

# GWS Summary and OneScore™ Report

## Bulgaria

December 11, 2018



Global Wireless  
Solutions, Inc.

THE STANDARD FOR BENCHMARKING™

# SUMMARY – INTRODUCTION & METHODOLOGY

Between 15<sup>th</sup> October 2018 and 15<sup>th</sup> November 2018, Global Wireless Solutions, Inc. (“GWS”) collected data for Vivacom Bulgaria.

A National representative sample for the Bulgarian population was structured by Region and Settlement type (Capital, Regional Center, Town or Village) containing 252 settlements and address locations within, randomly selected, for measuring the coverage.

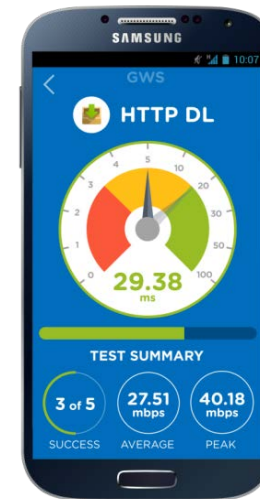
Results from these locations have been reported and the Technology Coverage and OneScore™ results are presented in this final report.

## Collection Equipment



Android Samsung  
Galaxy S8 (G950F)

using the GWS Mobile  
Diagnostics APP



# RANKING OF TECHNOLOGY COVERAGE BY POPULATION

Stat-Tested Coverage Rank	
1	indicates a win for Vivacom
National LTE	
Vivacom	1
Operator1	2
Operator2	3
Operator3	4
Operator4	5

Coverage Rank is based on the statistically validated drive testing results of the 252 settlements randomly selected across Bulgaria.

# OVERALL TECHNOLOGY COVERAGE (WITH NO-SERVICE)

Mode %	Vivacom	Operator1	Operator2	Operator3	Operator4
% LTE Mode	99.25%	97.21%	59.10%	50.47%	42.84%
% HSPA+ Mode	0.64%	2.76%	36.37%	0.00%	0.00%
% HSPA Mode	0.01%	0.03%	0.12%	0.00%	0.00%
%UMTS	0.00%	0.00%	0.80%	0.00%	0.00%
% EDGE/GPRS Mode	0.10%	0.00%	3.43%	0.00%	0.00%
% No Service	0.00%	0.00%	0.17%	49.53%	57.16%

- The chart above shows the distribution of the technology coverage for all testing locations based on the data collected (cumulative at a national level)
- Technology usage is calculated based on time spent by the tasks (success, setup failed, transfer failed), and includes no service counts

# SUMMARY – ONESCORE™ METHODOLOGY USED TO RANK NETWORKS

## Introduction to OneScore™

- OneScore™ provides one simplified number that is aggregated from various measured network performance metrics (voice, data, etc.) to determine a best-in-class operator.
- OneScore™ combines in-depth network testing data with a real understanding of how consumers are actually using their mobile device connections, to deliver the deepest insight into mobile network performance available.
- Operators use OneScore™ to not only see how their testing data fares compared to the competition, but also how this relates to actual consumer usage and behavior. This enables operators to better understand the areas where their customers are demanding top performance levels, as well as how the business can invest in its infrastructure to bring this performance to market.

## How is OneScore™ determined?

- GWS commissioned a survey to understand what network attributes are important to a typical wireless user.
- Based on this survey, different network service components have been weighted accordingly.
- Each network metric is normalized on a scale of 0 to 100 prior to weighting.



# ONESCORE™ RESULTS RANKING FOR BULGARIA

Stat-Tested OneScore Ranks		
	1 indicates a win for Vivacom	
PACKET	National - 4G only	National - Overall
Vivacom	1	1
Operator1	1	1
Operator2	1	3
Operator3	5	5
Operator4	4	4
SPEED	National - 4G only	National - Overall
Vivacom	2	1
Operator1	3	2
Operator2	1	3
Operator3	5	5
Operator4	4	4
SOCIAL MEDIA	National - 4G only	National - Overall
Vivacom	1	1
Operator1	3	2
Operator2	1	3
Operator3	5	5
Operator4	4	4

**National – 4G only** indicates ranking based on tasks on 4G- only

**National – Overall** indicates ranking based on tasks on all technologies

GWS OneScore™ is based on a significance ranking with a binominal confidence interval of 90%. In some cases, multiple OpCo's results are not statistically different enough to hit that 90% confidence level and consequently could be challenged so in these cases we rank them as a tie.