



*Bureau Telecommunicatie en Post*

*Statistical Publication*

# Telecommunication Services Performance Indicators

# 2019

CURAÇAO ICT SECTOR FIGURES COMPARED TO THE AMERICAS REGION



*Bureau Telecommunicatie en Post  
Regulatory Authority of Curaçao*

*Willemstad, Curaçao*

**September 2019**

**DISCLAIMER**

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## 1 ABOUT THIS REPORT

This report offers an overview of the trends in the telephony market (fixed and mobile), broadband market (fixed and wireless), subscription television market and other ICT-indicators. It is the sixth report that is based on data that Bureau Telecommunicatie en Post (BT&P) collected through an internationally standardized questionnaire from the International Telecommunication Union (ITU). The questionnaire was sent to operators in the first quarter of 2019, requesting them to provide the values on the point-in-time date of 31 December 2018 (from here on: EOY 2018). In this report the fixed and mobile-telephone subscription indicators for EOY 2018 are based on BT&P data that is collected separately from the ITU Questionnaire.

All benchmarking analysis are conducted on the previous year (EOY 2017) as the information of EOY 2018 from other sources were not readily available at the time of production of this document. Prices are collected by BT&P from local operators in this standardized questionnaire and then subsequently submitted to the ITU for its ‘ICT Price Basket’ analysis.

Telecommunication authorities of almost 200 countries collect the standardized questionnaire and ICT Price Basket information. In its policy for delivering data to the ITU, BT&P does not share what is considered to be market sensitive information belonging to operators. All available data is published yearly by the ITU in the ‘ITU Yearbook of Statistics’. Through the ITU World Telecommunication/ICT indicators (WTI) database (2019), BT&P was able to benchmark the Curaçao data against peers in the Caribbean region, South and Central America, and World averages. Relevant information can also be found in the yearly “ICT-Prices” publication by the ITU.

In addition, BT&P uses international studies and datasets from recognized bodies like the Central Bureau of Statistics to add interesting market information to this report. This is how BT&P keeps an eye on ICT-trends in various markets and is able to develop fact-based policy.

## 2 FIXED TELEPHONE NETWORK

### 2.1 Fixed-telephone subscriptions

The chart below shows Curaçao trend with fixed-telephone subscriptions access over the last 10 years. In the end of 2018, the number of fixed telephone subscriptions decreased to 58.2 thousand representing an overall 3.5 thousand decrease or 5.7 percent drop in subscriptions from the previous year. In Curaçao the proportion of fixed telephone access has decreased with 5.3% in EOY 2016 and increased with 4.2% in EOY 2017. The use of fixed telephone has changed considerably over the last 10 years. This change has come most probable from those subscribers using alternative apps for making calls via the internet. The proportion of households with fixed telephone access in Curaçao has generally been declining since 2009, but since 2012 the number of fixed telephone subscribers have maintained relatively stable.

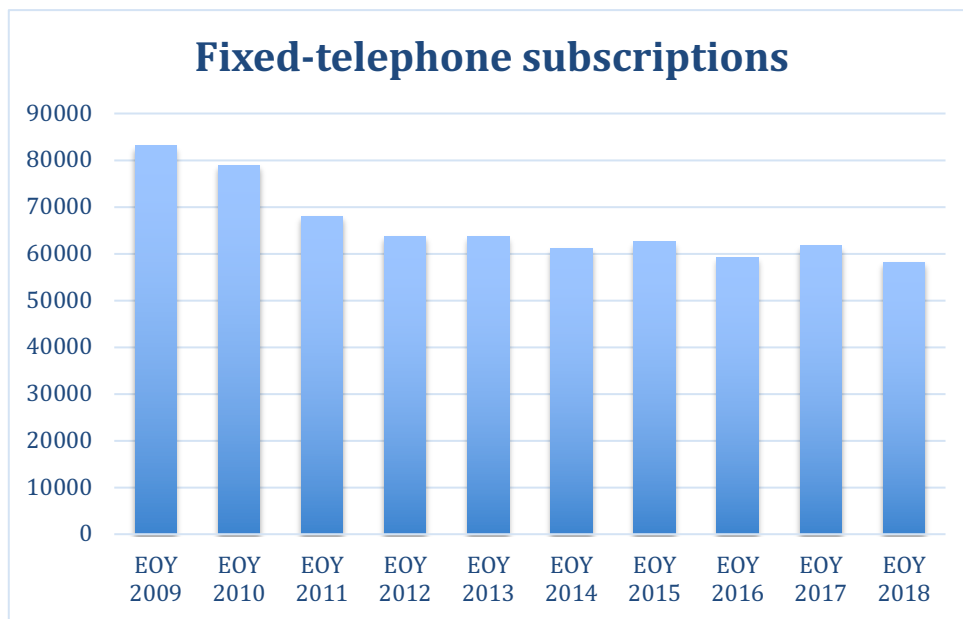


Figure 1: Fixed-telephone subscriptions, EOY 2009 - EOY 2018

## 2.2 Fixed-telephone subscriptions per 100 inhabitants

As the standard metric recognized internationally to measure the adoption of fixed voice services, fixed voice penetration is calculated based on the number of fixed voice subscriptions per 100 of the population. The EOY 2017 fixed voice penetration was calculated at 38.09, which is 3.56 percent, higher than the previous year. This means that in 2017 there were approximately 38 fixed voice subscriptions available to every 100 persons in Curaçao.

If compared to the region as shown in figure 2, Curaçao has the highest fixed-telephone subscription penetration rate. Curaçao scores slightly higher compared to developed<sup>1</sup> countries. The classification used according to the UN M49 results show the overall score for developed countries a score of 37,50, followed by 13.20 and 8.00 for world and developing respectively. See Appendix D1 for list of countries and source data.

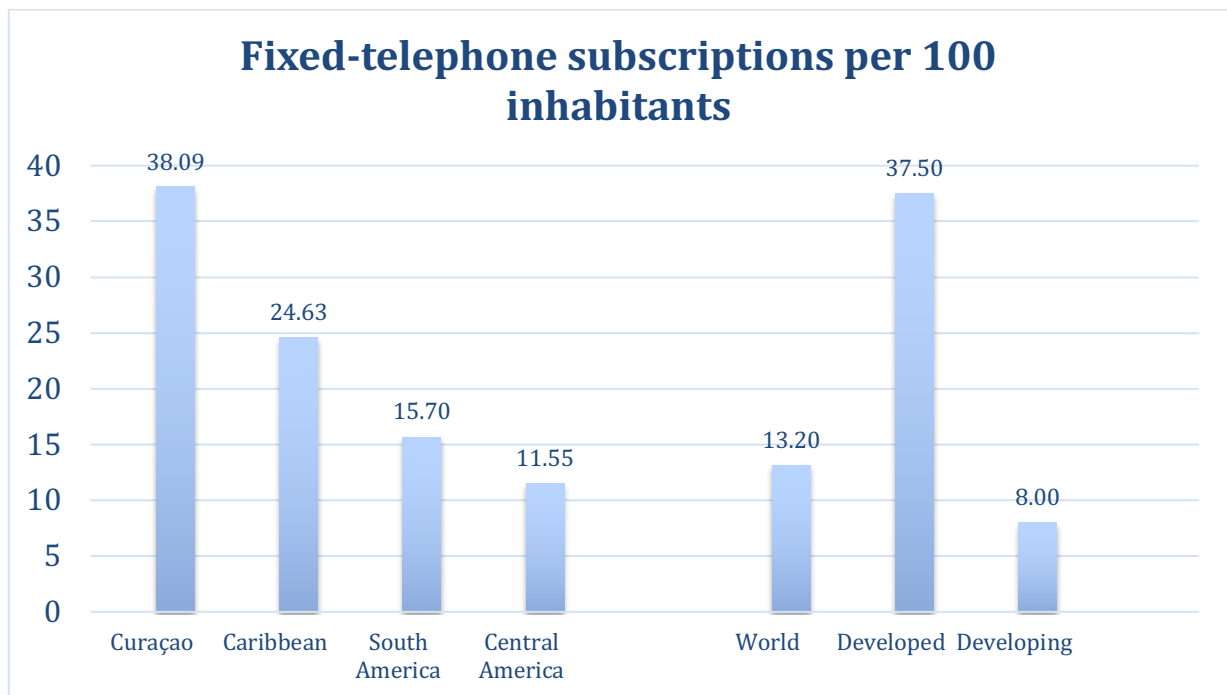


Figure 2: Fixed-telephone subscriptions per 100 inhabitants, EOY 2017  
Compared to the region and the World<sup>1</sup>

<sup>1</sup> The classification used for developed/developing countries is according to the UN M49. The M49 is a standard for area codes used by the United Nations for statistical purposes, developed and maintained by the United Nations Statistics Division. Based on the M49, countries are classified according to macro geographical regions and sub-regions, and selected economic and other groupings, see: <http://unstats.un.org/unsd/methods/m49/m49regin.htm>.

### 2.3 Fixed telephone tariff benchmark

Fixed telephone tariffs are internationally benchmarked by ITU through comparison of USD costs a three-minute call, including any call set-up charges and taxes. Both peak and off-peak calls are compared. See Appendix D2 for list of countries and source data.

A three-minute fixed-telephone peak call would cost 0.29 ANG/ 0.162 USD including taxes of 6% on Curaçao. This is calculated with the largest market share operator at a per-minute rate of 0.04 ANG and 0.17 ANG call set-up charge applied for each fixed local call. This is consistent with the previous two years. The largest market share operator makes no distinction between peak and off-peak prices. In the other regions there is a small difference of 0.01 USD between peak and off-peak prices. As shown in figure 3, for Curaçao the prices for peak and off-peak is higher if compared to the average costs in the Caribbean region, South and Central America. The average price of a three-minute fixed call in the Caribbean region would cost around 0.12 USD peak and 0.11 USD off-peak. For the Caribbean region, the British Virgin Island has the highest price of a three-minutes local call to a fixed-telephone line, around 0.51 USD as for peak and off-peak local calls. Cuba has the lowest rates in the Caribbean for a three-minutes local call to a fixed-telephone line, around 0.004 USD for peak and 0.002 for off-peak, followed by Jamaica with rates of 0.03 USD for peak and off-peak calls.

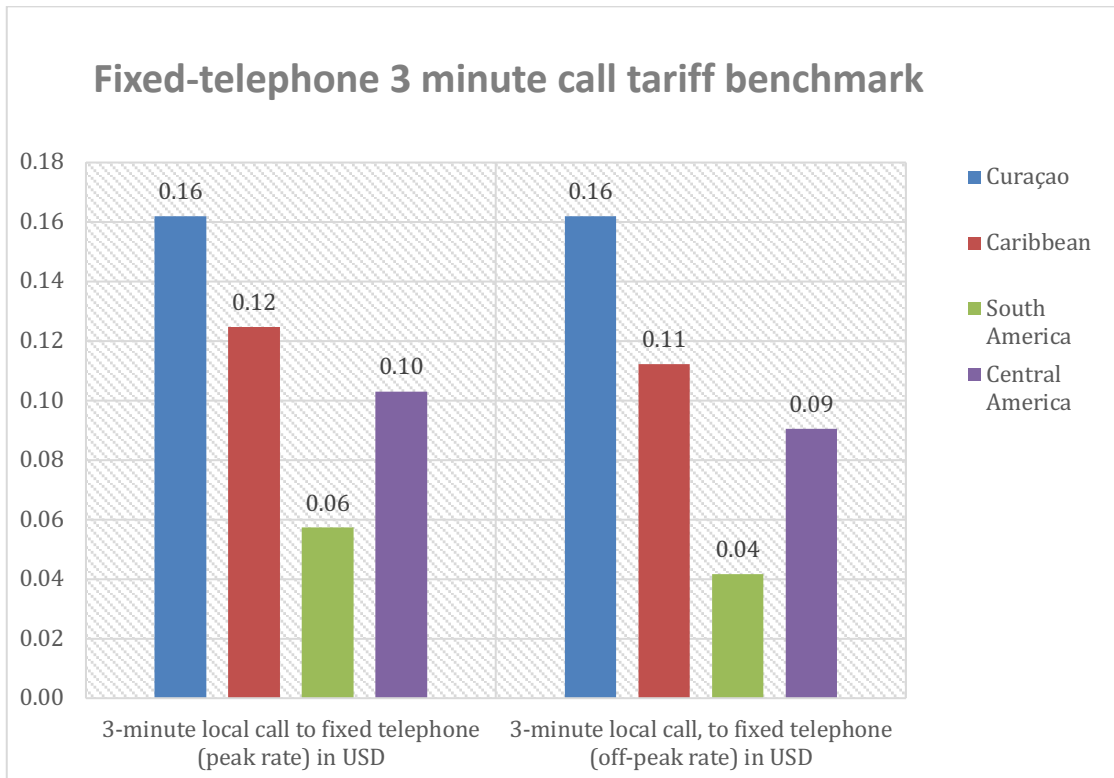


Figure 3: Fixed-telephone 3-minute call tariffs compared with the region in USD, EOY 2017

## 2.4 Affordability of fixed-telephone price sub-basket

While absolute prices are important, comparing these with the average net income per month for the country gives insight in affordability of fixed-telephone usage. ITU uses an international standardized “sub-basket” when comparing and benchmarking fixed-telephony prices. The fixed-telephone sub-basket is composed of the sum of the monthly subscription for fixed telephone services plus 30 local calls (15 peak and 15 off-peak) of 3 minutes each. The sub-basket is then divided by the average monthly income (GNI) per capita to know which portion of the monthly income would go for this portion of phone calls. For Curaçao, the sub-basket cost for EOY 2017 is 19.66 USD, which is the same as the previous year. This reflects a 1.20% of the GNI, which places Curaçao on the 14<sup>th</sup> position of affordability in the Caribbean, South and Central America region. Curaçao has also maintained his 14<sup>th</sup> position in comparison to previous year.

Rank	Economy	% of GNI	USD of fixed-tel sub-basket	Rank in 2016	GNI p.c., USD, 2017 (or latest available)
1	Cuba	0,06	0,34	1	7.000
2	Venezuela	0,27	1,55	2	7.000
3	Suriname	0,34	1,72	3	6.020
4	Trinidad and Tobago	0,44	5,68	5	15.350
5	Argentina	0,55	6,00	4	13.040
6	Bahamas	0,66	16,13	7	29.170
7	Uruguay	0,67	8,49	8	15.250
8	Aruba	0,72	14,47	6	24.000
9	St. Kitts and Nevis	0,87	11,61	11	16.030
10	Costa Rica	0,88	8,13	10	11.040
11	Panama	1,02	11,18	12	13.100
12	Antigua and Barbuda	1,08	12,78	13	14.170
13	Guyana	1,17	4,36	9	4.460
<b>14</b>	<b>Curaçao</b>	<b>1,20</b>	<b>19,66</b>	<b>14</b>	<b>19.594</b>
15	Puerto Rico	1,32	21,17	15	19.200
16	Ecuador	1,62	7,95	18	5.890
17	Grenada	1,67	13,41	21	9.650
18	Barbados	1,70	22,00	20	15.540
19	Peru	1,72	8,57	16	5.970
20	Mexico	1,77	12,69	19	8.610
21	St. Lucia	1,83	13,41	22	8.780
22	St. Vincent & Grenadines	1,86	10,86	23	6.990
23	Brazil	1,87	13,34	17	8.580
24	Chile	1,90	21,56	24	13.610
25	Dominica	2,16	12,56	26	6.990
26	Paraguay	2,17	7,07	25	3.920
27	El Salvador	2,79	8,27	11	3.560
28	Colombia	2,92	14,20	27	5.830
29	Dominican Republic	2,94	16,23	28	6.630
30	Honduras	3,29	6,18	30	2.250



## Telecommunication Services Performance Indicators

Selected Countries					
-	United States	0,17	8,21	--	58.270
-	Singapore	0,18	7,97	--	54.530
-	Malta	0,59	11,77	--	23.810
-	Netherlands	0,96	36,85	--	46.180

*Table 1 –Affordability of fixed-telephone sub-basket*

### 3 MOBILE-CELLULAR NETWORK

#### 3.1 Mobile-cellular telephone subscriptions

Over the past six years the mobile market in Curaçao experienced a continuous downward trend, with the exception of EOY 2017. In EOY 2017 the mobile market has slightly increased with 540 subscriptions, or 0.3 percent when compared to 2016. In 2018, mobile access continues again in the downward trend compared to the previous year. During the EOY 2018, the amount of mobile access decreased by 794 subscriptions, or 0.4 percent compared to EOY 2017. As Figure 4 below highlights, the mobile voice market has experienced a continuous 5 years downward trend since it peaked in EOY 2011 and a slight increase in the EOY 2017 reaching a total of 187.2 thousand subscriptions. In EOY 2018 the total amount of mobile subscriptions was of 186.4 thousand.

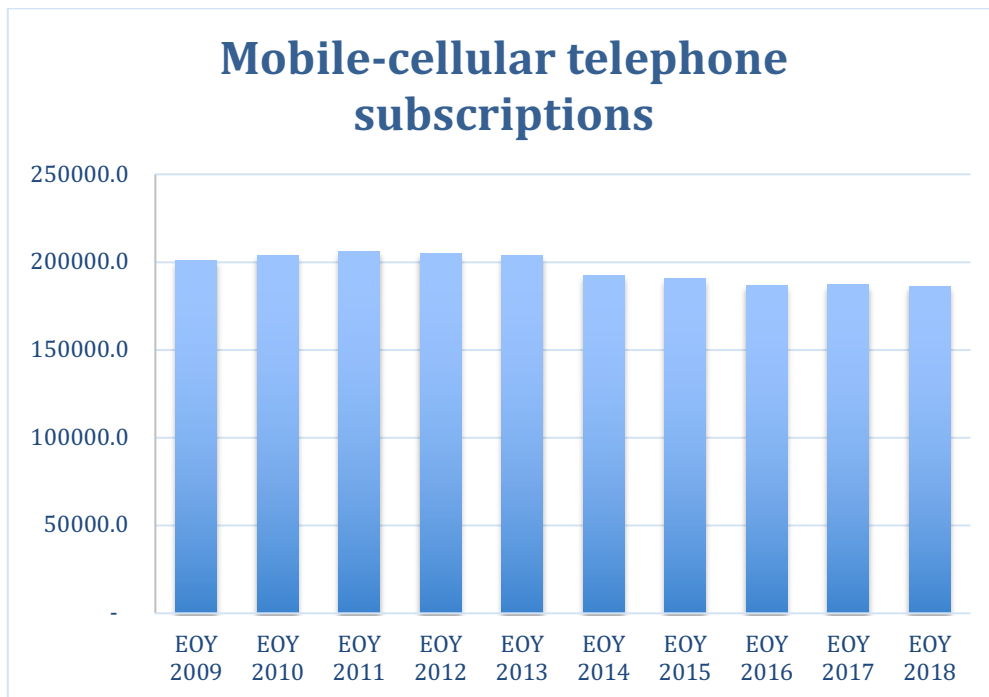


Figure 4: Mobile-cellular telephone subscriptions, EOY 2009 – EOY 2018

### 3.2 Mobile-cellular subscriptions prepaid versus postpaid ratio

Mobile voice subscriptions can be sub-divided into prepaid, where customers purchase credit prior to service use, and postpaid, where customers enter into a contractual billing arrangement with a mobile service provider. As shown in figure 5, the mobile market consists 89 percent out of prepaid subscriptions, while only 11 percent is postpaid by December 2018. The previous year the mobile market consisted of 93 percent prepaid and 7 percent postpaid. There has been a slight shift of 4 percent from prepaid towards postpaid subscriptions.

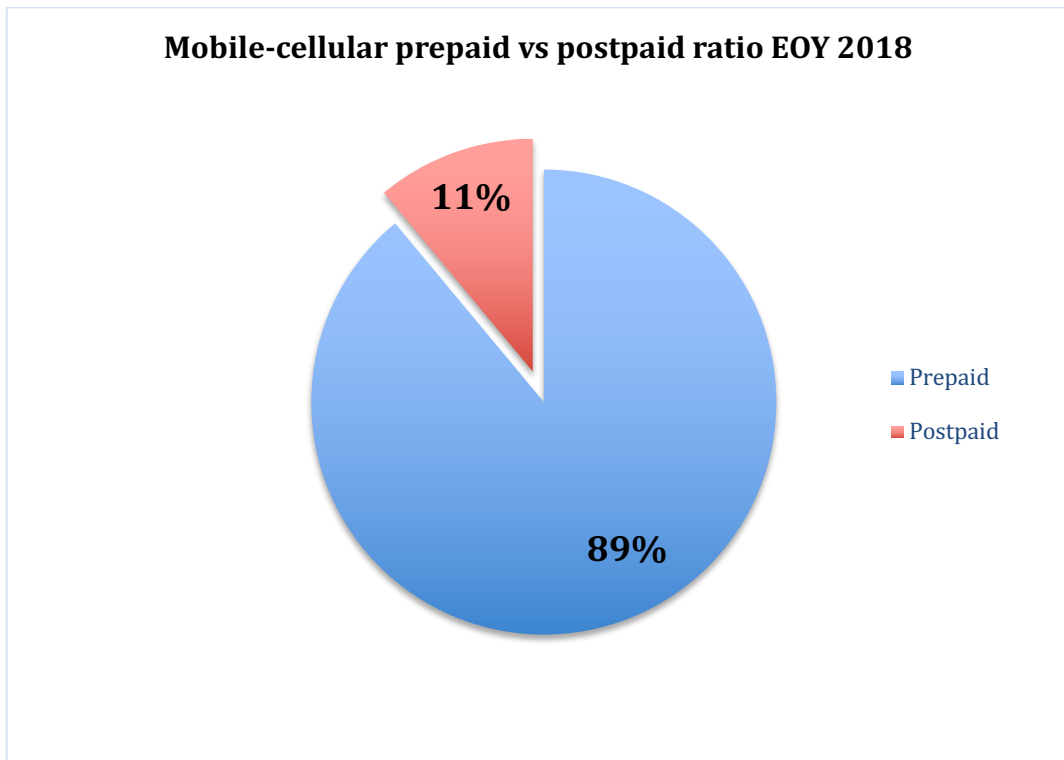


Figure 5: Mobile-cellular prepaid vs postpaid ratio, EOY 2018

### 3.3 Mobile-cellular subscriptions per 100 inhabitants

In December 2017, mobile penetration stood at 116. This means that there were approximately 116 mobile subscriptions per 100 inhabitants in Curaçao at the end of 2017. As shown in figure 6, the mobile penetration rates in Curaçao are comparable to region averages of the Caribbean, South American and Central American regions. See Appendix D1 for list of countries and source data.

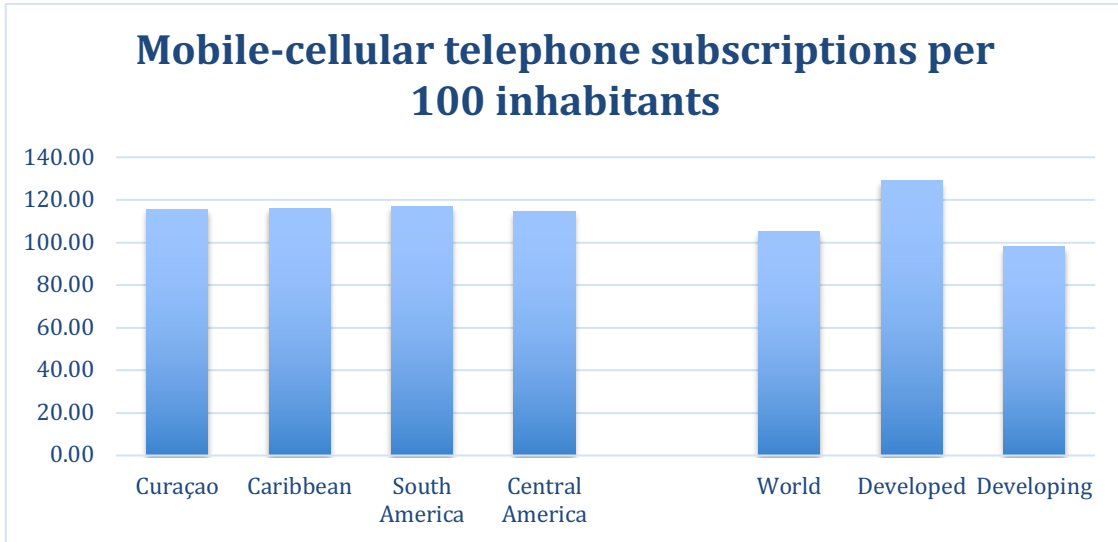


Figure 6: Mobile-cellular telephone subscriptions per 100 inhabitants, EOY 2017

Figure 7 shows a comparison of the numbers of mobile-cellular subscriptions per 100 inhabitants from 2009 to 2018. In Curaçao, there were approximately 117 mobile subscriptions per 100 inhabitants in 2018. The percentage value for the year 2018 is calculated by BT&P, by dividing the amount of subscription by the population.

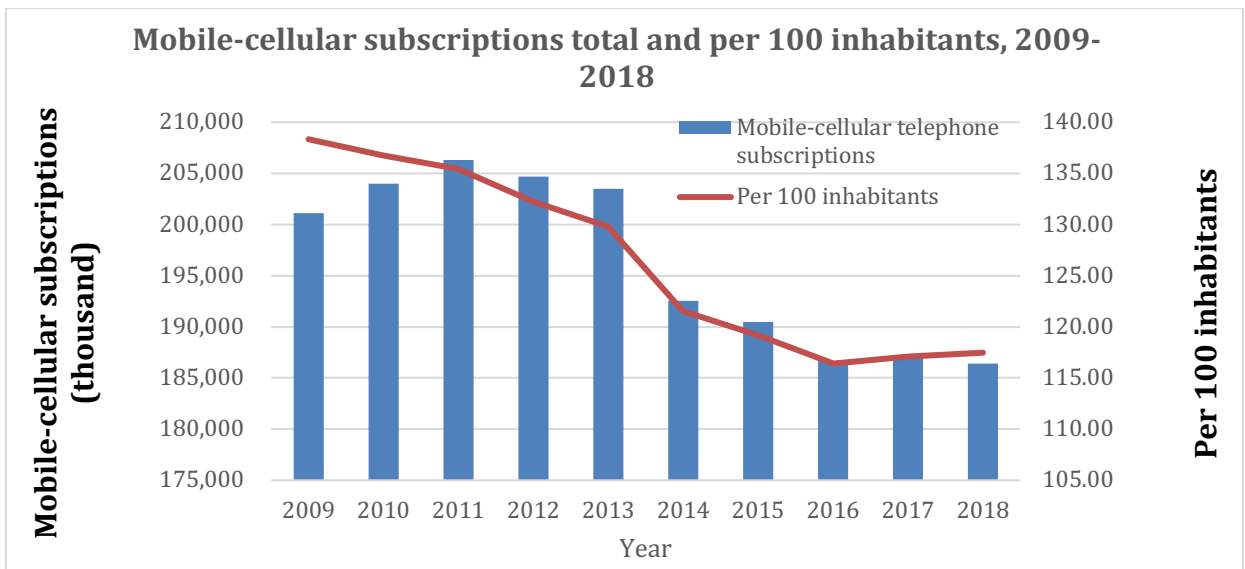


Figure 7: Mobile-cellular subscriptions total and per 100 inhabitants, EOY 2009- 2018

### 3.4 Mobile-cellular telephone tariff benchmark

Mobile-cellular telephone tariffs are benchmarked through comparison of USD costs of a one-minute call, including taxes. Both peak and off-peak calls are compared, both on-net and off-net. See Appendix D2 for list of countries and source data.

For example, in Curaçao the largest market share operator provides a slightly higher rate for off-net calls in comparison to on-net calls. They offered a prepaid plan where there is no difference in peak/off-peak. A one-minute mobile-cellular telephone peak/off-peak on-net call, would cost 0.39 USD and a one-minute mobile-cellular telephone peak/off-peak off-net call, would cost 0.41 USD in Curaçao end of year 2017. The prices per one-minute call includes 6% tax.

As shown in figure 8, both peak and off-peak, on-net and off-net prices are higher, if compared to the average costs in the Caribbean region and South and Central America. For example, the average price of a one-minute peak call, off-net, would be around 0,32 USD in the Caribbean.

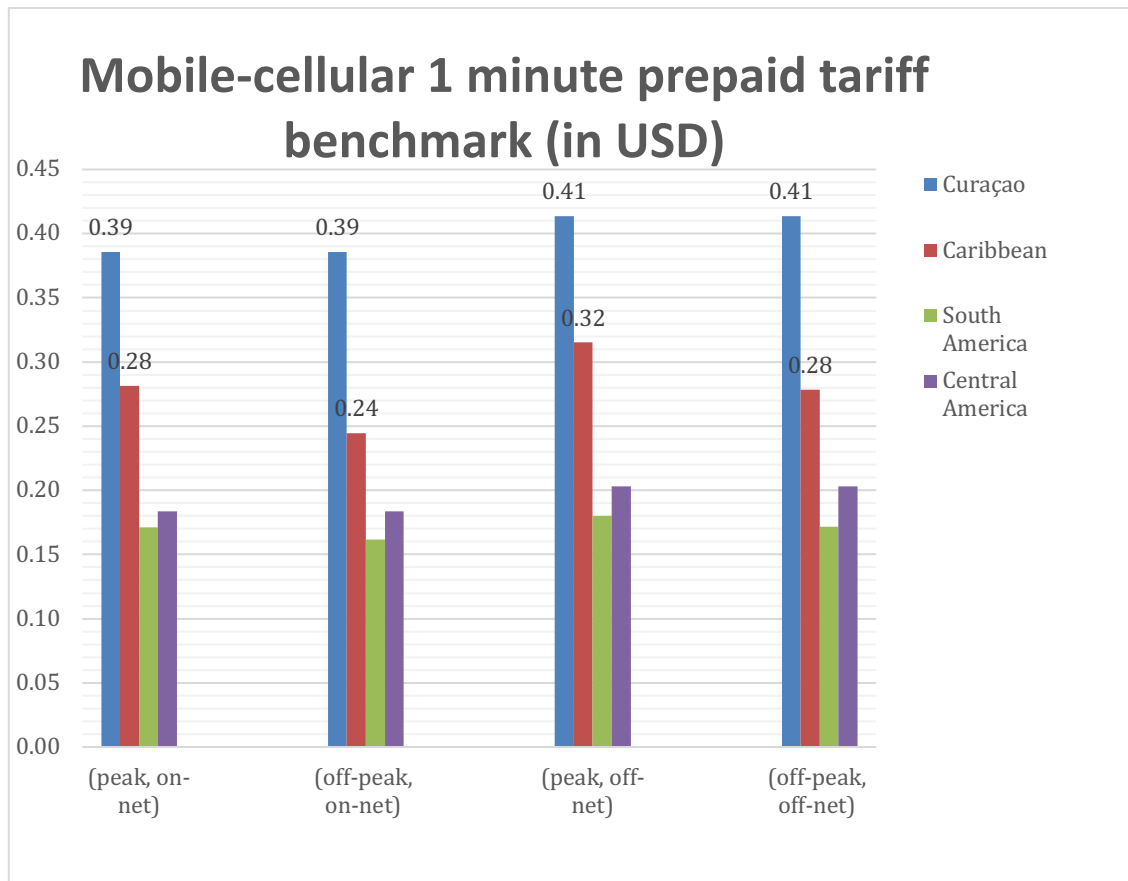


Figure 8: Mobile-cellular price of 1-minute call, compared to the region, EOY 2017

When looking at the trend in mobile-cellular prepaid tariffs in figure 9, the Curaçao prices has been stable for the last 6 years. In the rest of the Caribbean region, mobile prices have shown a relatively small overall increase over the last few years. However, the prices in Curaçao at this moment are still significantly higher than the Caribbean average. The price drop for the North America region since 2016 is mainly contributed due to the introduction of unlimited calling plans by telecom providers in the USA.

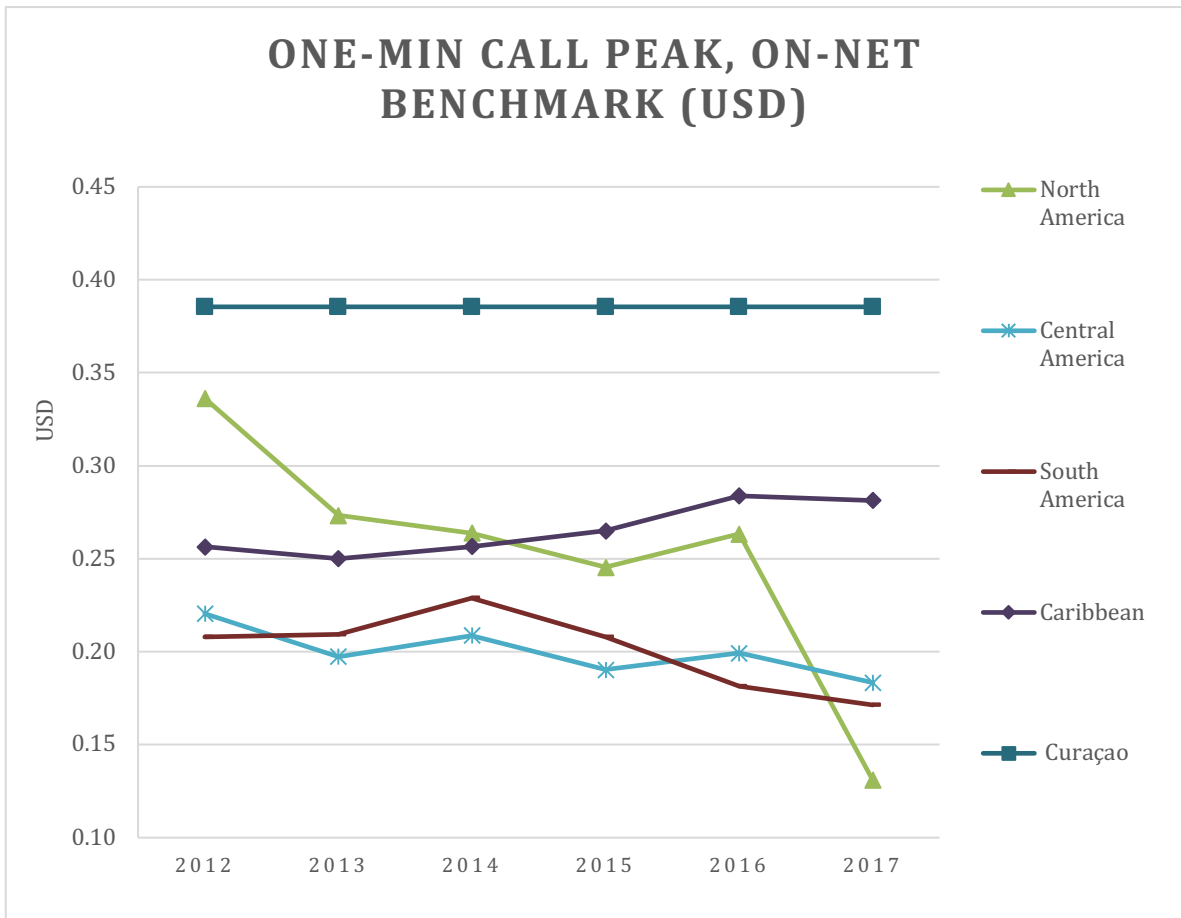


Figure 9: Mobile-cellular price of 1-min call peak, on-net, compared to the region, 2012-2017

### 3.5 Affordability of mobile-cellular price sub-basket

While absolute prices are important, comparing these with the average net income per month for the country gives insight in the affordability of mobile-cellular usage. The mobile-cellular sub-basket consists of 30 outgoing calls (both on-net, off-net and to a fixed line, and for peak, off-peak and weekend) in predetermined ratios, plus 100 SMS messages (50 SMS on-net and 50 SMS off-net). The sub-basket is then divided by the average monthly income (GNI) per capita to know which portion of the monthly income would go for this portion of phone calls. For Curaçao, this sub-basket will cost 35.07 USD, which relates to 2.15% of the GNI per capita, placing it on the 15<sup>th</sup> place in the region in terms of affordability. This represents a drop of 1 place in EOY 2017 compared to the year 2016 figures.

Rank	Economy	% of GNI	USD of mobile-cellular sub-basket	Rank in 2016	GNI p.c., USD, 2017 (or latest available)
1	Brazil	0,29	2,10	2	8.580
2	Costa Rica	0,45	4,11	1	11.040
3	Bahamas	0,77	18,79	3	29.170
4	Mexico	0,91	6,51	4	8.610
5	Chile	1,10	12,48	9	13.610
6	Panama	1,24	13,59	6	13.100
7	Trinidad and Tobago	1,29	16,46	5	15.350
8	Aruba	1,31	26,14	7	24.000
9	Uruguay	1,39	17,64	8	15.250
10	Jamaica	1,56	6,16	17	4.750
11	Paraguay	1,82	5,94	10	3.920
12	St. Kitts and Nevis	1,88	25,10	11	16.030
13	Argentina	2,00	21,68	13	13.040
14	Venezuela	2,08	12,14	--	7.000
<b>15</b>	<b>Curaçao</b>	<b>2,15</b>	<b>35,07</b>	<b>14</b>	<b>19.594</b>
16	Peru	2,15	10,71	12	5.970
17	Dominican Republic	2,40	13,27	19	6.630
18	Antigua and Barbuda	2,55	30,12	20	14.170
19	Suriname	2,61	13,11	15	6.020
20	Barbados	2,64	34,14	16	15.540
21	Colombia	2,72	13,23	18	5.830
22	Grenada	2,96	23,77	21	9.650
23	Ecuador	3,07	15,09	24	5.890
24	Guyana	3,60	13,38	25	4.460
25	Cuba	3,68	21,46	22	7.000
26	St. Lucia	3,77	27,56	26	8.780
27	Bolivia	3,96	10,32	27	3.130
28	Dominica	3,99	23,24	23	6.990
29	St. Vincent & Grenadines	4,73	27,54	29	6.990
30	El Salvador	5,27	15,63	28	3.560

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<b>Selected Countries</b>					
-	United States	--	--	--	58.270
-	Singapore	0,17	7,92	--	54.530
-	Netherlands	0,74	28,47	--	46.180
-	Malta	0,86	17,05	--	23.810

*Table 2 –Affordability of mobile-cellular sub-basket (EOY 2017)*



### 3.6 Mobile broadband subscriptions

In the mobile internet market, 2013 experienced a jump in technology with the introduction of High-Speed Packet Access (HSPA+) by the operators in Curaçao. The jump to 3G networks has paved the way for the provision of services at broadband mobile internet access speeds, a significant step up from the 2.5G technology (i.e. Enhanced Data Rates for GSM Evolution – EDGE). With the introduction of LTE over the last four years, the total number of subscriptions has reached even higher numbers. However, we see a decrease of 9.1 percent over the last year going back to a total number of mobile broadband subscriptions of 81.3 thousand at EOY 2018.

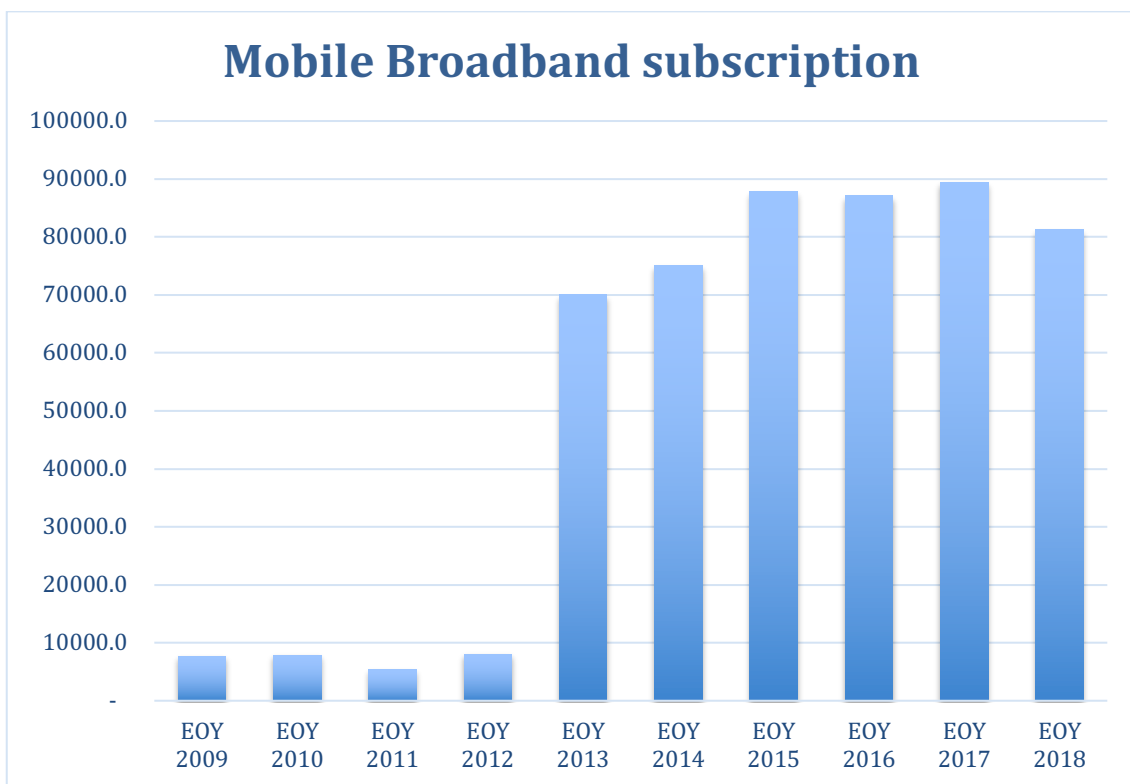


Figure 10: Wireless Broadband subscriptions, EOY 2009 – EOY 2018

## 4 FIXED BROADBAND

### 4.1 Fixed broadband subscriptions

Telecommunication service providers in Curaçao use a mix of technologies to provide fixed broadband internet services to the public. Fixed broadband internet services employ Digital Subscriber Line (DSL) over copper cables, Hybrid Fiber-Coax (HFC) networks utilizing DOCSIS 3.0 technology, as well as a mix of Fiber to the Curb (FttC), Fiber to the Business (FttB), or Fiber to the Home (FttH) topologies and terrestrial fixed-wireless broadband (i.e. fixed WiMAX and other fixed-wireless technologies).

The market for fixed broadband<sup>2</sup> subscriptions continues to show growth in 2018. Figure 11 illustrates the figures for fixed broadband subscriptions of 48.1 thousand subscriptions end of year 2018. The growth thereby represents an increase of 4.2 percent or 1.9 thousand subscriptions compared to December 2017. The presented numbers are based on residential subscriptions and may include small businesses. Fixed broadband subscriptions contracted by public and private organizations (non-residential customers), are not considered in this analysis. The fixed (wired) internet penetration has reached a level of 81.5% in EOY 2018 on terms of connected households.

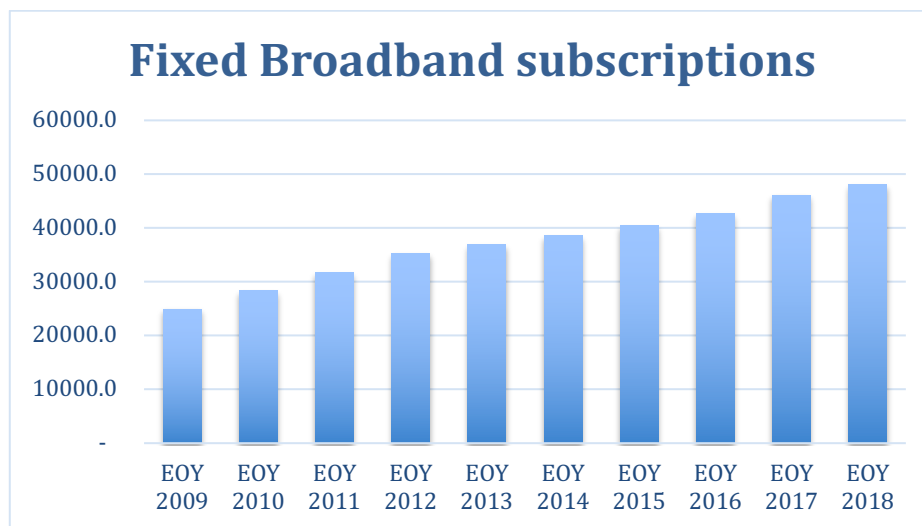


Figure 11: Fixed (wired) broadband subscriptions, EOY 2009 - EOY 2018

<sup>2</sup> To be able to compare to other countries and the region, this report defines broadband by the following international definition. Fixed (wired)-broadband subscriptions refers to subscriptions to high-speed access to the public Internet (a TCP/IP connection), at downstream speeds equal to, or greater than, 256 kbit/s. This includes cable modem, DSL, fibre-to-the-home/building and other fixed (wired)-broadband subscriptions. In following years (EOY 2016 and up) the definition also includes wireless-fixed broadband.

## 4.2 Fixed (wired) broadband subscriptions by speed

Total Fixed (wired) broadband subscription reached 49.4 thousand for the EOY 2018. The Fixed (wired) broadband speeds between 30 Mbit/s to less than 100 Mbit/s represents the largest category in EOY 2018, nearly 36 percent of the total users. In EOY 2018, 33 percent of the Fixed (wired) broadband subscriptions were of speeds between 2 Mbit/s to less than 10 Mbit/s, whereas 31 percent of the subscriptions were of speeds between 10 Mbit/s to less than 30 Mbit/s. The speed group below 2 Mbit/s has diminished in the last few years, as the Fixed (wired) broadband subscriptions for this category are not available anymore since EOY 2017. The lowest available entry-level fixed (wired) internet subscription in Curaçao starts at 5 Mbps download speed. The speed group above 100 Mbit/s is still relatively small but growing slowly.

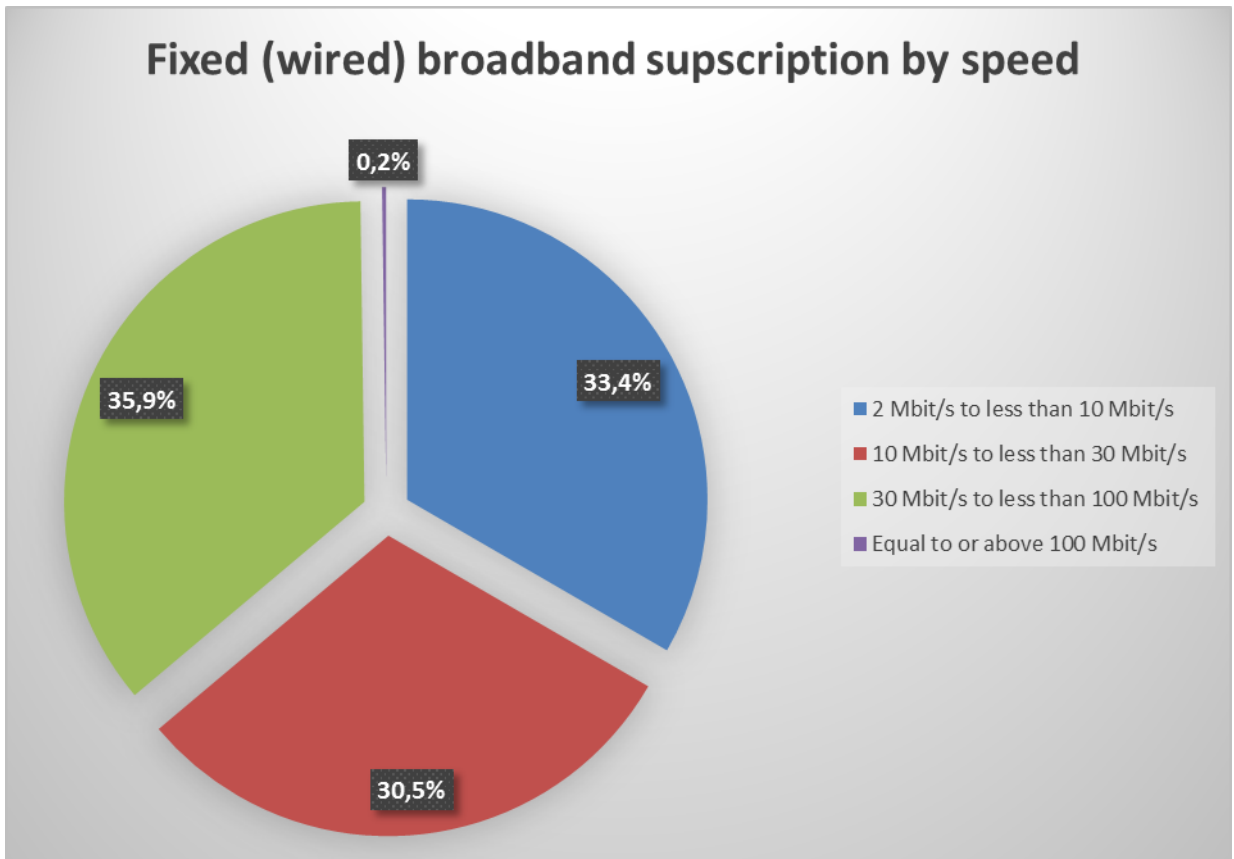


Figure 12: Fixed (wired) broadband subscriptions by speed, EOY 2018

In figure 13, an overview with the comparison of the fixed (wired) broadband subscriptions by speed over the year end 2017 and 2018 is shown. The trend below is particularly significant in Curaçao, where fixed (wired) broadband access rates have decrease by 15.3% in the Fixed (wired) broadband speeds between 10 Mbit/s to less than

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30 Mbit/s, while the higher Fixed (wired) broadband speeds between 30 Mbit/s to less than 100 Mbit/s have increased by 19.9%.

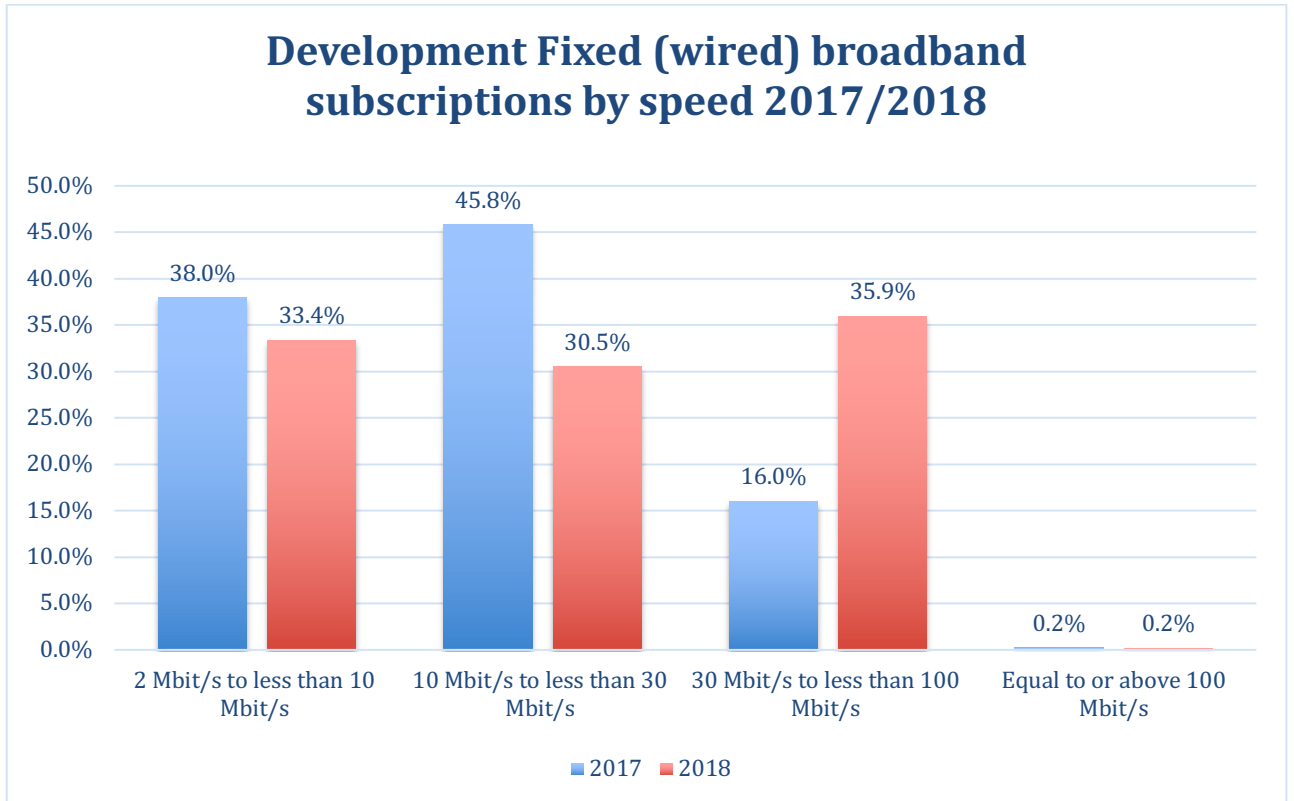


Figure 13: Development Fixed (wired) broadband subscriptions by speed EOY 2017/2018

### 4.3 Fixed (wired) broadband subscriptions per 100 inhabitants

In December 2017, Curaçao had a fixed (wired) Broadband penetration of 30.5 in terms of population. This implies that there were approximately 31 fixed (wired) Internet subscriptions for every 100 inhabitants in Curaçao. In comparison with EOY 2016, there is a considerable increase of 14.9% fixed (wired) Internet subscriptions for every 100 inhabitants in Curaçao. This is mainly contributed to a shift in the market from operators providing wireless data services to fixed wired services.

If compared to the region as shown in figure 14, Curaçao has a remarkable higher fixed (wired)-broadband subscription penetration rate to the Caribbean region. See Appendix D1 for list of countries and source data. This indicator for Curacao is also equally as high to the most developed countries in the world.

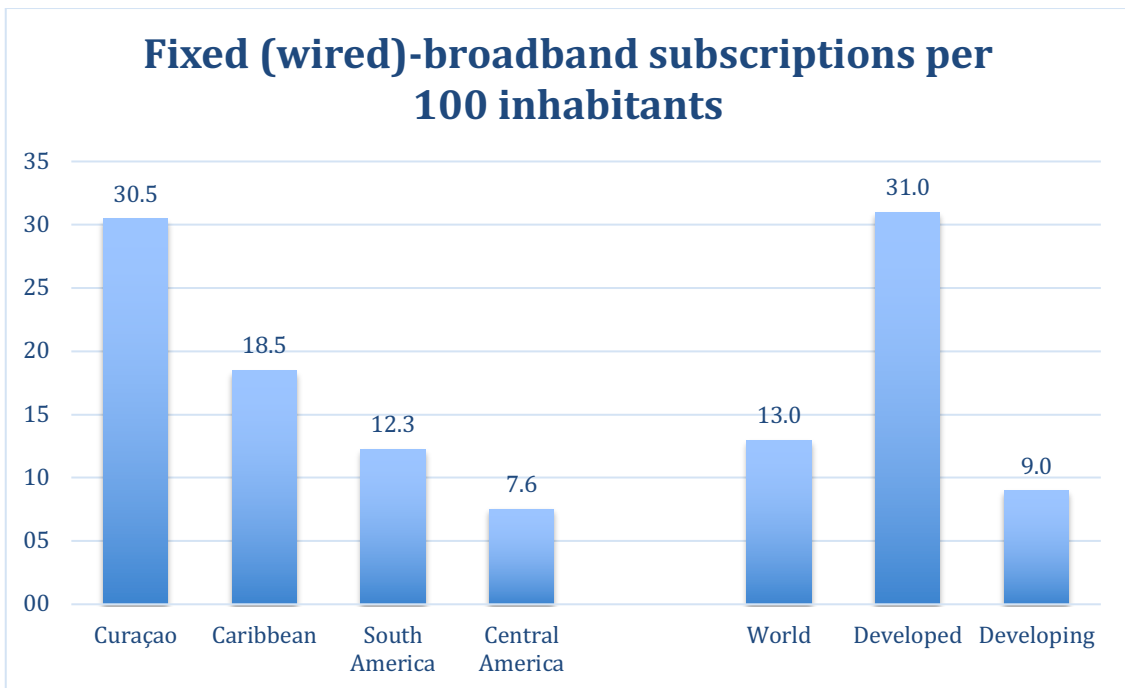


Figure 14: Fixed (wired) Broadband subscriptions per 100 inhabitants, EOY 2017

#### 4.4 List of broadband penetration in the Caribbean region, South and Central America

Compared to the top list of broadband internet subscription per 100 inhabitants of the Caribbean region, South and Central America, Curaçao ranks 2<sup>nd</sup> in December 2017, in a ranking list of countries of which data is available. Curaçao ranking as compared to the previous year, shows a remarkable increase of one place. Curaçao moved up from a sixth-place ranking in EOY 2015 to 3<sup>rd</sup> place in EOY 2016 and to a 2<sup>nd</sup> place in EOY 2017.

Rank	Economy	Fixed (wired) Broadband subscriptions per 100 inhabitants
1	Barbados	31,21
<b>2</b>	<b>Curaçao</b>	<b>30,46</b>
3	Uruguay	27,74
4	Trinidad and Tobago	23,61
5	Bahamas	22,75
6	Dominica	21,58
7	Puerto Rico	20,86
8	Grenada	20,05
9	Argentina	17,85
10	Saint Lucia	17,56
11	Saint Vincent and the Grenadines	17,55
12	Saint Kitts and Nevis	16,65
13	Chile	16,59
14	Costa Rica	15,03
15	Brazil	13,91
16	Mexico	13,75
17	Colombia	12,94
18	Suriname	12,48
19	Panama	10,74
20	Ecuador	10,03
21	Antigua and Barbuda	9,43
22	Venezuela	8,87
23	Guyana	8,37
24	Jamaica	8,19
25	Dominican Rep.	7,48
26	Peru	7,35
27	El Salvador	7,06
28	Belize	5,06
29	Paraguay	4,05
30	Bolivia	3,39

Selected Countries		
-	Netherlands	42,36
-	Malta	41,40
-	United States	34,00
-	Singapore	25,85

Table 3 - List of broadband penetration in the Caribbean region

#### 4.5 Average download speeds

Similar to the last years, the year average download speed continued its upward trend in 2018 as illustrated in Figure 15. In 2018, the estimated average download speed recorded was approximately 22.00 Mbit/s. Average yearly download speed data in 2018 is calculated from the largest market share operator weighted average of subscriptions per speed<sup>3</sup> and validating this against the average download speeds as indicated by the Ookla Speedtest.net online tool.

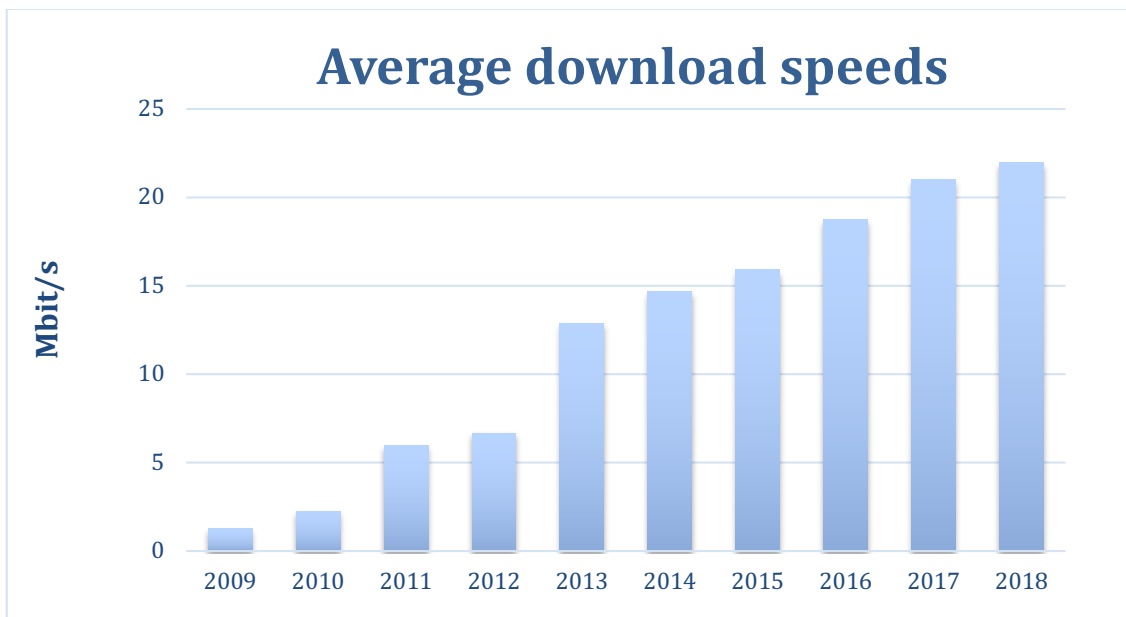


Figure 15: Download speeds (year average), 2009 – 2018

<sup>3</sup> Additional market intelligence is added to the average download speed analysis by applying a relevant factor for the real time user experience vs. the actual offered speed by the ISP.

#### 4.6 Affordability entry-level broadband plans compared with the region

Fixed-broadband prices have been collected by BT&P and compared with available ITU data regarding broadband prices. To be able to compare affordability and prices of Curaçao with the region, BT&P is following the ITU method for comparison of entry-level broadband plans. This fixed-broadband plan chosen represents an entry-level postpaid fixed-broadband plan, with a minimum speed of 256 kbit/s and a monthly usage of (a minimum of) 1 Gigabyte (GB). The prices of the operator with the largest market share (measured by the number of subscriptions) are used. For plans that are limited in terms of data allowance (below 1 GB), the cost per additional byte is added to the monthly subscription price up to 1 GB. Prices are presented in USD and also calculated as a percentage of the GNI per capita, to provide an insight into the affordability of fixed broadband. Countries are ranked according to the price of fixed broadband as a percentage of GNI p.c. The lower the percentage, the lower the relative cost of the service.

For Curaçao, the entry-level plan would be the 57,94 ANG / 32,37 USD internet service for the largest market share operator with a speed of 8 Mbit/s, including taxes. The Gross National Income (GNI) per capita is collected through the Central Bureau of Statistics with a value of 35'072 ANG/19'594 USD (latest figure, 2017). Therefore, the entry-level broadband plan costs 1.98% of the GNI per capita in Curaçao, clearly meeting the United Nations Broadband Commission for Sustainable Development 2025 target<sup>4</sup> of 2%.

Curaçao ranks 5<sup>th</sup> in terms of affordability compared to countries in the Caribbean region, South and Central America.

Rank	Economy	% of GNI	Fixed (wired) broadband monthly subscription charge in USD	Speed in Mbit/s	GNI p.c., USD, 2017 (or latest available)
1	Bahamas	1,23	29,99	1,00	29.170
2	Trinidad and Tobago	1,58	20,20	3,00	15.350
3	Costa Rica	1,88	17,27	1,00	11.040
4	Panama	1,96	21,35	4,00	13.100
<b>5</b>	<b>Curaçao</b>	<b>1,98</b>	<b>32,37</b>	<b>8,00</b>	<b>19.594</b>
6	Puerto Rico	2,09	33,44	1,00	19.200

<sup>4</sup> <https://www.broadbandcommission.org/about/Pages/default.aspx>



## Telecommunication Services Performance Indicators

7	Brazil	2,41	17,20	0,50	8.580
8	Mexico	2,57	18,44	10,00	8.610
9	St. Kitts and Nevis	2,74	36,67	6,00	16.030
10	Chile	2,85	32,35	30,00	13.610
11	Aruba	2,86	57,24	100,00	24.000
12	Barbados	2,90	37,50	35,00	15.540
13	Peru	3,02	15,03	2,00	5.970
14	Antigua and Barbuda	3,61	42,59	10,00	14.170
15	Argentina	3,61	39,24	3,00	13.040
16	Colombia	4,04	19,62	5,00	5.830
17	Dominican Republic	4,20	23,22	2,00	6.630
18	St. Lucia	4,51	32,97	2,00	8.780
19	Grenada	4,56	36,67	15,00	9.650
20	Venezuela	4,67	27,27	1,00	7.000
21	Ecuador	4,77	23,41	5,00	5.890
22	Belize	5,33	19,50	0,50	4.390
23	Dominica	5,53	32,20	2,00	6.990
24	St. Vincent & Grenadines	5,83	33,94	2,00	6.990
25	Guatemala	5,99	20,28	2,00	4.060
26	Suriname	6,04	30,29	3,00	6.020
27	Paraguay	7,08	23,14	3,00	3.920
28	El Salvador	7,45	22,09	3,00	3.560
29	Guyana	7,82	29,05	1,50	4.460
30	Jamaica	8,74	34,59	20,00	4.750

Selected Countries					
-	Singapore	0,80	36,14	500,00	54.530
-	Netherlands	1,02	39,44	20,00	46.180
-	United States	1,03	49,99	100,00	58.270
-	Malta	1,70	33,81	70,00	23.810

*Table 4 - Affordability entry-level broadband plan*

#### 4.7 Measuring progress towards the SDGs

One of the main targets of the Bureau Telecommunicatie en Post as regulator of the telecommunications and ICT-sector is to create a well-balanced and healthy competitive environment for service providers at one hand, but then also with the necessary elements to promote availability, accessibility and affordability (universal access) of broadband internet to the whole community. A well-connected nation has much better opportunities to equally participate in the worldwide digital economy and this on its turn will realize much better overall economic developments and progress.

With the previous analyzed broadband internet indicators from paragraph 4.1 to 4.6 (broadband penetration levels by households and individuals, entry-level internet packages, subscriptions by speed categories, average download speeds and affordability) it can be concluded that Curacao is on a good way towards the United Nation's Sustainable Development Goal (SDG) number 9: "Industry, Innovation and Infrastructure".



One of the targets is to significantly increase access to information and communications technology and strive to provide universal and affordable access to the Internet by the year 2020. While Curacao ranks number 6<sup>th</sup> in terms of affordability with the rest of the region, it should be noticed that Curacao exceeds the other countries by far in terms of entry-level speed (8 Mbps) and accordingly this will position Curacao at the top of the list if analyzed on a per Mbps scenario (see table 4).

## 5 OTHER INDICATORS

### 5.1 International internet bandwidth

The international internet bandwidth refers to the average traffic load (expressed in Mbit/s) of international subsea fiber optic cables for carrying internet traffic. The used international internet bandwidth is estimated at 26.300 Mbit/s in December 2018. This figure refers to the total of used capacity over the fiber-optic cables connecting Curaçao to the rest of the world over a 12-month period for all operators combined. This figure is an estimation based on data received by the telecom providers with international capacity and information gathered from the local AMS-IX Caribbean internet exchange.

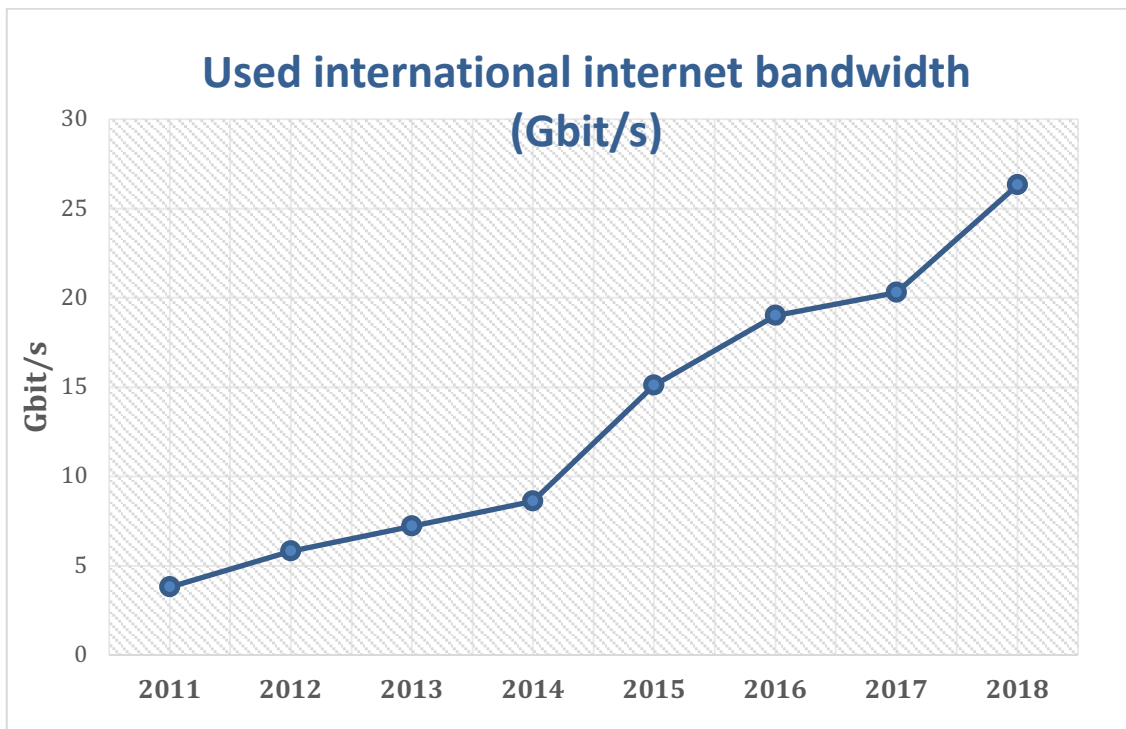


Figure 16: Used international internet bandwidth (Gbit/s), 2011-2018

## 5.2 ICT Price Basket

The cost and affordability of ICT services remain a determining factor for ICT uptake. As such, it is important to measure and benchmark the ICT market prices. To be able to benchmark the affordability of ICT services, BTP adopted the “ICT Price Basket” (IPB) methodology from the ITU. The IPB is relevant as a basic benchmarking tool that allows countries to assess their relative affordability of ICT prices, evaluate progress over time and identify challenges and shortcomings.

The IPB is a composite basket that includes three price sets, referred to as sub-baskets: the fixed-telephone, mobile-cellular and fixed broadband sub-basket (figure 17).

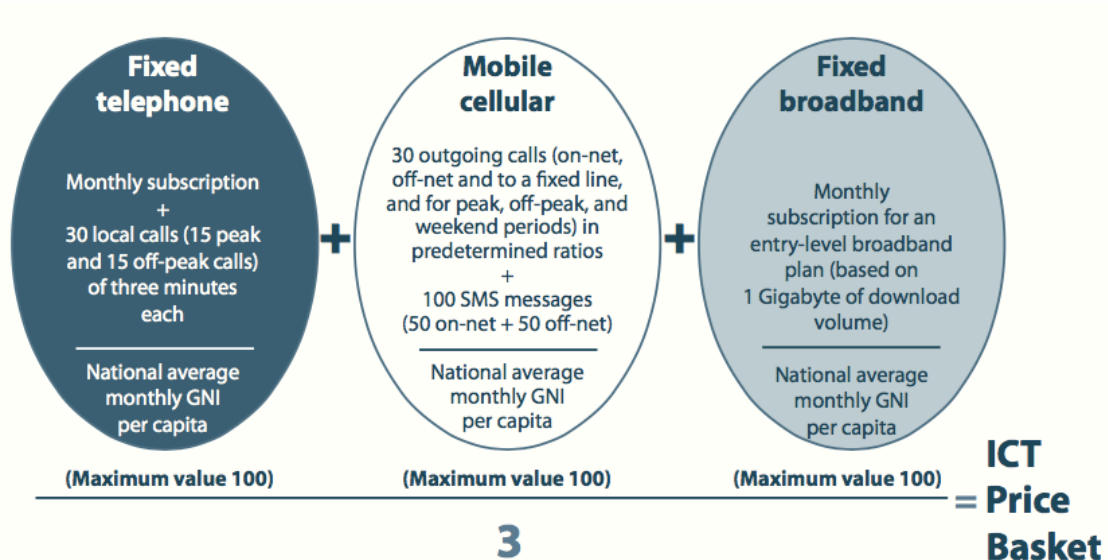


Figure 17: ICT Price Basket methodology

In this report, the three sub-baskets are calculated at 1.20% for fixed-telephone (paragraph 2.4), 2.15% for mobile-cellular (paragraph 3.5) and 1.98% for the fixed-broadband sub-basket (paragraph 4.6). The IPB for Curaçao end of year 2017, is the average of the three sub-baskets and values 1.8%.

This places Curaçao on a 10<sup>th</sup> position in the Caribbean, South and Central America region. The Bureau Telecommunicatie en Post will reassess the IPB every year to evaluate progress over time and determine the position of Curacao in the digital economy.

## Telecommunication Services Performance Indicators

Rank	Economy	IPB 2017
1	Uruguay	0,7
2	Bahamas	0,9
3	Costa Rica	1,1
4	Trinidad and Tobago	1,1
5	Puerto Rico	1,1
6	Panama	1,4
7	Brazil	1,5
8	Aruba	1,6
9	Mexico	1,7
<b>10</b>	<b>Curaçao</b>	<b>1,8</b>
11	St. Kitts and Nevis	1,8
12	Chile	2,0
13	Argentina	2,1
14	Peru	2,3
15	Venezuela	2,3
16	Barbados	2,4
17	Antigua and Barbuda	2,4
18	Suriname	3,0
19	Grenada	3,1
20	Ecuador	3,2
21	Dominican Republic	3,2
22	Colombia	3,2
23	St. Lucia	3,4
24	Paraguay	3,7
25	Dominica	3,9
26	St. Vincent & Grenadines	4,1
27	Guyana	4,2
28	Jamaica	4,6
29	El Salvador	5,2
30	Belize	5,8
31	Guatemala	6,3
32	Bolivia	7,6
33	Honduras	8,4
34	Cuba	11,5
35	Nicaragua	11,8
36	Haiti	33,2

Selected Countries		
-	Singapore	0,4
-	United States	0,4
-	Netherlands	0,9
-	Malta	1,1

*Table 5 – ICT Price Basket benchmark compared with the region*

### 5.3 Terrestrial multichannel TV-subscriptions

The subscription television or pay-tv market on Curaçao is provided by several players utilizing different technologies varying from Multichannel Multipoint Distribution Systems (MMDS), Hybrid Fiber-Coax (HFC) networks with DOCSIS 3.0 technology, IPTV-services over Fiber to the Home (FttH) networks, and satellite-TV<sup>5</sup> to deliver analogue and digital television channels.

The local subscription television market in 2018 showed again a considerable drop in comparison with the previous year as illustrated in Figure 18. End of year 2018, the total number of terrestrial multichannel TV subscriptions is 24.5 thousand compared to 26.7 thousand the year before. This represents an overall 2.2 thousand drop or 8.2% decrease in subscriptions.

This is a natural phenomenon, and this trend will most likely continue for the next few years, as with the evolution of the internet, Over-the-Top (video) services and applications are gaining more and more popularity.

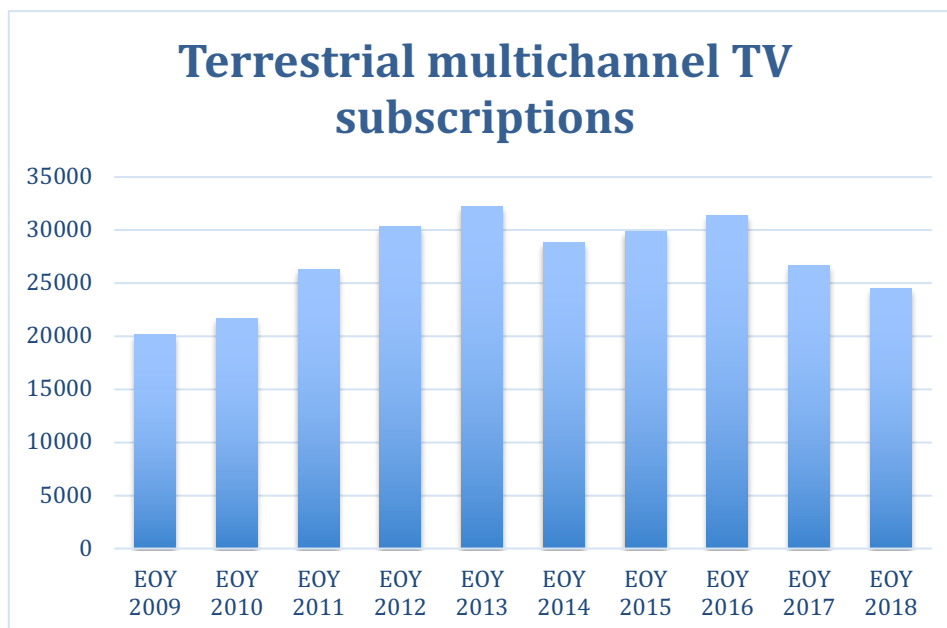


Figure 18: Terrestrial multichannel TV subscriptions, EOY 2009 – EOY 2018

<sup>5</sup> Satellite-TV is not analyzed in this study as these are not considered to be part of terrestrial (cable-television) services.

## Appendix A - Trends 2009-2018 for Curaçao

How to read the data:

1. Thousands are separated by an apostrophe (') and decimals by a period (.).
2. Other symbols used:

... or "blank"	Data not available (yet).
	Zero or a quantity less than the unit shown. Also used for data items that are not applicable.
Italics	Data in italics are BTP estimates.

3. Telecommunication/ICT data have been obtained from replies to ITU questionnaires from operators and the national statistics office. The main source of the telecommunication/ICT data for each economy is shown in the list of sources, see Appendix D.
4. The Yearbook has been prepared by the Bureau Telecommunicatie en Post Curaçao. Comments should be addressed to: Mr. Leonardo de Abreu Ladeira, Senior Policy and Market Regulation Advisor, Bureau Telecommunicatie en Post, Beatrixlaan 9, Willemstad, Curaçao.
5. Please refer to Appendix B for definitions.
6. Information about ITU statistics is available on: <http://www.itu.int/ITU-D/ict>

## Telecommunication Services Performance Indicators

### CURAÇAO

INDICATOR	EOY 2011	EOY 2012	EOY 2013	EOY 2014	EOY 2015	EOY 2016	EOY 2017	EOY 2018
<b>DEMOGRAPHY, ECONOMY</b>								
Population	151378	152798	154843	156971	158969	160337	160012	158665
Households	54834	55233	55751	56494	57274	58010	58384	N/A
<b>FIXED TELEPHONE NETWORK</b>								
Fixed-telephone subscriptions	68070	63754	63715	61130	62571	59231	61709	58183
Fixed-telephone subscriptions per 100 inhabitants	44.97	41.72	41.15	38.94	39,36	36,78	38,09	36,67
Price of a three-minute local call to a fixed-telephone line, peak rate, in USD	...	0.17	0.17	0.17	0.17	0.16	0.16	0.16
Price of a three-minute local call to a fixed-telephone line, off-peak rate, in USD	...	0.17	0.17	0.17	0.17	0.16	0.16	0.16
<b>MOBILE-CELLULAR NETWORK</b>								
Mobile-cellular telephone subscriptions	206294	204702	203502	192569	190489	186644	187184	186390
Mobile-cellular subscriptions per 100 inhabitants	136.28	133.97	131.42	122.68	119.81	115.89	115.54	117.47
Mobile-cellular prepaid – price of a one-minute local call (peak, on- net) in USD	...	0.39	0.39	0.39	0.39	0.39	0.39	0.39
Mobile-cellular prepaid – price of a one-minute local call (off-peak, on-net) in USD	...	0.32	0.32	0.32	0.32	0.32	0.32	0.39
Mobile-cellular prepaid – price of a one-minute local call (peak, off- net) in USD	...	0.41	0.41	0.41	0.41	0.41	0.41	0.41
Mobile-cellular prepaid – price of a one-minute local call (off-peak, off-net) in USD	...	0.41	0.41	0.41	0.41	0.41	0.41	0.41
<b>INTERNET</b>								
International Internet bandwidth, in Mbit/s	...	4730	8200	8600	15100	19000	20300	26300
<b>FIXED (WIRED) BROADBAND</b>								
Fixed (wired) Broadband subscriptions	31800	35380	37000	38663	40536	42713	46120	48080
Fixed (wired) Internet Broadband subscriptions per 100 inhabitants	21.01	23.15	23.89	24.63	25.50	26.52	30.46	30.30
<b>WIRELESS BROADBAND</b>								
Total wireless broadband subscription	5500	8120	70000	75138	87797	87101	89426	81291
<b>OTHER INDICATORS</b>								
Terrestrial multichannel TV subscriptions	26320	30329	32212	28858	29866	31394	26667	24489
<b>PERFORMANCE INDICATORS</b>								
Average download speed, in average Kb/s for the year (See appendix C for calculations)	6025	6727	12895	14744	15893	18760	21011	22000

*Table 6– Curacao data EOY 2011 – EOY 2018*



## Appendix B – Definitions

INDICATOR	DEFINITION
DEMOGRAPHY, ECONOMY	The indicators in this category are useful for deriving ratios in order to make comparisons across countries. They are generally obtained from international organizations (see Sources) or national statistical offices. Readers are advised to consult the publications of the international organizations shown in Sources for precise definitions of the demographic and macro-economic data.
Population	The data for population are mid-year estimates. They typically refer to the de facto population within the present boundaries.
Households	The data for households refer to the number of housing units consisting of persons who live together or a person living alone. Estimates are based on growth rates between censuses.
FIXED TELEPHONE NETWORK	The indicators in this category refer to the fixed telephone network.
Fixed-telephone subscriptions	Fixed-telephone subscriptions refers to the sum of active number of analogue fixed-telephone lines, voice-over-IP (VoIP) subscriptions, fixed wireless local loop (WLL) subscriptions, ISDN voice-channel equivalents and fixed public payphones.  This indicator was previously called Main telephone lines in operation.
Fixed-telephone subscriptions per 100 inhabitants.	Calculated by dividing the number of fixed telephone subscriptions by the population and multiplying by 100.
Price of a three-minute local call to a fixed-telephone line, peak rate	Price of a three-minute local call (peak-rate) to a fixed-telephone line refers to the price of a three-minute peak local call from a residential fixed-telephone line, including any call set-up charges, within the same exchange area using the subscriber's own terminal (i.e. not from a public telephone). Taxes should be included.
Price of a three-minute local call to a fixed-telephone line, off-peak rate	Price of a three-minute local call to a fixed-telephone line refers to the price of a three-minute off-peak local call from a residential fixed-telephone line, including any call set-up charges, within the same exchange area using the subscriber's own terminal (i.e. not from a public telephone). Taxes should be included. If not included, it should be specified in a note including the applicable tax rate.
MOBILE CELLULAR NETWORK	The indicators in this category refer to mobile cellular networks.
Mobile-cellular telephone subscriptions	Mobile-cellular telephone subscriptions refers to the number of subscriptions to a public mobile-telephone service that provide access to the PSTN using cellular technology. The indicator includes (and is split into) the number of postpaid subscriptions, and the number of active prepaid accounts (i.e. that have been used during the last three months). The indicator applies to all mobile-cellular subscriptions that offer voice communications. It excludes subscriptions via data cards or USB modems, subscriptions to public mobile data services, private trunked mobile radio, telepoint, radio paging and telemetry services.
Mobile-cellular subscriptions per 100 inhabitants	Calculated by dividing the number of mobile-cellular telephone subscriptions by the population and multiplying by 100.

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Mobile-cellular prepaid – price of a one-minute local call (peak, on- net)	Refers to the price per minute of a peak prepaid call from a mobile- cellular telephone with a prepaid subscription to another subscriber in the same network. Taxes should be included. If not included, it should be specified in a note including the applicable tax rate.
Mobile-cellular prepaid – price of a one-minute local call (off-peak, on-net)	Refers to the price per minute of a prepaid call from a mobile-cellular telephone with a prepaid subscription made to the same mobile-cellular network during off-peak time. Off-peak refers to the 2010: cheapest rate before mid-night. If the only off-peak period is after mid-night, the peak price should be used. Taxes should be included.
Mobile-cellular prepaid – price of a one-minute local call (peak, off- net)	The price per minute of a peak rate call from a mobile-cellular prepaid telephone to a mobile-cellular subscriber of another (competing) network during peak time. Taxes should be included. If not included, it should be specified in a note including the applicable tax rate.
Mobile-cellular prepaid – price of a one-minute local call (off-peak, off-net)	The price per minute of an off-peak rate call from a mobile cellular prepaid telephone to a mobile cellular subscriber of another (competing) network. Off-peak refers to the cheapest rate before mid-night. If the only off-peak period is after mid-night, the peak price should be used. Taxes should be included.
<b>INTERNET</b>	The indicators in this category refer to Internet.
International Internet bandwidth, in Mbit/s	International Internet bandwidth refers to the total used capacity of international Internet bandwidth, in megabits per second (Mbit/s). It is measured as the sum of used capacity of all Internet exchanges (locations where Internet traffic is exchanged) offering international bandwidth. If capacity is asymmetric (i.e. more incoming (downlink) than outgoing (uplink) capacity), then the incoming (downlink) capacity should be provided.
<b>FIXED (WIRED) BROADBAND BY TECHNOLOGY</b>	The indicators in this category refer to fixed (wired)-broadband subscriptions by technology.
Fixed (wired)-broadband subscriptions	Fixed (wired)-broadband subscriptions refers to subscriptions to high-speed access to the public Internet (a TCP/IP connection), at downstream speeds equal to, or greater than, 256 kbit/s. This includes cable modem, DSL, fibre-to-the- home/building and other fixed (wired)-broadband subscriptions. This total is measured irrespective of the method of payment. It excludes subscriptions that have access to data communications (including the Internet) via mobile-cellular networks and technologies listed under the wireless-broadband category.
Fixed (wired)-broadband subscriptions per 100 inhabitants.	Calculated by dividing the number of fixed (wired) broadband Internet subscriptions by the population and multiplying by 100.
Fixed (wired)-broadband monthly subscription charge	Fixed (wired)-broadband monthly subscription charge refers to the monthly charge subscription charge for fixed (wired)-broadband Internet service. Fixed (wired) broadband is considered to be any dedicated connection to the Internet at downstream speeds equal to, or greater than, 256 kbit/s. If several offers are available, preference should be given to the 256 kbit/s connection.
Fixed (wired)-broadband speed, in Mbit/s	Fixed (wired)-broadband speed, in Mbit/s refers to the advertised maximum theoretical download speed, and not speeds guaranteed to users associated with a fixed (wired)-broadband Internet monthly subscription.

## Telecommunication Services Performance Indicators

<b>WIRELESS BROADBAND</b>	The indicators in this category refer to wireless broadband.
Wireless-broadband subscriptions	Wireless-broadband subscriptions refers to the sum of satellite broadband, terrestrial fixed wireless broadband and active mobile-broadband subscriptions to the public Internet.
Mobile- broadband subscriptions	Mobile-broadband subscriptions refers to the sum of standard mobile-broadband and dedicated mobile-broadband subscriptions. It covers actual subscribers, not potential subscribers, even though the latter may have broadband enabled- handsets.
Mobile-broadband subscriptions per 100 inhabitants	Calculated by dividing the number of mobile-broadband Internet subscriptions by the population and multiplying by 100.
<b>OTHER INDICATORS</b>	
Terrestrial multichannel TV subscriptions	Terrestrial multichannel TV subscriptions refers to the number of subscriptions to terrestrial multichannel TV such as cable TV, Internet protocol television (IPTV), digital terrestrial TV (DTT), microwave multipoint distribution systems (MMDS).

*Table 7 – Definitions*

## Appendix C – Download speeds

YEAR AVERAGES in Kbps									
	2010	2011	2012	2013	2014	2015	2016	2017	2018
Average download speeds per year	2285.3	6024.8	6726.7	12895.14	14744.24	15893	18760	21011	22110

MONTHLY RESULTS in Kbps									
	2010	2011	2012	2013	2014	2015	2016	2017	2018
January	1348.84	5753.22	6490.05	...	10823.17	14050.00	...	...	...
February	1711.44	5719.62	6633.30	...	13679.56	14200.00	...	...	...
March	1615.78	5520.82	6529.43	...	14335.05	13500.00	...	...	...
April	1568.16	5675.62	6603.65	12814.36	14344.65	16000.00	...	...	...
May	2025.94	5437.88	6613.32	13042.97	14754.09	17000.00	...	...	...
June	1805.20	5542.92	6577.46	13849.50	16106.32	17500.00	...	...	...
July	1878.51	6205.85	6986.88	13095.30	15327.46	19000.00	...	...	22110.00
August	2654.15	6419.04	7846.57	13454.28	15922.03	...	...	...	...
September	2659.47	6424.34	7593.47	13176.01	16034.84	...	...	...	...
October	2808.32	5882.68	6451.46	13079.28	15801.44	...	...	...	...
November	3405.19	6681.45	5763.54	11557.14	14986.73	...	...	...	...
December	3942.85	7034.25	6631.60	11987.44	14815.57	...	...	...	...

Table 8 – Yearly and monthly download speed results

The average yearly download speed data is calculated from the yearly average of monthly results in a year until 2015. From 2016 on estimates are made by calculating the weighted average of subscribers per speed from the Largest Market Share operator.

## Notes:

- As from April 2013, Curaçao is recorded separately, so as of 2013 measurements from April to December are used for higher accuracy.
- From 2015 on, Ookla only shows graphs, no more raw data per country. The download speeds of 2015 are derived from that graph.
- From August 2015, Ookla data viewing is discontinued and therefore not available anymore.
- For the month of July 2018, the measurement of 22110.00 was reported by Ookla speed test (download).

## Appendix D1 – List of countries and comparison data

General Statistics		Fixed-telephone subscriptions per 100 inhabitants	Mobile-cellular telephone subscriptions per 100 inhabitants	Fixed (wired)-broadband subscriptions per 100 inhabitants	Mobile broadband subscriptions per 100 inhabitants
Curacao		38,09	115,55	30,46	55,20
Caribbean		24,63	116,03	18,5	59,41
South America		15,70	117	12,3	69,62
Central America		11,55	115	7,6	49,43
World		13,20	105	13,0	62
Developed		37,50	129	31,0	102
Developing		8,00	98	9,0	54
LDCs		1,50	69	1,0	23
Caribbean region	Island	Fixed-telephone subscriptions per 100 inhabitants	Mobile-cellular telephone subscriptions per 100 inhabitants	Fixed (wired)-broadband subscriptions per 100 inhabitants	Mobile broadband subscriptions per 100 inhabitants
Lucayan Archipelago	Bahamas	29,82	92,61	22,75	68,26
Greater Antilles	Cayman Islands	54,85	152,50	49,28	
	Cuba	11,90	40,69	0,30	14,27
	Dominican Rep.	12,65	83,41	7,48	56,33
	Haiti	0,05	57,42	0,27	28,21
	Jamaica	10,17	105,83	8,19	48,35
	Puerto Rico	24,77	107,14	20,86	85,70
Lesser Antilles - Leeward islands	British Virgin Islands	32,27	204,50	16,92	104,15
	Antigua and Barbuda	25,15	192,82	9,43	50,30
	ST. Kitts and Nevis	33,23	147,71	16,65	69,92
Windward islands	Dominica	18,14	105,28	21,58	72,98
	Saint Lucia	19,35	97,65	17,56	40,34
	St. Vincent and Grenadines	18,29	105,48	17,55	78,91
	Grenada	29,30	102,08	20,05	86,73
	Barbados	42,09	115,14	31,21	45,37
	Trinidad and Tobago	18,60	146,72	23,61	45,56
Curaçao	Curaçao	38,09	115,55	30,46	55,20
<i>AVERAGES</i>		<b>24,63</b>	<b>116,03</b>	<b>18,48</b>	<b>59,41</b>
<b>South America</b>					
Argentina		21,90	140,88	17,85	80,65
Bolivia		6,27	97,95	3,39	75,52
Brazil		18,29	105,01	13,91	90,87
Chile		16,00	124,59	16,59	86,26
Colombia		14,04	127,21	12,94	48,96
Ecuador		13,82	87,29	10,03	52,47

## Telecommunication Services Performance Indicators

Paraguay		4,35	108,76	4,05	52,97
Peru		9,80	123,76	7,35	65,66
Suriname		15,61	139,51	12,48	46,28
Uruguay		33,44	148,33	27,74	112,71
Venezuela		19,20	85,33	8,87	53,45
<b>AVERAGES</b>		<b>15,70</b>	<b>117,15</b>	<b>12,29</b>	<b>69,62</b>
<b>Central America</b>					
Belize		5,45	35,96	5,06	38,02
Costa Rica		15,48	178,59	15,03	96,75
El Salvador		13,73	148,37	7,06	55,80
Honduras		5,55	87,32	2,53	24,04
Mexico		16,93	91,63	13,75	65,00
Nicaragua		5,04	128,11	3,29	29,59
Panama		16,11	128,57	10,74	69,80
Guatemala		14,12	118,16	3,14	16,45
<b>AVERAGES</b>		<b>11,55</b>	<b>114,59</b>	<b>7,57</b>	<b>49,43</b>

*Table 9 – List of countries and comparison data (penetration)*

**Appendix D2 – List of countries and comparison data (prices)**

Economy	Fixed-Tariff 3 minute call, peak (USD)	Fixed-Tariff 3 minute call, off peak (USD)	1-min call (peak, on-net) (USD)	1-min call (off-peak, on-net) (USD)	1-min call peak, off-net (USD)	1-min call (off-peak, off-net) (USD)
Curaçao	0,16	0,16	0,39	0,39	0,41	0,41
Caribbean	0,12	0,11	0,28	0,24	0,32	0,28
South America	0,06	0,04	0,17	0,16	0,18	0,17
Central America	0,10	0,09	0,18	0,18	0,20	0,20
Economy	Fixed-Tariff 3 minute call peak (USD)	Fixed-Tariff 3 minute call off peak (USD)	Mobile-cellular prepaid– 1-min call (peak, on-net) (USD)	Mobile-cellular prepaid– 1-min call (off-peak, on-net) (USD)	Mobile-cellular prepaid– 1-min call (peak, off-net) (USD)	Mobile-cellular prepaid– 1-min call (off-peak, off-net) (USD)
Anguilla	0,089	0,056	0,252	0,252	0,348	0,348
Antigua and Barbuda	0,056	0,056	0,352	0,352	0,352	0,352
Aruba	0,184	0,184	0,428	0,208	0,428	0,208
Bahamas	0,000	0,000	0,355	0,161	0,355	0,161
Barbados	0,000	0,000	0,300	0,300	0,400	0,400
Bermuda	0,200	0,200	0,000	0,000	0,000	0,000
British Virgin Islands	0,510	0,510	0,000	0,000	0,000	0,000
Cayman Islands	0,159	0,159	0,341	0,341	0,524	0,524
Cuba	0,004	0,002	0,350	0,100	0,350	0,100
Curacao	0,162	0,162	0,385	0,385	0,413	0,413
Dominica	0,100	0,056	0,259	0,259	0,370	0,370
Dominican Rep.	0,090	0,090	0,164	0,164	0,213	0,213
Grenada	0,089	0,056	0,293	0,293	0,293	0,293
Guadeloupe	0,000	0,000	0,000	0,000	0,000	0,000
Haiti	0,000	0,000	0,036	0,036	0,077	0,077
Jamaica	0,031	0,031	0,063	0,063	0,063	0,063
Martinique	0,000	0,000	0,000	0,000	0,000	0,000
Montserrat	0,156	0,156	0,000	0,000	0,000	0,000
Puerto Rico	0,000	0,000	0,250	0,250	0,250	0,250
Saint Kitts and Nevis	0,078	0,044	0,330	0,330	0,330	0,330
Saint Lucia	0,089	0,056	0,349	0,349	0,349	0,349
Saint Vincent and the Grenadines	0,089	0,056	0,367	0,367	0,367	0,367
St. Maarten	0,000	0,000	0,000	0,000	0,000	0,000
Trinidad and Tobago	0,037	0,037	0,190	0,190	0,190	0,190

## Telecommunication Services Performance Indicators

Turks & Caicos Is.	0,000	0,000	0,000	0,000	0,000	0,000
Virgin Islands (US)	0,000	0,000	0,000	0,000	0,000	0,000
<b>AVERAGES</b>	<b>0,12</b>	<b>0,11</b>	<b>0,28</b>	<b>0,24</b>	<b>0,32</b>	<b>0,28</b>
<b>South America</b>						
Argentina	0,007	0,003	0,286	0,286	0,286	0,286
Bolivia	0,058	0,058	0,174	0,078	0,174	0,078
Brazil	0,107	0,069	0,000	0,000	0,157	0,157
Chile	0,000	0,000	0,185	0,185	0,185	0,185
Colombia	0,000	0,000	0,118	0,118	0,118	0,118
Ecuador	0,034	0,034	0,112	0,112	0,224	0,224
Paraguay	0,077	0,077	0,043	0,043	0,043	0,043
Peru	0,000	0,000	0,150	0,150	0,150	0,150
Suriname	0,039	0,039	0,179	0,179	0,179	0,179
Uruguay	0,127	0,042	0,279	0,279	0,279	0,279
Venezuela	0,011	0,011	0,187	0,187	0,187	0,187
<b>AVERAGES</b>	<b>0,057</b>	<b>0,042</b>	<b>0,171</b>	<b>0,162</b>	<b>0,18</b>	<b>0,17</b>
<b>Central America</b>						
Belize	0,169	0,169	0,264	0,264	0,281	0,281
Costa Rica	0,045	0,045	0,070	0,070	0,070	0,070
El Salvador	0,110	0,110	0,125	0,125	0,147	0,147
Guatemala	0,196	0,196	0,354	0,354	0,354	0,354
Honduras	0,074	0,074	0,172	0,172	0,172	0,172
Mexico	0,094	0,094	0,040	0,040	0,040	0,040
Nicaragua	0,000	0,003	0,342	0,342	0,460	0,460
Panama	0,034	0,034	0,100	0,100	0,100	0,100
<b>AVERAGES</b>	<b>0,103</b>	<b>0,09</b>	<b>0,18</b>	<b>0,18</b>	<b>0,20</b>	<b>0,20</b>

*Table 10 – List of countries and comparison data (prices)*



## Appendix E – Sources

### DEMOGRAPHY, ECONOMY

CBS data 2012, 2013, 2014, 2015, 2016, 2017 and 2018

### TELECOMMUNICATION AND INFORMATION AND COMMUNICATION TECHNOLOGIES

Data on these subjects are obtained from operators through the annual ITU questionnaire, completed by ‘BTP aansluitpuntgegevens concessiehouders’ and ITU publications.

A full list:

- ITU Enquete EOY 2012, 2014, 2015, 2016, 2017, 2018 – UTS
- ITU Enquete EOY 2012, 2013, 2014, 2015, 2016, 2017, 2018 – Flow
- ITU Enquete EOY 2012, 2013, 2014, 2015, 2016, 2017, 2018 – Digicel
- ITU Enquete EOY 2012, 2013, 2014, 2015, 2016, 2017 – TRES
- ITU Enquete EOY 2012, 2013, 2014 – Scarlet
- ITU Enquete ICT Price Basket EOY 2012 - 2018
- Curaçao Fixed Internet Penetration Indicators, BT&P
- BTP aansluitpuntgegevens concessiehouders 2012, 2013, 2014, 2015, 2016, 2017, 2018
- BTP betaaltelevisie aansluitpunt gegevens
- ITU EYE Data: <http://www.itu.int/net4/itu-d/icteye/>
- ITU Yearbook of Statistics Telecom & ICT Indicators 2005-2018
- ITU Key data 2005-2017
- ITU Measuring the Information Society 2013, 2014, 2015, 2016, 2017
- ITU World Telecommunication/ICT Indicators (WTI) database 2016, 2017, 2018, 2019
- CBS: Population and Population Growth of Curaçao (2-10-2018); [www.cbs.cw](http://www.cbs.cw)
- CBS: Gross national income of Curaçao (2-10-2018); [www.cbs.cw](http://www.cbs.cw)
- World bank: World development indicators, GNI per Capita (28-09-2018), downloaded from [data.worldbank.org/indicator](http://data.worldbank.org/indicator)
- AMS-IX Caribbean statistics portal: <https://cw.ams-ix.net/technical--2/statistics>
- United Nations Sustainable Development Goals (SDGs); <https://sustainabledevelopment.un.org/>
- ITU ICT Prices 2017

### AVERAGE DOWNLOAD SPEEDS

- Global Broadband Ookla Speedtest.net Index

**Appendix F – List of concession holders and broadband technologies**

Operator	Used technologies
United Telecommunication Services N.V. (UTS)	Fixed-Wired Broadband: DSL / Fibre-to-the-Home or Building Wireless-broadband/mobile: HSPA+ / LTE International communication
Columbus Communications N.V. (Flow)	Fixed-Wired Broadband: Cable / HFC International communication
Digicel N.V.	Wireless-broadband/mobile: HSPA+ / LTE International communication
TRES Networks	Fixed-Wired Broadband: Fibre-to-the-Home or Building International communication
Smitcoms N.V.	International communication
Flamingo TV Bonaire	International communication

*Table 11 – List of operators and used broadband technology*