QoS Framework for Consumer Protection in Pakistan

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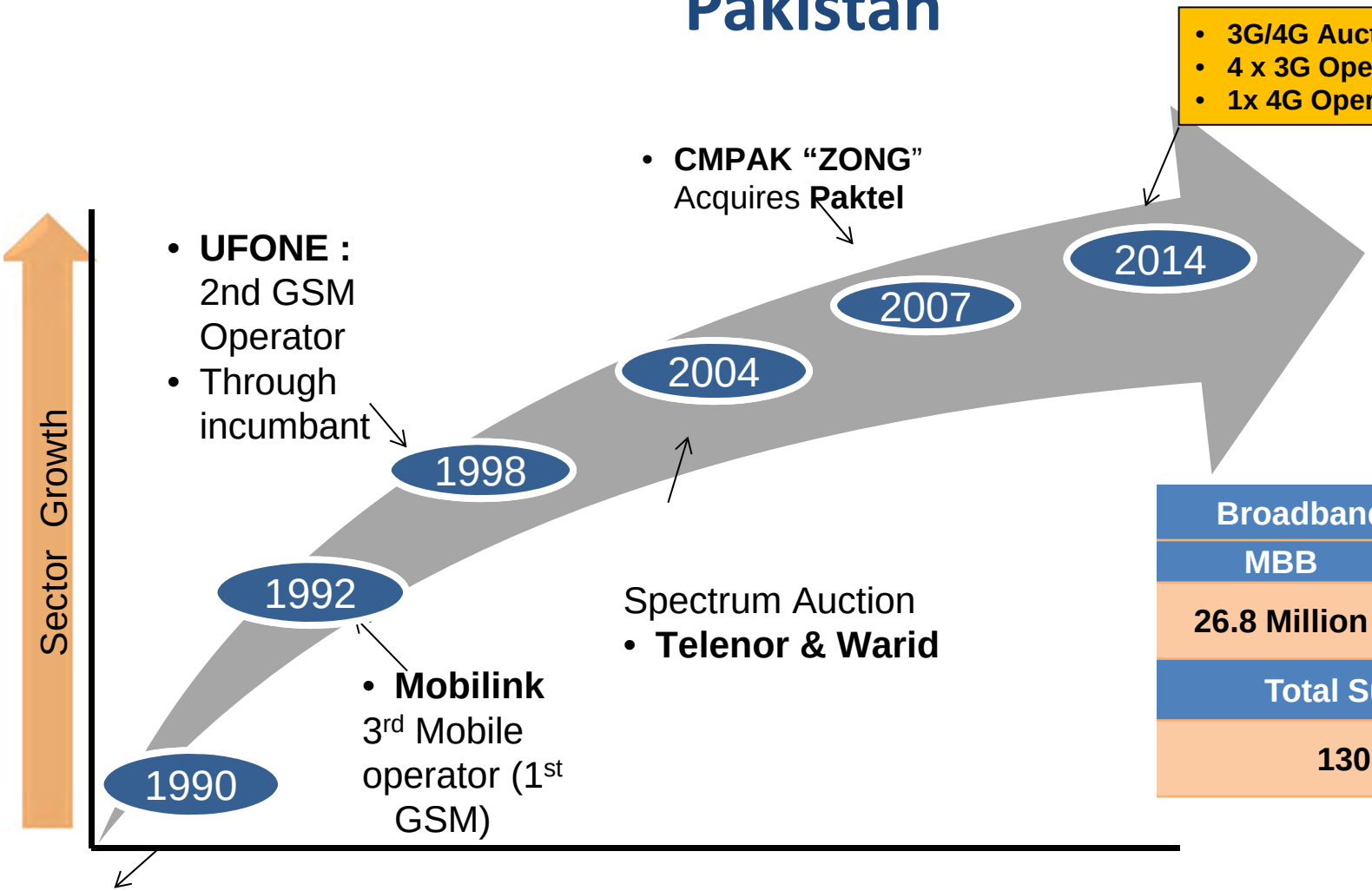
PTA's VISION

"Create a fair regulatory regime to promote investment, encourage competition, protect consumer interest and ensure high quality information and Communication Technology Services."

Sequence of Presentation

- Overview of Cellular Industry
- Need to have QoS?
- QoS Regulatory Framework
- QoS Key Performance Indicators
- Results & Initiatives
- Conclusions

Telecom Overview : Evolution of Cellular Industry in Pakistan



Broadband Subscribers	
MBB	Total
26.8 Million	29.8 Million
Total Subscribers	
130 Million	

- *Subscriber base is substantially pre-paid dominant representing ~98% of the total market*
- *~10% Non-Voice Revenue*

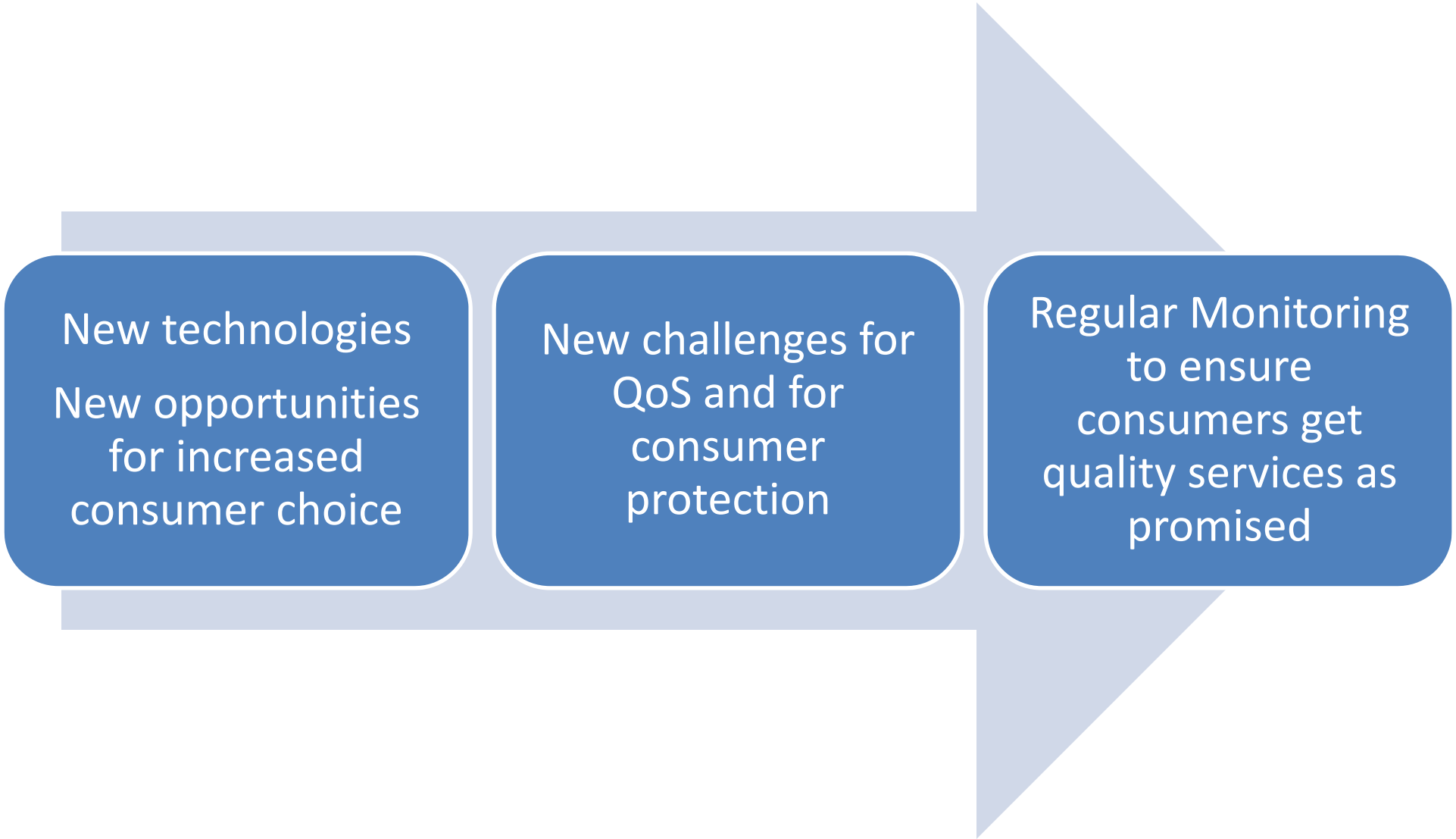
SOURCE: PTA Data

Impact of 3G/4G on Changing the Dynamics of Telecom and IT Sector in Pakistan

Expected Impact

- Modernization of existing mobile networks
- Growth of device market
- Innovative Apps development
- Digitization impact on Social & Economical sectors e.g. E/M governance, E-Education

Why Need QoS?


New technologies
New opportunities for increased consumer choice
New challenges for QoS and for consumer protection
Regular Monitoring to ensure consumers get quality services as promised

General QoS Regulatory Frameworks

- Standards
  e.g. ITU, ETSI, National Standards, Industry Standards, Other Standardization bodies

- License condition
  e.g. India, Pakistan,
- Regulation
  e.g. India, Malaysia, Pakistan, Singapore, Tanzania
- Industry guidelines
  e.g. Australia

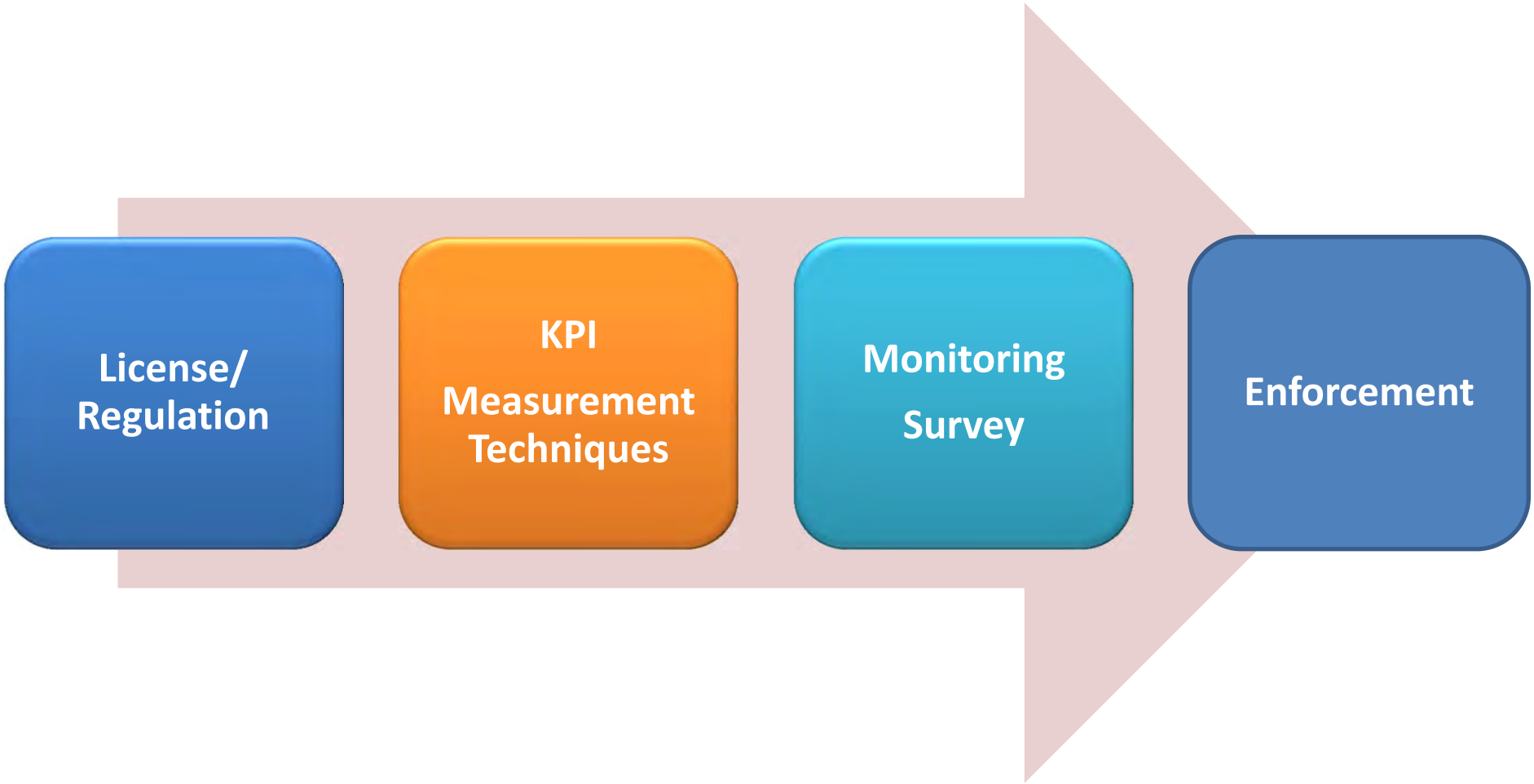
- Technical
  e.g. Call drop, call success rate, connection speed, SMS quality
- Customer focused
  e.g. Billing accuracy, fault
- Guideline
  e.g. Measurement methods

- Technical
  e.g. Network auditing, drive tests
- Customer survey
  e.g. Network auditing, drive tests

- Regulatory notice
  e.g. Website, Press release, Directive
- Publication
  e.g. Website, newspaper
- Penalty
- Dispute

SOURCE: ITU

Quality of Service Regulatory Framework in Pakistan



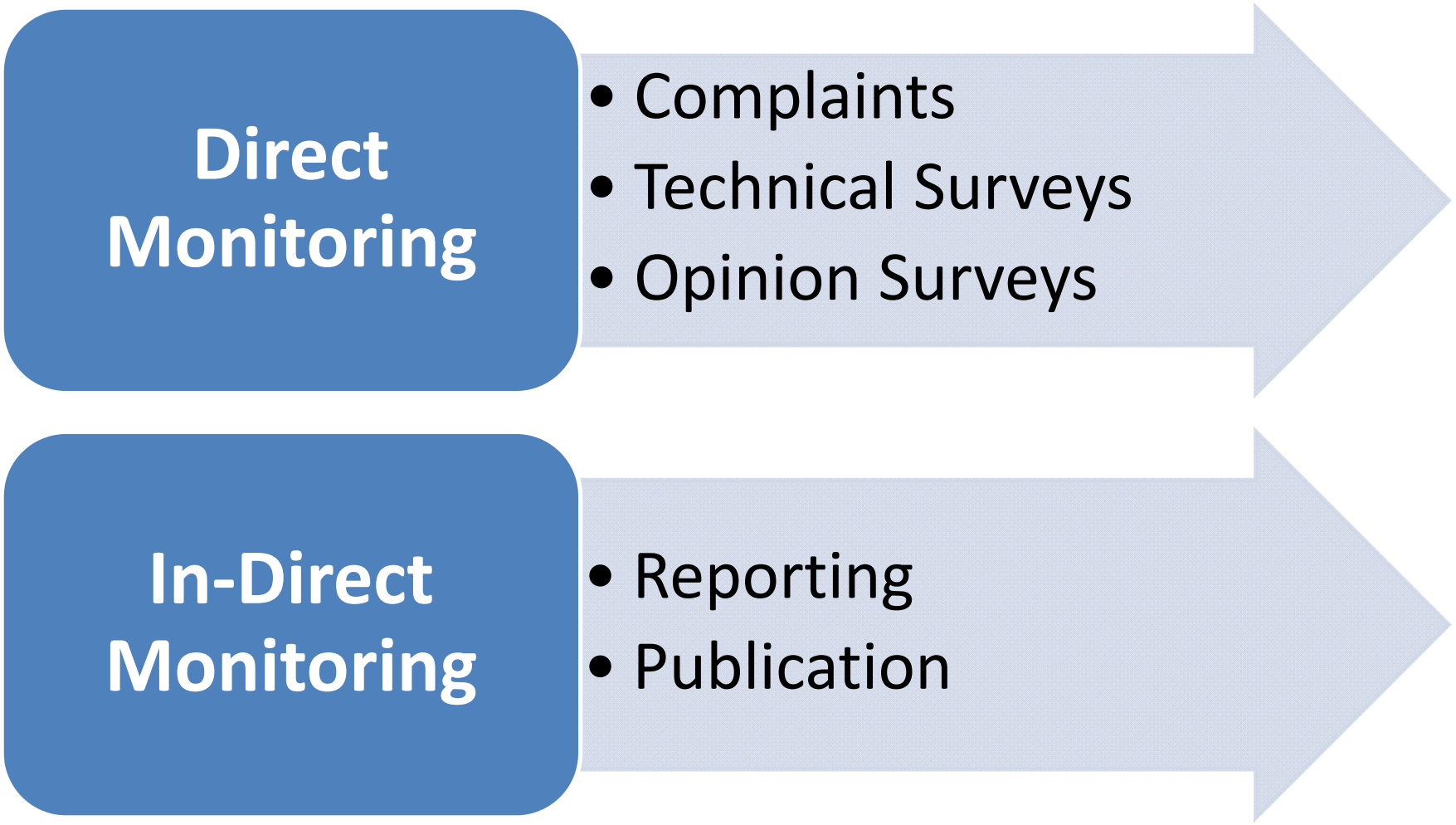
Consumer Specific Regulatory Instruments

- Cellular Mobile Network QoS Regulations 2010
- Fixed Broadband Regulations, 2014
- License Conditions
- Telecom Consumers' Protection Regulations, 2009
- Regulations for Measures against SPAM, Obnoxious, Fraudulent & Unsolicited Communications, 2009
- SOPs to Control Spamming, Unsolicited, Fraudulent and Obnoxious Communications

ITU-T Recommendations and QoS / QoE

	ITU-T Recommendations
Subjective assessment of voice quality	P.85, P.800, P.805, P.806, P.810, P.830, P.835, P.840, P.851, P.880, P Suppl. 24, P Suppl. 25
Objective assessment of voice quality	P.862, P.862.1, P.862.2, P.862.3, P.863, P.863.1
QoS and QoE for multimedia and assessment methods	G.1010, G.1011, G.1030, G.1040, G.1040, G.1050, G.1070, G.1080, G.1081, G.1082, P.1010, Y.1562, P.1201, P.1201.1, P.1201.2, P.1202, P.1202.1, P.1202.2, P.1501
telephonometry	P.32, P.48, P.50, P.51, P.52, P.57, P.58, P.59, P.61, P.64, P.75, P.76, P.78, P.79, P.300, P.310, P.311, P.313, P.330, P.340, P.341, P.342, P.350, P.360, P.370, P.380, P.581, P.501, P.502, P.505, P Suppl. 10, P Suppl. 16, P Suppl 20,
Hands free Communications and User Interfaces in Vehicles	P.1100, P.1110
Network Performance and OAM for Performance Measurement	Y.1540, Y.1541, Y.1543, Y.1544, Y.1560, Y.1561, Y.1563, Y.1564, Y.1565. G.8013/Y.1731, G.8113.1, and G.8113.2
QOS FOR MOBILE SERVICES	E.804
TRAFFIC MANAGEMENT	Y.1221, Y.1222, Y.1223, Y.1530, Y.1531, Y.1542
BITRATE MEASUREMENT OF INTERNET CONNECTIONS	currently available as working draft under Question 15/11

QoS – Monitoring Techniques



QoS KPIs for 2G

Parameter	Standard Value
Network Downtime	< 1%
Grade of Service	≤ 2%
Call Connection Time	≤ 5 Seconds
Call Completion Ratio	>98%
Mean Opinion Score (MOS)	> 3
Service Accessibility	97% *(3Years)* >98%
SMS Success Rate	> 99%
SMS End to End Delivery Time	≤ 12 Seconds

Additional QoS KPIs for 3G/4G

Parameter	Definition	
User Data Throughput	Refers to Download speed	Changed from time to time
Signal Strength *(RSCP – 3G)* *(RSRP – 4G)*	Received Signal Code Power (RSCP) denotes the power measured by a receiver. Used as an indication of signal strength. Minimum outdoor signal strength must be achievable with 90% confidence within the areas defined in Rollout.	-100 dBm
Session Abnormal Release Rate	Shows how often an end-user abnormally looses an E-RAB during the time the E-RAB is used.	< 2%

RSCO: Received Signal Code Power, RSCP: RSRP: Reference Signal Receive Power

Field Testing

- Drive (Road) Tests
- In-building coverage
- Interference Analysis

Short Calls Analysis

Set-up a call and maintain it for a pre-defined time duration (for 15-60 s)

Call set-up failure and drops during short calls can be mainly used to analysis Accessibility failure due to:

- UE Failure
- Unsuitable Parameters Setting
- Coverage Problem
- Interference
- Others

Long Calls Analysis

Set-up a call and maintain it until it is drop (used for the analysis of Retainability performace)

Drops during long call can be used to identify:

- Missing Neighbor Relation
- Coverage Problem
- UE Problems
- Network Characteristics
- Best Parameter Setting
- Others

KEY PERFORMANCE INDICATORS

- Accessability (Call set-up success rate)
- Retainability (Dropped calls)
- Mobility (Handover success rate)
- Quality, Integrity (BLER and throughput)

Initiatives Taken by PTA

- Conduct of Nationwide QoS Surveys
- Publication of Survey Results
- Issuance of regulatory directives
- Capacity Building of Human Resource
- Consumer centric development of rules and regulations
- App development for QoS Testing

QoS Reports

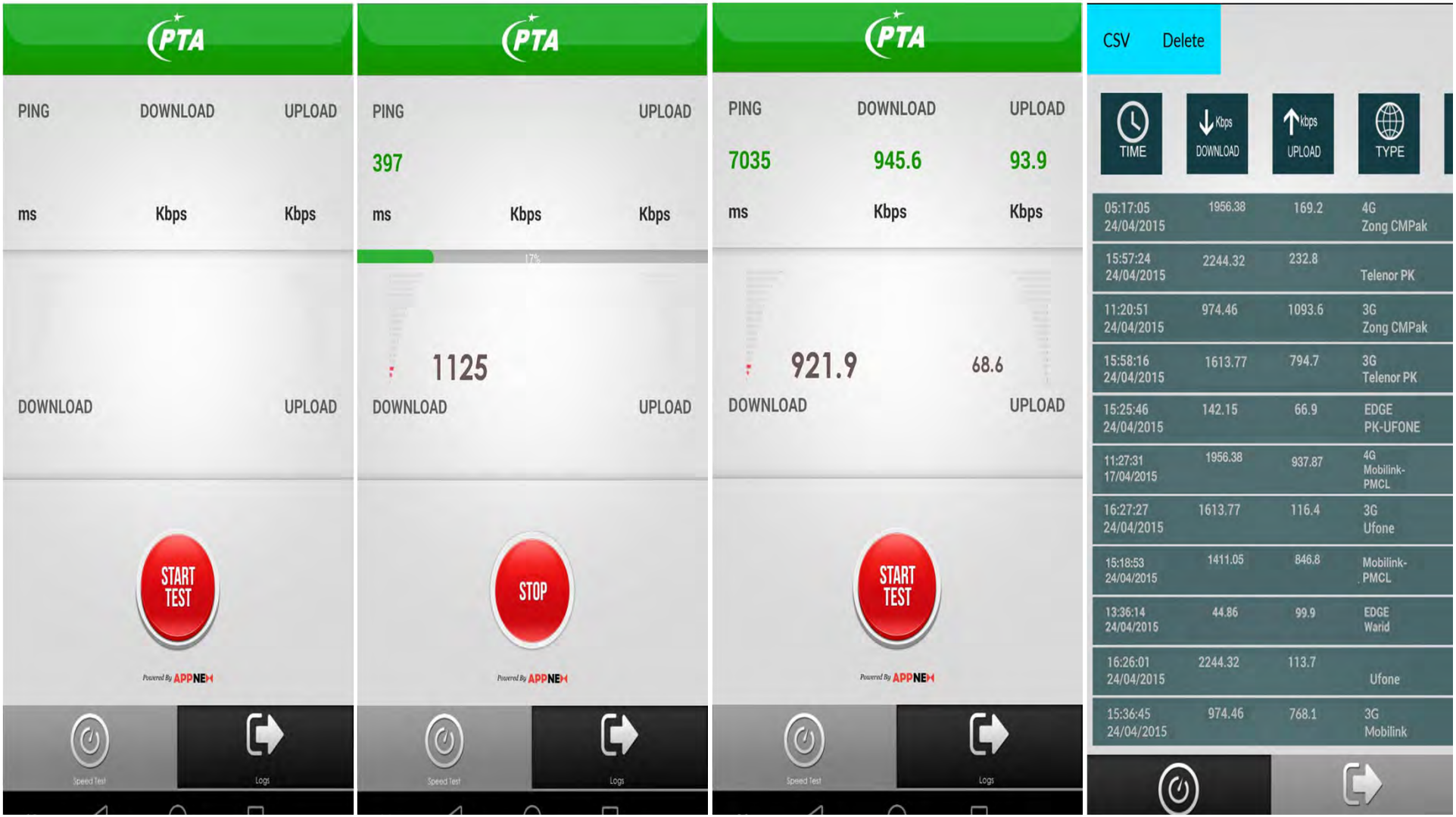
QoS Report

http://www.pta.gov.pk/media/cmo_qos_survey_results_2015_091015.pdf

PTA Speed Test Application for Consumers

Free Downloadable Application on Google Play Store

PTA Speed Test Application for Consumers



SpeedTest

- Dashboard
- 3G Stats
- 4G Stats
- Data Table

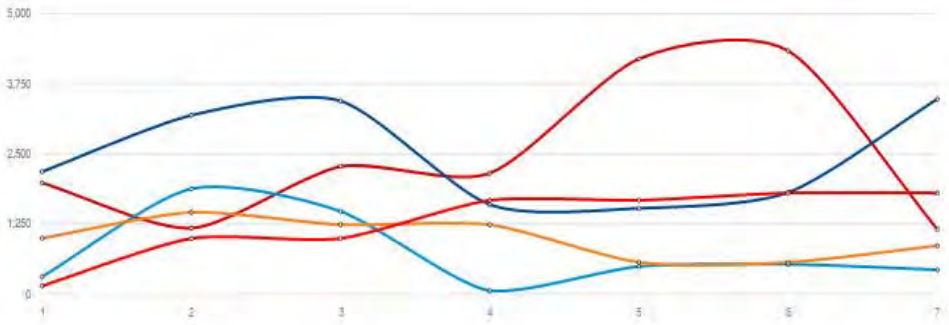
SpeedTest Results

253	41	199	493
Tests over 3G	Tests Over 4G	Tests Over WiFi	Total Tests
View Details	View Details	View Details	View Details

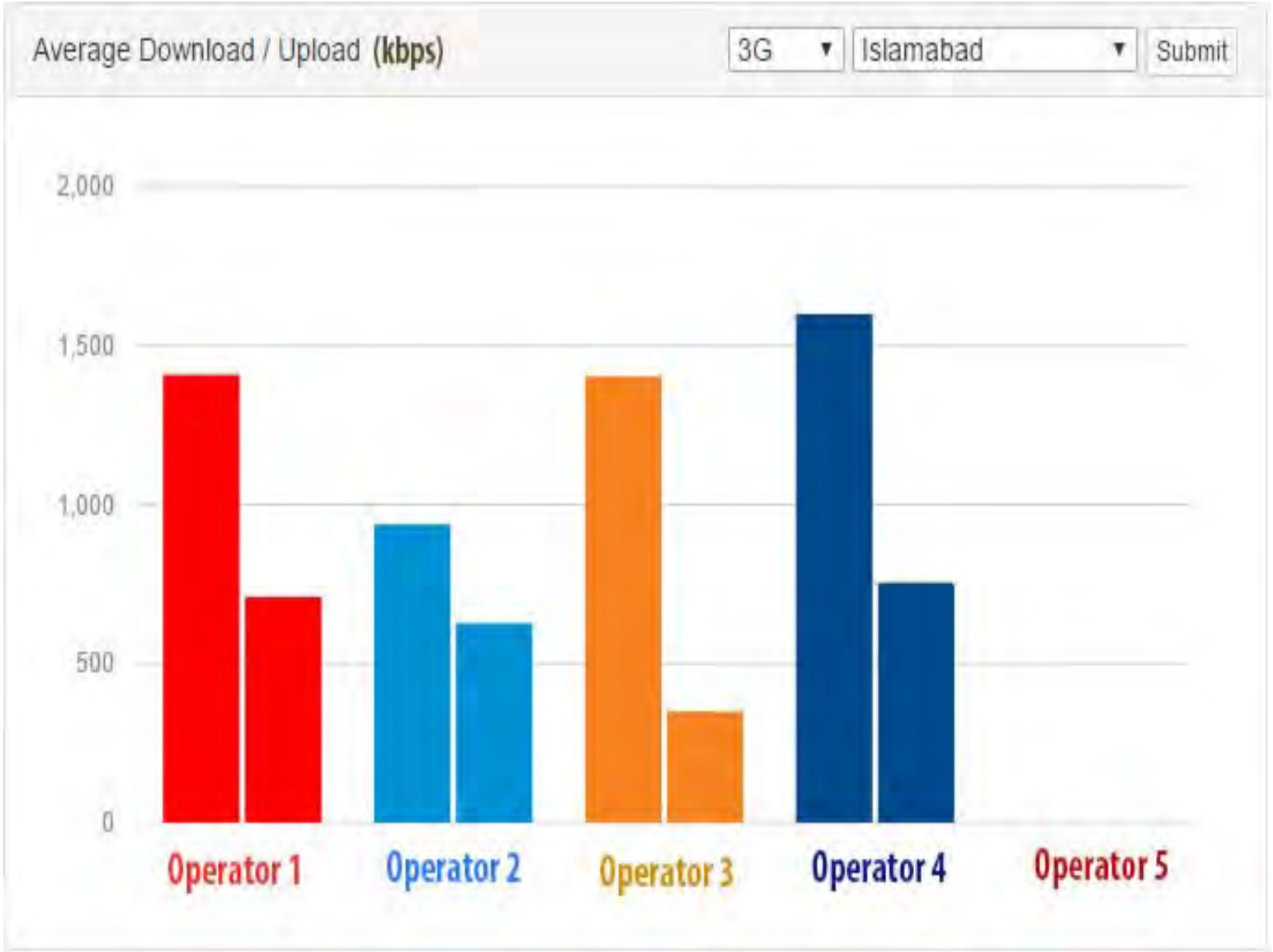
Average Download / Upload (kbps) — 3G — Islamabad — Submit

Total Tests for : All — Tests Over : 3G

Recent Results (Last 7 results for each operator)



GPRS Highest Download	69 kbps
City : Sargodha	Mobilink
EDGE Highest Download	350 kbps
City : Rawalpindi	Zong
3G Highest Download	3602 kbps
City : Islamabad	Mobilink
4G Highest Download	9668 kbps
City : Islamabad	Warid


Average Download / Upload (kbps)
3G
Islamabad
Submit
2,000
1,500
1,000
500
0
Operator 1
Operator 2
Operator 3
Operator 4
Operator 5

SpeedTest

Dashboard

3G Stats

4G Stats

Data Table

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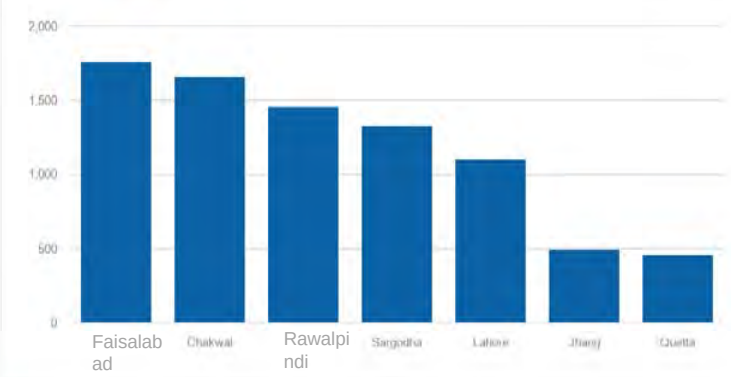
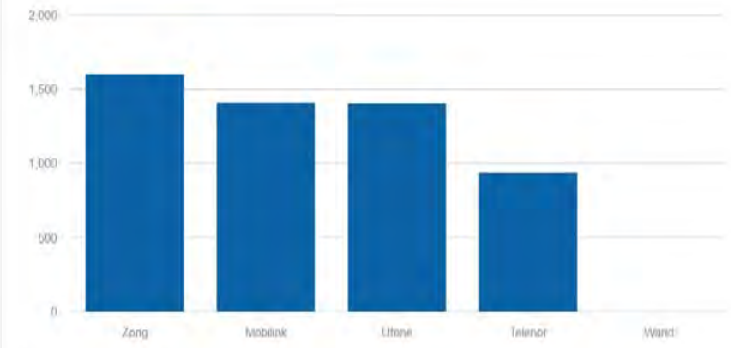
Zong Telenor Ufone Mobilink Warid

3G Results

Top Cities with sequencial downloads



Highest Download speed operator wise



Average download, upload and ping of top cities

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3G Results

Average download, upload and ping of top cities

Show 10 entries Search:

City	Average Ping (ms)	Average Download (Kbps)	Average Upload (Kbps)	Total Tests
Faisalabad	519	1958	289	1
Sukkur	349	1950	977	7
Rawalpindi	278	1757	583	20
Chakwal	334	1656	683	2
Islamabad	450	1453	699	102
Islamabad District	319	1444	790	6
Muzaffargarh	316	1405	927	1
Karachi	314	1375	686	9
Gujrat	590	1375	1125	1
Sargodha	395	1325	530	4

Showing 1 to 10 of 20 entries

Previous 1 2 Next

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SpeedTest

- Dashboard
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4G Results

Top Cities with highest download speed — Islamabad — Submit

Average download, upload and ping of top cities

Show 10 entries — Search:

City	Average Ping (ms)	Average Download (Kbps)	Average Upload (Kbps)	Total Tests
Barcelona	288	6038	3420	4
Madrid	246	4527	1562	1
Islamabad	1657	3239	1303	17
Lahore	1255	2922	536	5
Karachi	477	2476	844	4
	598	2444	437	3
Rawalpindi	1037	1386	474	7

Showing 1 to 7 of 7 entries

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SpeedTest

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PTA Speed Tests Result

Data Table

Show 10 entries Search:

Timestamp	Device	Network	Provider	City	Ping (ms)	Download (Kbps)	Upload (Kbps)
2016-03-21 14:50:49	HUAWEI GRA-UL00	WiFi	Local WiFi	South Delhi	392	382	1959
2016-03-21 11:25:48	HUAWEI GRA-UL00	WiFi	Local WiFi	South Delhi	307	402	2223
2016-03-19 19:40:53	SM-T230NU	WiFi	Local WiFi		122	1033	744
2016-03-19 19:40:33	SM-T230NU	WiFi	Local WiFi		176	991	633
2016-03-19 01:23:20	SM-G7102	WiFi	Local WiFi	Peshawar	326	1085	720
2016-03-18 21:15:40	LG-D415	WiFi	Local WiFi	H?sal	481	2155	583
2016-03-18 20:52:06	HUAWEI GRA-UL00	3G	Mobilink		284	3215	993
2016-03-16 04:30:28	ALE-L21	WiFi	Local WiFi	Karachi	411	2395	593
2016-03-16 04:30:06	ALE-L21	WiFi	Local WiFi	Karachi	417	2404	581
2016-03-16 01:46:02	GT-I9190	WiFi	Local WiFi		139	1072	624

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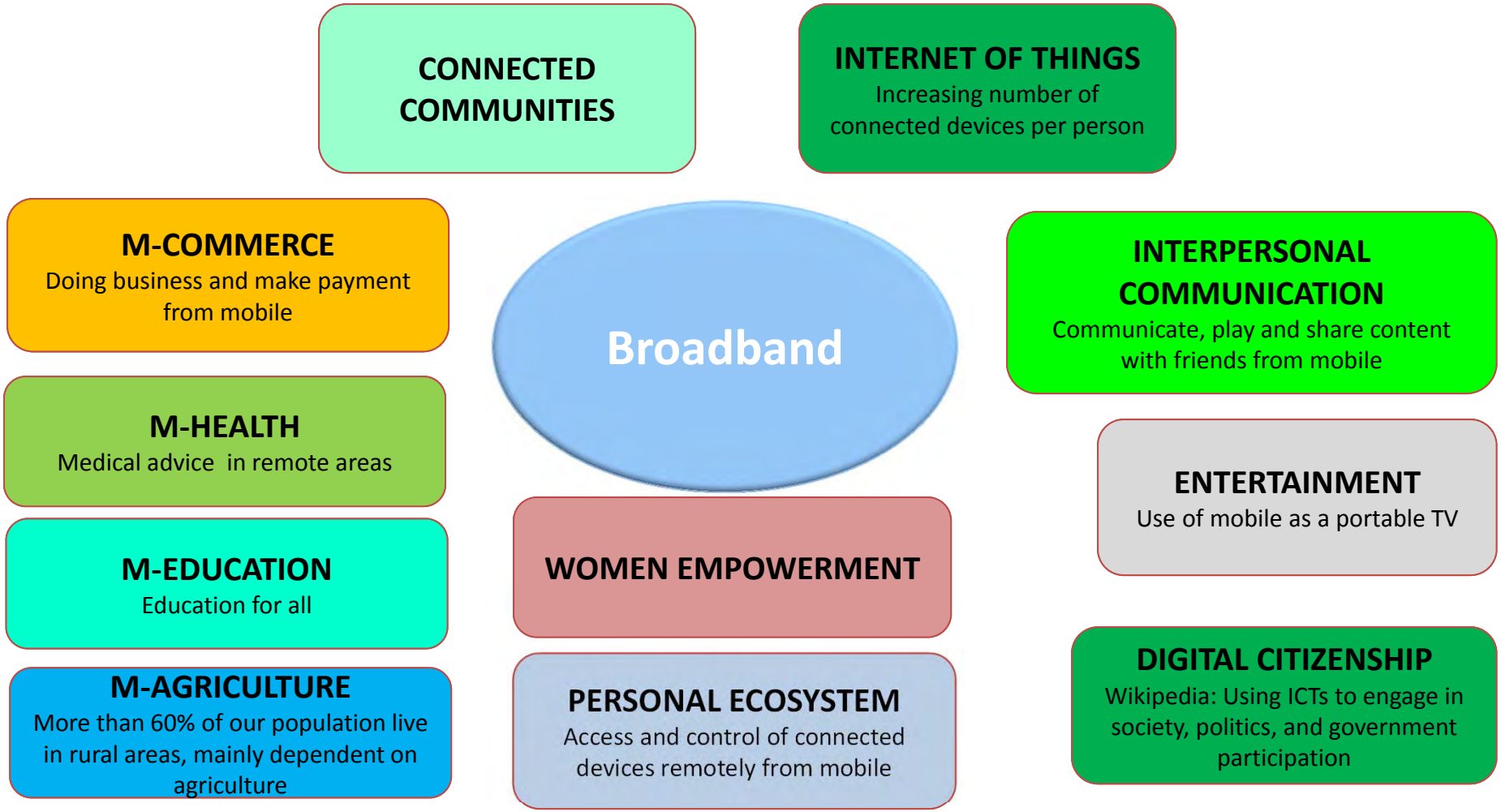
Previous 1 2 3 4 5 ... 52 Next

Two More Slides

Broadband – an enabler for accelerated socio-economic development through Broadband



How to achieve all the benefits?

- MBB is good, however, we need to have more fiber
- FTTx (homes, towers, offices, curbs)
- Have the big picture in sight
- Bridge the digital divide

Thank You

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