



NATIONAL COMMUNICATIONS AUTHORITY

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

[September 2016]

**QUALITY OF SERVICE (QoS) MONITORING OF CELLULAR MOBILE DATA SERVICES IN WESTERN
REGION, SEPTEMBER 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 Western Region between 11th September and 23rd September 2016 for all Operators except 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 Western 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, September 2016

Month	Town	MTN	Vodafone	Tigo	Airtel	Glo
September	Adaborkrom	No 3G Coverage	No 3G Coverage	No 3G Coverage	No 3G Coverage	No 3G Coverage
September	Agona Nkwanta	100%	100%	96%	98%	95%
September	Asankragua	100%	100%	98%	97%	No 3G Coverage
September	Axim	100%	100%	97%	98%	95%
September	Bibiani	100%	100%	96%	98%	No 3G Coverage
September	Bogoso	100%	100%	98%	100%	No 3G Coverage
September	Daboase	100%	100%	94%	97%	No 3G Coverage
September	Dadieso	100%	100%	No 3G Coverage	No 3G Coverage	No 3G Coverage
September	Enchi	100%	100%	98%	99%	No 3G Coverage
September	Essam-Debiso	100%	100%	98%	100%	No 3G Coverage
September	Half-Assini	100%	100%	99%	98%	No 3G Coverage
September	Juaboso	100%	100%	98%	100%	No 3G Coverage
September	Manso Amenfi	No 3G Coverage	100%	No 3G Coverage	No 3G Coverage	No 3G Coverage
September	Mpohor	100%	100%	94%	100%	No 3G Coverage
September	Nkroful	100%	100%	97%	100%	No 3G Coverage
September	Sefwi Akontombra	100%	100%	96%	100%	No 3G Coverage
September	Sefwi Bodi	100%	100%	94%	100%	No 3G Coverage
September	Sefwi Wiawso	100%	100%	98%	99%	No 3G Coverage
September	Shama	100%	100%	94%	100%	No 3G Coverage
September	Takoradi	100%	100%	97%	99%	91%
September	Tarkwa	100%	100%	98%	100%	89%
September	Wassa Akropong	100%	100%	94%	97%	85%

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REMARKS:

- ❖ All Operators except Tigo and Glo complied with the Data Access Success Rate obligation in all the available District Capitals tested.
- ❖ Tigo failed Data Access Success Rate at Daboase, Mpohor, Sefwi Bodi, Shama and Wassa Akropong.
- ❖ Glo failed Data Access Success Rate at Takoradi, Tarkwa and Wassa Akropong.

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, September 2016

Month	Town	MTN	Vodafone	Tigo	Airtel	Glo
September	Adaborkrom	No 3G Coverage	No 3G Coverage	No 3G Coverage	0%	No 3G Coverage
September	Agona Nkwanta	0%	0%	0%	0%	0%
September	Asankragua	0%	0%	0%	0%	No 3G Coverage
September	Axim	0%	0%	0%	0%	0%
September	Bibiani	0%	0%	0%	0%	No 3G Coverage
September	Bogoso	0%	0%	0%	0%	No 3G Coverage
September	Daboase	0%	0%	0%	0%	No 3G Coverage
September	Dadieso	0%	0%	No 3G Coverage	No 3G Coverage	No 3G Coverage
September	Enchi	0%	0%	0%	0%	No 3G Coverage
September	Essam-Debiso	0%	0%	0%	0%	No 3G Coverage

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Month	Town	MTN	Vodafone	Tigo	Airtel	Glo
September	Half-Assini	0%	0%	0%	0%	No 3G Coverage
September	Juaboso	0%	0%	0%	0%	No 3G Coverage
September	Manso Amenfi	No 3G Coverage	0%	No 3G Coverage	No 3G Coverage	No 3G Coverage
September	Mpohor	0%	0%	0%	0%	No 3G Coverage
September	Nkroful	0%	0%	0%	0%	No 3G Coverage
September	Sefwi Akontombra	0%	0%	0%	0%	No 3G Coverage
September	Sefwi Bodi	0%	0%	0%	0%	No 3G Coverage
September	Sefwi Wiawso	0%	0%	0%	0%	No 3G Coverage
September	Shama	0%	0%	0%	0%	No 3G Coverage
September	Takoradi	0%	0%		0%	0%
September	Tarkwa	0%	0%	0%	0%	0%
September	Wassa Akropong	0%	0%	0%	0%	0%

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, September 2016

Month	Town	MTN	Vodafone	Tigo	Airtel	Glo
September	Adaborkrom	No 3G Coverage	No 3G Coverage	No 3G Coverage	No 3G Coverage	No 3G Coverage
September	Agona Nkwanta	1079	3227	3882	3647	1671
September	Asankragua	94	3271	2060	573	No 3G Coverage
September	Axim	2371	3682	3708	573	1368

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Month	Town	MTN	Vodafone	Tigo	Airtel	Glo
September	Bibiani	1770	4659	6448	1261	No 3G Coverage
September	Bogoso	1480	3521	3800	5104	No 3G Coverage
September	Daboase	5861	3565	4579	5470	No 3G Coverage
September	Dadieso	968	4195	No 3G Coverage	No 3G Coverage	No 3G Coverage
September	Enchi	453	5600	2414	5600	No 3G Coverage
September	Essam-Debiso	1112	3781	2567	2581	No 3G Coverage
September	Half-Assini	1222	3341	7838	1478	No 3G Coverage
September	Juaboso	2277	4476	3180	356	No 3G Coverage
September	Manso Amenfi	No 3G Coverage	3373	No 3G Coverage	No 3G Coverage	No 3G Coverage
September	Mpohor	1843	2689	709	456	No 3G Coverage
September	Nkroful	1527	3222	4619	1603	No 3G Coverage
September	Sefwi Akontombra	4457	4395	3295	2797	No 3G Coverage
September	Sefwi Bodi	4457	3761	1332	4123	No 3G Coverage
September	Sefwi Wiawso	1722	4685	2904	4082	No 3G Coverage
September	Shama	1801	5347	5511	9548	No 3G Coverage
September	Takoradi	4008	3385	1621	1669	1829
September	Tarkwa	967	2298	1511	2445	1361
September	Wassa Akropong	1186	1283	3785	3814	1879

REMARKS:

- ❖ All Operators except MTN were compliant with the licence threshold of Data Throughput in all the available District Capitals tested.
- ❖ MTN failed the Data Throughput licence condition at Asankragua.

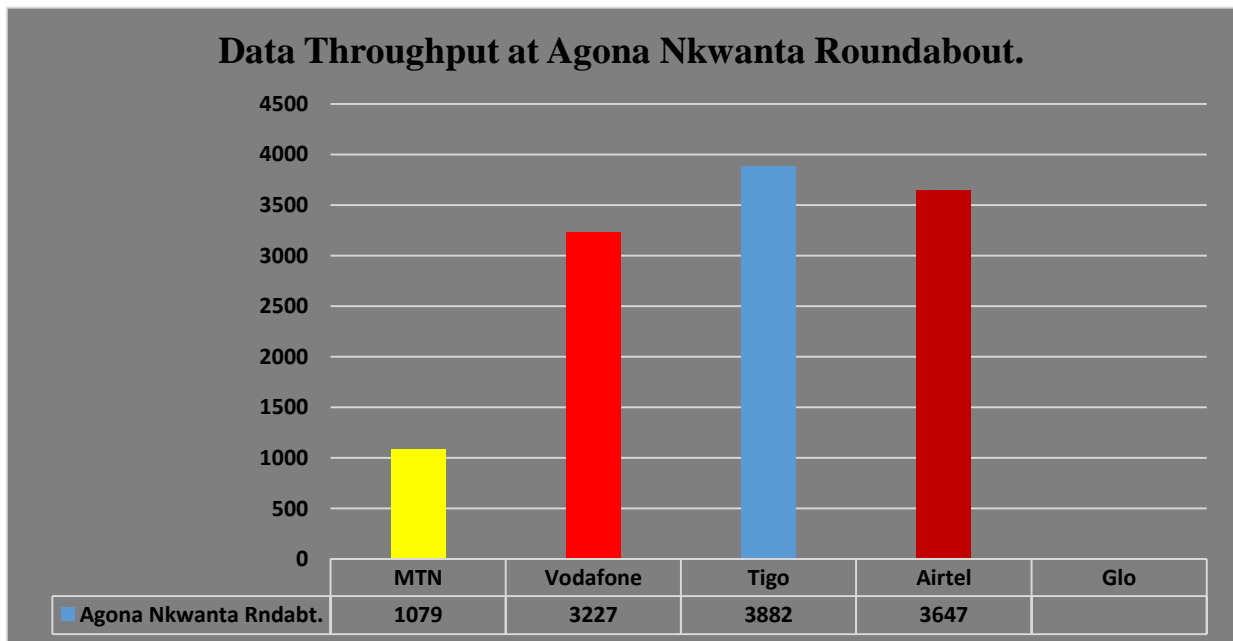
REMEDIES

- ❖ The NCA has notified Operators of publication of these findings and directed all Operators to improve any obligation in default by January, 2017.
- ❖ Sanctions will be applied to Operators on District Capitals that persist in default after January, 2017.

APPENDIX 1

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

Figure 1. Data Throughput September 2016, Agona Nkwanta Roundabout

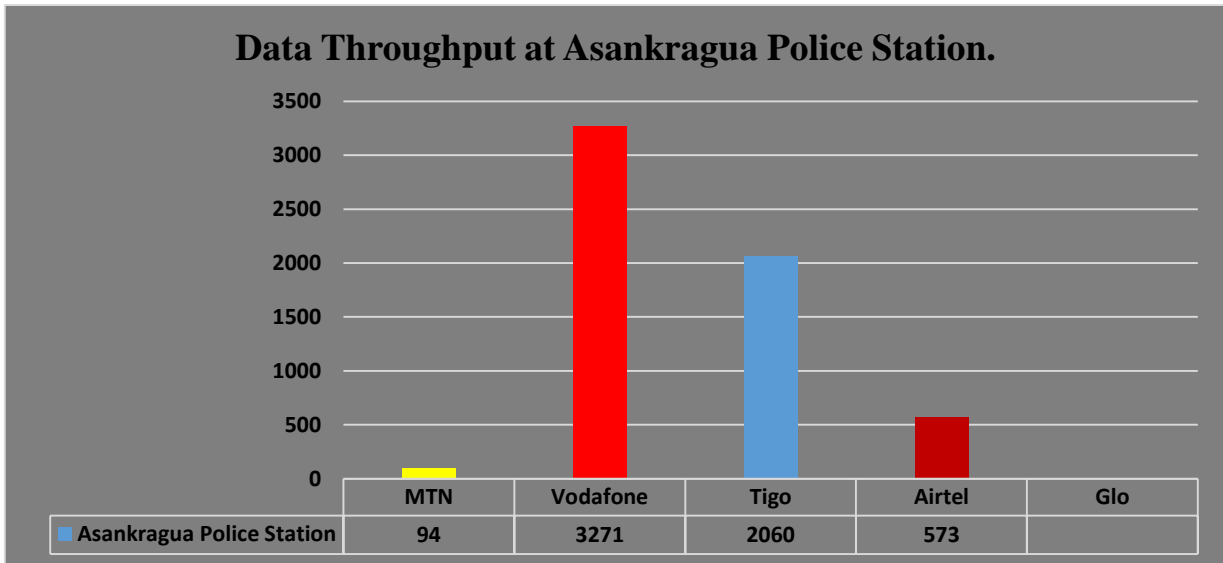


REMARKS:

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

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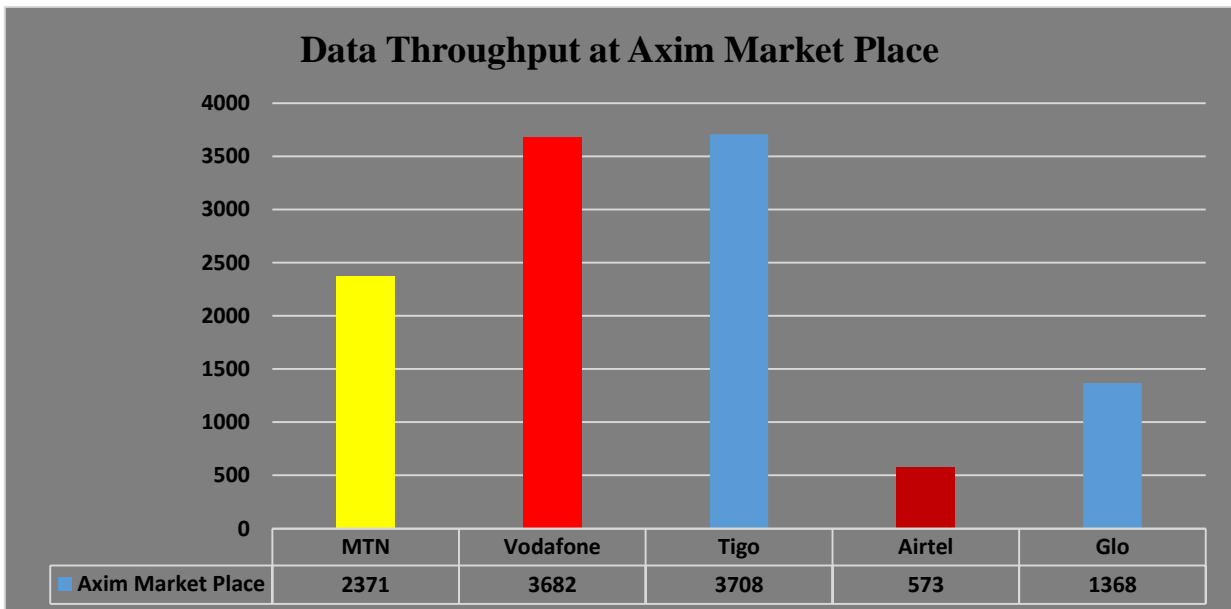
Figure 2. Data Throughput September 2016, Asankragua Police Station.



REMARKS:

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

Figure 3. Data Throughput September 2016, Axim Market Place.

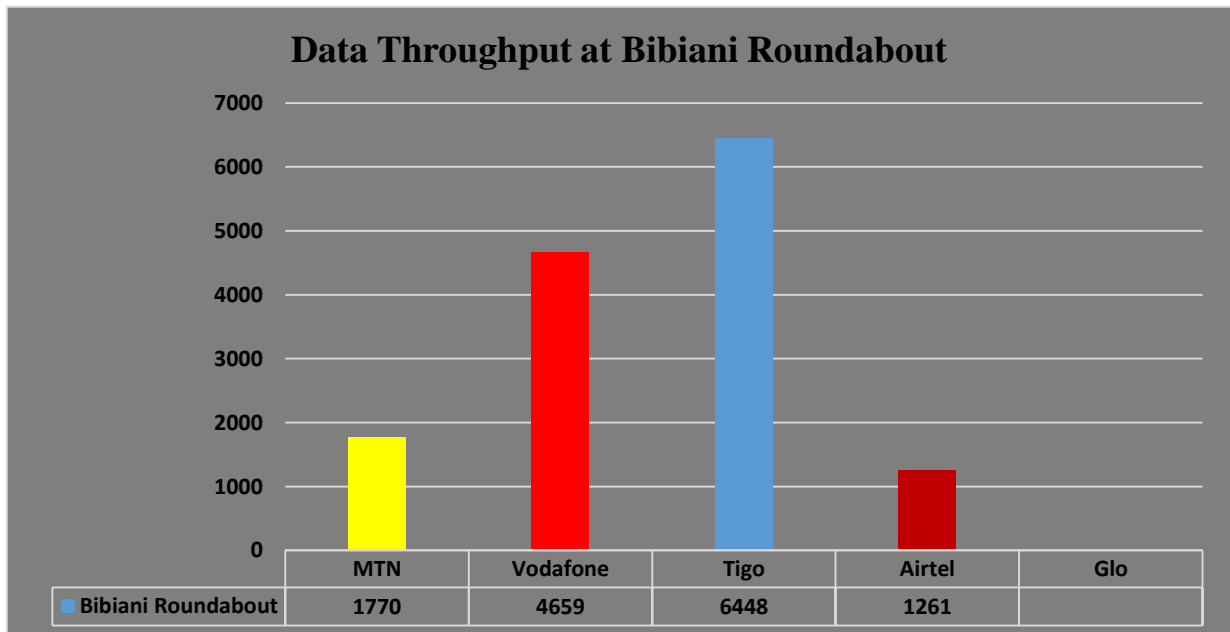


REMARKS:

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

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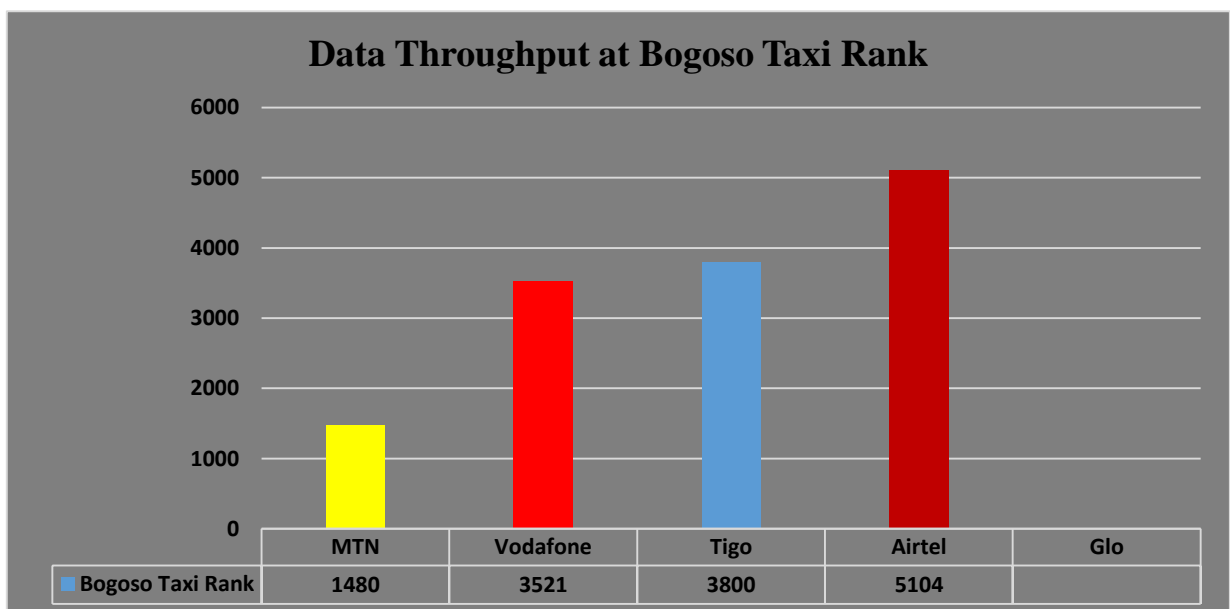
Figure 4. Data Throughput September 2016, Bibiani Roundabout



REMARKS:

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

Figure 5. Data Throughput September 2016, Bogoso Taxi Rank

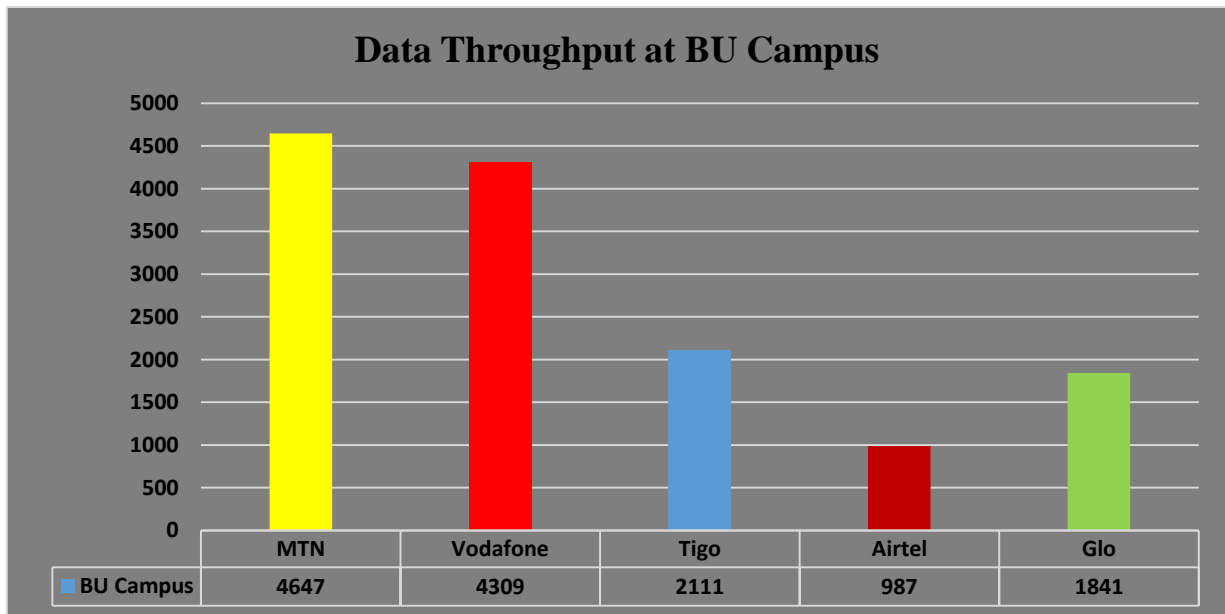


REMARKS:

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

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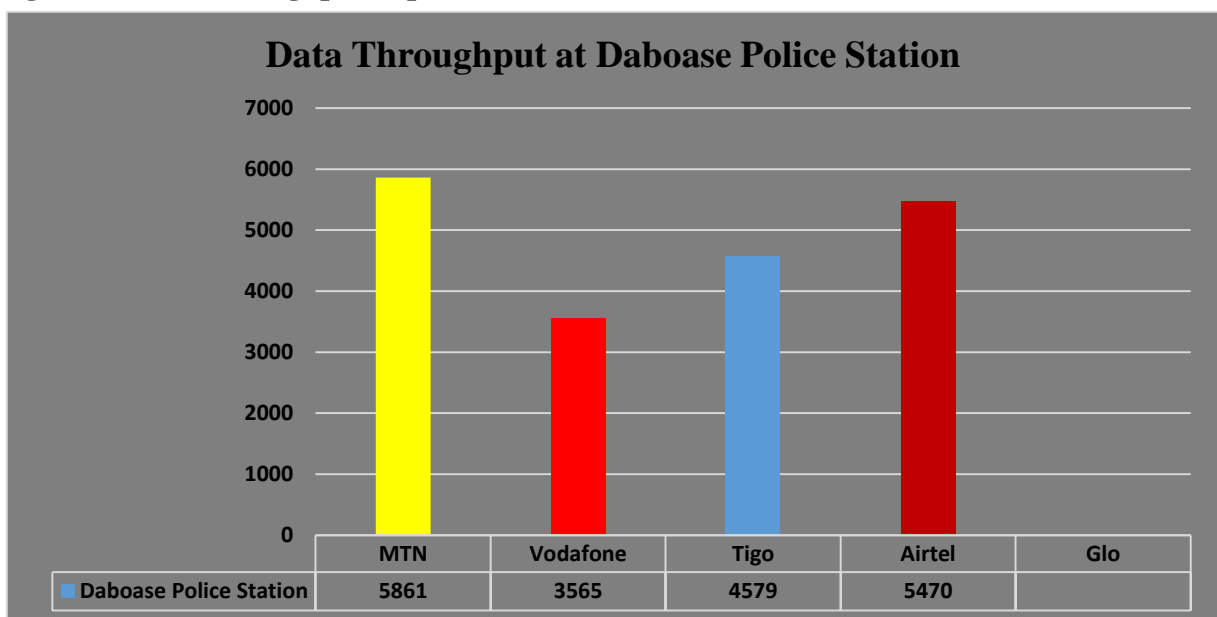
Figure 6. Data Throughput September 2016, BU Campus



REMARKS:

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

Figure 7. Data Throughput September 2016, Daboase Police Station.

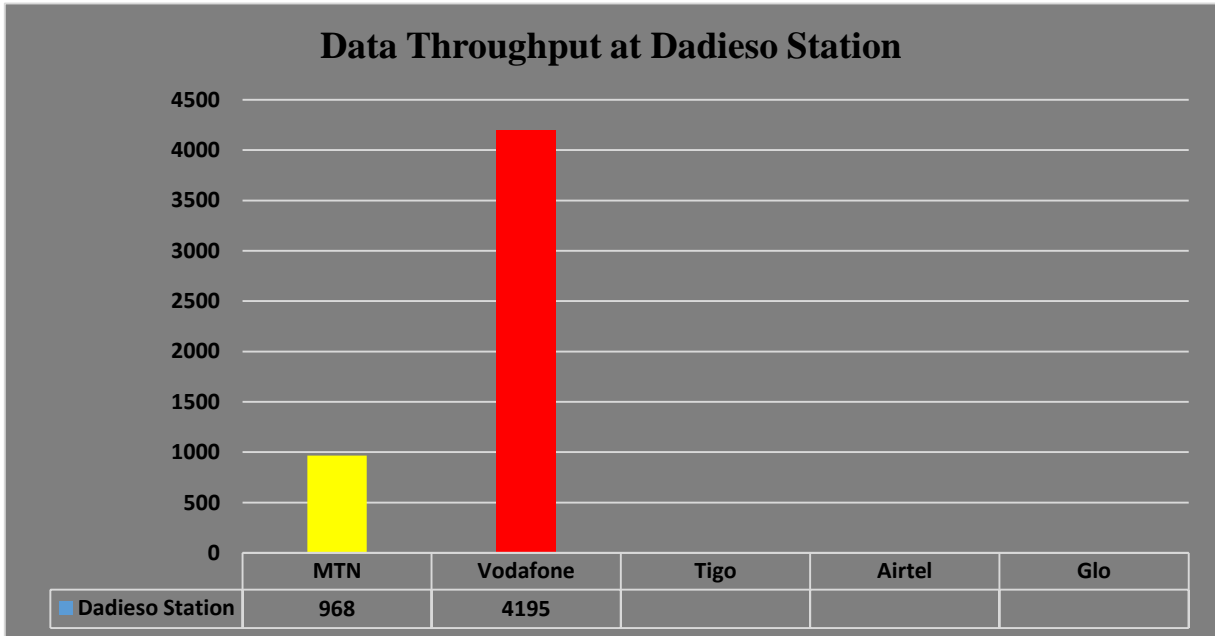


REMARKS:

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

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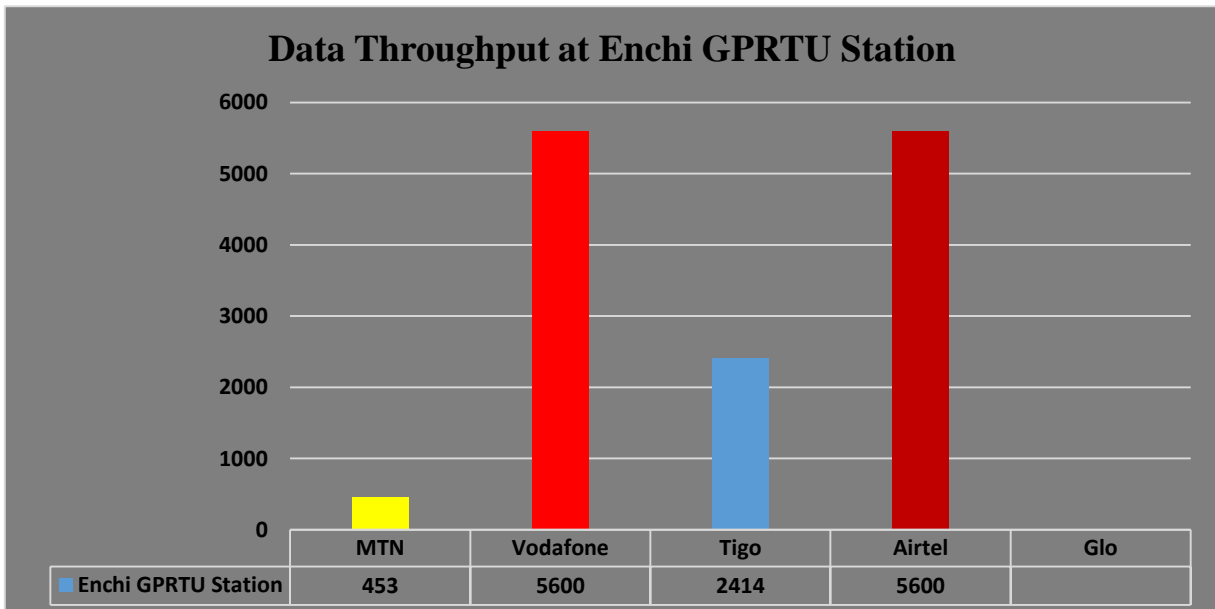
Figure 8. Data Throughput September 2016, Dadieso Station.



REMARKS:

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

Figure 9. Data Throughput September 2016, Enchi GPRTU Station.

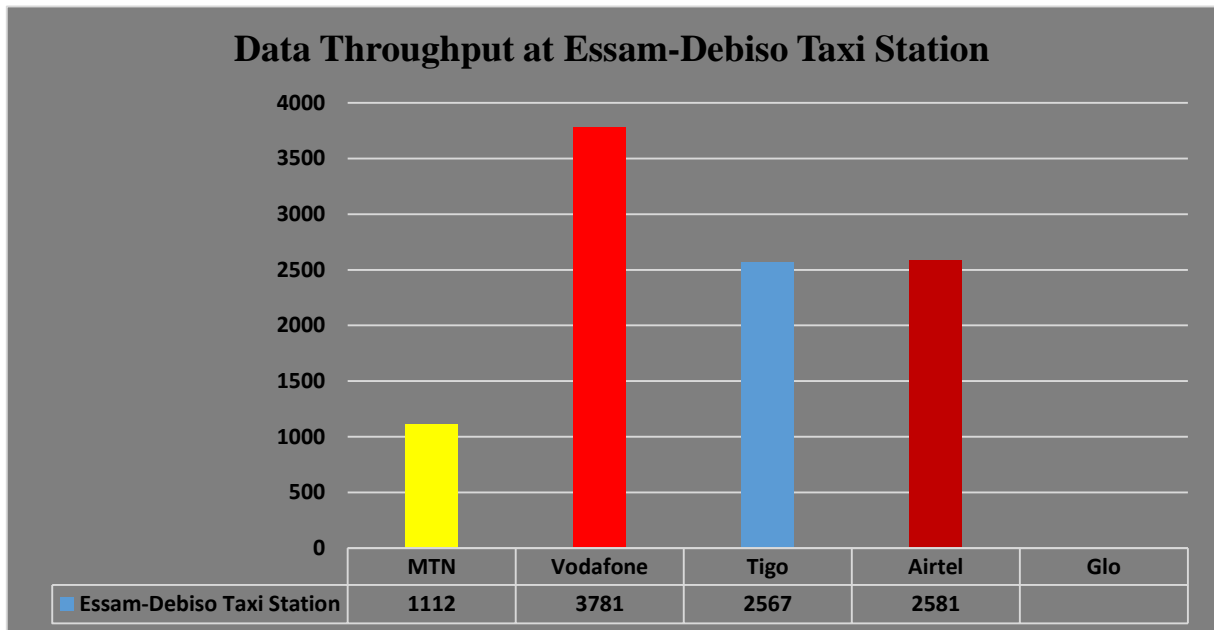


REMARKS:

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

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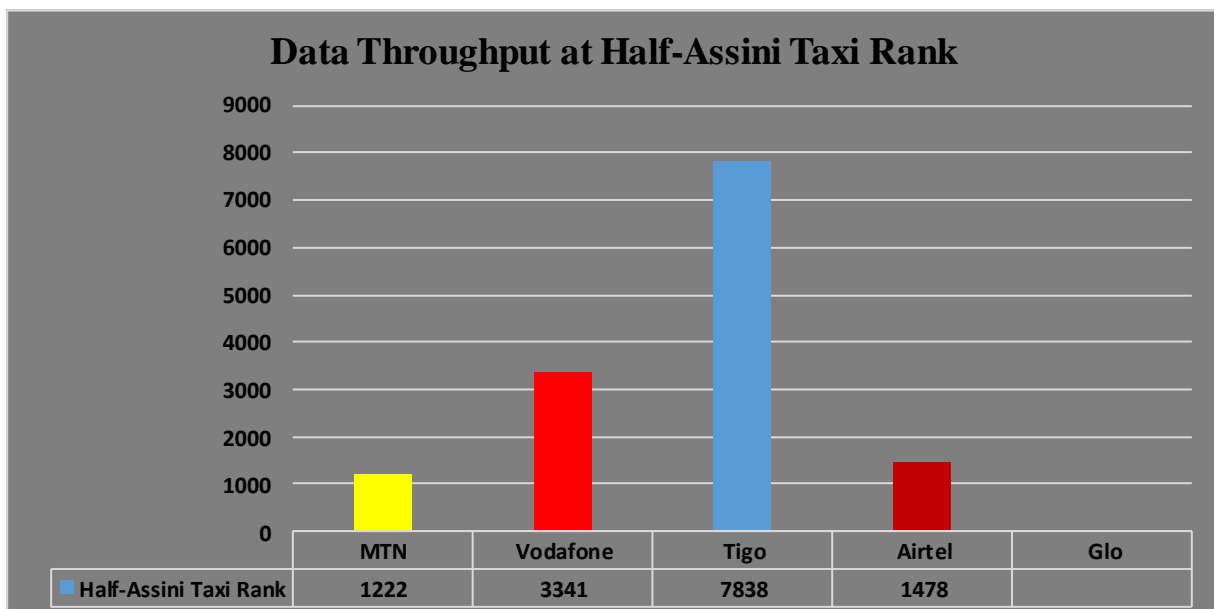
Figure 10. Data Throughput September 2016, Essam-Debiso Taxi Station.



REMARKS:

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

Figure 11. Data Throughput September 2016, Half-Assini Taxi Rank.

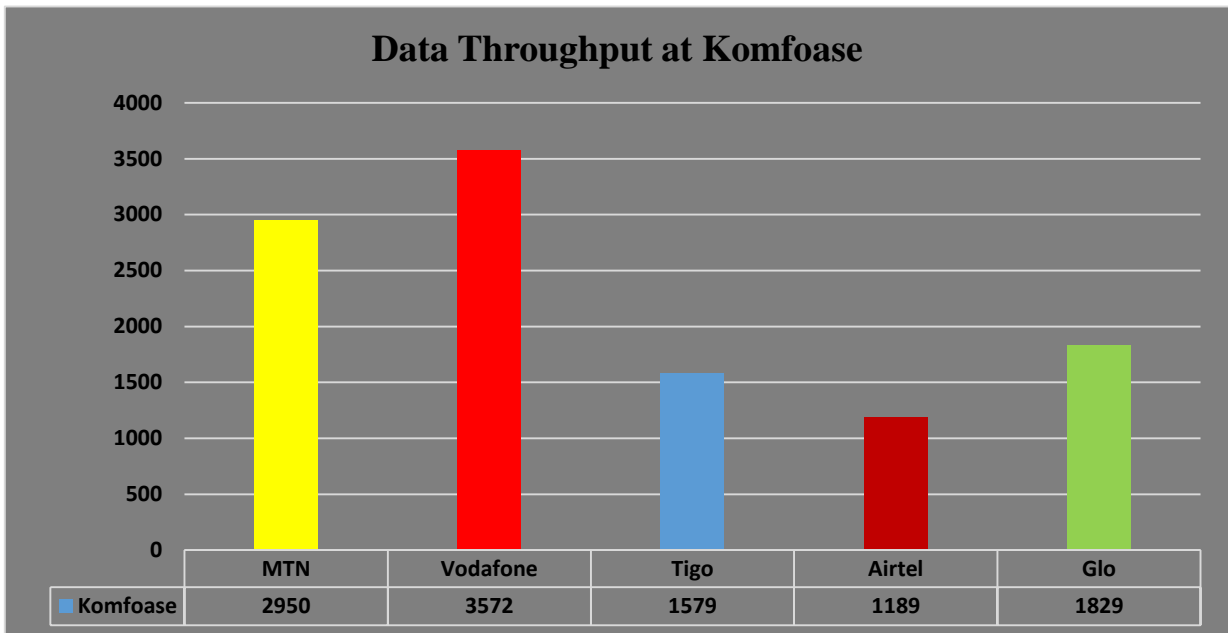


REMARKS:

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

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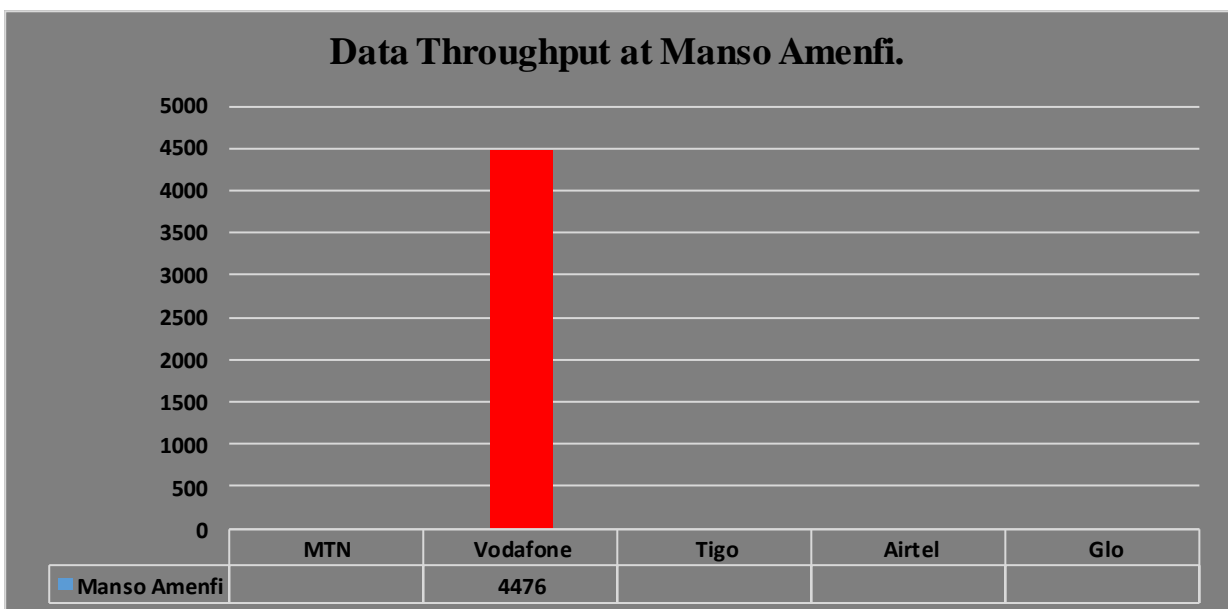
Figure 12. Data Throughput September 2016, Komfoase.



REMARKS:

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

Figure 13. Data Throughput September 2016, Manso Amenfi.

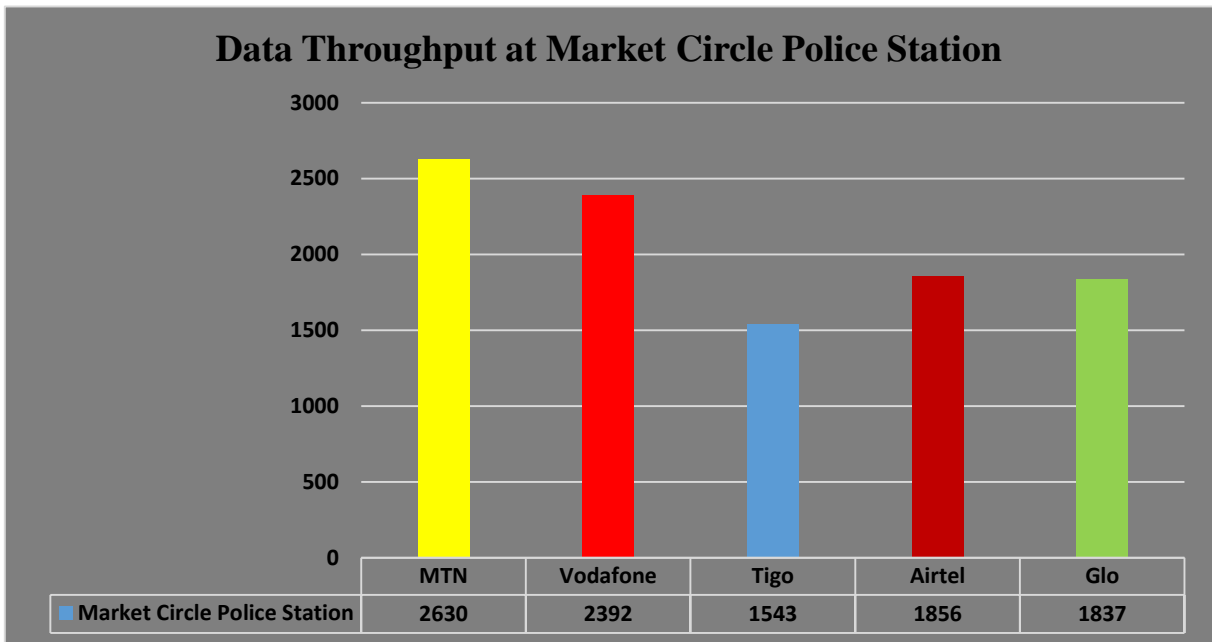


REMARKS:

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

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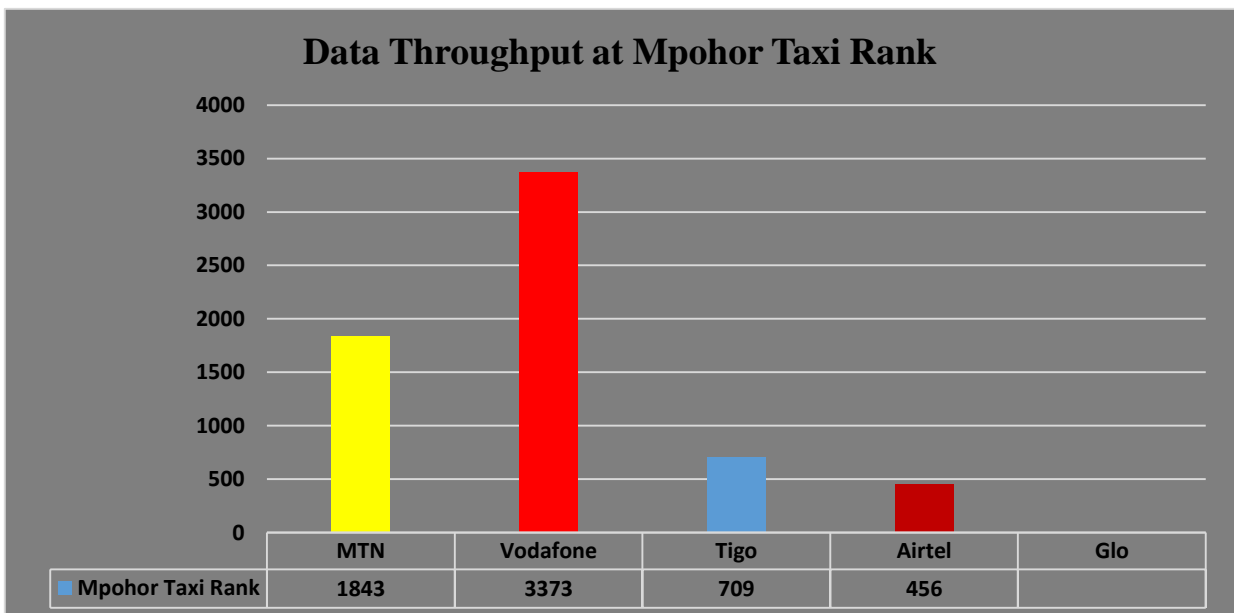
Figure 14. Data Throughput September 2016, Market Circle Police Station



REMARKS:

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

Figure 15. Data Throughput September 2016, Mpohor Taxi Rank

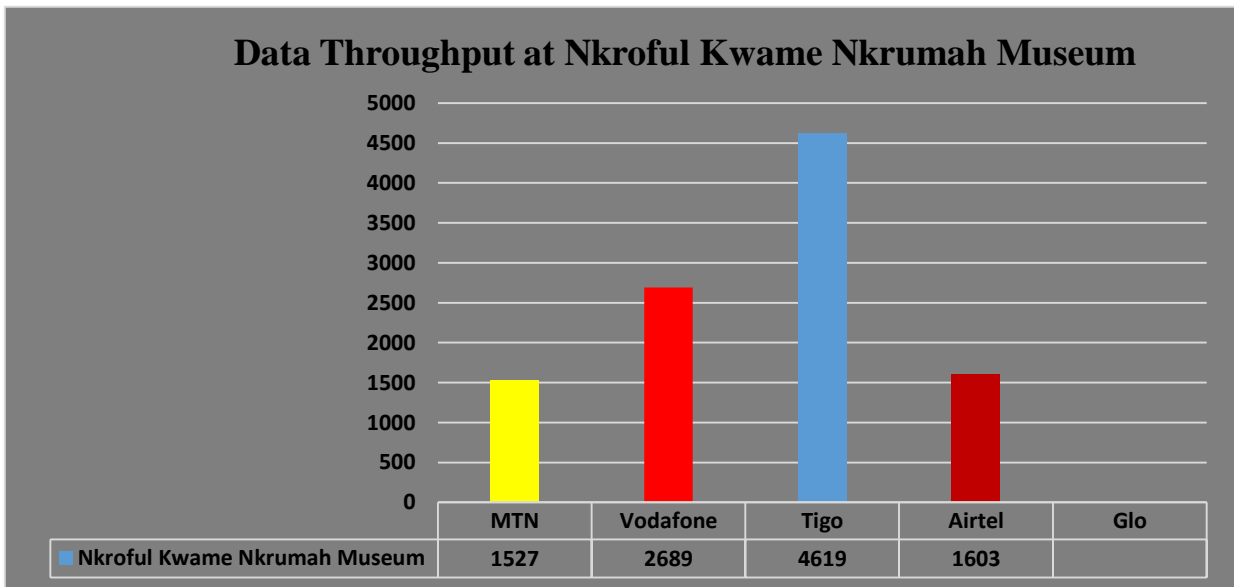


REMARKS:

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

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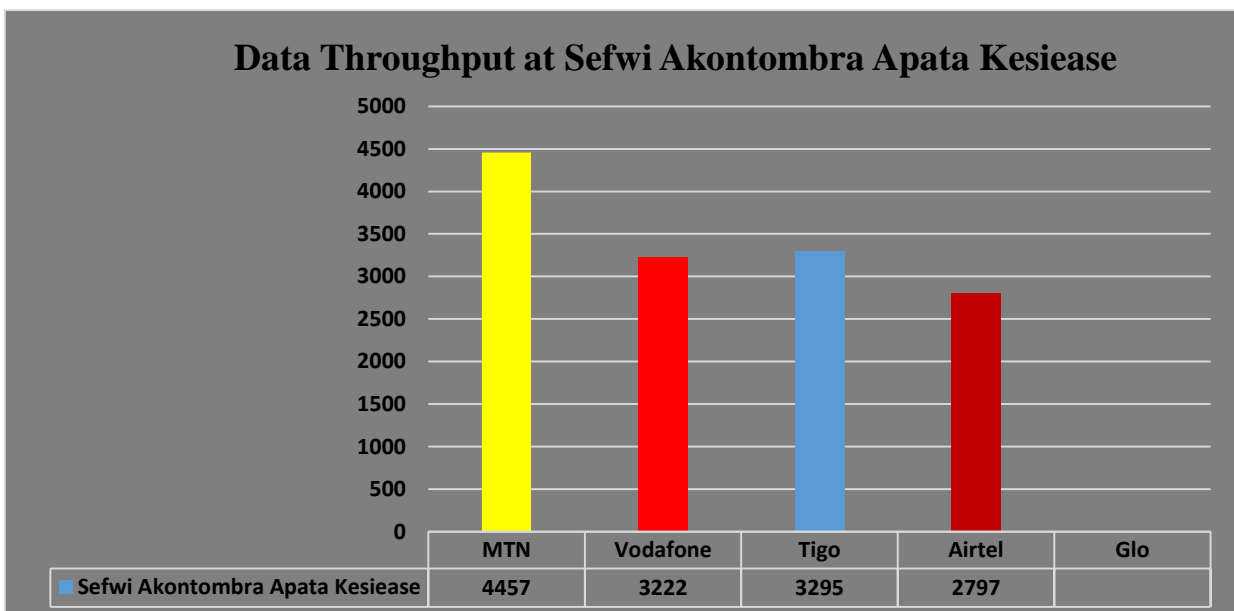
Figure 16. Data Throughput September 2016, Nkroful Kwame Nkrumah Museum



REMARKS:

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

Figure 17. Data Throughput September 2016, Sefwi Akontombra Apata Kesiease

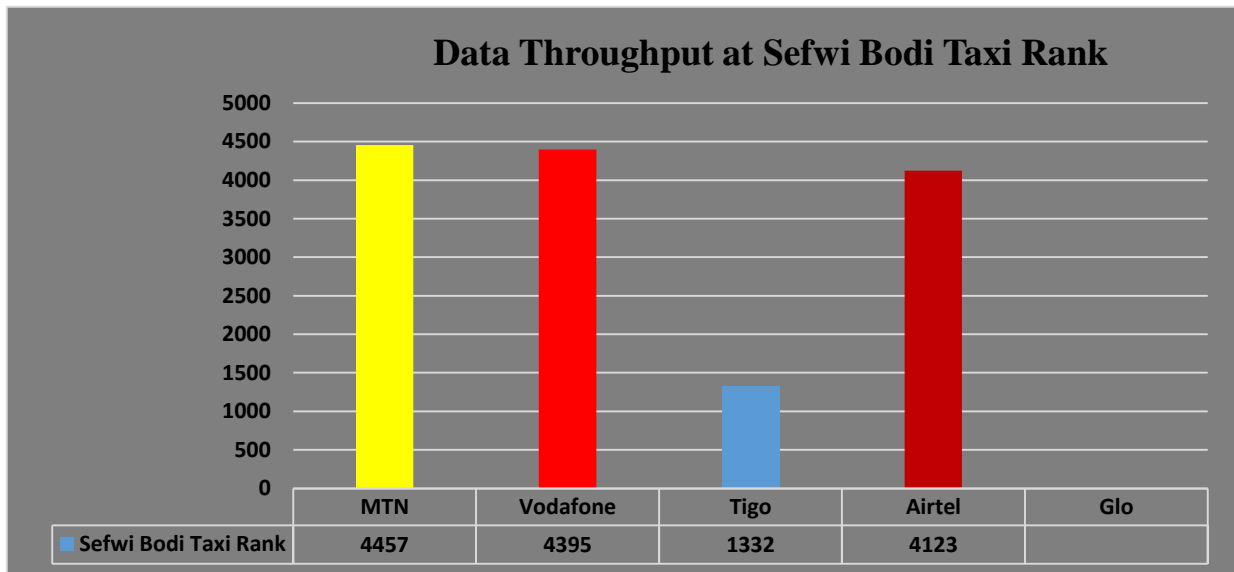


REMARKS:

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

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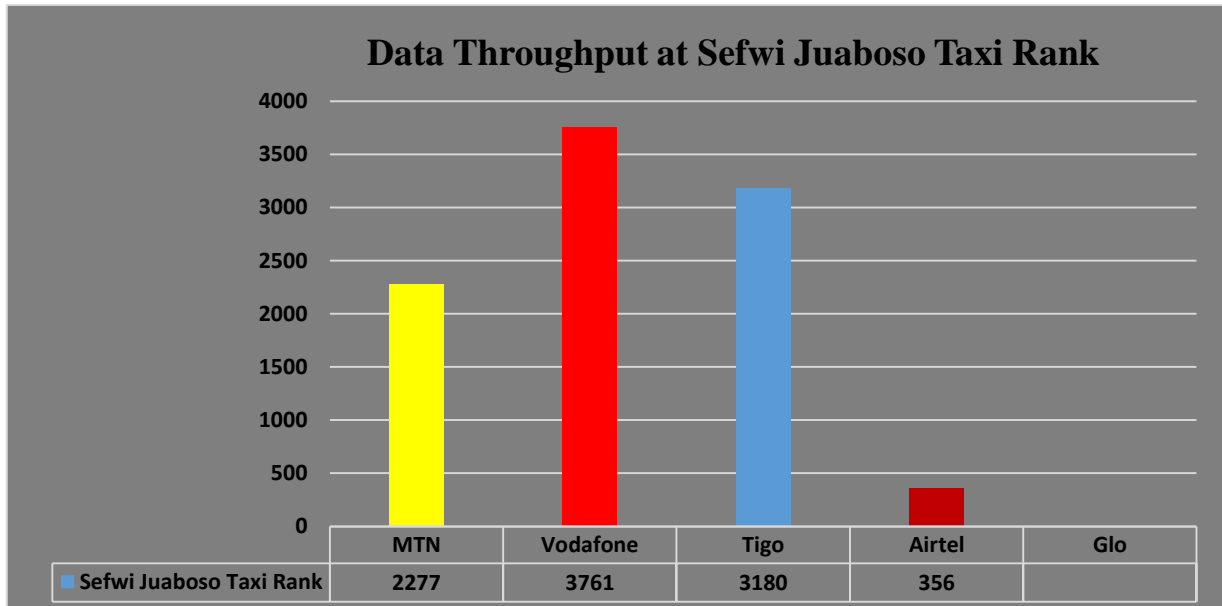
Figure 18. Data Throughput September 2016, Sefwi Bodi Taxi Rank



REMARKS:

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

Figure 19. Data Throughput September 2016, Sefwi Juaboso Taxi Rank

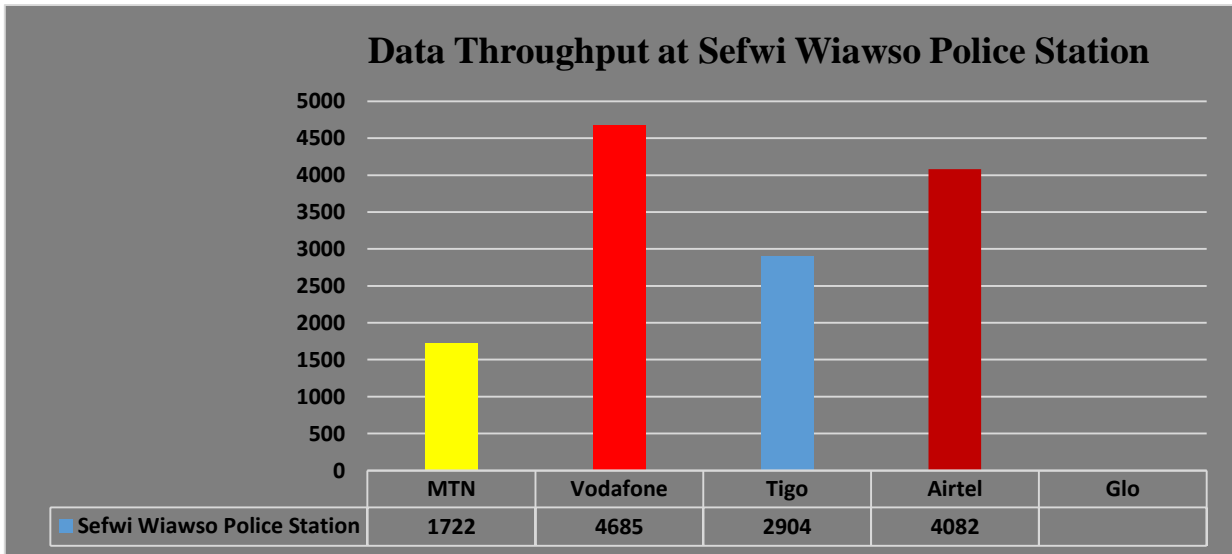


REMARKS:

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

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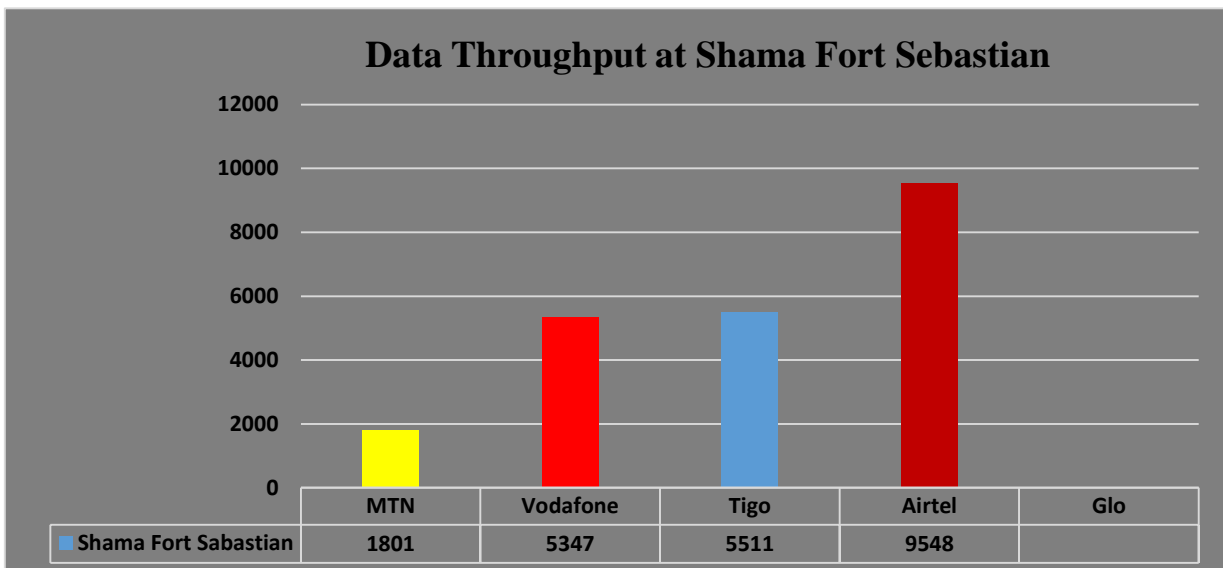
Figure 20. Data Throughput September 2016, Sefwi Wiawso Police Station



REMARKS:

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

Figure 21. Data Throughput September 2016, Shama Fort Sebastian

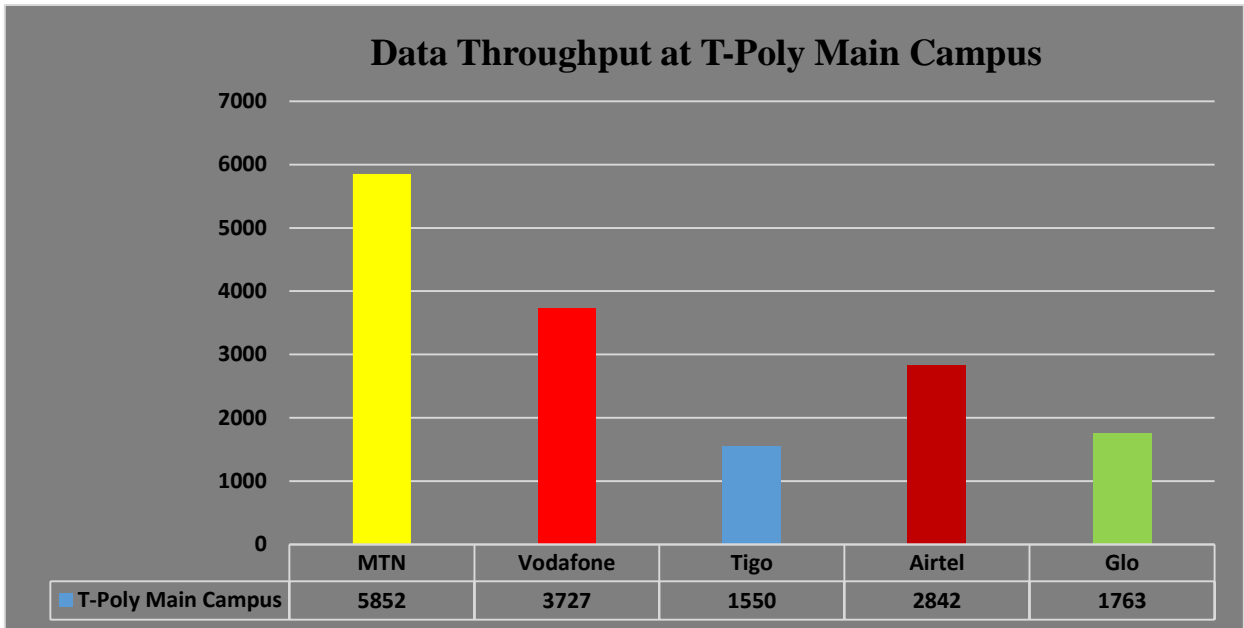


REMARKS:

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

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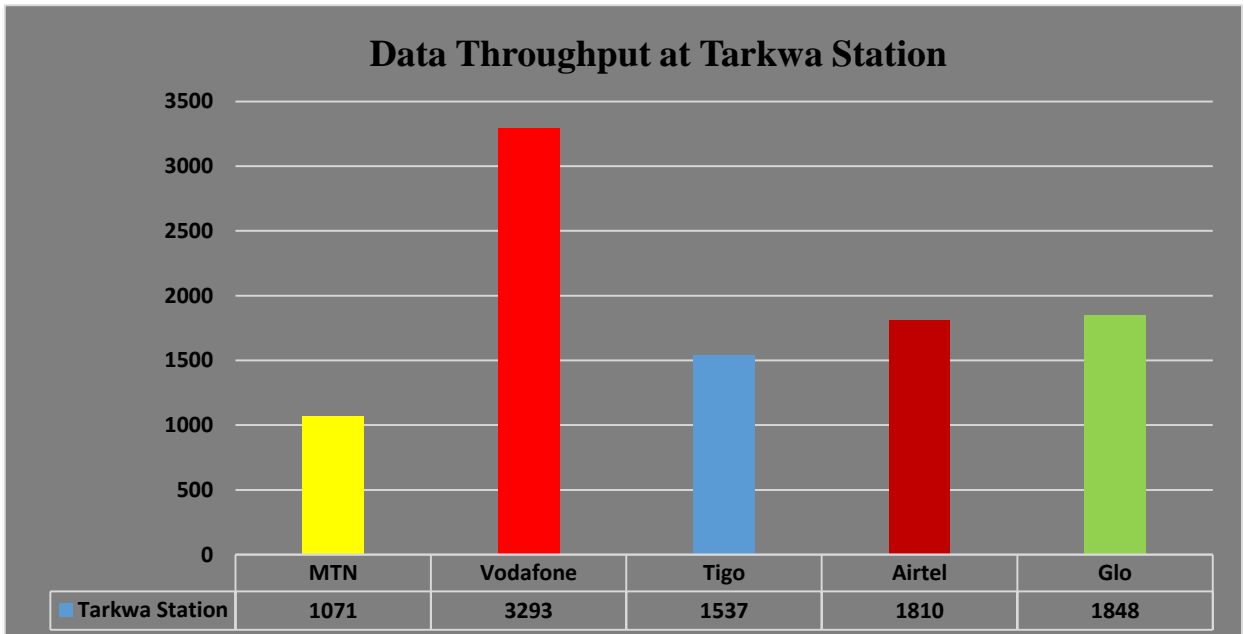
Figure 22. Data Throughput September 2016, T-Poly Main Campus



REMARKS:

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

Figure 23. Data Throughput September 2016, Tarkwa Station

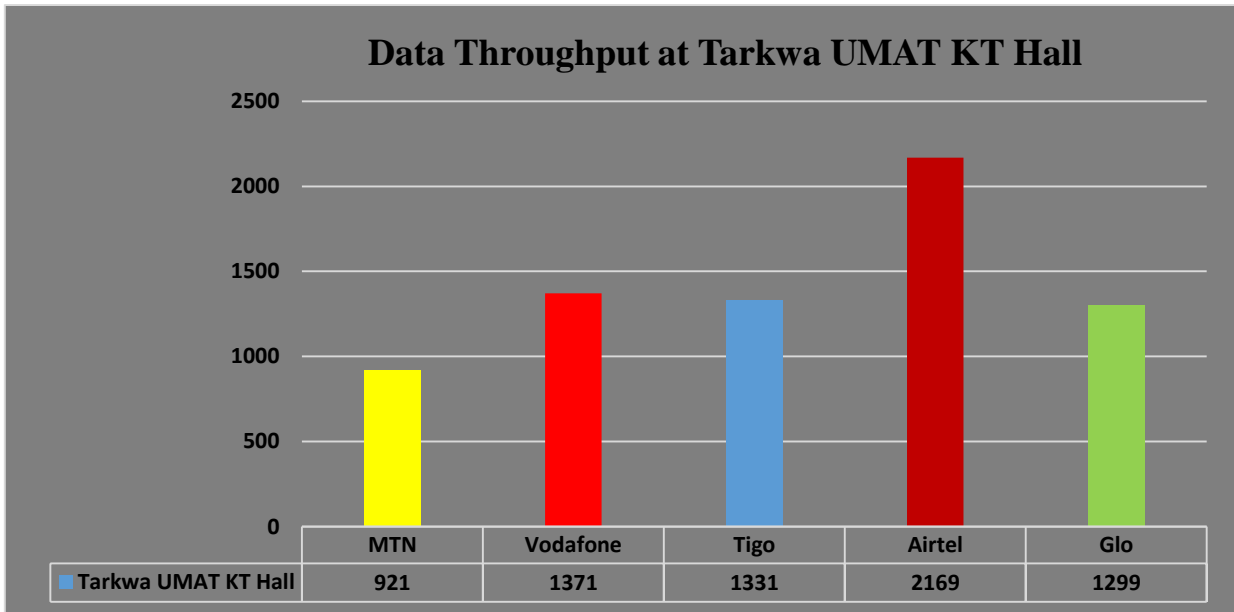


REMARKS:

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

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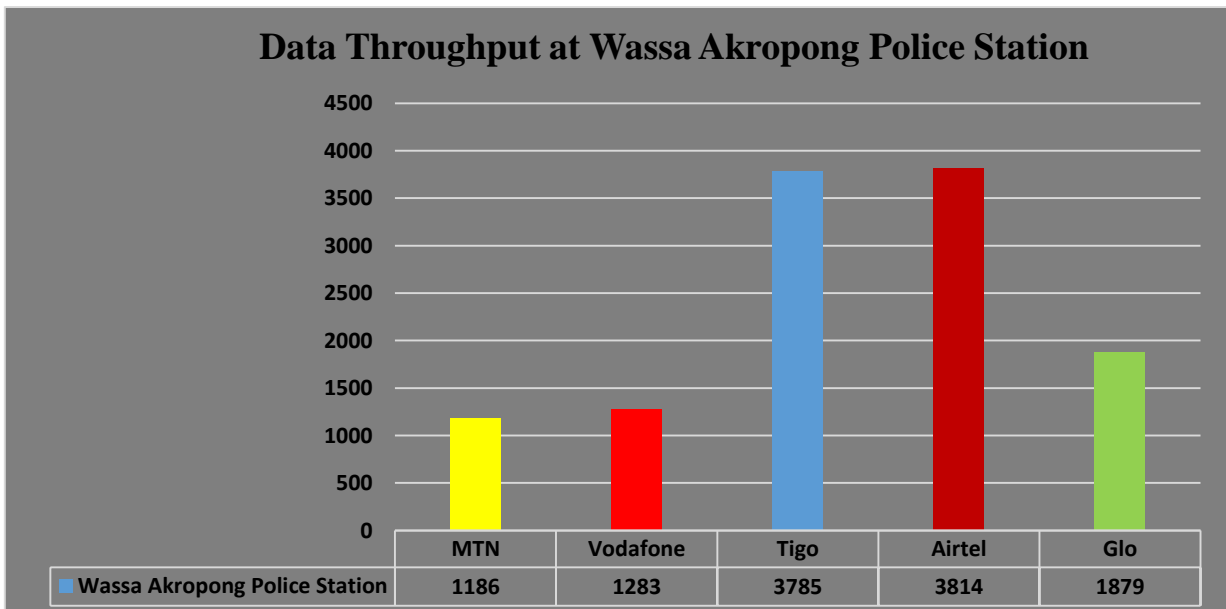
Figure 24. Data Throughput September 2016, Tarkwa UMAT KT Hall



REMARKS:

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

Figure 25. Data Throughput September 2016, Wassa Akropong Police Station



REMARKS:

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