



NATIONAL COMMUNICATIONS AUTHORITY

Quality of Service (QoS) Monitoring of Cellular Mobile Data Services-UPPER EAST REGION

[May 2016]

**QUALITY OF SERVICE (QoS) MONITORING OF CELLULAR MOBILE DATA SERVICES IN UPPER EAST
REGION, MAY 2016**

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Background

In pursuance of obligations of the 3G Cellular Mobile Licence of Telecommunication Operators, the consumer perspective of the quality of data services are tested to ensure the compliance of Operators to the obligations on service quality to the user.

The report is based on findings on quality of data service in the Upper East Region between 12th May and 16th May 2016 all Operators except for Espresso due to technical challenges.

What we measure

As per the 3G Cellular Mobile licence obligations, the QoS indicators and their respective threshold for compliance under assessment considering the user's perspective are as below;

- **Data Access Success Rate (DASR)**
- **Data Drop Rate (DDR)**
- **Data Throughput**

Findings

The results for the district capitals within Eastern Region tested during the period are as below:

a. Data Access Success Rate

Data Access Success Rate is the probability of success in connecting to the public server.

Data Access Success Rate should be equal or better than *ninety-five per cent (95%)*

For analysis and calculations,

$$\text{Packet Service Success Rate } [\%] = \frac{\text{Number of successful PDP Context Activations}}{\text{Total number of PDP Context Activation requests}} \times 100\%$$

The results for the district capitals tested during the period are as below:

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Table 1. Data Access Success Rate, May 2016

DISTRICT CAPITAL	MTN	VODAFONE	TIGO	AIRTEL	GLO
Bawku	100	100	100	93.10	No 3G Coverage
Bolgatanga	100	100	100	90.15	100
Bongo	100	100	No 3G Coverage	66.67	No 3G Coverage
Garu	100	100	100	100	No 3G Coverage
Navrongo	100	100	100	93.33	No 3G Coverage
Paga	100	100	100	85.42	No 3G Coverage
Sandema	100	100	100	96.55	No 3G Coverage
Tongo	100	100	No 3G Coverage	97.37	No 3G Coverage
Zebilla	100	100	No 3G Coverage	97.06	No 3G Coverage

REMARKS:

- ❖ All Operators except Airtel complied with the Data Access Success Rate obligation in all the available District Capitals tested.
- ❖ Airtel failed the Data Access Success Rate obligation at Bawku, Bolgatanga, Bongo, Navrongo and Paga.

b. Data Drop Rate

Data Drop Rate is the probability to drop in connection to a public server without end user's intervention.

Data Drop Rate should be equal or less than *one per cent (1%)*.

$$\text{Data Drop Rate } [\%] = \frac{\text{Number of aborted PDP context activations}}{\text{Total number of PDP Context Activation requests}} \times 100\%$$

Table 2. Data Drop Rate, May 2016

DISTRICT CAPITAL	MTN	VODAFONE	TIGO	AIRTEL	GLO
Bawku	0	0	0	0	No 3G Coverage
Bolgatanga	0	0	0	0	0
Bongo	0	0	No 3G Coverage	0	No 3G Coverage
Garu	0	0	0	0	No 3G Coverage

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DISTRICT CAPITAL	MTN	VODAFONE	TIGO	AIRTEL	GLO
Navrongo	0	0	0	0	No 3G Coverage
Paga	0	0	0	0	No 3G Coverage
Sandema	0	0	0	0	No 3G Coverage
Tongo	0	0	No 3G Coverage	0	No 3G Coverage
Zebilla	0	0	No 3G Coverage	0	No 3G Coverage

REMARKS:

- ❖ All Operators complied with the licence threshold of less than one percent (1%) in the available District Capitals tested.

c. Data Throughput

Data Throughput is the rate of data transfer.

As per the 3G licence obligations, the minimum data transfer rate for 90% of data connections should be *256kbps or better*

Table 3. Data Throughput, May 2016

DISTRICT CAPITAL	MTN	VODAFONE	TIGO	AIRTEL	GLO
Bawku	5127.26	5399.92	2263.00	564.59	No 3G Coverage
Bolgatanga	6974.15	5428.52	2601.40	3021.10	1924.57
Bongo	8000.59	709.52	No 3G Coverage	1506.10	No 3G Coverage
Garu	6900.61	100.54	2887.81	220.6	No 3G Coverage
Navrongo	7629.68	4028.5	2744.34	663.25	No 3G Coverage
Paga	6503.20	2754.11	1781.95	663.15	No 3G Coverage
Sandema	9155.66	2893.52	2078.62	603.66	No 3G Coverage
Tongo	9814.65	6492.93	No 3G Coverage	580.38	No 3G Coverage
Zebilla	6105.44	4768.98	No 3G Coverage	700.21	No 3G Coverage

REMARKS:

- ❖ MTN,Tigo and Glo complied with the licence threshold of Data Throughput in all the available District Capitals tested.
- ❖ Vodafone and Airtel failed the Data Throughput licence threshold at Garu.

REMEDIES

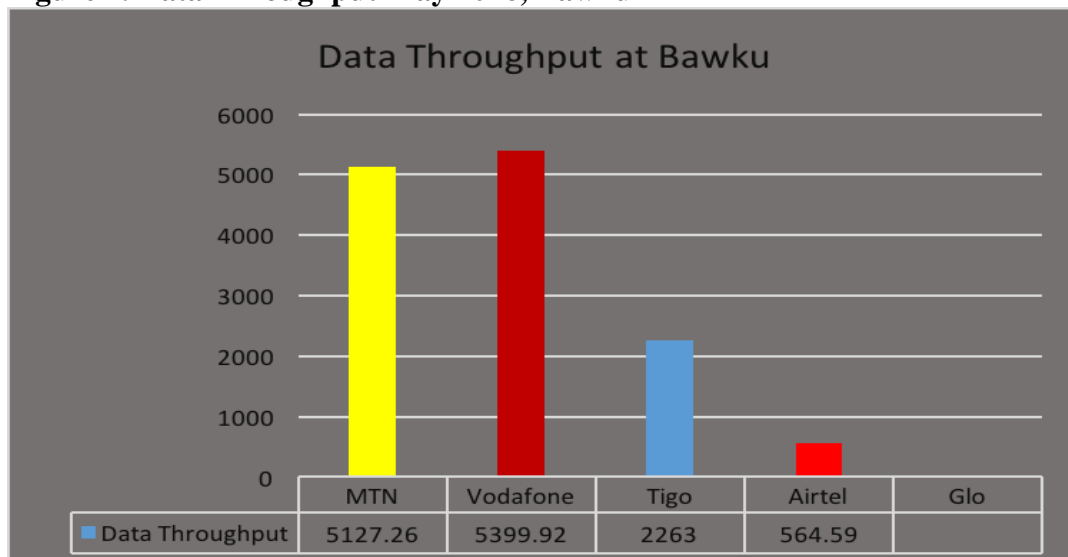
- ❖ The NCA has notified Operators of publication of these findings and directed all Operators to improve any obligation in default by September, 2016.
- ❖ Sanctions will be applied to Operators on obligations in default after September, 2016.
- ❖ Glo was directed to improve its 3G Service in the Upper East Region by December, 2016.

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APPENDIX 1

The Graphs below show the Throughput levels attained by Operators in each location where monitoring was performed.

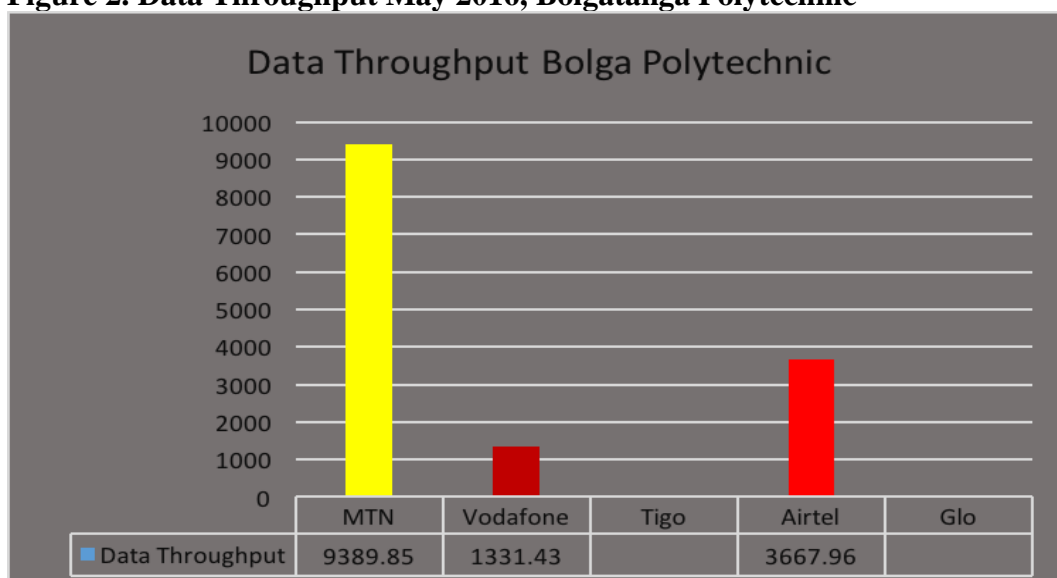
Figure 1. Data Throughput May 2016, Bawku



REMARKS:

- ❖ MTN, Vodafone, Tigo and Airtel exceeded Data Throughput threshold of 256kbps.
- ❖ Glo had no 3G Service at the time of the tests.

Figure 2. Data Throughput May 2016, Bolgatanga Polytechnic

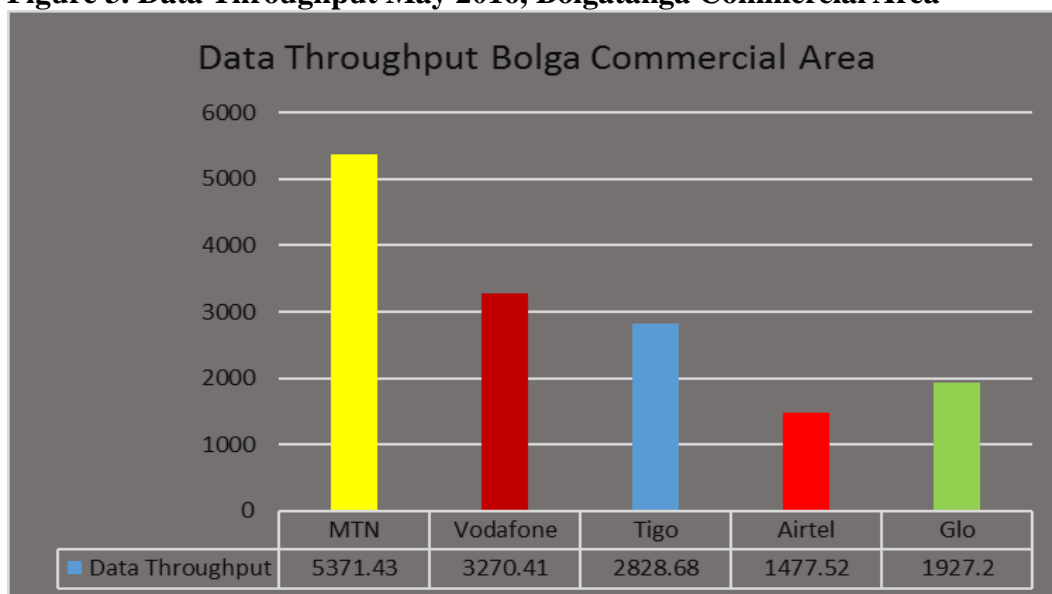


REMARKS:

- ❖ MTN, Vodafone and Airtel exceeded Data Throughput threshold of 256kbps.
- ❖ Tigo and Glo had no 3G Service at the time of the test.

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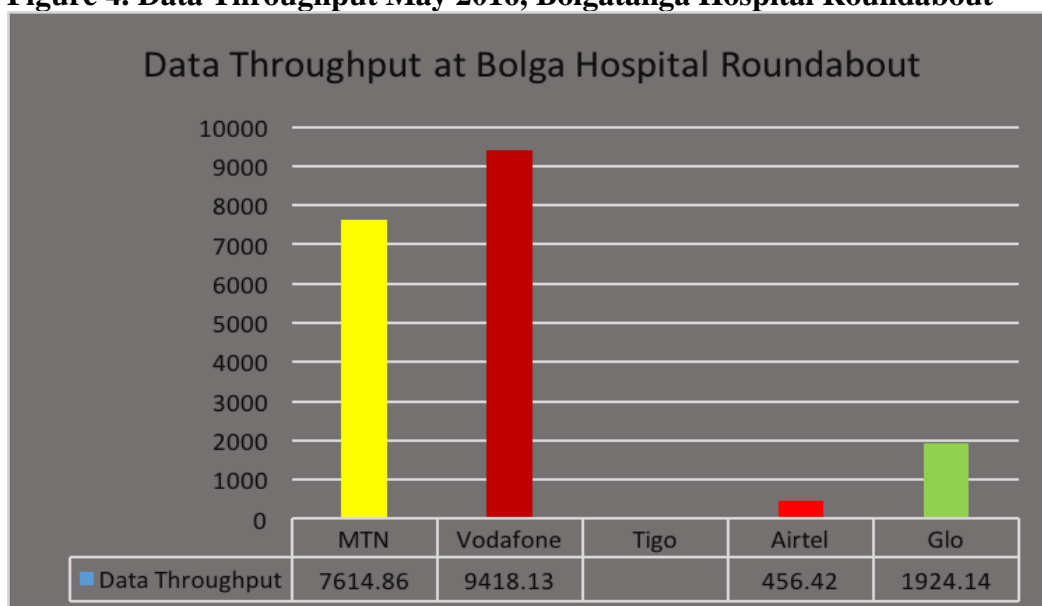
Figure 3. Data Throughput May 2016, Bolgatanga Commercial Area



REMARKS:

- ❖ All Operators exceeded the Data Throughput threshold of 256kbps.

Figure 4. Data Throughput May 2016, Bolgatanga Hospital Roundabout

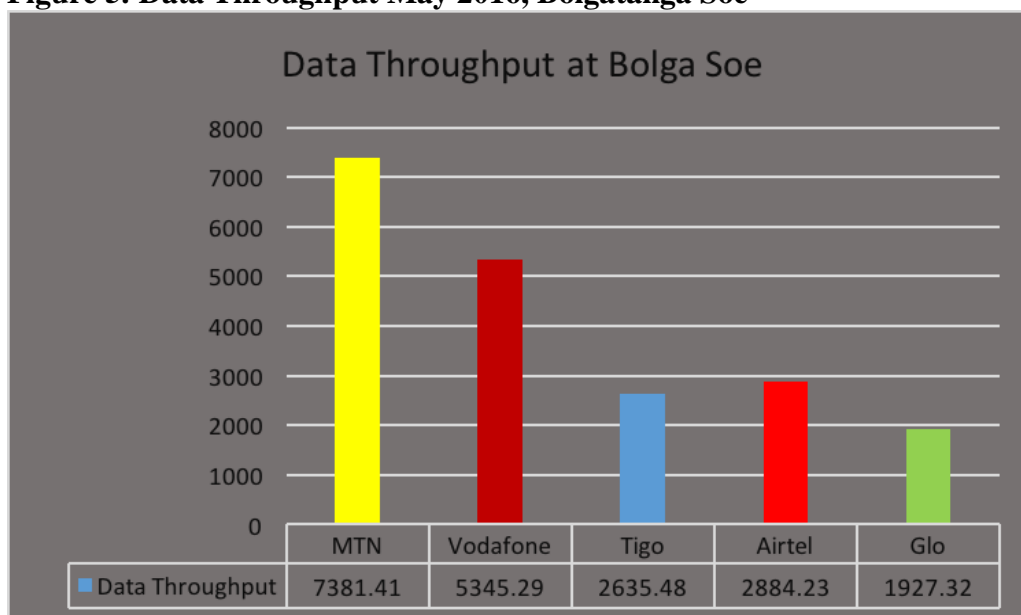


REMARKS:

- ❖ MTN, Vodafone, Glo and Airtel exceeded the Data Throughput threshold of 256kbps.
- ❖ Tigo had no 3G Service at the time of the test.

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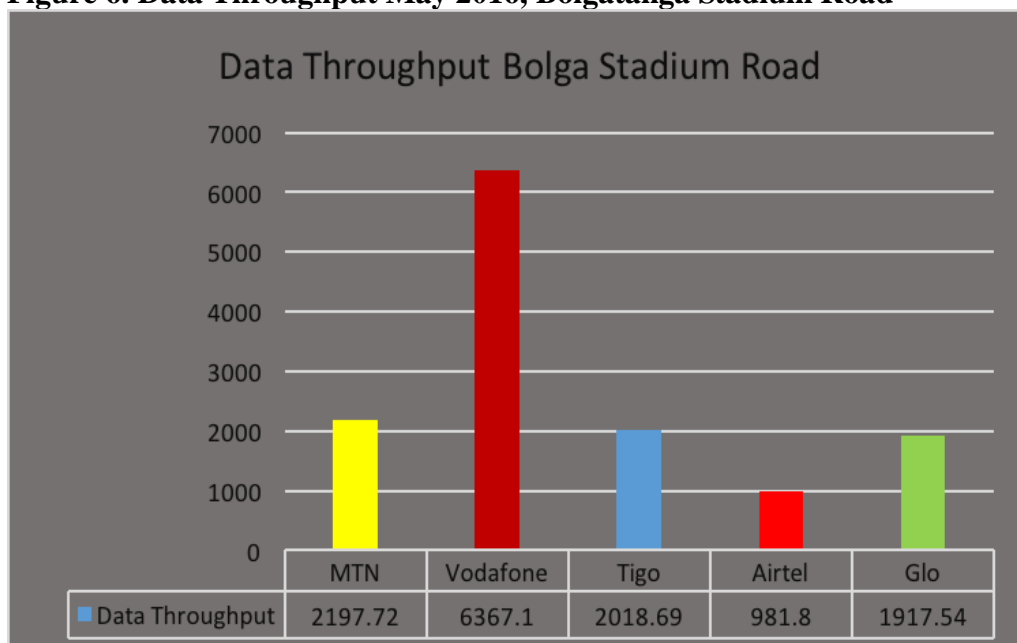
Figure 5. Data Throughput May 2016, Bolgatanga Soe



REMARKS:

- ❖ All Operators exceeded the Data Throughput threshold of 256kbps.

Figure 6. Data Throughput May 2016, Bolgatanga Stadium Road

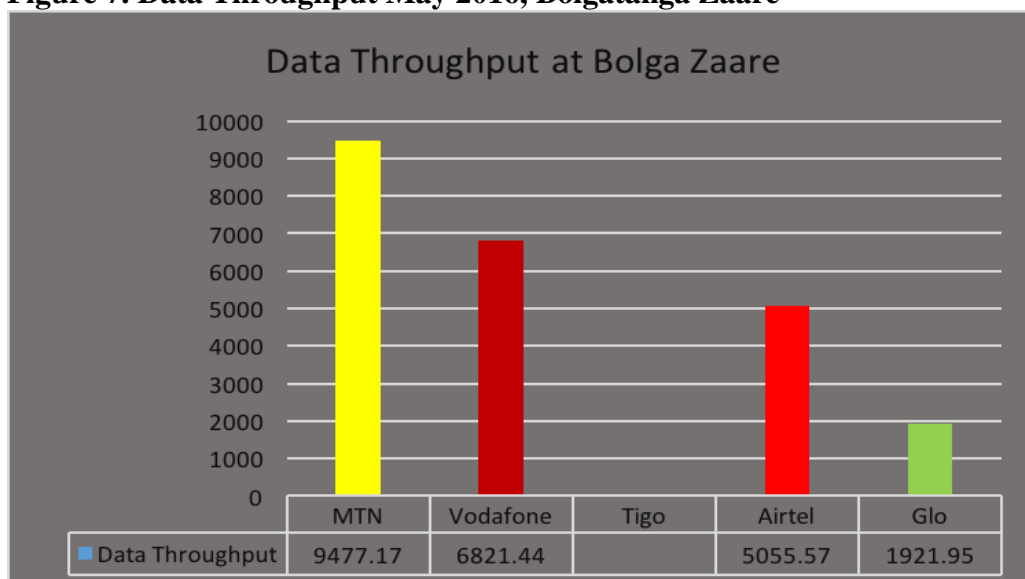


REMARKS:

- ❖ All Operators exceeded the Data Throughput threshold of 256kbps.

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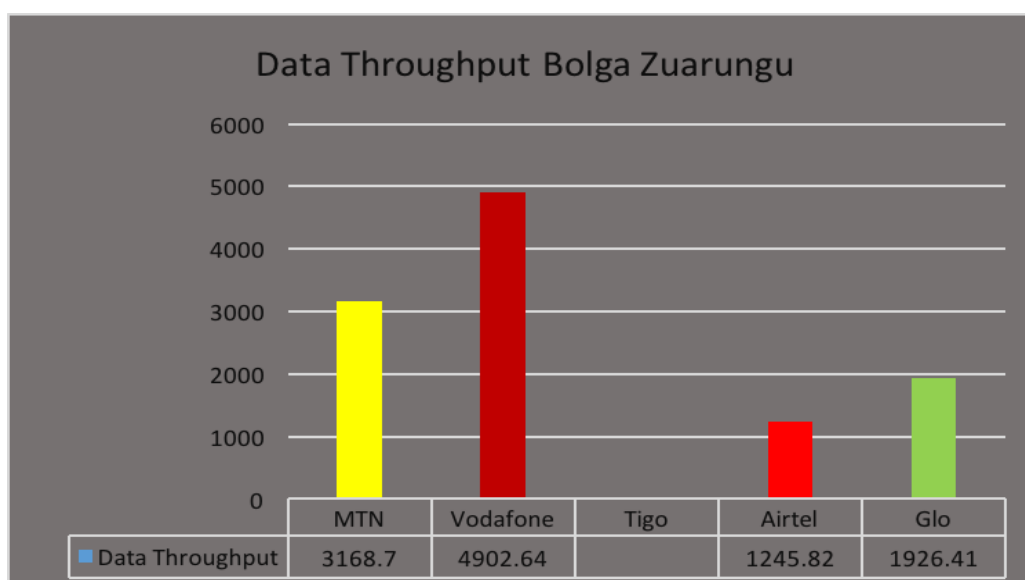
Figure 7. Data Throughput May 2016, Bolgatanga Zaare



REMARKS:

- ❖ MTN, Vodafone, Glo and Airtel exceeded Data Throughput threshold of 256kbps.
- ❖ Tigo had no 3G Service at the time of the test.

Figure 8. Data Throughput May 2016, Bolgatanga Zuarungu

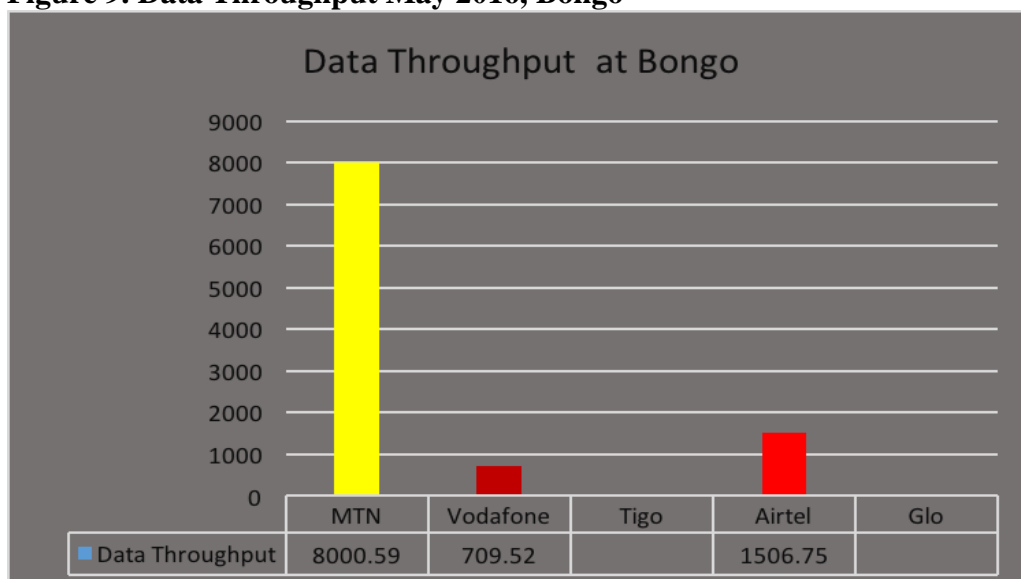


REMARKS:

- ❖ MTN, Vodafone, Glo and Airtel exceeded Data Throughput threshold of 256kbps.
- ❖ Tigo had no 3G Service at the time of the tests.

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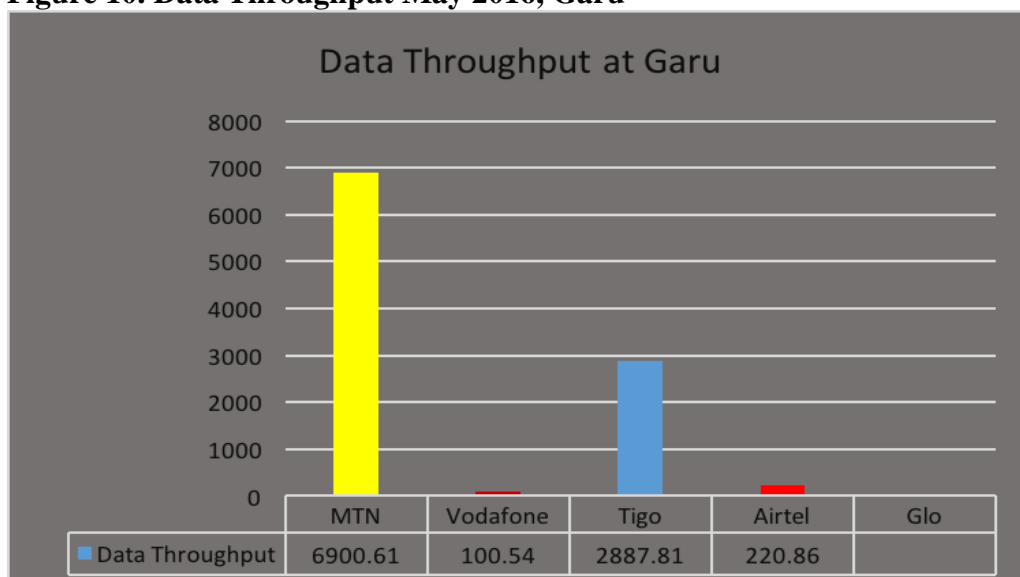
Figure 9. Data Throughput May 2016, Bongo



REMARKS:

- ❖ MTN, Vodafone and Airtel exceeded the Data Throughput threshold of 256kbps.
- ❖ Glo and Tigo had no 3G Service at the time of the test.

Figure 10. Data Throughput May 2016, Garu

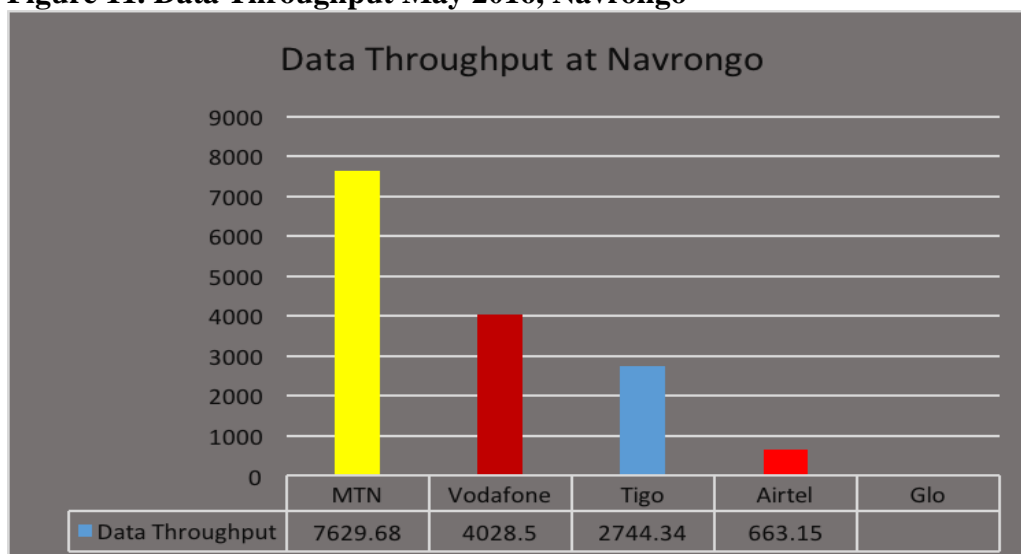


REMARKS:

- ❖ MTN and Tigo exceeded the Data Throughput threshold of 256kbps.
- ❖ Vodafone and Airtel failed the Data Throughput licence condition at Garu.
- ❖ Glo had no 3G Service at the time of the test.

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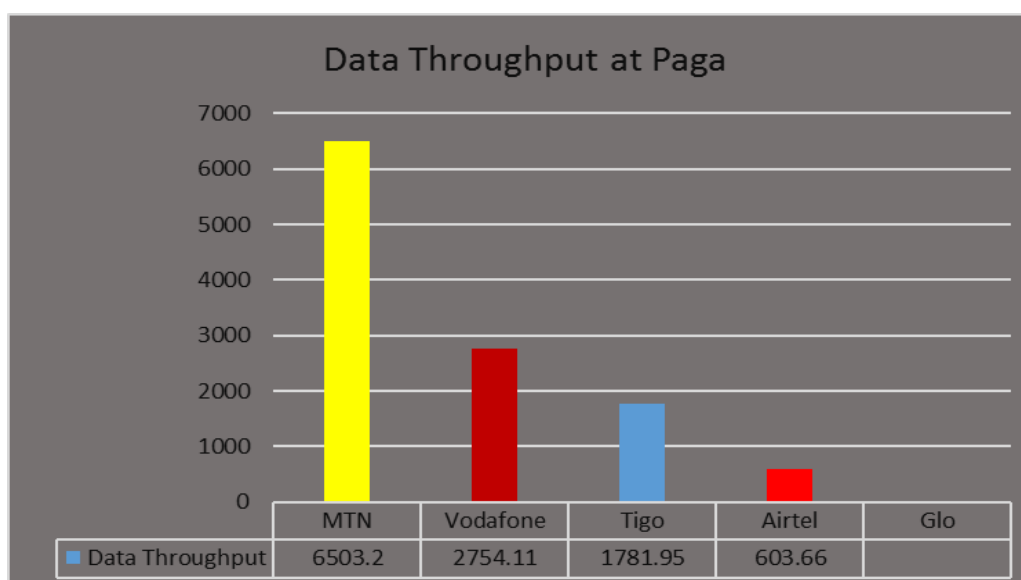
Figure 11. Data Throughput May 2016, Navrongo



REMARKS:

- ❖ MTN, Vodafone, Airtel and Tigo exceeded the Data Throughput threshold of 256kbps.
- ❖ Glo had no 3G Service at the time of the test.

Figure 12. Data Throughput May 2016, Paga

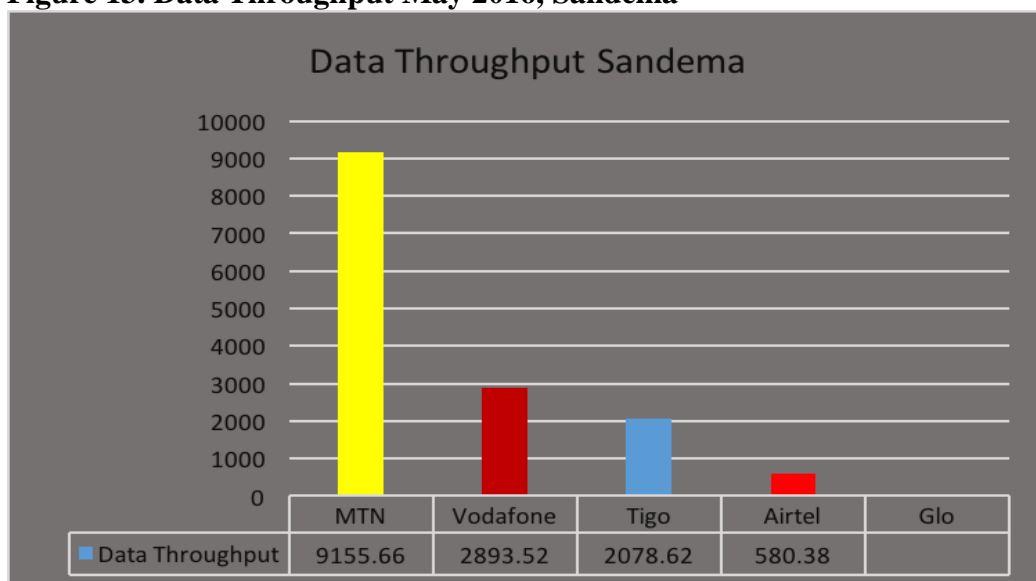


REMARKS:

- ❖ MTN, Vodafone, Airtel and Tigo exceeded the Data Throughput threshold of 256kbps.
- ❖ Glo had no 3G Service at the time of the test

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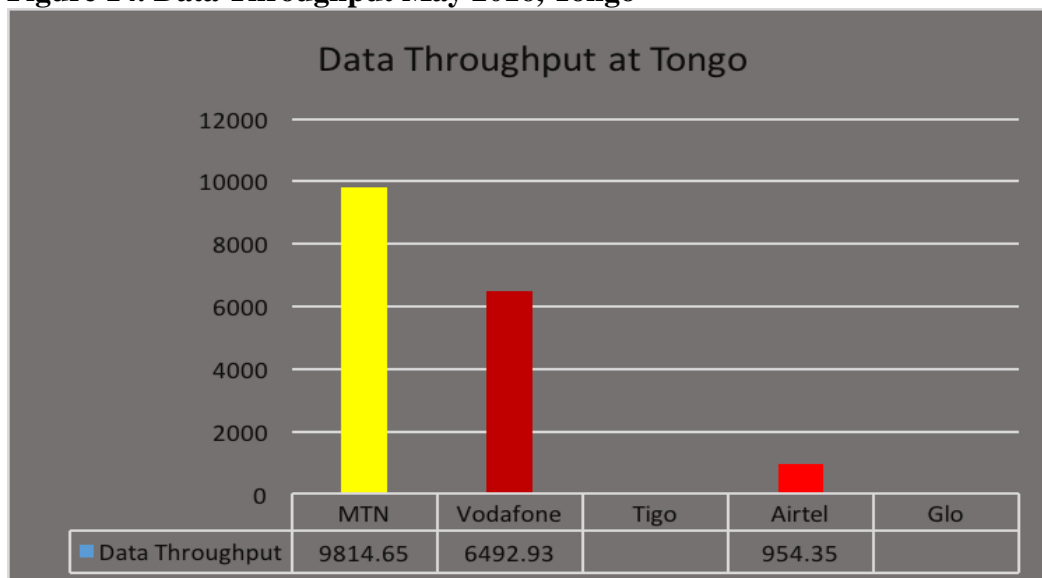
Figure 13. Data Throughput May 2016, Sandema



REMARKS:

- ❖ MTN, Vodafone, Airtel and Tigo exceeded the Data Throughput threshold of 256kbps.
- ❖ Glo had no 3G Service at the time of the test.

Figure 14. Data Throughput May 2016, Tongo

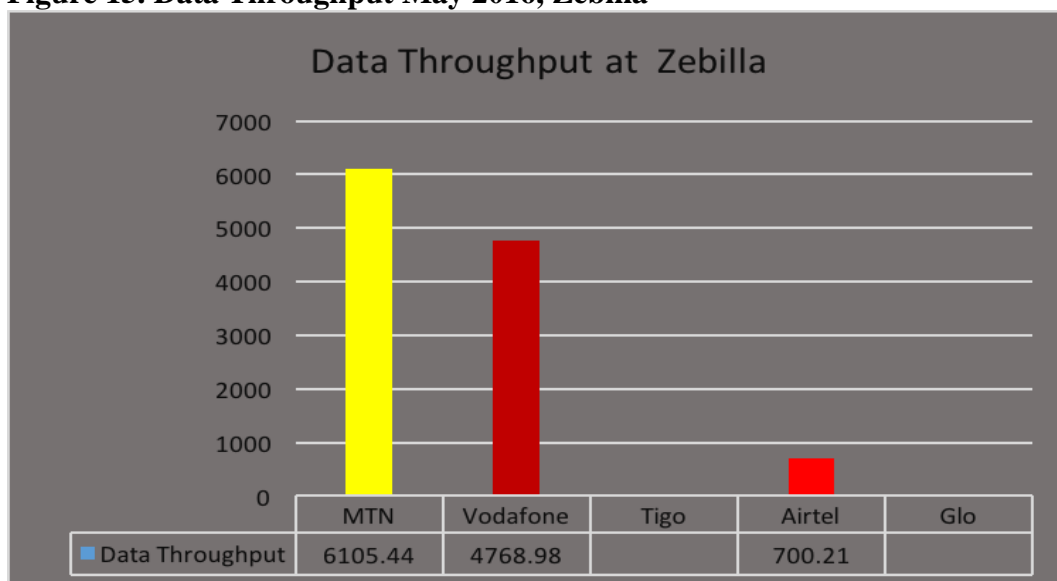


REMARKS:

- ❖ MTN, Vodafone and Airtel exceeded the Data Throughput threshold of 256kbps.
- ❖ Tigo and Glo had no 3G Service at the time of the test.

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Figure 15. Data Throughput May 2016, Zebilla



REMARKS:

- ❖ MTN, Vodafone and Airtel exceeded the Data Throughput threshold of 256kbps.
- ❖ Tigo and Glo had no 3G Service at the time of the test.