

KPIs AND USER EXPERIENCE

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TIME TO CONTENT

CRITICAL FOR USER EXPERIENCE



25%

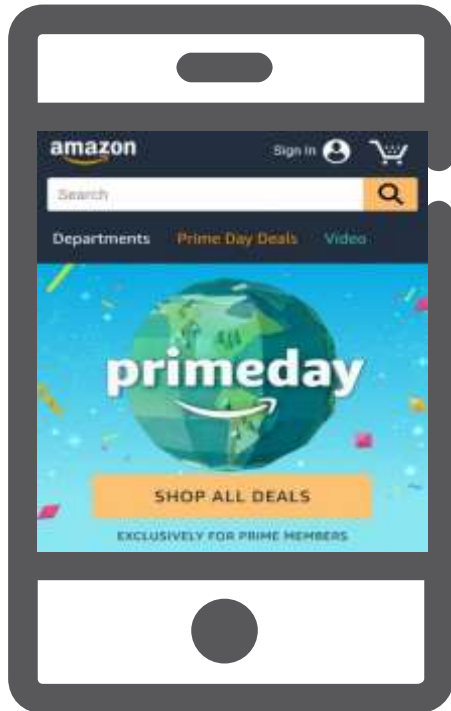
OF MOBILE USERS
ABANDON WEB PAGE
AFTER 4 SECONDS



50%

OF MOBILE USERS
ABANDON WEB PAGE
AFTER 10 SECONDS

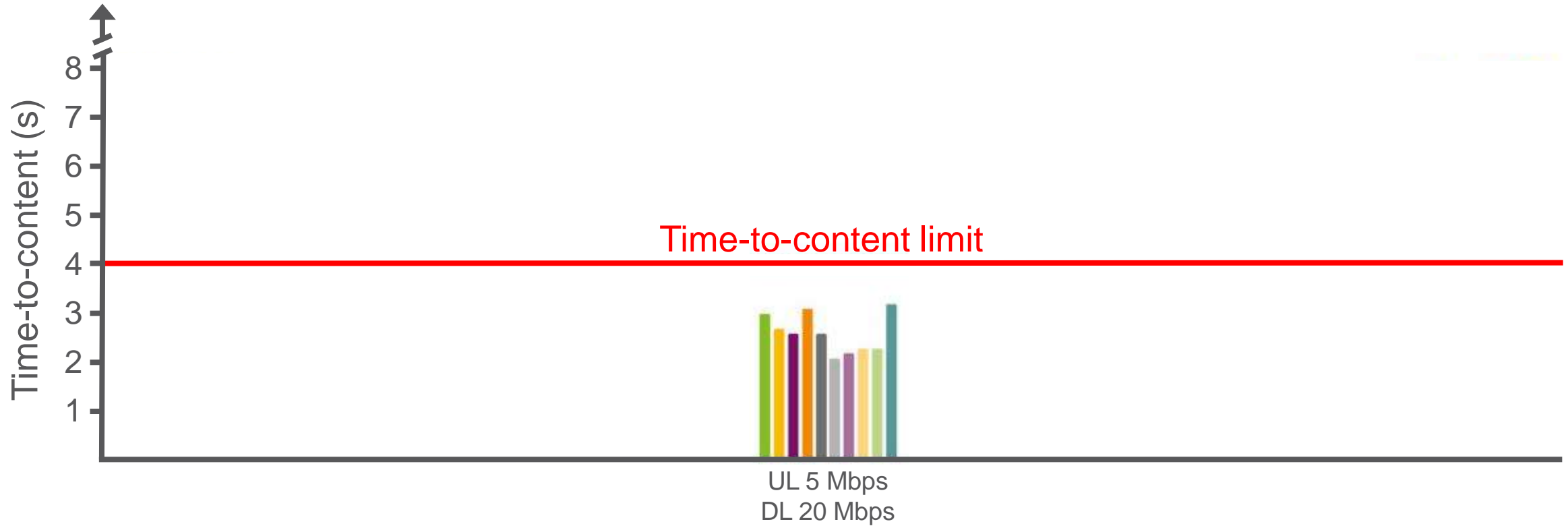
IT'S ALL ABOUT TIME-TO-CONTENT



4 sec

- › Users experience mobile broadband as time-to-content
- › Applies to web & video
- › Single most relevant metric to monitor MBB user experience

TIME-TO-CONTENT LARGELY DETERMINED BY THROUGHPUT

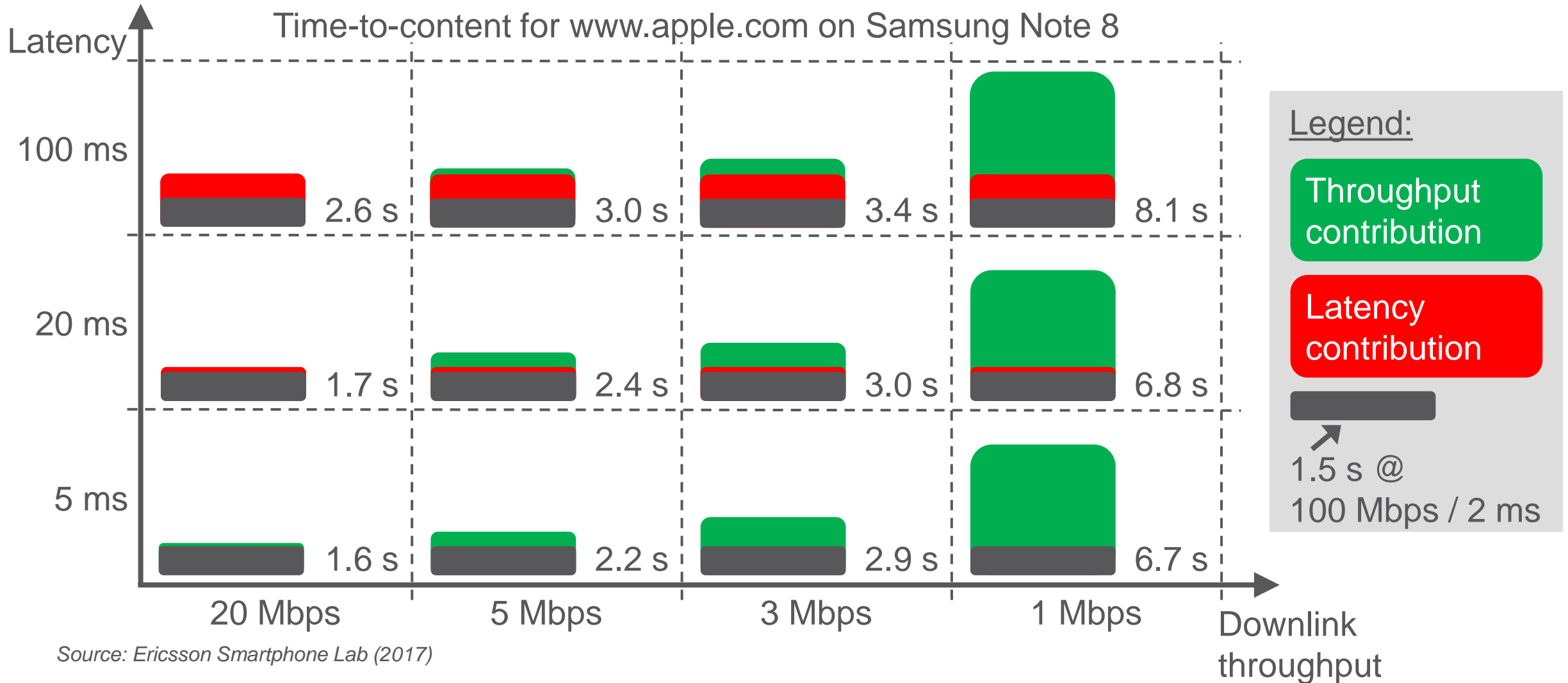


Websites

- swedbank.se
- amazon.com
- hemnet.se
- imdb.com
- seb.se
- pricerunner.se
- apple.com
- ebay.com
- svtplay.se
- expressen.se

Source: Ericsson Mobility Report (Nov. 2016)

THROUGHPUT MATTERS



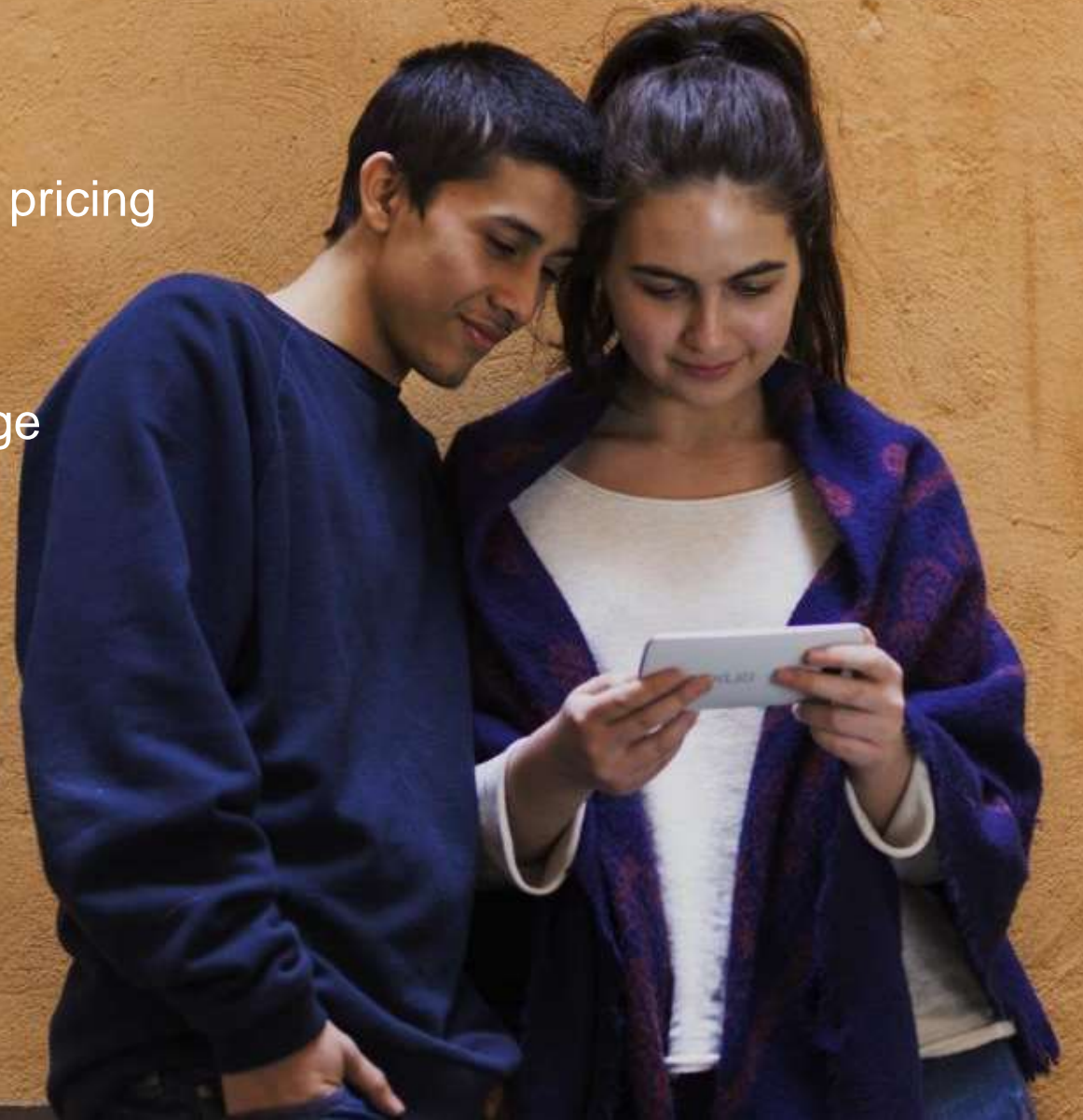
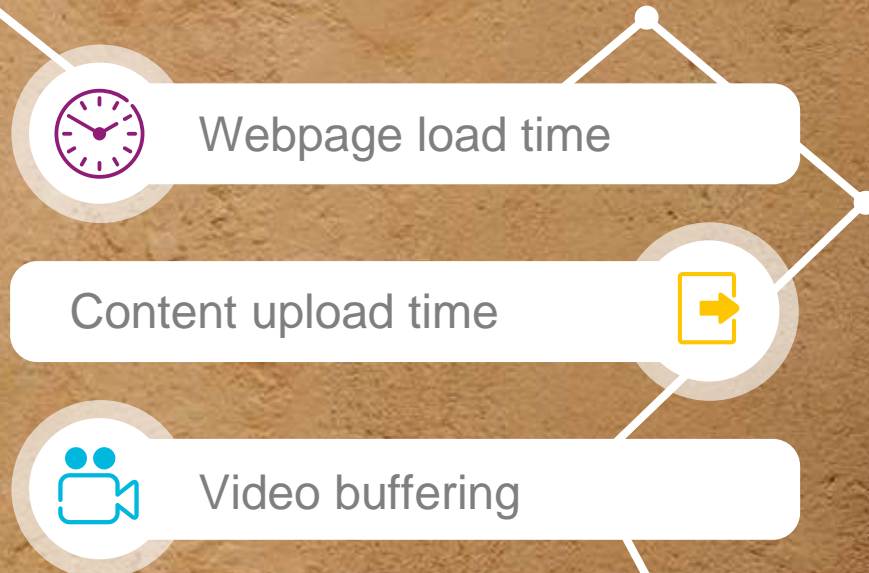
Source: Ericsson Smartphone Lab (2017)

APP EXPERIENCE MATTERS



- › Principal driver of customer loyalty
- › 3x more important to consumers than pricing
- › Translates directly to perception of mobile broadband quality

Top 3 factors that consumers use to judge the quality of their mobile broadband:



ADAPTING TO CHANGE

Traffic Profile Shift



From long DL FTP...



- › Few accesses, large data volume per session
- › User initiated traffic
- › Low signaling load



...to bursty DL traffic and UL

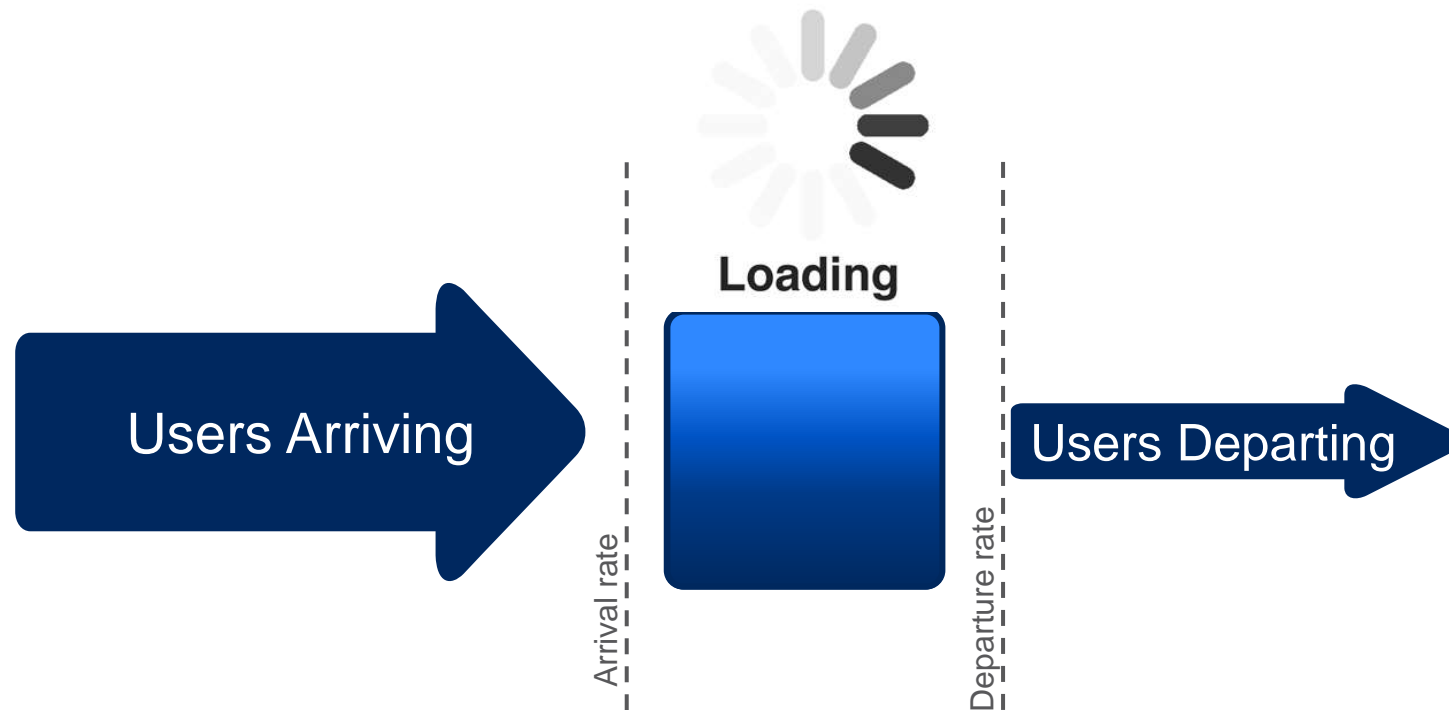


- › Multiple accesses, low data volume per session
- › App initiated traffic (not users)
- › High signaling load



TIME TO CONTENT

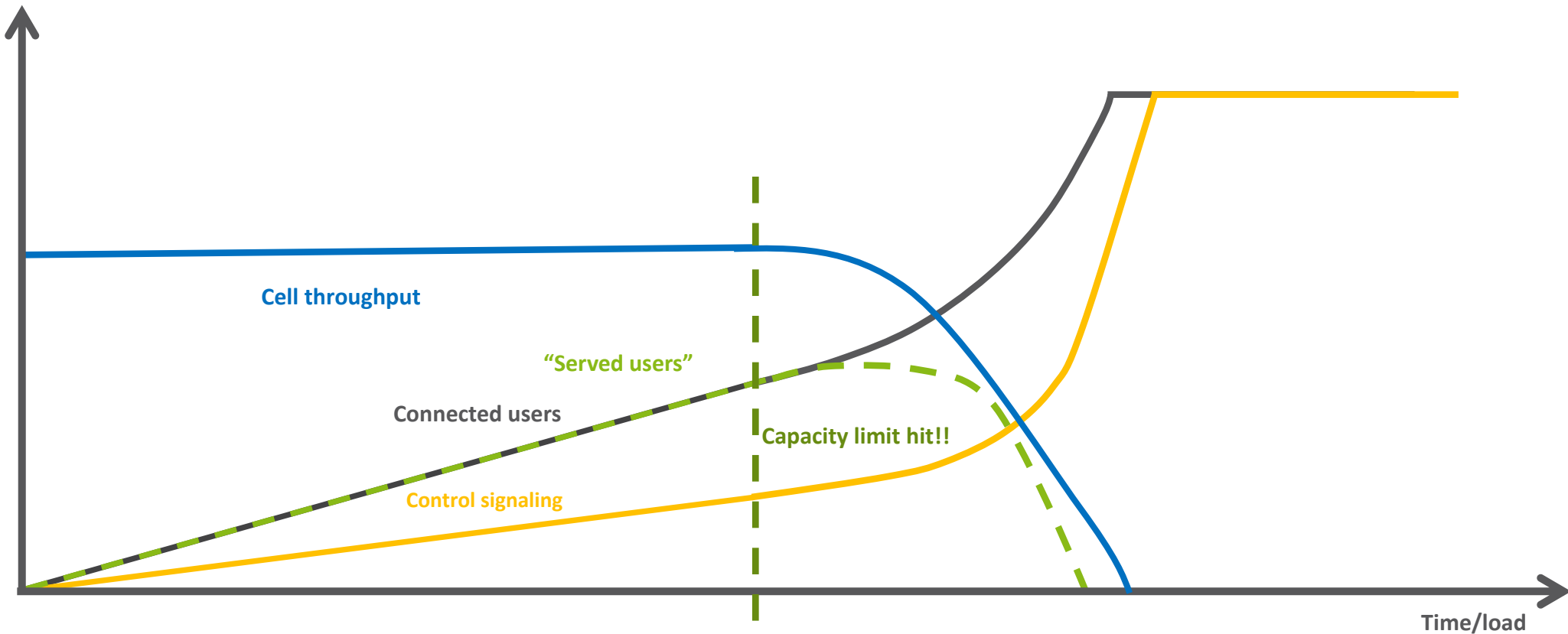
CRITICAL FOR USER EXPERIENCE



Lower rate mean longer mean hold time
Users can get in, but they can't get out

NEED FOR RELIABLE SPEED

Avoid overload scenarios – LTE Example



- ① Number of connected UEs increase
- ② With increasing control signaling
- ③ More connected users → more signaling

- ④ Less data transmission → even more connected users
- ⑤ Served users decreases. Non-served users will consider the radio link to be broken and do reestablish/reconnect causing control signaling to increase

USER EXPERIENCE RELATED KPI:S



- +** 1. **Speech Retainability**
The probability of losing a voice call connection
- +** 2. **Speech Accessibility**
The probability of establish a voice call connection
- 3. **Packet Retainability**
The probability of losing a packet connection
- 4. **Packet Accessibility**
The probability of establish a packet connection
- +** 5. **Session Accessibility and Mean Holding Time**
Experienced delay when accessing network
- +** 6. **APP Coverage**
Connection throughput speed for HS and EUL
- +** 7. **IRAT HO Intensity / Trapped users**
Users generating traffic in the wrong technology

Leading operators
are shifting to a new KPI approach

THE IMPORTANT KPI:S

How would you rate your most important KPI:s?



Packet Retainability

The probability of losing a packet connection

To secure a good KPI, the alternative is to move the smartphone to GSM... But, from an end user perspective, what is better?



Re-establish the data connection in LTE / WCDMA? (~3s to open a webpage)
Send users to GPRS/EDGE? (~40s to open a webpage)

A dropped data connection is automatically re-established after a few seconds with small/no user impact

THE IMPORTANT KPI:S

How would you rate your most important KPI:s?



Packet Accessibility

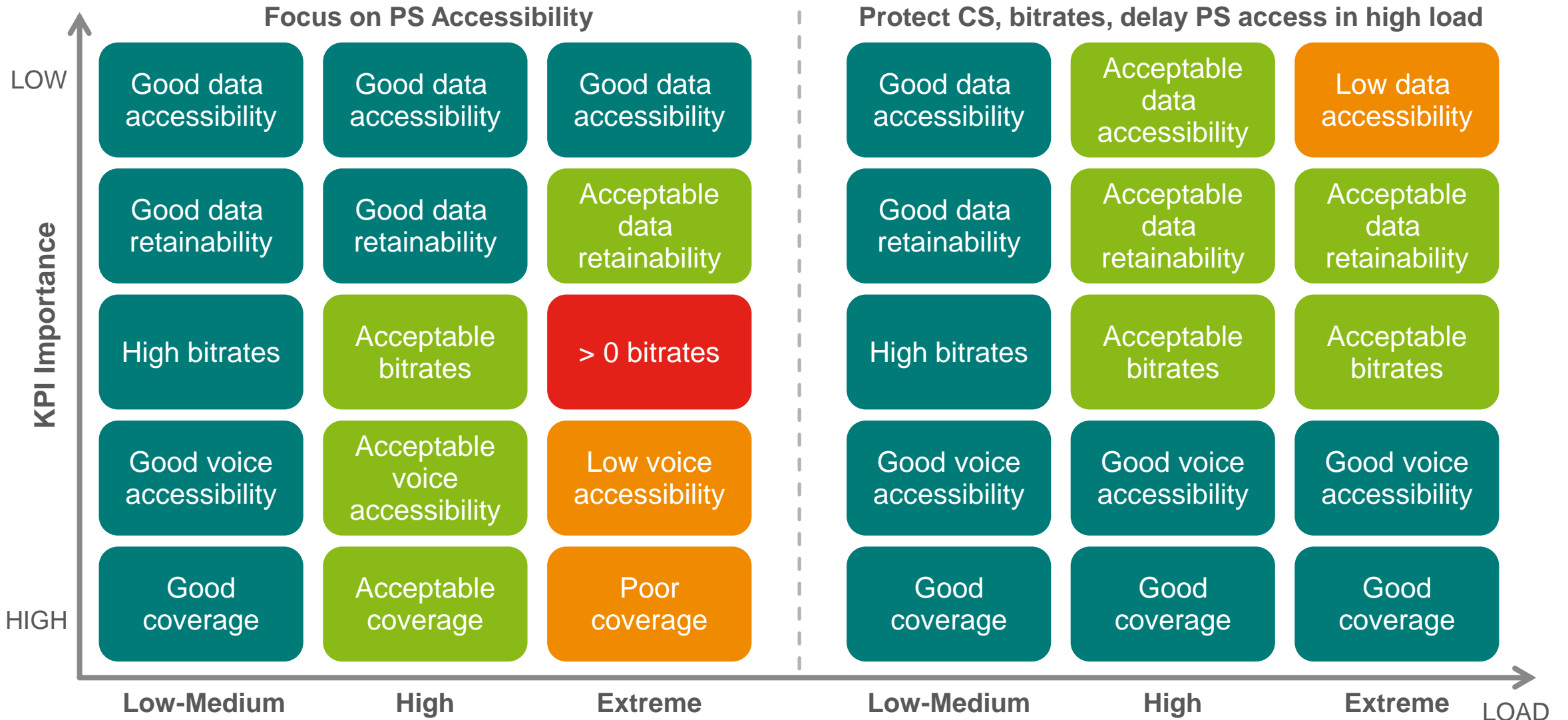
The probability of establish a packet connection

A failed PS access will automatically retry every 1s and ~80% of all PS connection attempts are non user initiated → No end-user impact!



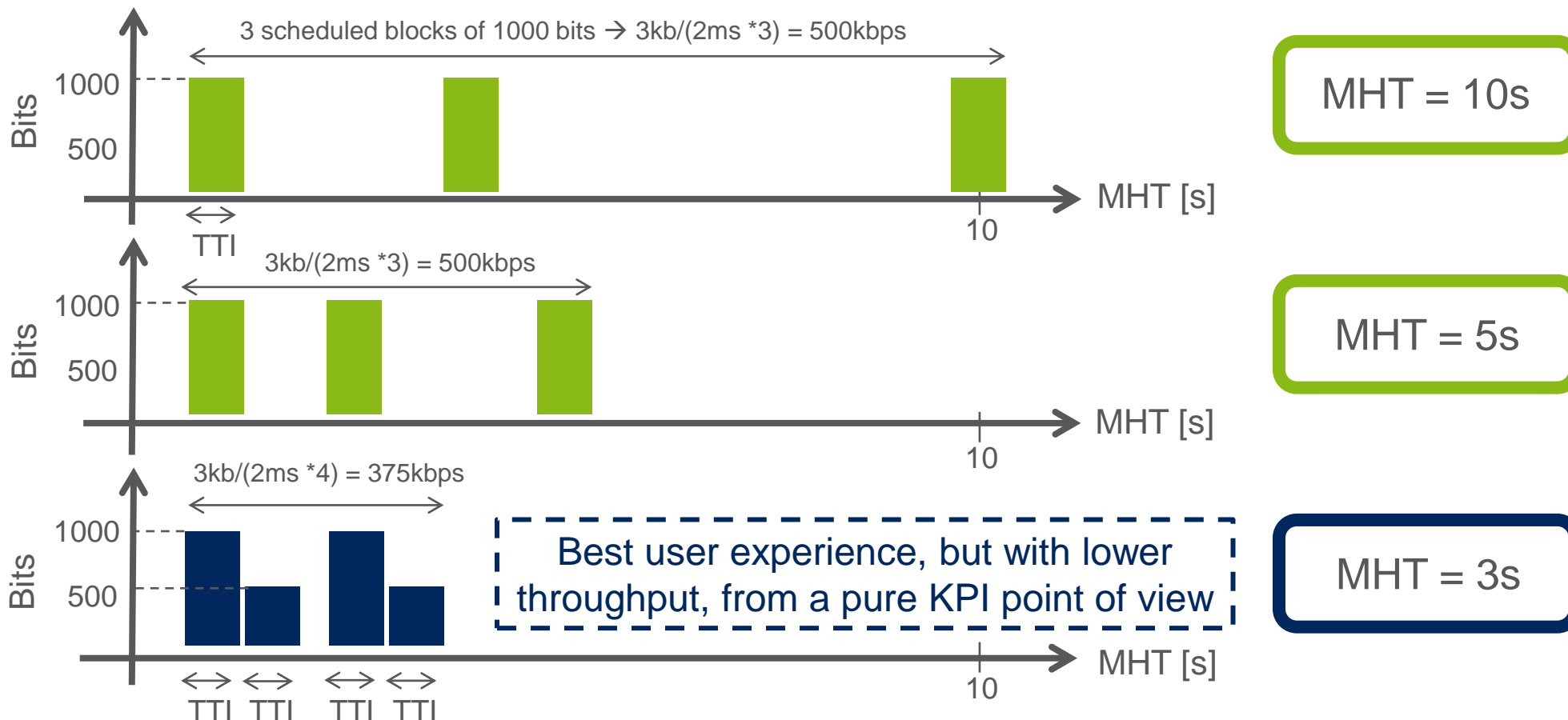
In a smartphone centric network, optimizing “PS accessibility” can be directly counter productive

FOCUS ON END USER EXPERIENCE



MEAN HOLDING TIME EXAMPLE

Recommended way to measure user experience



Traditional KPI do not always able to reflect user experience in a good way

PROTECT USER EXPERIENCE

What you do with your data users matters



Data

Wanted operation → better to delay access, but ensure good throughput

Signaling

Everyone can get in, nobody can get out → Operation with low resources (power and/or codes)

Data

Signaling

- › With a higher MHT, users need to spend a lot more codes and power on the control channel, to send the same amount of data

Higher costs when resources are scarce creates very unstable cells

P3 METHODOLOGY

Focus on user experience

› Using top end phones, performing constantly performed a suite of tests covering:

- DL of different types of web-pages. DL and UL of large file
- Video streams from services like Youtube
 - › Average video resolution
 - › Success ratios, start times and the absence of interruptions
- Success ratios and average session times
- Record average throughputs for all DL and UL
- Minimum rates available in 90% of the cases plus peak rates that would be surpassed in 10% of cases

› Full P3 report available [here](#).



Data in Cities - Drivetest	Telia	Tele2	Telenor	Tre
Web-Page Download (Live/Static)				
Success Ratio (%/%)	99.9/100.0	99.7/99.8	99.6/99.8	99.1/99.7
Static: Avg. Session Time (s/s)	1.0	1.4	1.3	1.5
Live: Reaction Time (ms)	394	446	417	813
Live: Initial DL Speed 1st second (kB/s)	660	579	594	567
File Download (3 MB)				
Success Ratio/Avg. Session Time (%/s)	100.0/0.9	99.9/2.3	99.9/2.0	99.9/3.4
90%/10% faster than (kbit/s)	18222/67989	4417/53074	6745/52402	4989/36697
File Upload (1 MB)				
Success Ratio/Avg. Session Time (%/s)	99.9/0.7	99.7/1.5	99.8/1.4	99.4/1.9
90%/10% faster than (kbit/s)	8604/27778	2737/20997	3048/21680	2738/14045
File Download (7 Seconds)				
Success Ratio (%)	100.0	100.0	100.0	99.5
Avg. Throughput (kbit/s)	85726	38607	41753	31063
90%/10% faster than (kbit/s)	22776/166969	7146/87172	6867/93887	9512/66203
File Upload (7 Seconds)				
Success Ratio (%)	99.9	99.6	99.5	99.4
Avg. Throughput (kbit/s)	30076	16298	17503	10938
90%/10% faster than (kbit/s)	10243/44103	3464/33922	3481/35055	2910/18756
Youtube Video				
Success Ratio/Start Time (%/s)	99.8/1.9	98.2/2.3	98.4/2.2	99.5/2.7
Playouts without Interruptions (%)	99.8	98.8	98.7	99.3
Average Video Resolution (p)	1078	1070	1070	1070



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