



Connecting India Digitally

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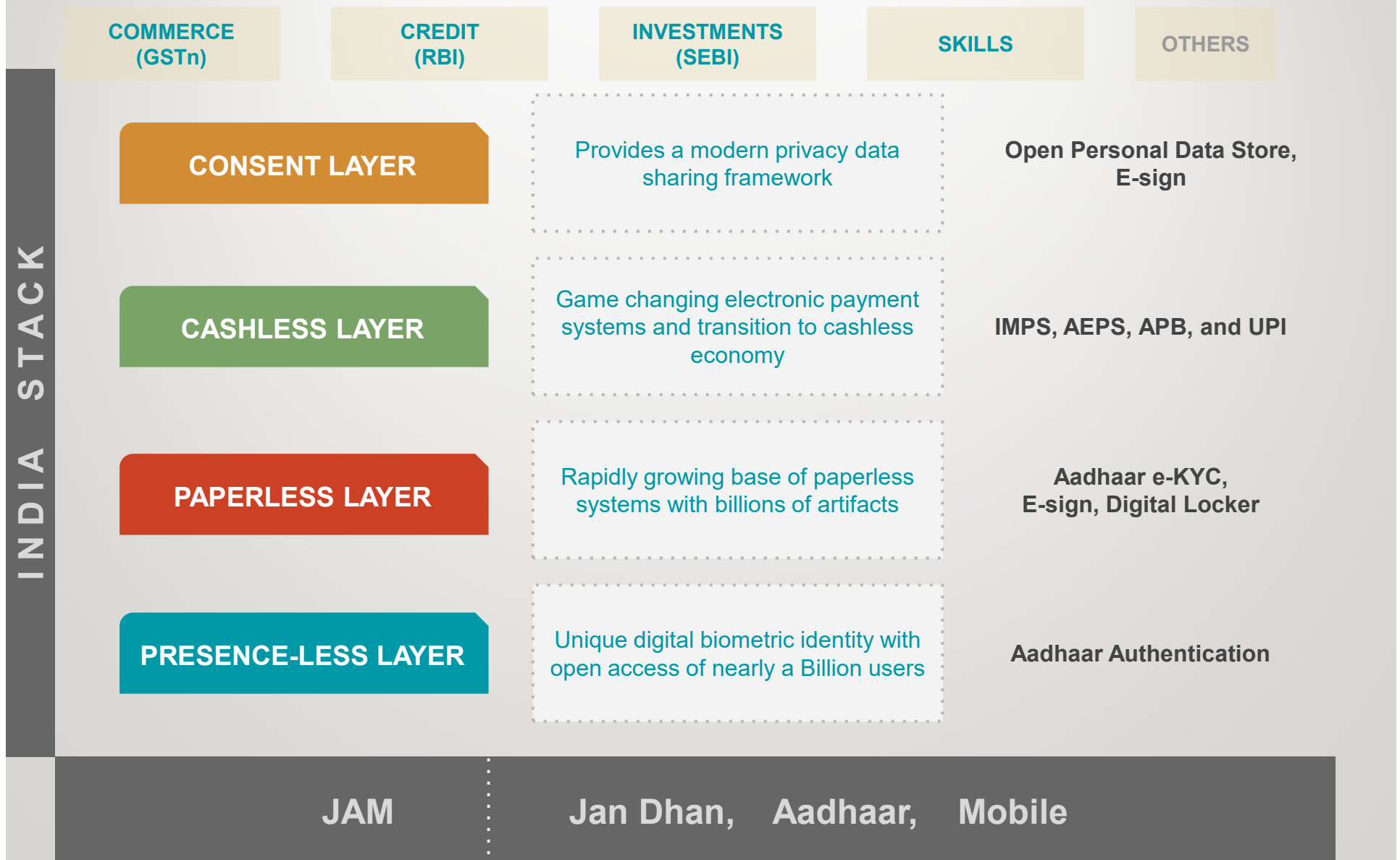
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**A digitally empowered
society and knowledge
economy**

India has created a unique Technology Stack powered by Aadhaar



Ubiquitous

Affordable

Broadband
that is ...

Fast

Reliable

Agenda

Where are we
now?

Why are we
lagging?

Broad Areas of
intervention

Conclusion



Where are we
now?

Broadband penetration – Where are we?

Country	ICT Develop Index 2015 (Rank) *	Country	Fixed BB per 100 capita (Rank) #	Country	Mobile BB per 100 capita (Rank) #
Brazil	6.03 (61)	Mexico	11.6 (74)	Brazil	78.1 (27)
Malaysia	5.92 (63)	Brazil	11.5 (76)	Malaysia	58.3 (52)
Maldives	5.08 (81)	Malaysia	10.1 (80)	Maldives	48.9 (65)
S. Africa	4.90 (88)	Maldives	5.6 (97)	S. Africa	46.7 (69)
Mexico	4.86 (95)	Algeria	4.0 (105)	Mexico	37.5 (81)
Algeria	3.71 (113)	Egypt	3.7 (107)	Bhutan	28.2 (101)
Sri Lanka	3.64 (115)	Bhutan	3.3 (109)	Algeria	20.8 (112)
Bhutan	3.35 (119)	S. Africa	3.2 (110)	Sri Lanka	13.0 (126)
Kenya	3.02 (124)	Sri Lanka	2.6 (114)	Bangladesh	6.4 (149)
India	2.69 (131)	India	1.2 (131)	India	5.5 (155)
Pakistan	2.24 (143)	Pakistan	1.1 (135)	Pakistan	5.1 (156)

Source: * ITU Measuring the Information Society Report 2015

Broadband Commission Report : The State of Broadband 2015

Broadband penetration – Where are we?

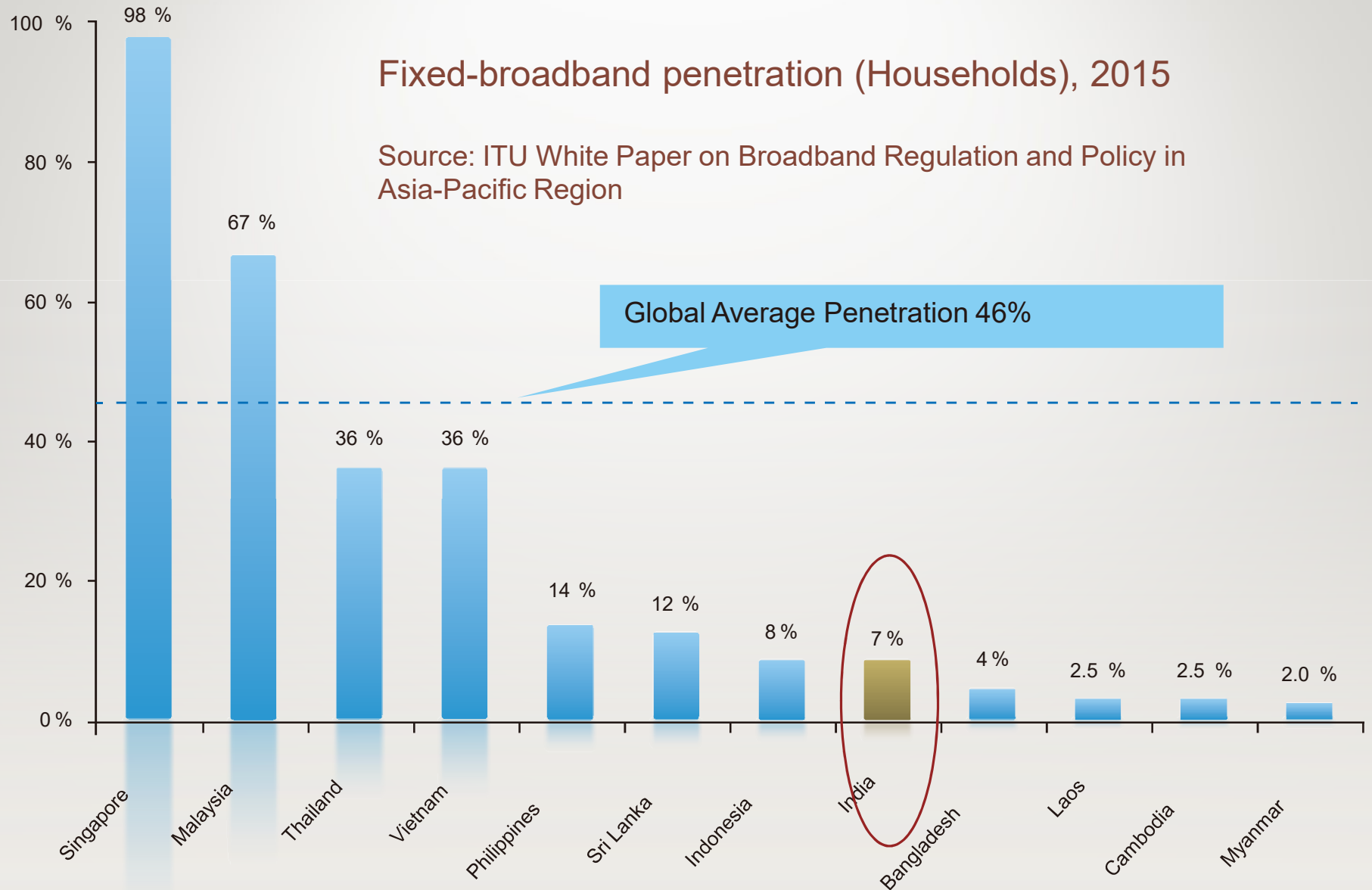
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<p>India Ranks 131 out of 167 countries in the world, having achieved a score of 2.69 / 10 on the IDI index created by ITU</p>					
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Fixed-broadband penetration (Households), 2015

Source: ITU White Paper on Broadband Regulation and Policy in Asia-Pacific Region



Broadband prices : International Scenario

Country	Fixed Broadband			Mobile Broadband - handset	
	Price USD	Speed Mbps	Cap per month in GB	Price USD	Cap per month in GB
USA	16.32	2	unlimited	48.94	0.5
UK	16.45	17	10	16.45	0.5
Hong Kong	21.67	200	unlimited	11.67	1
Singapore	31.49	1000	unlimited	11.84	0.5
Belgium	33.83	30	100	33.17	0.5
Brazil	12.66	1	unlimited	11	0.5
Malaysia	26.89	1	unlimited	8.56	0.8
Thailand	16.13	6	unlimited	6.13	0.5
Sri Lanka	4.29	2	2.5	2.57	1
India	24	8	40	4	1

Source: ITU World Telecommunication/ICT Indicators 2015 , Data for the period ending 31.12.2014

Broadband Speed (APAC Region)

Global Rank	Country/Region	% Above 4 Mbps
1	South Korea	97%
5	Thailand	96%
17	Hong Kong	94%
20	Taiwan	93%
22	Japan	92%
28	Singapore	91%
30	New Zealand	91%
60	Australia	78%
65	Sri Lanka	71%
69	Malaysia	68%
80	Vietnam	55%
88	Indonesia	46%
90	China	44%
107	India	23%
109	Philippines	18%

Global Rank	Country/Region	% Above 10 Mbps
1	South Korea	84%
6	Hong Kong	66%
9	Japan	65%
10	Singapore	65%
16	Taiwan	57%
36	Thailand	39%
40	New Zealand	33%
50	Australia	23%
66	Malaysia	11%
69	Vietnam	4.9%
70	India	4.8%
75	Indonesia	3.0%
76	Philippines	2.7%
78	China	2.1%
-	Sri Lanka	4.5%

Source: Akamai's [State of the internet] Q1 2016 report


National Telecom Policy (NTP)- 2012 targets

2015	Affordable and reliable broadband-on-demand	Not available due to inadequate infrastructure
	Broadband connections @ 2 Mbps minimum	Wireline @ 2Mbps
2017	175 million	15 million
2020	600 million	
	Providing 100 Mbps on demand	Very limited

Inadequate penetration

Low speeds

Overly dependent on wireless

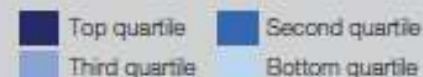


Why are we
lagging?

Internet Barriers Index

Maximum score of 100

Low score indicates high barriers, high score indicates low barriers



Country	Incentives	Low incomes and affordability	User capability	Infrastructure	Internet Barriers Index score
United States	100	93	99	85	94
Germany	72	100	99	100	93
South Korea	91	89	97	94	93
Japan	79	88	99	92	90
Spain	66	91	97	80	84
Italy	40	88	99	87	78
Russia	30	84	100	61	69
Turkey	40	67	91	57	64
Thailand	37	79	90	48	63
Mexico	49	67	90	41	62
China	28	81	92	43	61
Sri Lanka	38	74	86	45	61
Brazil	42	64	85	53	61
South Africa	38	62	89	49	59
Colombia	46	60	90	39	59
Philippines	35	65	93	35	57
Indonesia	29	79	89	30	57
Vietnam	29	69	90	34	55
Egypt	38	79	57	35	52
India	38	65	39	19	40
Nigeria	33	49	37	5	31
Pakistan	21	63	29	10	30
Bangladesh	29	45	31	5	28
Tanzania	13	27	47	0	22
Ethiopia	0	0	0	5	1

Low barriers

High barriers

Source: McKinsey & Company: Offline and falling behind: Barriers to Internet adoption



3rd Quartile

4th Quartile

Incentives

• 38

Low incomes and
affordability

• 65

User Capability

• 39

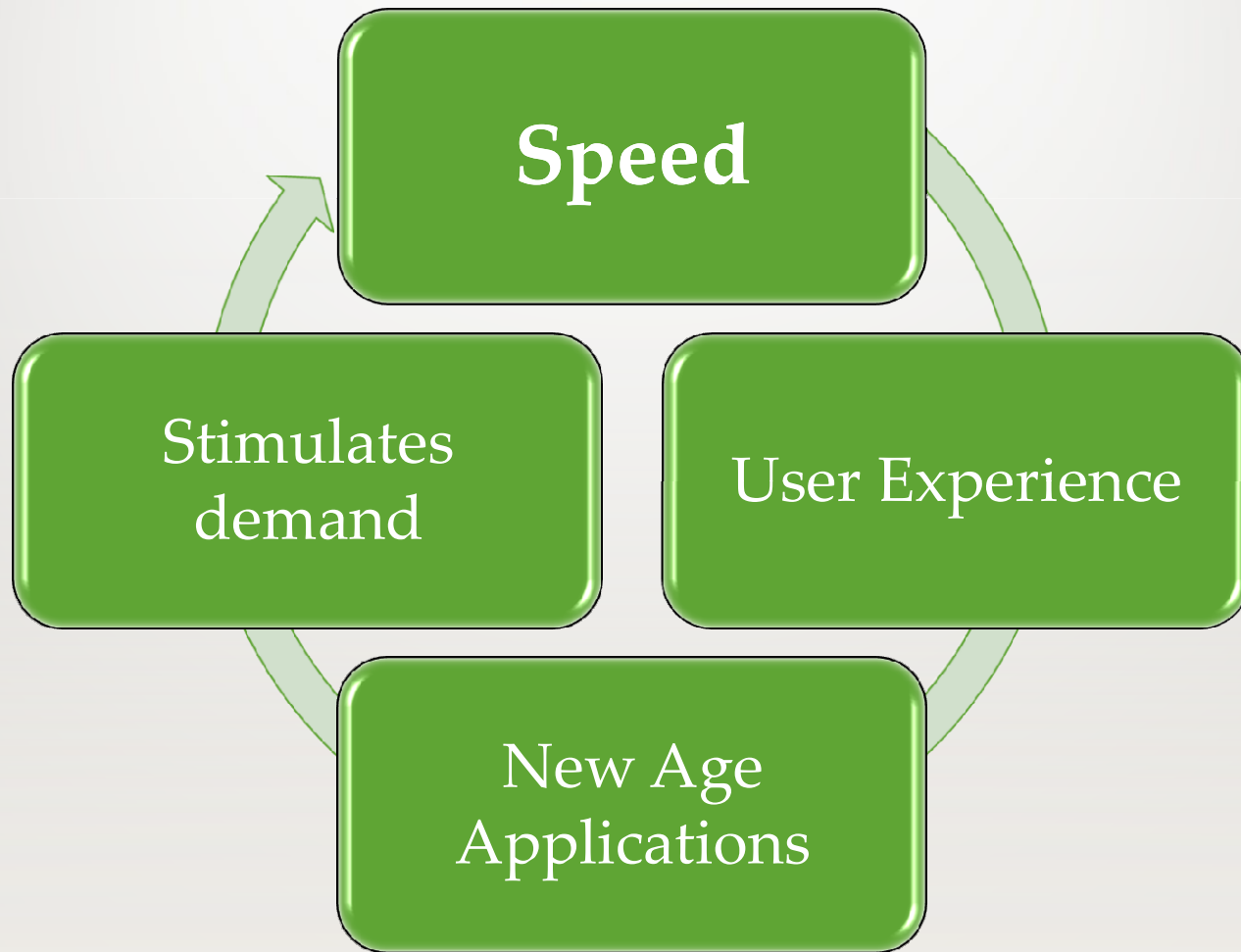
Infrastructure

• 19

Overall Index

• 40

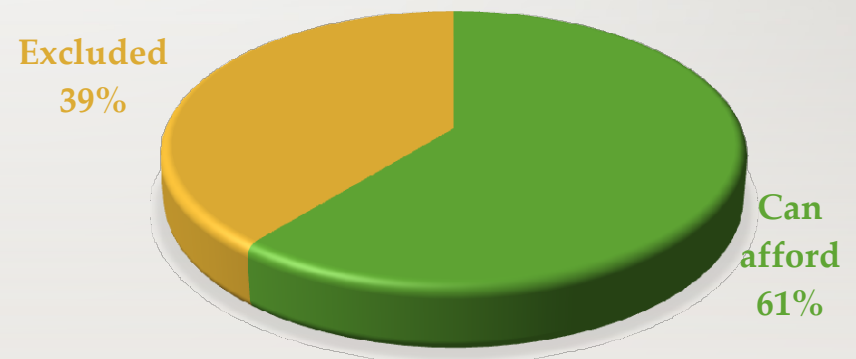
India




Affordability
barrier

5% of household
income for 500 MB per
month per user

PwC's definition





High speed wire line data networks help in reducing the cost to serve per megabyte (MB) data

Low Wired Teledensity

- Low investment in wireline
- Optical fibre mainly in long distance
- Negligible Fibre to Home or Fibre to Curb

RoW
Issues

Difficult
to get

Expensive

Non-
uniform
price



Broad Areas of intervention

BharatNet
in
PPP mode

Cable TV
for
broadband

Grid of
Wi-Fi
hotspots

Open Sky



Conclusion



Essential for Digital India

- Wired-infrastructure as a long-term solution to India's broadband requirements.
 - Implementing BharatNet is critical to this.
 - Digital Cable TV Infra to use existing pipe
- An inter-operable community wi-fi grid
- Satellite Link for remote and far-flung areas



Thanks!