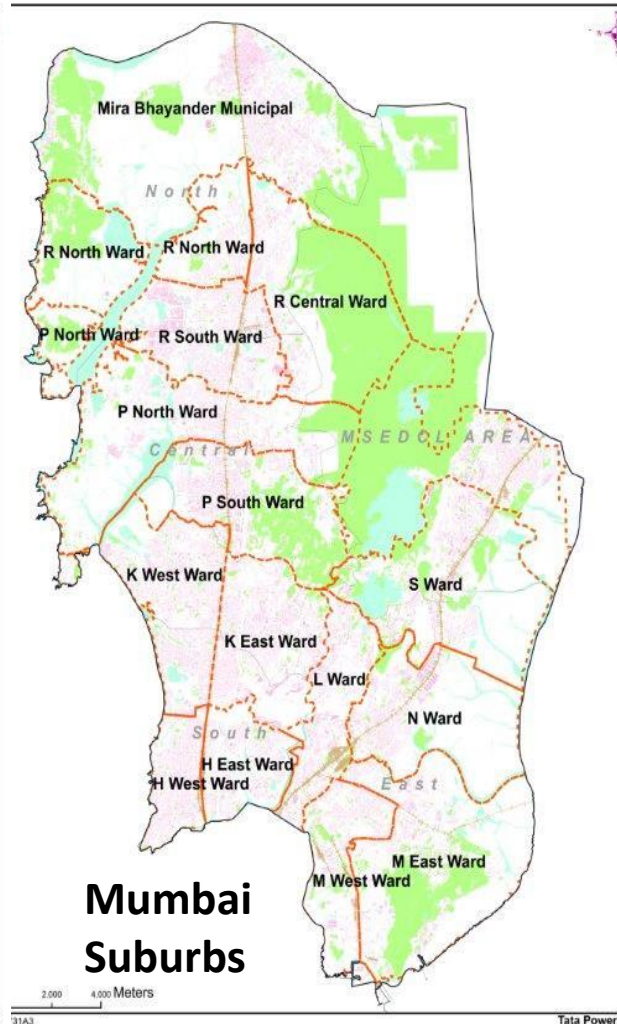
Network Rollout Plan Basis

Geographical Spread of Licence Area



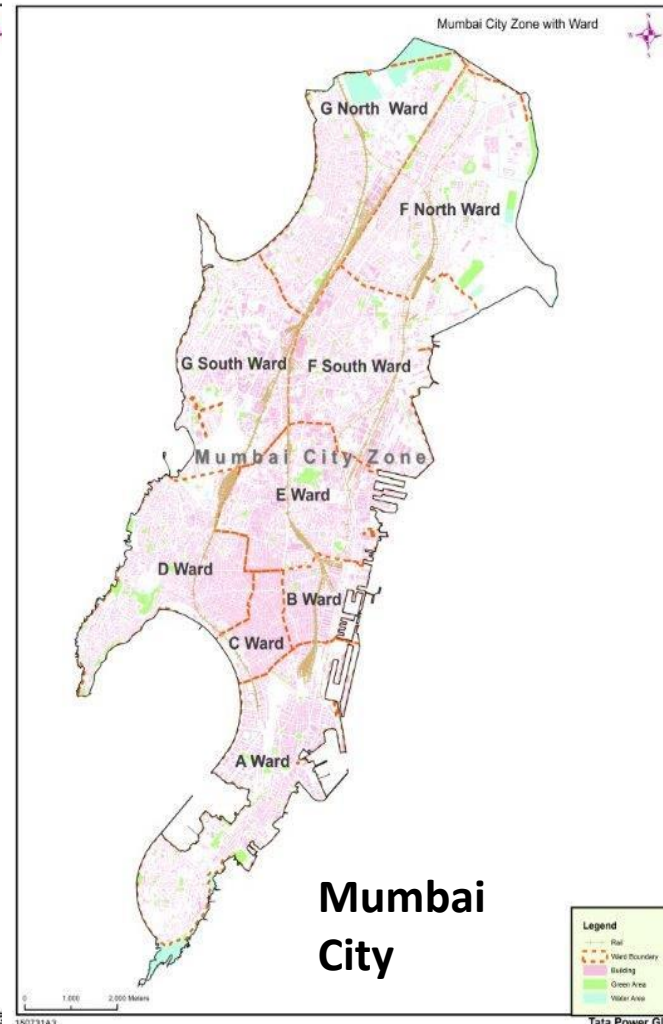
Licence Area

23 Ward & MBMC



Mumbai Suburbs

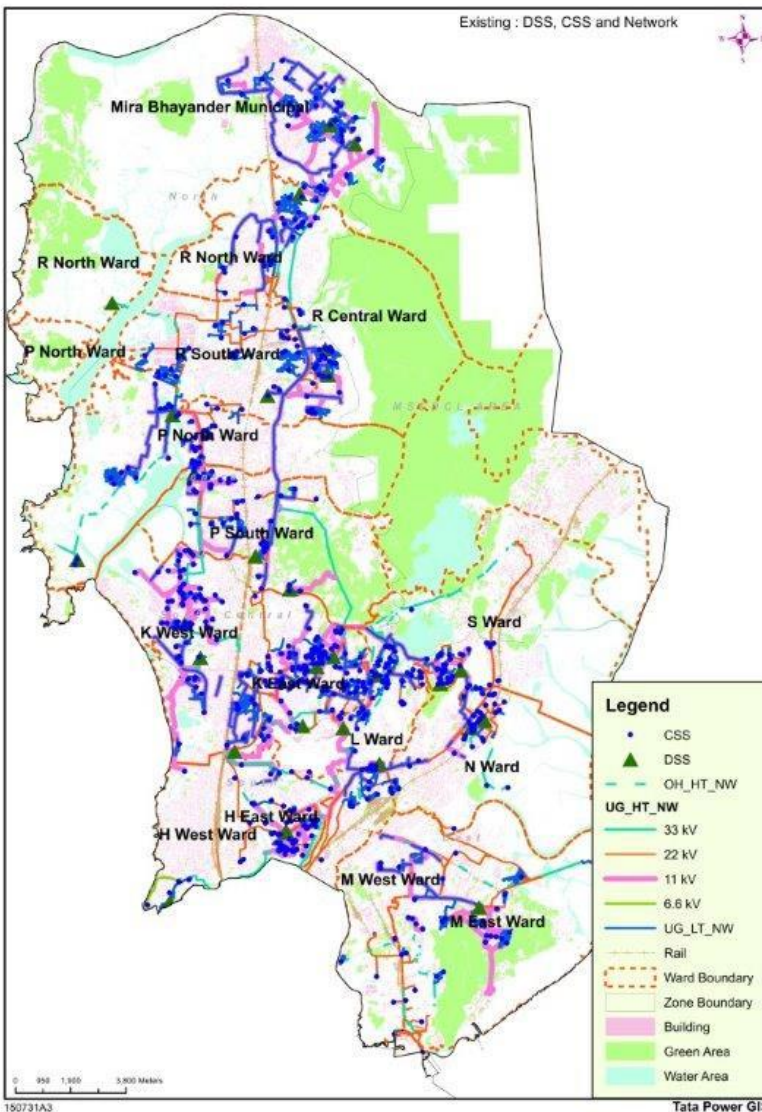
15 Ward & MBMC



Mumbai City

9 Ward

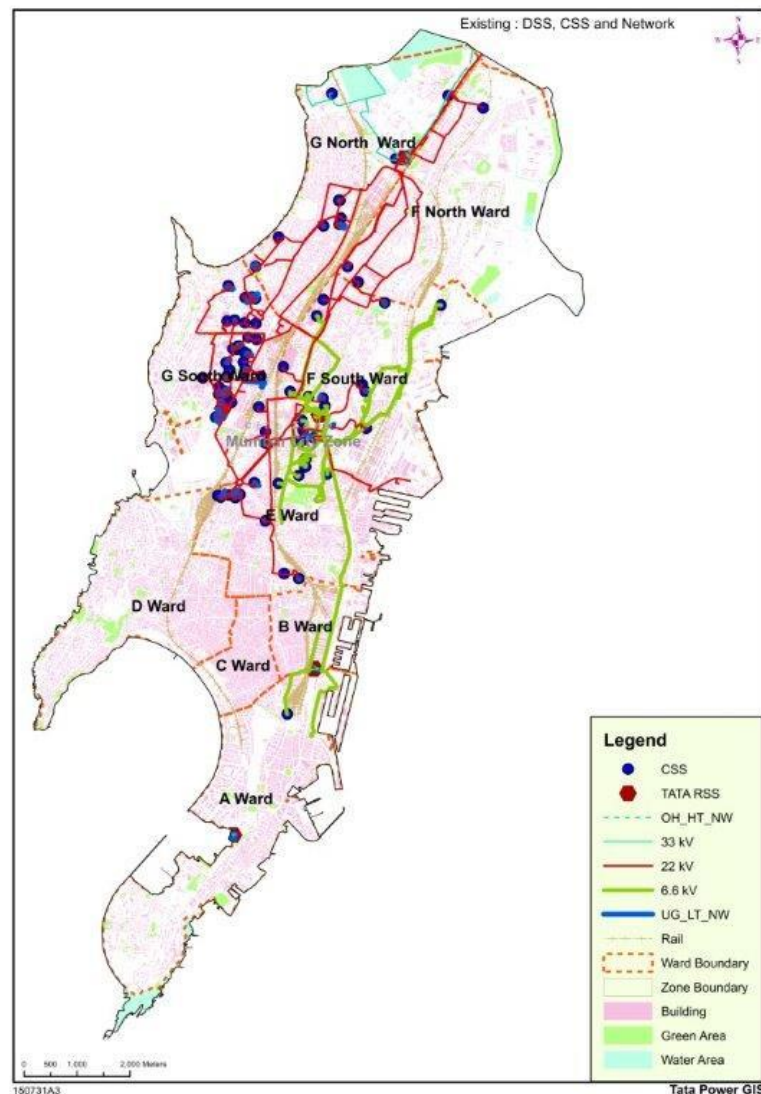
Existing Network – Mumbai Suburbs



Ward	Existing Network as on 30 th June, 2015					CSS Loading (%)
	DSS Capacity (MVA)	33 kV Cable (km)	11 kV Cable (km)	CSS Capacity (MVA)	LT Cable (km)	
H East Ward	60	84	62	40	24	13%
H West Ward	35	5	10	3	3	17%
K East Ward	200	163	136	127	171	29%
K West Ward	80	21	102	66	62	15%
L Ward	80	115	51	75	108	26%
M East Ward	30	63	41	17	56	9%
M West Ward	0	23	17	4	24	50%
Mira Bhayander Municipal	80	23	113	42	151	18%
N Ward	20	69	43	48	31	15%
P North Ward	140	54	51	69	107	27%
P South Ward	80	101	84	62	67	20%
R Central Ward	10	58	63	8	129	25%
R North Ward	0	9	21	35	38	6%
R South Ward	80	91	26	48	103	27%
S Ward	80	69	35	33	37	27%
Mumbai Suburbs	975	949	856	678	1113	23%

The new network developed as per case 151 of 2011 is loaded only to the extent of 8 %.

Existing Network – Mumbai City



Ward	Existing Network as on 30 th June, 2015					CSS Loading (%)
	DSS Capacity (MVA)	33 kV Cable (km)	11 kV Cable (km)	CSS Capacity (MVA)	LT Cable (km)	
A Ward	0	2	2	0	1	-
B Ward	0	8	5	1	1	0%
C Ward	0	0	0	0	0	-
D Ward	0	0	0	0	0	-
E Ward	0	13	22	10	2	12%
F North Ward	0	32	0	2	0	36%
F South Ward	40	47	61	12	4	30%
G North Ward	0	84	0	8	3	16%
G South Ward	0	67	0	42	15	33%
Mumbai City	40	253	89	75	26	28%

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Network Rollout Approach

Network Rollout Approach – Principle ① & ②

- Each Ward in the License Area of Tata Power has been classified into following 3 types based on growth pattern
- The additional network requirement is based on
 1. Expected growth in each ward based on load growth pattern
 2. Existing network of Tata Power in these wards

Growth Type	Area Description	Network
Yellow Field	Saturated areas with limited potential of growth in next 5-7 years	Limited network development to the extent of last mile connectivity
Brown Field	Considerable potential of growth in terms of redevelopment of existing properties	<ul style="list-style-type: none"> - This area is expected to see significant network development - Tata Power will undertake network development to meet part of this demand based on consumer choice
Green Field	Significant potential with the event based triggers	Network development to serve load booked and backbone network to cater to load growth in the next 5-7 years

Network Rollout Approach – Principle 3

III. Network Rollout is considering network already developed

- Tata Power has made considerable investment in pursuance of the Order in Case 151 of 2011 and earlier orders towards developing a new network across the License area.
- Tata Power has considered this investment and identified areas where there exists Tata Power Backbone network in terms of DSS ,11 kV Network and CSS.
- In order to load these consumer substations ,Tata Power considered in the Rollout plan loading of these consumer substations and thus putting to use the assets already commissioned.

Network Rollout Approach – Principle 4

IV. For increasing the reliability of supply to the consumer

- Consumers of Mumbai are being supplied uninterrupted power supply
- Tata Power in its assessment of the increasing trend of power supply failure complaints from its changeover consumers has identified some of the wards where reliability may be suspected
- In order to assess, reliability of an area/ward following would be required:
 - ✓ Loading of the network and commensurate n-1 arrangement
 - ✓ Aging of the network
 - ✓ Spread of network depicted on GIS
- In the interest of consumer, the Hon'ble Commission may direct all the utilities to make available their network the above data on a periodic basis, in order to ensure continued reliability

Network Rollout Approach

- To ensure development of Efficient and Economical network ,Tata Power has taken the following steps:
 - ✓ Network Development in Green Field Areas
 - ✓ Network Development in Redevelopment areas wherein existing assets would not suffice
 - ✓ Utilization of network wherein substantial investment has been made
 - ✓ Network Development in areas for improving the reliability and decongestion of network

This Network Rollout Plan is based on certain assumptions, subject to the obligations of Tata Power as a distribution licensee under the statutory framework.

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Load Projections for Network Planning

Load Projections - Basis

Yellow Field Areas

- Estimated based on builtup area as per MCGM Development Plan, Load Density, Land Usage, CAGR of Demand for RCI
- This is the Natural Growth of consumers in each ward

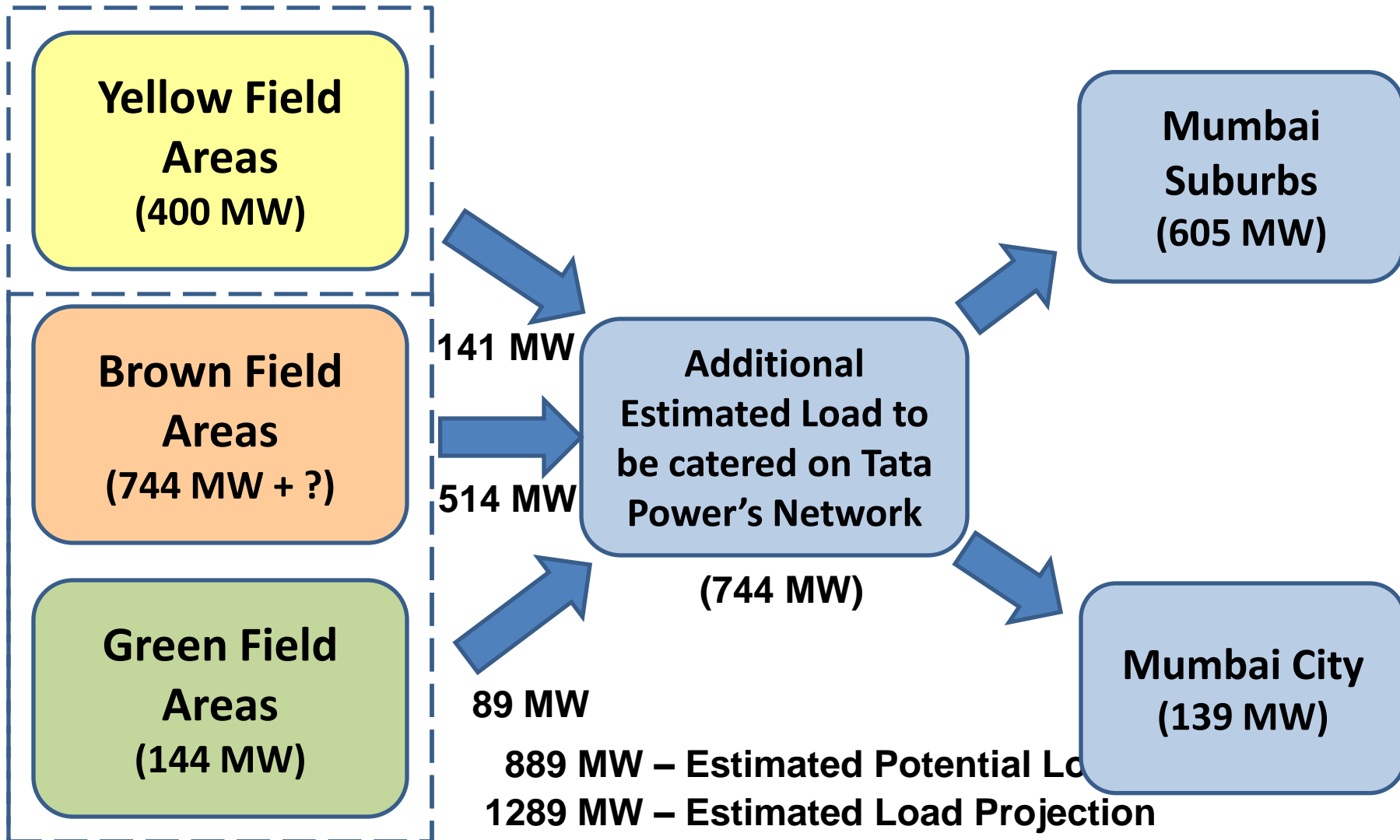
Brown Field Areas

- This is based on the load surveyed, discussions with developers, etc.
- This is based on Tata Power's assessment, however, there would be untapped load that would be with other utilities

Green Field Areas

- This is based on approximate area that would be opened up for development as a result of event based triggers

Load Projections -Mumbai



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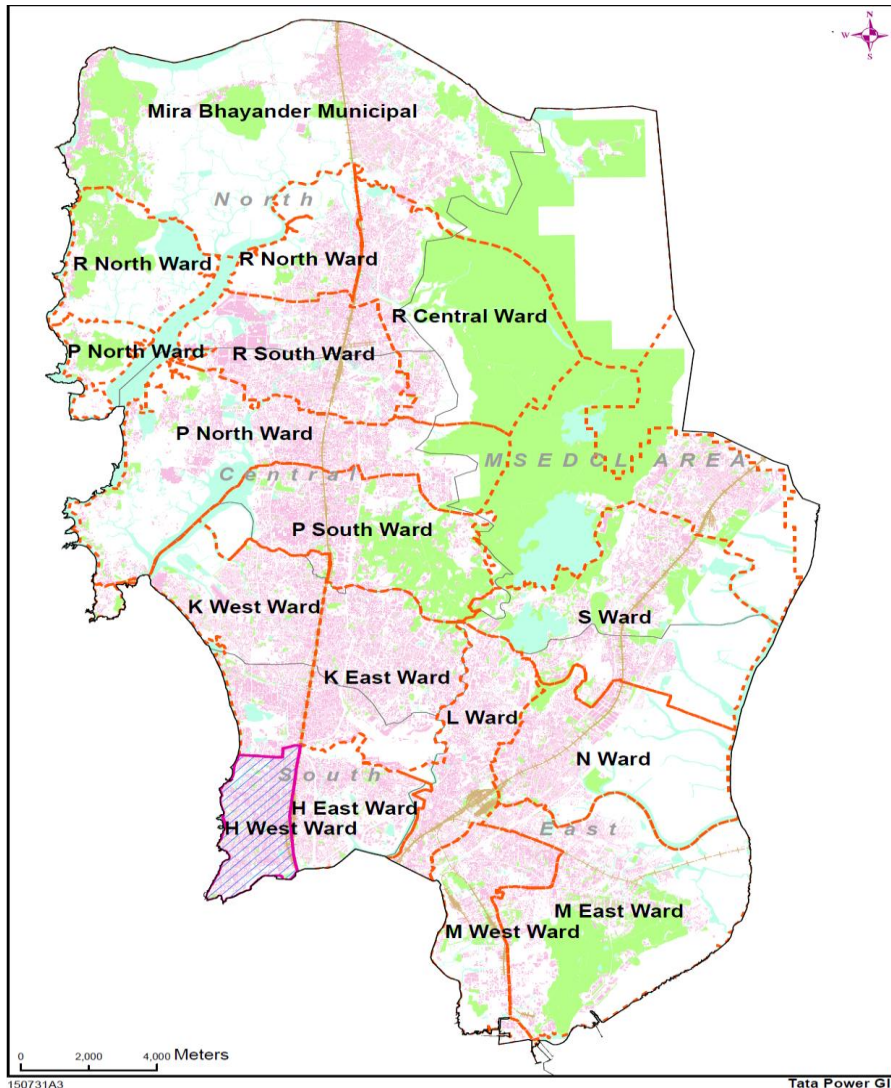
Ward wise Network Rollout Plan – Mumbai Suburbs

Network Planning – Mumbai Suburbs

- Network Planning for Mumbai Suburbs is considering following broader area/ward classifications based on analysis of Development Plan:

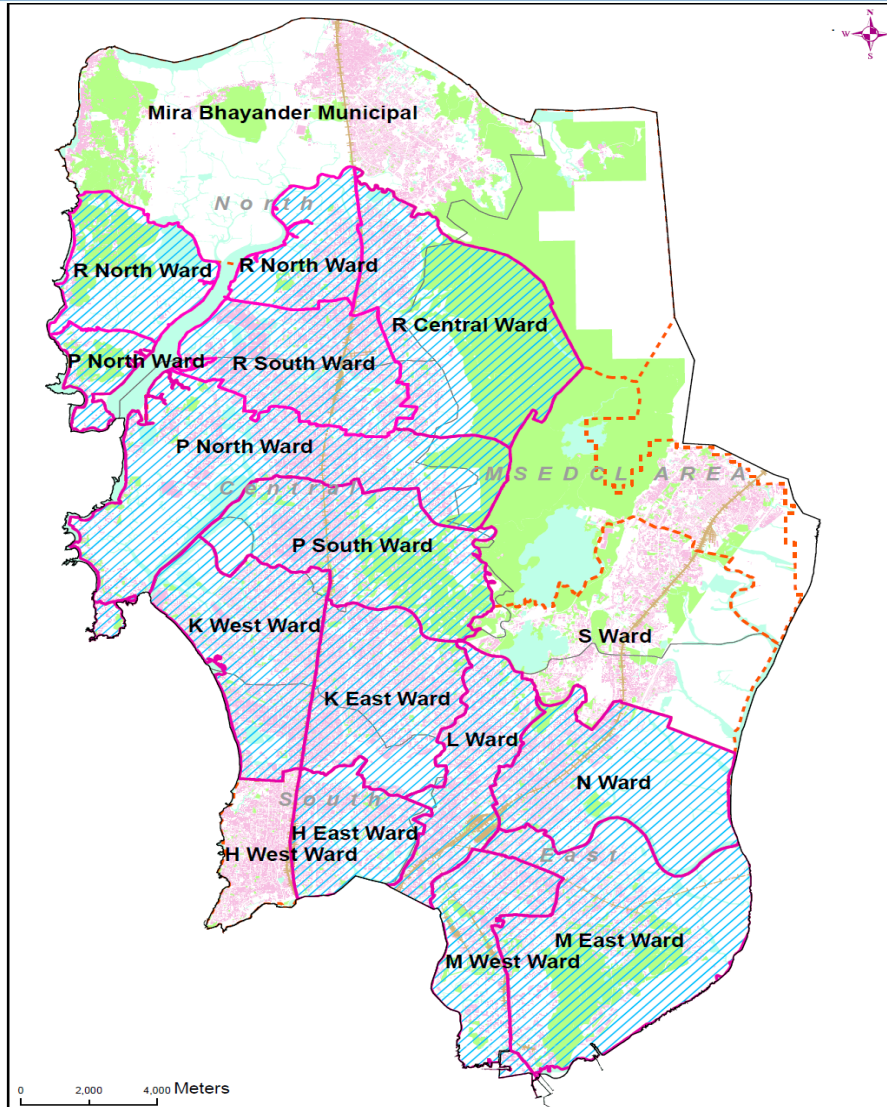
Growth Type	Development Potential	Wards
Yellow Field	<ul style="list-style-type: none"> - No further development; or - Miniscule development 	Areas of H West Ward – Pali Hills, Khar, etc.
Brown Field	<ul style="list-style-type: none"> - Slum redevelopment – SRAs - Low rise converting to high rise - Industrial Plots being redeveloped into Commercial and Residential Complexes 	Most of the wards in Mumbai Suburbs – Chembur, Ghatkopar, Vile Parle
Green Field	<ul style="list-style-type: none"> - New growth is taking place or expected to take place during the Network Rollout Plan Period 	Areas of H East Ward, MBMC and S Ward

Yellow Field Areas – Mumbai Suburbs



- These are areas wherein there would be miniscule or no new further development with little or no land being available for development
- Some such areas are Khar, Pali Hill, Juhu etc in H West
- Such areas in blue hatched demarcation

Brown Field Areas – Mumbai Suburbs



- Primarily three types of redevelopments:
 - Slum redevelopment – SRAs
 - Low rise converting to high rise
 - Industrial Plots being redeveloped into Commercial and Residential Complexes
- These are typically wards where FSIs would increase manifold and growth is taking place vertically
- Reliability of network is suspect in M East, P North, K East, K West, N Ward, H East, P South and R North

Brown Field Areas – FSI – Mumbai Suburbs

DCR - 1991			Draft DCR – 2014		
Location	Zone	Permissible FSI	Zone	% area	Permissible FSI
Suburbs	Residential	0.5 M ward 0.75 N ward 1.0 Other wards	Majority area	58.32	3.5
	Commercial	1.0	No public transit	5	2
	Industrial	0.5 storage bldg. 1.0 Others			

(Source: Draft DP-2034)

FSI in Mumbai Suburbs is proposed to be ~3.5. This shall lead to significant increase in load density and thereby requiring capacity addition/augmentation by either of the Utilities

Brown Field Areas – Registered SRAs *(as on April, 2014)*



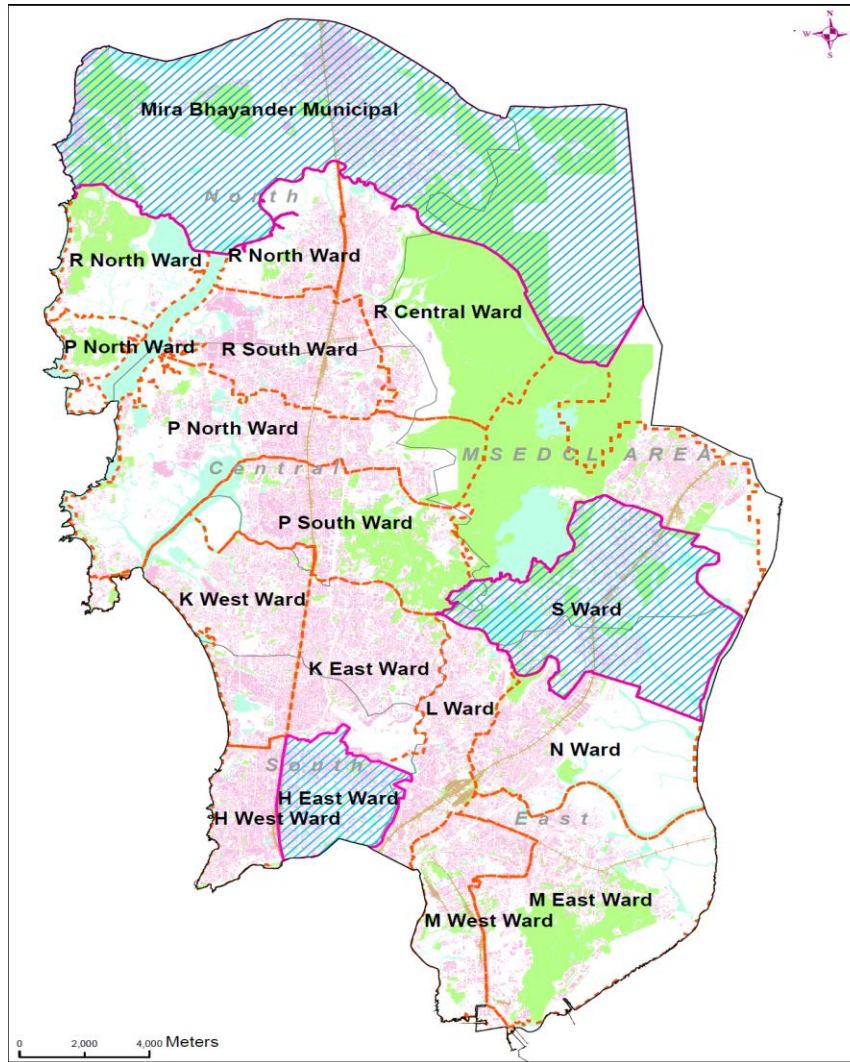
#	Description	Nos.	Area in Ha	%
Proposals				
1	Proposals received	2622	-	100%
2	Proposals approved	1344	-	51.20%
Tenements				
1	No. of tenements in approved proposals	4,67,673	1169	100%
2	No. of tenements issued CC	2,43,471	609	52%
3	No. of tenements issued OC	1,57,402	393	33.70%

- Total slum population in 2011 – 52,07,700
- Total Slum Households in 2011 – 11,36,000
- Built up area required for rehabilitation – 2840 Ha

(Source: white paper by NGO - Praja)

- **Opportunity to serve to about 300,000 low end consumers in the entire Licence Area**
- **Tata Power has already catering to 14 SRA projects (out of 55 projects under development) and more are in pipeline eg: Aziz Baug-Chembur, Karam Bhoomi-Kandivli**

Green Field Areas – Mumbai Suburbs



- Entire country is poised for economic growth
- Mumbai being the substantial contributor to country's GDP, would see second burst of growth
- As Mumbai is surrounded by water bodies on 3 sides, this growth would unlocking of the land parcels eg: MBPT, salt pan areas, etc.
- This areas will develop based on time based triggers
- Part of H East, MBMC and S would fall under this category

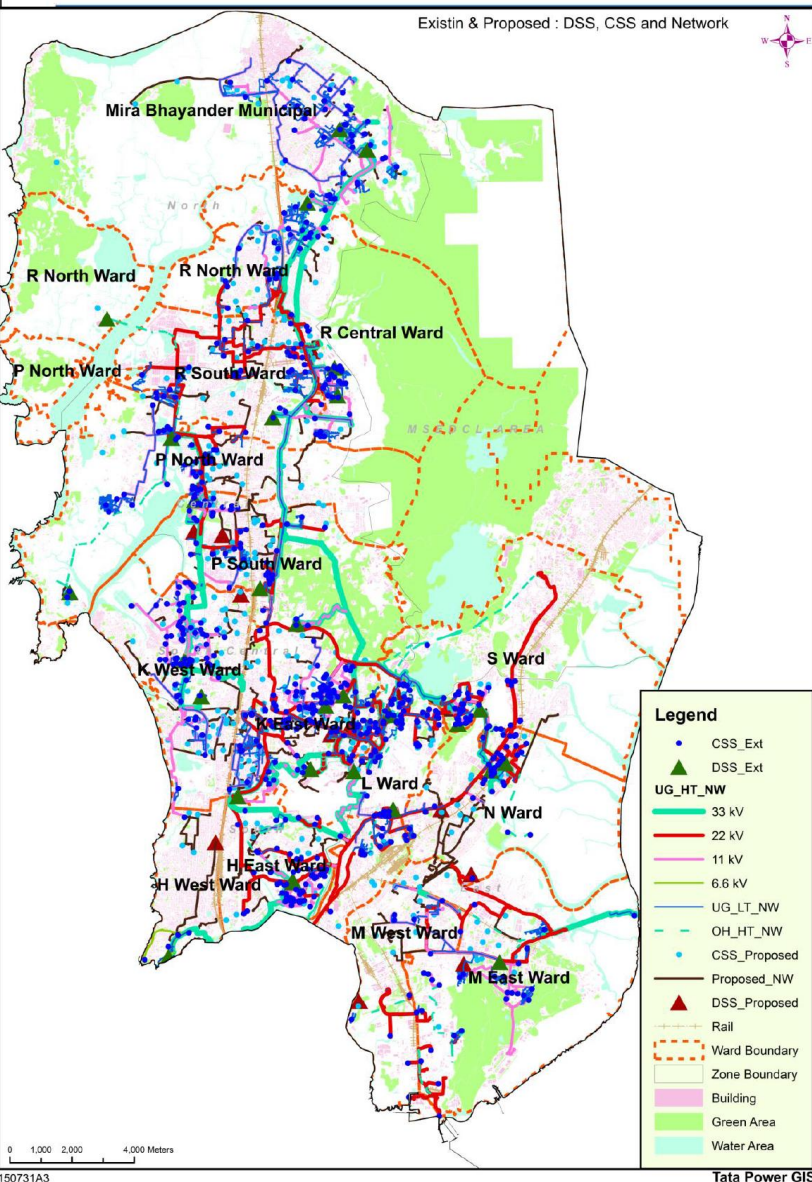
Ward wise Load Projection – Mumbai Suburbs

Ward	Yellow Field	Brown Field	Green Field	Estimated natural load growth of existing consumers (MW)	Estimated load growth due to redevelopment of existing properties (MW)	Estimated addition in load on account of opening of new areas for development (MW)	Load Projection (MW)
				a	b	c	d=a+b+c
H East Ward*		√	√	28	20	-	48
H West Ward	√			11	6	-	17
K East Ward		√		29	135	-	164
K West Ward		√		28	87	-	114
L Ward		√		17	35	-	52
M East Ward		√		18	22	-	41
M West Ward		√		10	9	-	19
Mira Bhayander Municipal			√	28	57	31	116
N Ward		√		21	84	-	104
P North Ward		√		23	49	-	72
P South Ward		√		17	48	-	65
R Central Ward		√		17	33	-	50
R North Ward		√		11	20	-	31
R South Ward		√		21	18	-	39
S Ward*		√	√	20	6	49	75
T Ward	Outside Licence Area						
Mumbai Suburbs				299	630	80	1,009

Ward wise Rollout Approach – Mumbai Suburbs

Wards	Potential Load Assessment of Tata Power (Yellow field)		Potential Load Assessment of Tata Power (Brown field)		Potential Load Assessment of Tata Power (Green field)		Potential Load Assessment of Tata Power
	%	MW	%	MW	%	MW	MW
H East Ward	30%	8	80%	16	70%	0	24
H West Ward	10%	1	70%	4	70%	0	5
K East Ward	50%	15	60%	81	70%	0	96
K West Ward	50%	14	80%	69	70%	0	83
L Ward	30%	5	70%	25	70%	0	30
M East Ward	10%	2	70%	15	70%	0	17
M West Ward	10%	1	70%	6	70%	0	7
Mira Bhayander Municipal	50%	14	70%	40	70%	22	76
N Ward	30%	6	80%	67	70%	0	73
P North Ward	30%	7	70%	34	70%	0	41
P South Ward	50%	8	70%	34	70%	0	42
R Central Ward	30%	5	70%	23	70%	0	28
R North Ward	30%	3	70%	14	70%	0	17
R South Ward	50%	11	70%	13	70%	0	23
S Ward	10%	2	70%	5	70%	34	41
Mumbai Suburbs		102		446		56	605

Existing & Proposed Network – Mumbai Suburbs



Ward	Network Planned				
	DSS Capacity (MVA)	33 kV Cable (km)	11 kV Cable (km)	CSS Capacity (MVA)	LT Cable (km)
H East Ward	20	10	16	13	9
H West Ward	0	0	0	7	5
K East Ward	40	20	32	89	61
K West Ward	100	50	80	89	61
L Ward	0	0	0	9	6
M East Ward	20	10	16	16	11
M West Ward	0	0	0	11	8
MBMC	40	10	32	98	67
N Ward	90	30	72	88	60
P North Ward	0	0	0	41	28
P South Ward	10	0	8	27	19
R Central Ward	40	10	32	13	9
R North Ward	0	0	0	21	14
R South Ward	0	0	0	19	13
S Ward	40	10	32	40	27
Mumbai Suburbs	400	150	320	581	399

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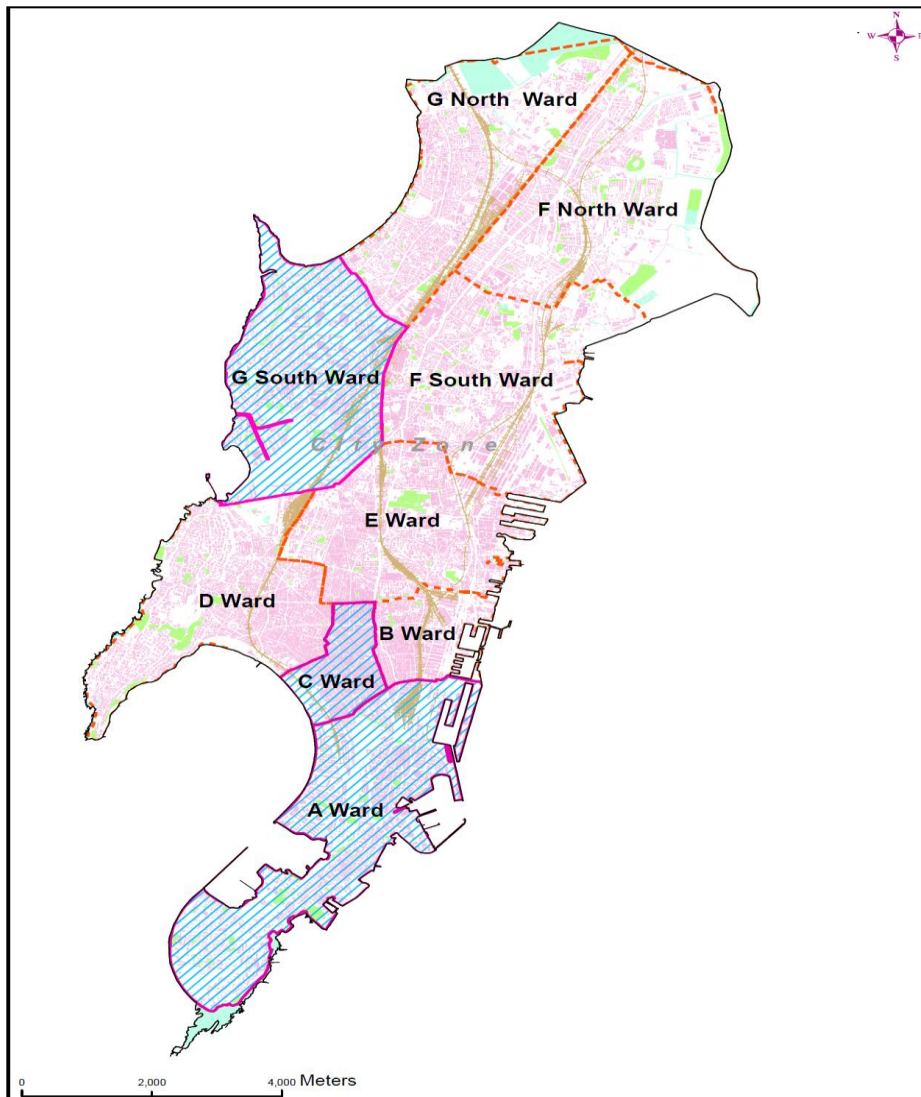
Ward wise Network Rollout Plan – Mumbai City

Network Planning – Mumbai City

- Network Planning for Mumbai Suburbs is considering following broader area/ward classifications based on analysis of Development Plan:

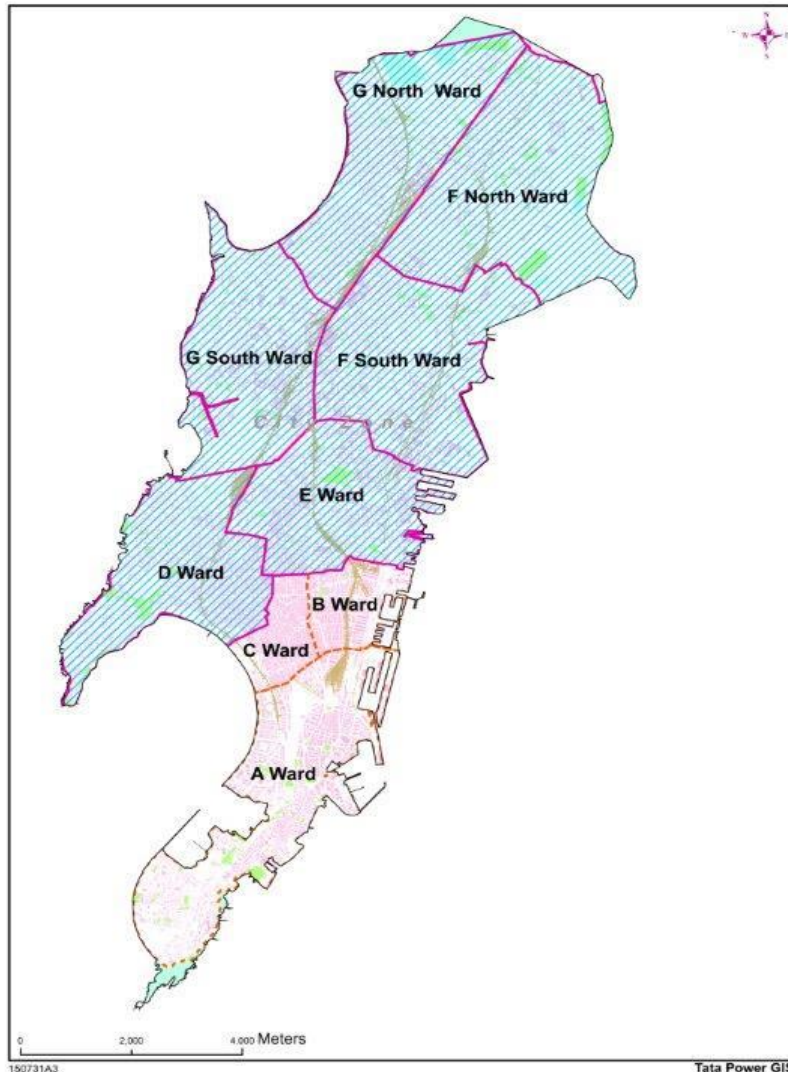
Growth Type	Development Potential	Wards
Yellow Field	<ul style="list-style-type: none"> - No further development; or - Miniscule development 	Areas of A Ward, C Ward and G (South) Ward
Brown Field	<ul style="list-style-type: none"> - Slum redevelopment – SRAs - MHADA – Cess Building, BDD Chawl - Mill Areas being redeveloped into Commercial and Residential Complexes 	Most of the wards in Mumbai Suburbs – Dharavi Redevelopment, Machimar Nagar, Worli, Lalbaug, Parel
Green Field	<ul style="list-style-type: none"> - New growth is taking place or expected to take place during the Network Rollout Plan Period 	Eastern Coast – B Ward, E Ward, F (South) Ward & F (North) Ward

Yellow Field Areas – Mumbai City



- These are areas wherein there would be miniscule or no new development with little or no land being available for development
- Some such areas are in A Ward , C Ward, G South

Brown Field Areas – Mumbai City



- Primarily three types of redevelopments:
 - Slum redevelopment – SRAs
 - MHADA – Cess Buildings and BDD chawls
 - Mill Areas being redeveloped into Commercial and Residential Complexes

- These are typically wards where FSIs would increase manifold and growth is taking place vertically

- Dharavi redevelopment is expected to be one such big redevelopment apart from what is already happening at Dharavi

Brown Field Areas – FSI – Mumbai City

DCR - 1991			Draft DCR – 2014		
Location	Zone	Permissible FSI	Zone	% area	Permissible FSI
City	Residential	1.33	Bulk FSI	0.5	8
	Commercial	1.33	Major stns & Central Business Districts	4.55	6.5
	Industrial	0.5 storage bldg. 1.0 Others	Rail & metro stns	31.87	5

(Source: Draft DP-2034)

FSI in Mumbai Suburbs is proposed to be ~6. This shall lead to significant increase in load density and thereby requiring capacity addition/augmentation by either of the Utilities

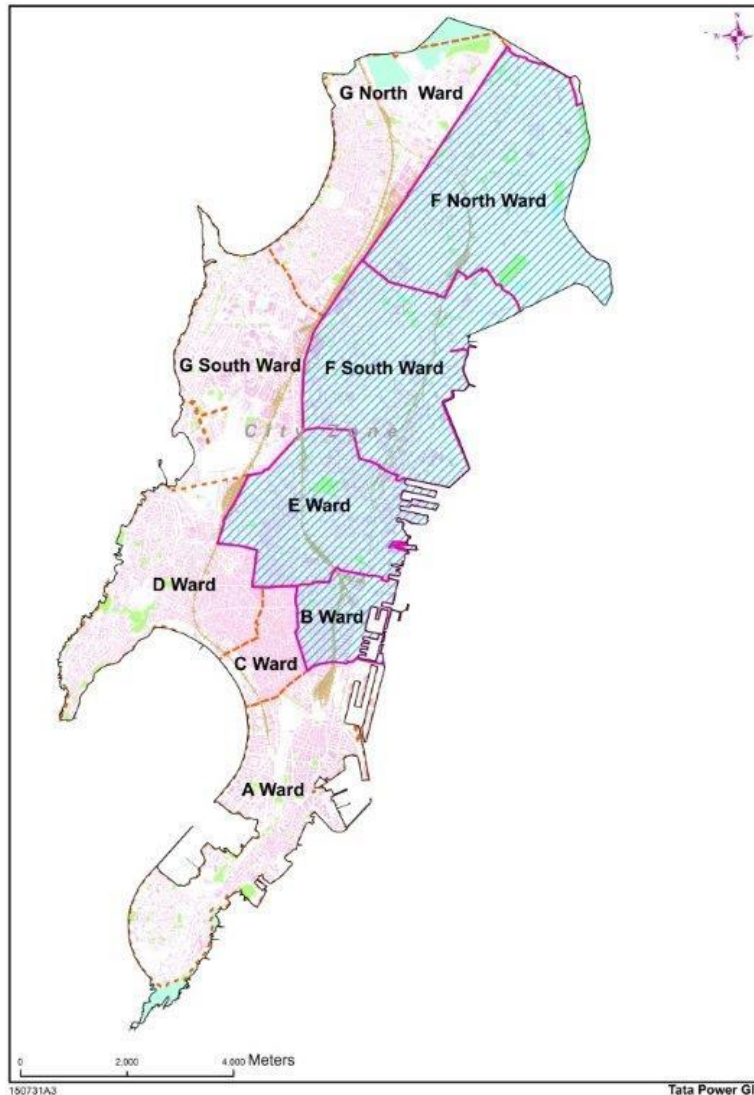
Brown Field Areas – Mumbai City

- Tata Power has a significant presence in some areas of Mumbai City area in terms of its HT Network and Consumer Substations
- Tata Power had to remove its last mile connectivity in terms of substations and LT equipment to facilitate re -development of erstwhile Mill consumers
- Wires and Supply were extended by BEST to these areas due to the Supreme Court's Status Quo Order, in spite of Tata Power's wires and supply being economical
- The available capacity of Tata Power ready to be utilized is to the tune of 400 MVA

Existing 22 kV Feeders -191 kms				
Station	Nos.	Capacity (MVA)	Loading (MVA)	Available Capacity (MVA)
Parel	11	110	6.5	103.5
Dharavi	15	230	37	193
Mahalaxmi	9	90	23	67
Carnac	2	20	3	17
	37	450	69.5	380.5

Existing CSS -22/0.4 kV (Nos.)	Installed (MVA)	Loading (MVA)	Available Capacity (MVA)
55	63.71	12	51.71

Green Field Areas – Mumbai City



- Areas on the Eastern corridor are expected to be developed considering various initiatives announced by the Government
- This areas will develop based on time based triggers
- Part of B, E, F (South) and F (North) would fall under this category

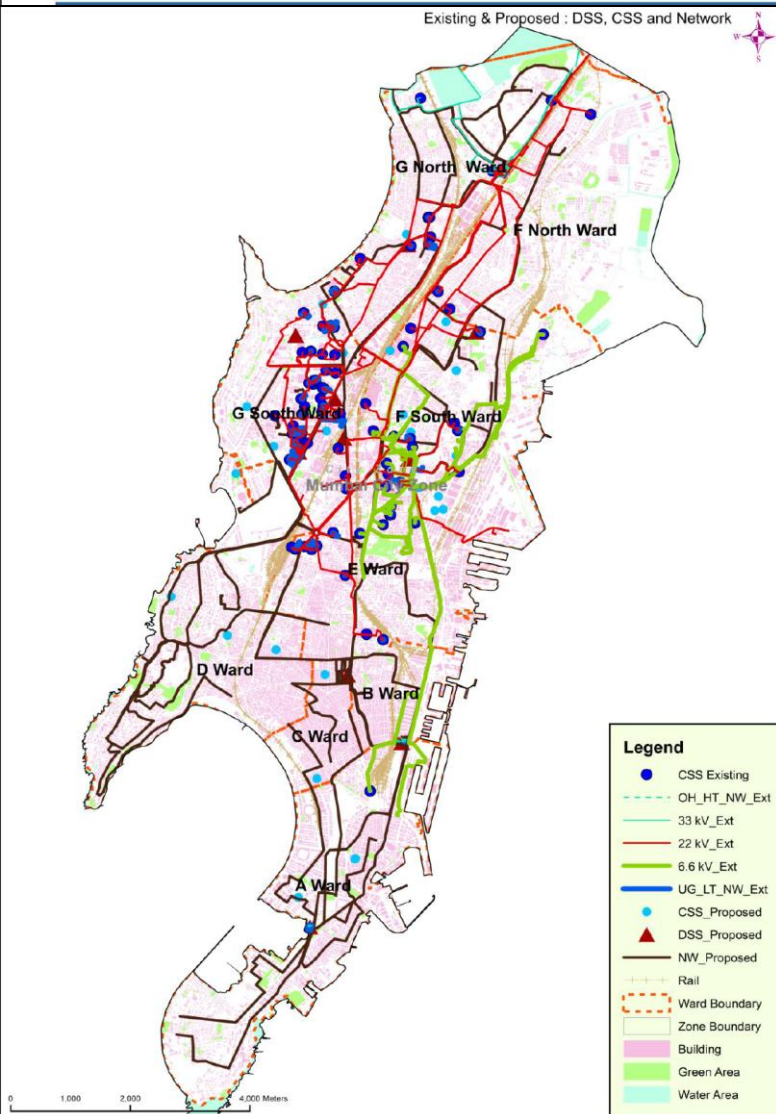
Ward wise Load Projection – Mumbai City

Ward	Yellow Field	Brown Field	Green Field	Estimated natural load growth of existing consumers (MW)	Estimated load growth due to redevelopment of existing properties (MW)	Estimated addition in load on account of opening of new areas for development (MW)	Load Projection (MW)
				a	b	c	d=a+b+c
A Ward	√			19	-	-	19
B Ward*	√		√	4	-	4	8
C Ward	√			3	-	-	3
D Ward		√		10	15	-	25
E Ward*		√	√	11	60	17	89
F North Ward*		√	√	10	6	20	37
F South Ward*		√	√	15	21	23	58
G North Ward		√		11	8	-	19
G South Ward*	√	√		16	5	-	21
Mumbai City				101	114	64	280

Ward wise Rollout Approach – Mumbai City

Wards	Potential Load Assessment of Tata Power (Yellow field)		Potential Load Assessment of Tata Power (Brown field)		Potential Load Assessment of Tata Power (Green field)		Potential Load Assessment of Tata Power
	%	MW	%	MW	%	MW	MW
A Ward	50%	10	70%	0	50%	0	10
B Ward	0%	0	70%	0	50%	2	2
C Ward	0%	0	70%	0	50%	0	0
D Ward	0%	0	70%	10	50%	0	10
E Ward	50%	6	50%	30	50%	9	44
F North Ward	50%	5	70%	4	50%	10	20
F South Ward	50%	7	70%	14	50%	11	33
G North Ward	50%	6	70%	5	50%	0	11
G South Ward	30%	5	70%	3	50%	0	8
Mumbai City		38		68		32	139

Existing & Proposed Network – Mumbai City



Ward	Network Planned				
	DSS Capacity (MVA)	33 kV Cable (km)	11 kV Cable (km)	CSS Capacity (MVA)	LT Cable (km)
A Ward	20	10	16	13	9
B Ward	0	0	0	2	1
C Ward	0	0	0	1	1
D Ward	20	10	16	14	10
E Ward	80	40	64	53	36
F North Ward	0	0	0	26	18
F South Ward	0	0	0	39	27
G North Ward	0	0	0	11	8
G South Ward	20	10	16	0	0
Mumbai City	140	70	112	159	109

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Summary

Overview – Network and Capex Estimated



Particulars		FY 2014-15	FY 2015-16	FY 2016-17	FY 2017-18	FY 2018-19	FY 2019-20	FY 2020-21	Total
Distribution Substation (DSS) -40 MVA	Nos.	0	1	0	2	1	0	1	5
Distribution Substation (DSS) -20 MVA	Nos.	0	2	4	1	3	4	3	17
Consumer Substation (CSS) - 0.5 MVA	Nos.	2	89	77	93	22	22	25	330
Consumer Substation (CSS) - 1 MVA	Nos.	10	67	60	60	27	52	7	283
Additional CSS	Nos.	0	58	61	67	48	54	3	291
33 kV Cable Network	kms	0	30	40	20	50	40	40	220
11 kV Cable Network	kms	0	64	64	32	96	64	112	432
LT Cable Network	kms	102	124	87	60	41	61	34	509

Area		FY 2015-16	Q1 FY 2015-16	FY 2016-17	FY 2017-18	FY 2018-19	FY 2019-20	FY 2020-21	Total
South Mumbai	Rs. Cr.	124	6.44	81	6	130	82	97	537
Mumbai Suburbs	Rs. Cr.	129	62.90	157	201	95	119	115	843
Total Licence Area	Rs. Cr.	253	69.34	238	207	225	201	212	1380

- Considering this Network Rollout Plan and existing network , Tata Power could create a transformation capacity of about 1450 MVA to cater to the demand of last mile consumers.
- LT cable network extension is being phased based on the consumer demand as against a full-fledged LT network rollout proposed earlier.
- The HT : LT ratio has improved.

Physical Progress of Network Rollout

Phasing of Network Rollout Plan - Mumbai Suburbs

Particulars		FY 2015-16	Actual Q 1 FY 2015-16
DSS Capacity	MVA	20	0
33 kV Cable Network (km)	kms	10	8
11 kV Cable Network (km)	kms	16	17
CSS Capacity	MVA	144	4
LT Cable Network (km)	kms	68	26

Phasing of Network Rollout Plan - Mumbai City

Particulars		FY 2015-16	Actual Q 1 FY 2015-16
DSS Capacity	MVA	60	0
33 kV Cable Network (km)	kms	20	1
11 kV Cable Network (km)	kms	48	0
CSS Capacity	MVA	26	1
LT Cable Network (km)	kms	56	8

Total Licence Area

Particulars		FY 2015-16	Actual Q 1 FY 2015-16
DSS Capacity	MVA	80	0
33 kV Cable Network (km)	kms	30	8
11 kV Cable Network (km)	kms	64	17
CSS Capacity	MVA	170	5
LT Cable Network (km)	kms	124	34

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Compliances

Compliances to Daily Order(1/2)

S. No.	Direction	Status	Details
1	Detailed geographical plan indicating existing and proposed network	√	GIS Maps submitted separately for Mumbai City and Mumbai Suburbs as part of Additional Submissions
2	Explain how its proposed network rollout plan satisfies the various principles provided in paragraph 58 to 61 of ATE Judgment and previous Orders of this Commission	√	Principles considered under Network Rollout Approach
3	Provide distinction, wherever necessary, for the area served by R Infra and area served by BEST	√	Network Rollout details provided separately for Mumbai Suburbs and South Mumbai
4	Reconcile the figures provided in year wise network rollout and year wise capex phasing.	√	Reconciled

Compliances to Daily Order.....(2/2)

S. No.	Direction	Status	Details
5	Clarify load projection of 1385 MW, potential load of 1065 MW and load booked of 744 MW considered in network rollout plan. Also separate out the details for Rlnfra and BEST's area of supply in this respect	√	Reassessed based on updated figures and explained
6	Update the Petition to reflect the new statistics	√	Data updated through additional submission
7	Make necessary modifications in the Petition to address the concerns raised by the Commission in its Order dated 14 August, 2014 in Case No. 90 of 2014 as well as issues addressed in ATE Judgment.	√	Comparison of the modifications carried out has been presented
8	Submit its response on the preliminary submissions filed by Rlnfra	√	Submitted as part of additional submissions and this presentation

- To approve the revised Network Rollout Plan
- Condone any inadvertent omissions /errors /shortcomings and permit Tata Power to add /change /modify/alter this filing and make further submission as may be required at a future date.
- Pass any such directive as that the Hon'ble Commission may deem appropriate in the facts and circumstances of the case.

**“Journey Continues..
We value your inputs, suggestions and
critique.”**

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