



Independent Quality of Service Survey In Pakistan – Cities

Second Quarter 2024

Enforcement Division
PTA | F-5/1, Islamabad

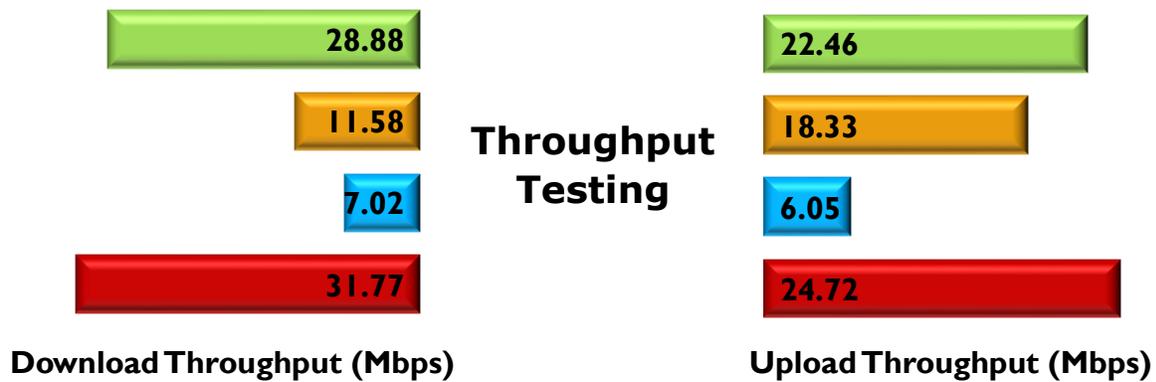
Executive Summary

1. QUALITY OF SERVICE SURVEY

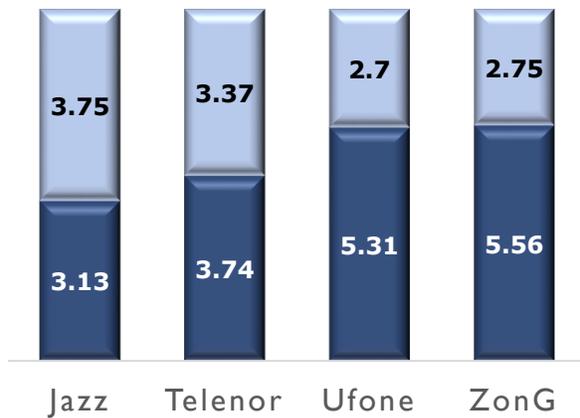
Pakistan Telecommunication Authority (PTA) has carried out independent Quality of Service (QoS) Survey in 23x cities of Pakistan during 2nd Quarter 2024. During the survey, performance of Cellular Mobile Operators (CMOs) has been assessed in accordance with the Cellular Mobile Network Quality of Service (QoS) Regulations 2021.

2. OVERVIEW

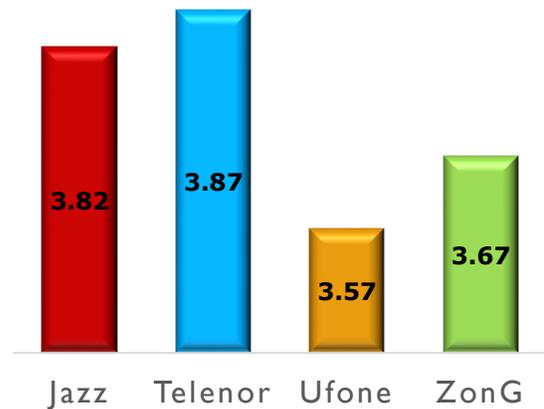
The survey drive comprised of approximately 4000KMs travelling per CMO in 83 days to cover maximum areas of surveyed cities. During the survey 0.38 Million tests of Mobile Broadband and 57500 Calls & SMS tests were conducted. Summary of the survey and overall results are as below:



■ Call Connection Time ■ SMS Send Time



Mean Opinion Score





Network Latency

3. RANKING

Based upon the compliance level of each KPI in surveyed cities against threshold defined in QoS Regulations, CMOs have been ranked between 1st to 4th position in Mobile Network Coverage, Mobile Broadband, Voice and SMS Services. CMOs scoring 1st position in respective services are shown as:

Cellular Mobile Operator	Coverage	Mobile Broadband				Voice	SMS	
		Throughput 		Latency 		Browsing 		
		Auto Mode 	Ookla 	Auto Mode 	Ookla 			
								
								
								
								

Quality of Service Survey

1. SURVEY CITIES

Quality of Service Survey was conducted in 23x cities of Khyber Pakhtunkhwa, Punjab, Sindh and Balochistan from 1st April till 30th June 2024. Survey routes were selected in a manner to cover maximum population area of the respective surveyed cities. The names of cities along with survey dates are mentioned in Table 1.1: QoS Survey Cities & Dates:

S. #.	City	Province	Days	Survey Dates
1	D.I KHAN	KHYBER PAKHTUNKHWA	03	22 nd ~24 th Apr,2024
2	PHARPUR		02	25 th ~26 th Apr,2024
3	MINGORA		04	6 th ~9 th May,2024
4	HARIPUR		05	14 th ~ 17 th May,2024
5	SHINKIARI		03	26 th May~6 th & 7 th June,2024
6	WAH CANTT & TAXILA CITY	PUNJAB	04	29 th ~30 th Apr&2 nd ~3 rd May,24
7	GUJRANWALA		04	22 nd ~ 25 th Apr,2024
8	ISLAMABAD		05	22 nd ~ 26 th Apr,2024
9	DG KHAN		04	6 th May ~9 th May, 2024
10	FEROZWALA		05	29 th Apr ~3 rd May, 2024
11	JARANWALA		03	13 th ~ 15 th May,2024
12	MAIN CHANNU		04	27 th ~30 th May,2024
13	RAWALPINDI		04	6 th ~ 9 th May,2024
14	VEHARI		03	12 th ~ 14 th June,2024
15	PISHIN	BALOCHISTAN	03	22 nd ~24 th Apr,2024
16	DALBANDIN		03	29 th Apr ~1 st May, 2024
17	NOUSHKI		03	20 th ~ 22 nd May,2024
18	HALA	SINDH	03	23 rd ~ 25 th Apr,2024
19	KEEMARI		04	14 th ~ 17 th May,2024
20	KOTRI		03	7 th ~ 9 th May,2024
21	SANGHAR		03	28 th ~ 30 th May,2024
22	SHIKARPUR		04	6 th ~ 9 th May,2024
23	TANDO ADAM		04	20 th ~ 23 rd May,2024

Table 1.1: QoS Survey Dates and Samples

2. TEST STATISTICS

During the survey, Quality of Services tests were conducted in the areas of Voice, Mobile Broadband (i.e. Data (Automode), Data (Ookla), Latency (Ookla) & Web Browsing) and Short Messaging Service (SMS). Service wise tests conducted for each CMO are shown in Table 2.1: Test Statistics.

Service	Jazz	ZonG	Telenor	Ufone
Data (Download)	10985	10942	10970	10405
Data (Upload)	11006	10962	10988	10423
Ookla (Download)	16919	16840	16982	16966
Ookla (Upload)	16919	16840	16982	16966
Ookla (Latency)	17861	17761	17906	17893
Webpage Browsing	22062	21937	21984	20849
Voice Call	7270	7199	7327	7041
Short Messaging Service	7253	7176	7284	7000

Table 2.1: Test Statistics

3. KEY PERFORMANCE INDICATORS (KPIs)

As per Cellular Mobile Network Quality of Service (QoS) Regulations 2021, all CMOs are required to meet or exceed the benchmark of QoS KPIs as shown in Table 3.1: QoS KPIs

Key Performance Indicators		Threshold Value	
Voice	Network Accessibility	≥ 99%	
	Call Setup Success Rate	≥ 98%	
	Call Connection Time	< 7.5 Seconds	
	Call Completion Ratio	> 98%	
	Mean Opinion Score	> 3	
	ISHO for CS Voice	≥ 98%	
	RAB Setup Success Rate	≥ 98%	
SMS	SMS Success Rate	≥ 99%	
	SMS End-to-End Delivery Time	≤ 12 Seconds	
Data (Automode)	Latency	< 75 ms	
	Webpage Loading Time	< 5 Seconds	
	Download Throughput	> 4 Mbps	
	Download Throughput	> 1 Mbps	
Network Coverage	Signal Strength (RSRP)	Signal Level	Minimum -100dBm
		Confidence Level	> 90%
	Signal Strength (RSCP)	Signal Level	Minimum -100dBm
		Confidence Level	> 90%

Table 3.1: QoS KPIs

4. NETWORK COVERAGE – 4G

During the survey, while conducting data test in technology auto detect mode, 4G/LTE signal strength samples were recorded on survey routes. City wise compliance of 90% Confidence Level of signal strength is shown in Table 4.1: 4G Signal Confidence Level- Technology Auto Detect Mode.

4G Signal Confidence Level- Technology Auto Detect Mode								
City	Confidence Level (%)				Compliant (Yes/No)			
	Jazz	Telenor	Ufone	ZonG	Jazz	Telenor	Ufone	ZonG
DALBANDIN	N/A	91.58%	99.25%	96.32%	N/A	Yes	Yes	Yes
D.I KHAN	90.70%	95.92%	98.42%	94.14%	Yes	Yes	Yes	Yes
HALA	98.58%	91.19%	100.00%	98.78%	Yes	Yes	Yes	Yes
PAHARPUR	92.34%	98.24%	98.27%	79.72%	Yes	Yes	Yes	No
PISHIN	86.99%	78.01%	93.51%	91.55%	No	No	Yes	Yes
DG KHAN	90.98%	92.75%	99.56%	99.15%	Yes	Yes	Yes	Yes
RAWALPINDI	96.26%	96.34%	99.70%	98.99%	Yes	Yes	Yes	Yes
WAH / TAXILA	95.16%	86.84%	99.85%	96.74%	Yes	No	Yes	Yes
MINGORA	91.70%	99.62%	99.72%	95.02%	Yes	Yes	Yes	Yes
KOTRI	94.09%	93.86%	86.13%	96.39%	Yes	Yes	No	Yes
KEEMARI	95.38%	83.31%	89.31%	86.06%	Yes	No	No	No
JARANWALA	99.45%	92.98%	87.78%	94.86%	Yes	Yes	No	Yes
SHIKARPUR	96.53%	91.1%	99.06%	99.81%	Yes	Yes	Yes	Yes
NOUSHKI	N/A	90.30%	98.05%	95.98%	N/A	Yes	Yes	Yes
ISLAMABAD	96.57%	96.68%	99.74%	97.60%	Yes	Yes	Yes	Yes
FEROZWALA	98.42%	74.31%	90.3%	98.55%	Yes	No	Yes	Yes
GUJRANWALA	99.18%	91.91%	99.46%	99.36%	Yes	Yes	Yes	Yes
HARIPUR	88.90%	81.99%	98.90%	94.23%	No	No	Yes	Yes
MIAN CHANNU	94.16%	91.62%	97.11%	95.49%	Yes	Yes	Yes	Yes
TANDO ADAM	98.27%	93.41%	98.81%	99.56%	Yes	Yes	Yes	Yes
SANGHAR	98.79%	97.80%	99.28%	99.34%	Yes	Yes	Yes	Yes
VEHARI	92.79%	84.63%	90.11%	93.07%	Yes	No	Yes	Yes
SHINKIARI	79.96%	81.42%	93.63%	89.85%	No	No	Yes	No

N/A means Coverage Not Available

Table 4.1: 4G Signal Confidence Level 90%- Technology Auto Detect Mode

5. NETWORK COVERAGE – 3G

During the survey, 3G signal strength samples were also recorded on survey routes, wherever network switched to 3G while keeping the mobile handset in technology auto detect mode. City wise compliance of 90% Confidence Level of signal strength is shown in Table 5.1: 3G Signal Confidence Level - Technology Auto Detect Mode

3G Signal Confidence Level - Technology Auto Detect Mode								
City	Confidence Level (%)				Compliant (Yes/No)			
	Jazz	Telenor	Ufone	ZonG	Jazz	Telenor	Ufone	ZonG
DALBANDIN	99.97	100.00	100.00	N/A	Yes	Yes	Yes	N/A
D.I KHAN	N/A	100.00	100.00	N/A	N/A	Yes	Yes	N/A
HALA	98.58	76.19	94.69	95.78	Yes	No	Yes	Yes
PAHARPUR	78.50	N/A	100.00	92.69	No	N/A	Yes	Yes
PISHIN	11.03	70.32	99.41	84.92	No	No	Yes	No
DG KHAN	N/A	100.00	N/A	N/A	N/A	Yes	N/A	N/A
RAWALPINDI	N/A	100.00	100.00	N/A	N/A	Yes	Yes	N/A

3G Signal Confidence Level - Technology Auto Detect Mode								
WAH / TAXILA	N/A	N/A	100.00	100.00	N/A	N/A	Yes	Yes
MINGORA	N/A	100.00	100.00	100.00	N/A	Yes	Yes	Yes
KOTRI	N/A	100.00	95.7	N/A	N/A	Yes	Yes	N/A
KEEMARI	85.92	83.00	99.71	74.60	No	No	Yes	No
JARANWALA	100.00	N/A	N/A	N/A	Yes	N/A	N/A	N/A
SHIKARPUR	N/A	N/A	100.00	100.00	N/A	N/A	Yes	Yes
NOUSHKI	N/A	100.00	100.00	N/A	Yes	Yes	Yes	N/A
ISLAMABAD	100.00	100.00	100.00	100.00	Yes	Yes	Yes	Yes
FEROZWALA	N/A	N/A	N/A	100.00	N/A	N/A	N/A	Yes
GUJRANWALA	100.00	100.00	100.00	N/A	Yes	Yes	Yes	N/A
HARIPUR	100.00	27.59	100.00	100.00	Yes	No	Yes	Yes
MIAN CHANNU	100.00	N/A	100.00	N/A	Yes	N/A	Yes	N/A
TANDO ADAM	N/A	100.00	N/A	N/A	N/A	Yes	N/A	N/A
SANGHAR	N/A	N/A	100.00	100.00	N/A	N/A	Yes	Yes
VEHARI	99.51	97.57	100.00	97.84	Yes	Yes	Yes	Yes
SHINKIARI	N/A	100.00	99.45	97.81	N/A	Yes	Yes	Yes

N/A means No Fallback to 3G

Table 5.1: 3G Signal Confidence Level - Technology Auto Detect Mode

6. MOBILE BROADBAND SERVICE – DATA SPEED

Automode Testing. In order to measure the performance of Mobile Broadband Services, Data Download and Upload tests were performed. During the test, a File of 10GB was downloaded and Uploaded for 3 minutes duration. Test Statistics are shown in Table 6.1: Data Tests Statistics while the Download and Upload Speed Results are shown in Table 6.2: Download Data Throughput and Table 6.3: Upload Data Throughput respectively.

DESCRIPTION		Jazz	Telenor	Ufone	Zong
DOWNLOAD	ATTEMPTS	10985	10942	10970	10405
	SPEED (Mbps)	23.026	7.323	8.571	19.671
UPLOAD	ATTEMPTS	11006	10962	10988	10423
	SPEED (Mbps)	20.783	5.774	16.549	19.79

Table 6.1: Data Tests Statistics

DOWNLOAD DATA THROUGHPUT >4Mbps								
City	Download Data Throughput [Mbps]				Operator Position			
	Jazz	Telenor	Ufone	ZonG	Jazz	Telenor	Ufone	ZonG
DALBANDIN	N/A	2.94	5.88	15.15	N/A	Third	Second	First
D.I KHAN	15.94	3.19	3.52	8.97	First	Fourth	Third	Second
HALA	17.40	7.53	10.94	15.27	First	Fourth	Third	Second
PAHARPUR	27.02	2.34	3.27	26.17	First	Fourth	Third	Second
PISHIN	18.29	11.97	5.89	19.87	Second	Third	Fourth	First
DG KHAN	16.84	8.29	6.81	18.00	Second	Third	Fourth	First
RAWALPINDI	28.12	5.59	9.01	14.03	First	Fourth	Third	Second
WAH / TAXILA	28.30	5.12	7.92	16.46	First	Fourth	Third	Second
MINGORA	28.78	1.92	4.69	13.55	First	Fourth	Third	Second
KOTRI	24.74	7.59	11.72	17.66	First	Fourth	Third	Second
KEEMARI	22.19	7.65	3.45	13.17	First	Third	Fourth	Second

JARANWALA	13.99	6.56	7.72	16.77	Second	Fourth	Third	First
SHIKARPUR	13.07	9.72	4.88	11.31	First	Third	Fourth	Second
NOUSHKI	N/A	3.08	4.84	17.28	N/A	Third	Second	First
ISLAMABAD	23.70	5.44	9.43	16.47	First	Fourth	Third	Second
FEROZWALA	17.32	7.12	7.00	22.26	Second	Third	Fourth	First
GUJRANWALA	19.99	11.22	8.08	13.50	First	Third	Fourth	Second
HARIPUR	20.10	7.73	3.19	13.01	First	Third	Fourth	Second
MIAN CHANNU	8.78	7.16	8.50	22.76	Second	Fourth	Third	First
TANDO ADAM	12.39	6.54	3.86	12.35	First	Third	Fourth	Second
SANGHAR	14.60	13.29	6.44	22.07	Second	Third	Fourth	First
VEHARI	11.53	9.13	7.51	16.79	Second	Third	Fourth	First
SHINKIARI	11.77	2.07	4.38	12.88	Second	Fourth	Third	First

Table 6.2: Download Data Throughput

UPLOAD DATA THROUGHPUT \geq 1Mbps								
City	Upload Data Throughput [Mbps]				Operator Position			
	Jazz	Telenor	Ufone	ZonG	Jazz	Telenor	Ufone	ZonG
DALBANDIN	N/A	1.8.4	12.04	15.40	N/A	Third	Second	First
D.I KHAN	16.13	4.84	10.99	14.06	First	Fourth	Third	Second
HALA	20.11	2.87	13.97	20.52	Second	Fourth	Third	First
PAHARPUR	18.46	5.18	10.07	8.41	First	Fourth	Second	Third
PISHIN	18.16	3.74	12.86	20.36	Second	Fourth	Third	First
DG KHAN	15.15	5.44	12.05	17.71	Second	Fourth	Third	First
RAWALPINDI	18.79	5.92	13.20	13.76	First	Fourth	Third	Second
WAH / TAXILA	17.22	4.82	14.15	14.59	First	Fourth	Third	Second
MINGORA	15.99	3.04	11.53	14.36	First	Fourth	Third	Second
KOTRI	23.18	4.47	12.11	19.62	First	Fourth	Third	Second
KEEMARI	19.15	6.05	11.45	16.52	First	Fourth	Third	Second
JARANWALA	21.40	3.51	11.90	22.85	Second	Fourth	Third	First
SHIKARPUR	18.75	6.09	12.62	17.25	First	Fourth	Third	Second
NOUSHKI	N/A	2.27	12.23	11.44	N/A	Third	First	Second
ISLAMABAD	18.05	6.28	16.22	13.20	First	Fourth	Second	Third
FEROZWALA	18.50	5.83	12.68	19.17	Second	Fourth	Third	First
GUJRANWALA	23.99	7.53	15.33	20.41	First	Fourth	Third	Second
HARIPUR	19.63	6.45	9.02	16.53	First	Fourth	Third	Second
MIAN CHANNU	11.45	6.04	13.38	17.08	Third	Fourth	Second	First
TANDO ADAM	18.58	6.45	12.38	20.19	Second	Fourth	Third	First
SANGHAR	19.03	5.03	11.87	24.48	Second	Fourth	Third	First
VEHARI	13.61	5.50	12.34	16.16	Second	Fourth	Third	First
SHINKIARI	12.15	3.00	12.75	18.23	Third	Fourth	Second	First

Table 6.3: Upload Data Throughput

Ookla Speed Test. Ookla Speed Test was also carried out to measure Download and Upload Data Throughput. During the survey, Speed Test servers were automatically selected based on the lowest ping and geographical location of the server. Ookla Test Statistics are shown in [Table 6.4: Ookla Tests Statistics](#) while the Download and Upload Speed Results are shown in [Table 6.5: Download Data Throughput](#) and [Table 6.6: Upload Data Throughput](#) respectively.

DESCRIPTION		Jazz	Telenor	Ufone	Zong
DOWNLOAD	ATTEMPTS	16919	16840	16982	16966
	SPEED (Mbps)	31.77	7.02	11.58	28.88
UPLOAD	ATTEMPTS	16919	16840	16982	16966
	SPEED (Mbps)	24.72	6.05	18.33	22.461

Table 6.4: Ookla Tests Statistics

OOKLA DOWNLOAD DATA THROUGHPUT \geq 4Mbps								
City	Download Data Throughput [Mbps]				Operator Position			
	Jazz	Telenor	Ufone	ZonG	Jazz	Telenor	Ufone	ZonG
DALBANDIN	N/A	2.27	9.92	5.27	N/A	Third	First	Second
D.I KHAN	31.02	3.49	7.56	27.28	First	Fourth	Third	Second
HALA	30.36	9.41	18.67	26.90	First	Fourth	Third	Second
PAHARPUR	32.17	2.51	8.70	29.64	First	Fourth	Third	Second
PISHIN	39.32	20.16	13.15	45.14	Second	Third	Fourth	First
DG KHAN	30.92	12.07	10.04	34.37	Second	Third	Fourth	First
RAWALPINDI	41.43	2.71	14.70	29.36	First	Fourth	Third	Second
WAH / TAXILA	41.18	4.00	11.49	30.90	First	Fourth	Third	Second
MINGORA	39.58	2.11	7.76	22.37	First	Fourth	Third	Second
KOTRI	32.73	11.62	17.20	32.69	First	Fourth	Third	Second
KEEMARI	30.59	10.14	11.00	27.93	First	Fourth	Third	Second
JARANWALA	31.62	9.53	22.52	34.16	Second	Fourth	Third	First
SHIKARPUR	24.30	14.00	9.20	15.50	First	Third	Fourth	Second
NOUSHKI	N/A	7.10	14.15	28.17	N/A	Third	Second	First
ISLAMABAD	37.13	3.60	9.62	29.39	First	Fourth	Third	Second
FEROZWALA	22.39	7.10	10.66	27.68	Second	Fourth	Third	First
GUJRANWALA	26.59	12.93	12.94	26.09	First	Fourth	Third	Second
HARIPUR	38.17	9.37	7.09	25.07	First	Third	Fourth	Second
MIAN CHANNU	11.46	20.03	10.32	33.72	Third	Second	Fourth	First
TANDO ADAM	29.09	10.16	14.80	31.05	Second	Fourth	Third	First
SANGHAR	23.80	5.19	8.99	34.70	Second	Fourth	Third	First
VEHARI	23.18	13.19	12.64	27.28	Second	Third	Fourth	First
SHINKIARI	16.78	2.64	6.99	23.75	Second	Fourth	Third	First

Table 6.5: Ookla Download Data Throughput

OOKLA UPLOAD DATA THROUGHPUT \geq 1Mbps								
City	Upload Data Throughput [Mbps]				Operator Position			
	Jazz	Telenor	Ufone	ZonG	Jazz	Telenor	Ufone	ZonG
DALBANDIN	N/A	2.89	17.71	21.39	N/A	Third	Second	First
D.I KHAN	23.61	5.37	19.08	21.01	First	Fourth	Third	Second
HALA	33.38	3.77	19.62	23.19	First	Fourth	Third	Second
PAHARPUR	27.24	5.27	14.64	8.06	First	Fourth	Second	Third
PISHIN	24.5	4.2	19.6	29.6	Second	Fourth	Third	First
DG KHAN	24.62	6.64	19.44	27.90	Second	Fourth	Third	First
RAWALPINDI	25.16	5.98	19.81	22.76	First	Fourth	Third	Second
WAH / TAXILA	23.49	4.88	21.28	19.14	First	Fourth	Second	Third
MINGORA	25.08	3.35	17.06	21.05	First	Fourth	Third	Second
KOTRI	28.79	5.52	19.00	26.63	First	Fourth	Third	Second
KEEMARI	21	6.93	17.68	21.97	Second	Fourth	Third	First
JARANWALA	36.83	5.94	18.75	26.09	First	Fourth	Third	Second
SHIKARPUR	23.00	5.70	21.40	20.60	First	Fourth	Second	Third
NOUSHKI	N/A	3.06	17.01	16.99	N/A	Third	First	Second

OOKLA UPLOAD DATA THROUGHPUT > 1Mbps								
ISLAMABAD	23.43	6.45	16.84	19.31	First	Fourth	Third	Second
FEROZWALA	29.85	6.52	17.23	20.59	First	Fourth	Third	Second
GUJRANWALA	29.20	7.97	22.74	26.35	First	Fourth	Third	Second
HARIPUR	28.76	7.56	16.68	22.33	First	Fourth	Third	Second
MIAN CHANNU	15.88	18.28	6.92	22.96	Third	Second	Fourth	First
TANDO ADAM	21.20	7.50	20.30	30.00	Second	Fourth	Third	First
SANGHAR	21.80	5.36	18.11	31.55	Second	Fourth	Third	First
VEHARI	18.69	6.67	14.47	23.50	Second	Fourth	Third	First
SHINKIARI	15.90	3.84	15.31	22.07	Second	Fourth	Third	First

Table 6.6: Ookla Upload Data Throughput

7. MOBILE BROADBAND SERVICE – LATENCY

Latency is a vital indicator of Mobile Broadband Performance as user experience is highly dependent of it. During the survey, Network Latency was measured by calculating the ping between different websites and Ookla Speed Test servers. Latency Test Statistics are shown in Table 7.1: Latency Tests Statistics while the Results are shown in Table 7.2: Automode Latency and Table 7.3: Ookla Latency respectively.

DESCRIPTION	Jazz	Telenor	Ufone	Zong	
Automode	ATTEMPTS	11091	11099	11113	10514
	LATENCY (ms)	135.47	90.63	88.57	125.55
Ookla	ATTEMPTS	16919	16840	16982	16966
	LATENCY (ms)	33.7	38.7	41.9	26.1

Table 7.1: Latency Tests Statistics

LATENCY IN AUTOMODE TESTING								
City	Latency [milliseconds]				Compliant (Yes/No)			
	Jazz	Telenor	Ufone	ZonG	Jazz	Telenor	Ufone	ZonG
DALBANDIN	N/A	206.82	135.06	208.30	N/A	No	No	No
D.I KHAN	126.56	99.58	120.25	125.68	No	No	No	No
HALA	81.41	136.42	56.83	52.95	No	No	Yes	Yes
PAHARPUR	185.00	89.00	141.00	93.00	No	No	No	No
PISHIN	102.90	111.49	80.95	110.55	No	No	No	No
DG KHAN	105.31	101.41	100.74	88.80	No	No	No	No
RAWALPINDI	104.57	77.75	70.31	168.64	No	No	Yes	No
WAH / TAXILA	114.88	62.06	71.18	177.31	No	Yes	Yes	No
MINGORA	111.96	108.24	101.98	186.44	No	No	No	No
KOTRI	89.31	67.27	95.77	86.64	No	Yes	No	No
KEEMARI	106	75.56	104	100.4	No	No	No	No
JARANWALA	103.87	85.49	67.99	71.24	No	No	Yes	Yes
SHIKARPUR	103.00	85.00	88.00	97.00	No	No	No	No
NOUSHKI	N/A	245.09	104.45	338.73	N/A	No	No	No
ISLAMABAD	106.72	90.60	70.25	115.25	No	No	Yes	No
FEROZWALA	114.51	62.63	62.60	58.46	No	Yes	Yes	Yes
GUJRANWALA	129.71	52.60	70.11	50.22	No	Yes	Yes	Yes
HARIPUR	122.00	74.00	87.00	216.00	No	Yes	No	No
MIAN CHANNU	156.06	102.77	105.55	117.06	No	No	No	No
TANDO ADAM	107.00	81.00	80.00	82.00	No	No	No	No

LATENCY IN AUTOMODE TESTING								
SANGHAR	81.40	84.94	110.64	79.92	No	No	No	No
VEHARI	146.00	106.00	115.00	119.00	No	No	No	No
SHINKIARI	114.41	118.50	90.08	126.22	No	No	No	No

Table 7.2: Automode Latency

LATENCY IN OOKLA TESTING								
City	Latency [milliseconds]				Compliant (Yes/No)			
	Jazz	Telenor	Ufone	ZonG	Jazz	Telenor	Ufone	ZonG
DALBANDIN	N/A	63.24	82.84	98.59	N/A	Yes	No	No
D.I KHAN	30.33	70.84	57.54	29.09	Yes	Yes	Yes	Yes
HALA	27.86	38.77	64.70	22.92	Yes	Yes	Yes	Yes
PAHARPUR	87.87	49.93	63.12	29.41	No	Yes	Yes	Yes
PISHIN	37.34	40.13	75.32	29.13	Yes	Yes	No	Yes
DG KHAN	30.34	46.59	56.25	22.28	Yes	Yes	Yes	Yes
RAWALPINDI	20.64	37.23	25.10	17.00	Yes	Yes	Yes	Yes
WAH / TAXILA	21.19	24.68	21.64	16.95	Yes	Yes	Yes	Yes
MINGORA	29.92	54.16	33.60	24.70	Yes	Yes	Yes	Yes
KOTRI	22.57	25.86	22.50	25.55	Yes	Yes	Yes	Yes
KEEMARI	24.31	24.91	65.41	27.28	Yes	Yes	Yes	Yes
JARANWALA	27.80	32.71	42.93	21.36	Yes	Yes	Yes	Yes
SHIKARPUR	25.70	30.80	70.10	29.10	Yes	Yes	Yes	Yes
NOUSHKI	N/A	171.92	80.06	164.31	N/A	No	No	No
ISLAMABAD	22.12	32.16	29.49	15.98	Yes	Yes	Yes	Yes
FEROWALA	39.65	21.86	26.54	15.96	Yes	Yes	Yes	Yes
GUJRANWALA	32.12	26.29	35.03	19.23	Yes	Yes	Yes	Yes
HARIPUR	21.38	29.48	29.78	22.18	Yes	Yes	Yes	Yes
MIAN CHANNU	67.55	32.02	46.27	24.25	Yes	Yes	Yes	Yes
TANDO ADAM	23.70	28.65	60.04	23.98	Yes	Yes	Yes	Yes
SANGHAR	22.74	32.85	69.53	24.74	Yes	Yes	Yes	Yes
VEHARI	32.35	58.16	70.65	26.14	Yes	Yes	Yes	Yes
SHINKIARI	24.81	45.48	34.09	57.13	Yes	Yes	Yes	Yes

Table 7.3: Ookla Latency

8. MOBILE BROADBAND SERVICE – WEB PAGE LOADING

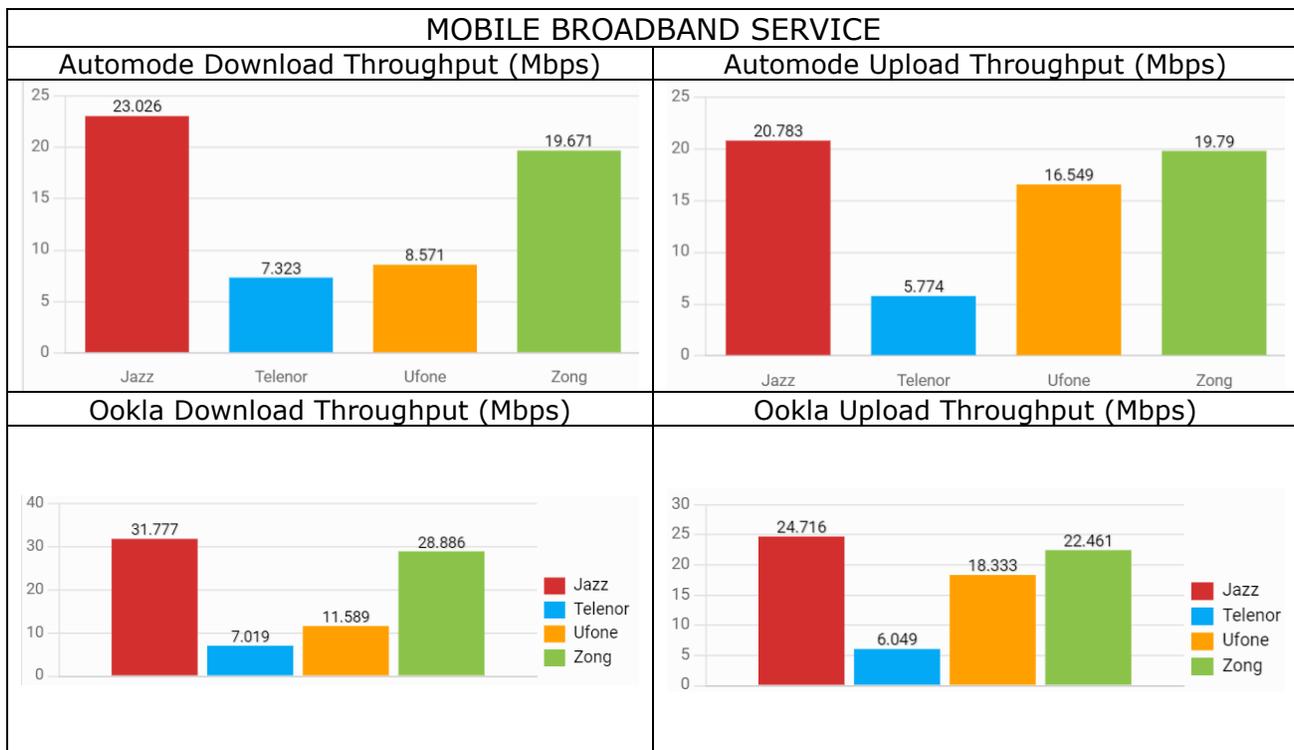
Web Page Loading Time of different national and international websites were tested. Results of testing are shown in Table 8.1: Web Page Loading Time.

WEBPAGE LOADING TIME IN IN TECHNOLOGY AUTO DETECT MODE								
City	Webpage Loading Time [seconds]				Compliant (Yes/No)			
	Jazz	Telenor	Ufone	ZonG	Jazz	Telenor	Ufone	ZonG
DALBANDIN	6.14	6.54	8.21	2.70	No	No	No	Yes
D.I KHAN	5.55	6.78	7.75	6.11	No	No	No	No
HALA	4.21	6.14	6.32	4.21	Yes	No	No	Yes
PAHARPUR	5.50	6.70	6.20	5.10	No	No	No	No
PISHIN	4.99	5.91	6.30	4.43	Yes	No	No	Yes
DG KHAN	0.85	0.60	0.25	0.14	Yes	Yes	Yes	Yes
RAWALPINDI	2.50	4.04	5.09	3.06	Yes	Yes	No	Yes
WAH / TAXILA	2.68	3.90	4.34	3.57	Yes	Yes	Yes	Yes
MINGORA	4.79	6.77	6.05	6.75	Yes	No	No	No

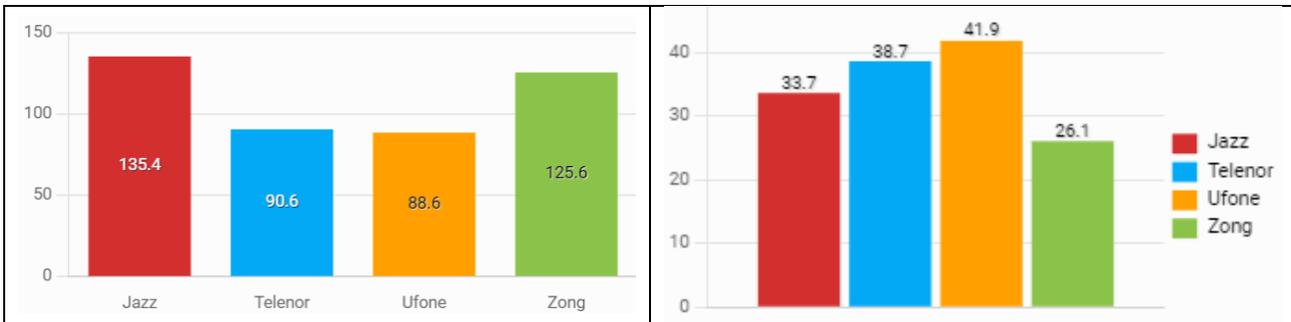
WEBPAGE LOADING TIME IN IN TECHNOLOGY AUTO DETECT MODE								
KOTRI	4.00	6.22	5.73	4.70	Yes	No	No	Yes
KEEMARI	5.19	6.84	7.28	4.81	No	No	No	Yes
JARANWALA	6.00	8.15	5.87	8.21	No	No	No	No
SHIKARPUR	5.20	0.60	0.28	0.78	No	Yes	Yes	Yes
NOUSHKI	6.19	7.26	7.48	6.82	No	No	No	No
ISLAMABAD	2.51	3.40	3.33	2.67	Yes	Yes	Yes	Yes
FEROZWALA	5.96	7.35	7.01	6.71	No	No	No	No
GUJRANWALA	5.31	6.64	7.14	6.44	No	No	No	No
HARIPUR	5.32	7.08	7.43	6.96	No	No	No	No
MIAN CHANNU	0.45	0.45	0.13	0.11	Yes	Yes	Yes	Yes
TANDO ADAM	6.60	0.59	0.15	0.76	No	Yes	Yes	Yes
SANGHAR	8.30	0.47	0.09	0.77	No	Yes	Yes	Yes
VEHARI	0.41	0.49	0.16	0.11	Yes	Yes	Yes	Yes
SHINKIARI	7.30	6.65	7.80	7.36	No	No	No	No

Table 8.1: Web Page Loading Time

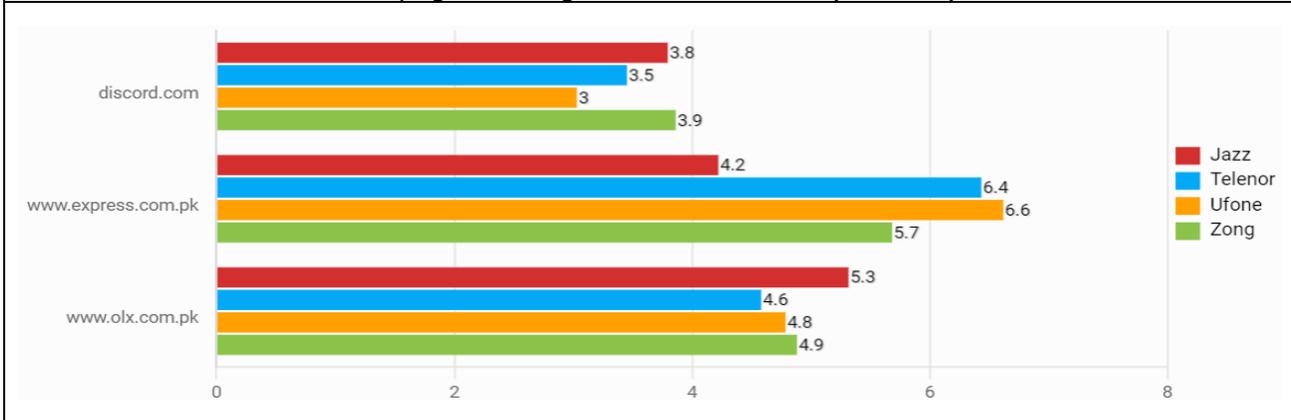
Overall survey results of Mobile Broadband Services for each Mobile Operator are shown in the below graphs.



Automode Latency (milliseconds)	Ookla Latency (milliseconds)
---------------------------------	------------------------------



Webpage Loading Time Per Website (seconds)



9. VOICE SERVICE

A total of 28,837 Call attempts were made and out of which 537 were failed attempts. In 28,300 successful call attempts, 233 calls dropped prior to completion of two minutes duration, whereas 28,067 calls remained connected for the complete duration of two minutes. The 5 x QoS KPIs (i.e. Network Accessibility, Call Setup Success Rate, Call Setup Time, Call Completion Rate and Mean Opinion Score) have been measured while testing voice services in the surveyed cities. Company wise call statistics is shown in Table 9.1: Call Statistics, while the compliance in each surveyed city are shown in Tables 9.2 to Table 9.3: Voice QoS KPIs Compliance Level,

Description	Jazz	Telenor	Ufone	Zong
Total Calls Attempts	7270	7199	7327	7041
Failed Calls Attempts	104	216	115	102
Established Calls Attempts	7,166	6,983	7212	6939
Dropped Calls Attempts	36	84	88	25
Completed Calls Attempts	7130	6899	7124	6914
Call Setup Success Rate (%)	98.57	97.0	98.43	98.55
Call Connection Time (Sec)	3.13	3.74	5.31	5.56
Call Completion Rate (%)	99.50	98.80	98.78	99.64
Mean Opinion Score	3.78	3.83	3.55	3.7
Total Speech Test	70891	69845	72215	69889

Table 9.1: Call Statistics

CMO	KPIS	Dalbandin	DI Khan	Hala	Paharpur	Pishin	DG Khan
Jazz	NA	No	Yes	Yes	Yes	Yes	Yes
	CSSR	No	Yes	Yes	No	Yes	No
	CCT	No	Yes	Yes	Yes	Yes	Yes
	CCR	Yes	Yes	Yes	Yes	No	Yes
	MOS	Yes	Yes	Yes	Yes	Yes	Yes
Telenor	NA	Yes	Yes	No	Yes	Yes	Yes
	CSSR	Yes	No	No	Yes	No	Yes
	CCT	Yes	Yes	Yes	Yes	Yes	Yes
	CCR	Yes	Yes	No	Yes	Yes	Yes
	MOS	Yes	Yes	Yes	Yes	Yes	Yes
Ufone	NA	Yes	Yes	Yes	Yes	Yes	Yes
	CSSR	Yes	No	Yes	Yes	Yes	Yes
	CCT	Yes	Yes	Yes	Yes	Yes	Yes
	CCR	Yes	Yes	Yes	Yes	No	Yes
	MOS	Yes	Yes	Yes	Yes	Yes	Yes
ZonG	NA	Yes	Yes	Yes	Yes	Yes	Yes
	CSSR	No	Yes	Yes	Yes	Yes	Yes
	CCT	Yes	Yes	Yes	Yes	Yes	Yes
	CCR	Yes	Yes	Yes	Yes	Yes	Yes
	MOS	Yes	Yes	Yes	Yes	Yes	Yes

** Note Voice QoS KPIs: Network Accessibility (NA), Call Setup Success Rate (CSSR) > 98%, Call Connection Time (CCT), Call Completion Ratio (CCR), Mean Opinion Score (MOS)*

Table 9.2: Voice QoS KPIs Compliance Level

CMO	KPIS	Rawalpindi	Wah / Taxila	Mingora	Kotri	Keemari	Jaranwala
Jazz	NA	Yes	Yes	Yes	Yes	Yes	Yes
	CSSR	Yes	Yes	Yes	Yes	Yes	Yes
	CCT	Yes	Yes	Yes	Yes	Yes	Yes
	CCR	Yes	Yes	Yes	Yes	Yes	Yes
	MOS	Yes	Yes	Yes	Yes	Yes	Yes
Telenor	NA	Yes	Yes	Yes	Yes	Yes	Yes
	CSSR	Yes	Yes	No	Yes	No	Yes
	CCT	Yes	Yes	Yes	Yes	Yes	Yes
	CCR	Yes	Yes	Yes	No	No	Yes
	MOS	Yes	Yes	Yes	Yes	Yes	Yes
Ufone	NA	Yes	Yes	Yes	Yes	Yes	Yes
	CSSR	No	Yes	No	Yes	No	Yes
	CCT	Yes	Yes	Yes	Yes	Yes	Yes
	CCR	No	No	Yes	Yes	Yes	Yes
	MOS	Yes	Yes	Yes	Yes	Yes	Yes
ZonG	NA	Yes	Yes	Yes	Yes	Yes	Yes
	CSSR	Yes	Yes	No	Yes	No	Yes
	CCT	Yes	Yes	Yes	Yes	Yes	Yes
	CCR	Yes	Yes	Yes	Yes	No	Yes
	MOS	Yes	Yes	Yes	Yes	Yes	Yes

** Note Voice QoS KPIs: Network Accessibility (NA), Call Setup Success Rate (CSSR) > 98%, Call Connection Time (CCT), Call Completion Ratio (CCR), Mean Opinion Score (MOS)*

Table 9.3: Voice QoS KPIs Compliance Level

CMO	KPIS	Shikarpur	Noushki	Islamabad	Ferozwala	Gujranwala	Haripur
Jazz	NA	No	Yes	Yes	Yes	Yes	Yes
	CSSR	Yes	Yes	Yes	Yes	Yes	Yes
	CCT	Yes	Yes	Yes	Yes	Yes	Yes
	CCR	Yes	Yes	Yes	Yes	Yes	Yes
	MOS	Yes	No	Yes	Yes	Yes	Yes
Telenor	NA	Yes	Yes	Yes	Yes	Yes	Yes
	CSSR	Yes	No	No	Yes	Yes	No
	CCT	Yes	Yes	Yes	Yes	Yes	Yes
	CCR	Yes	Yes	No	Yes	Yes	No
	MOS	Yes	Yes	Yes	Yes	Yes	Yes
Ufone	NA	No	Yes	Yes	Yes	Yes	Yes
	CSSR	No	No	Yes	Yes	Yes	No
	CCT	Yes	Yes	Yes	Yes	Yes	Yes
	CCR	Yes	No	Yes	No	Yes	No
	MOS	Yes	Yes	Yes	Yes	Yes	Yes
ZonG	NA	Yes	Yes	Yes	Yes	Yes	Yes
	CSSR	Yes	Yes	No	Yes	Yes	No
	CCT	Yes	Yes	Yes	Yes	Yes	Yes
	CCR	Yes	Yes	Yes	Yes	Yes	Yes
	MOS	Yes	Yes	Yes	Yes	Yes	Yes

* Note Voice QoS KPIs: Network Accessibility (NA), Call Setup Success Rate (CSSR) > 98%, Call Connection Time (CCT), Call Completion Ratio (CCR), Mean Opinion Score (MOS)

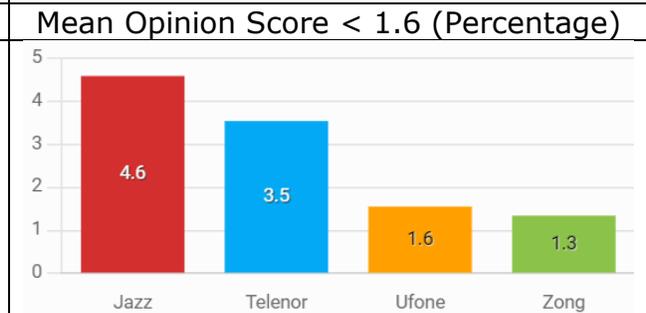
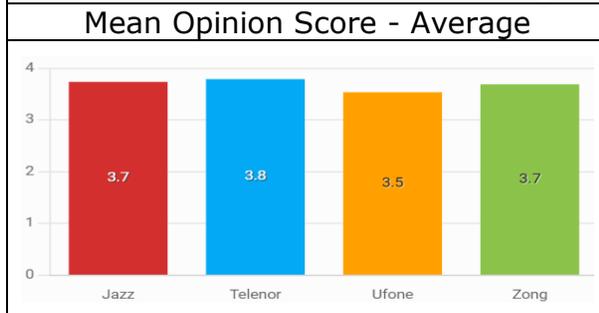
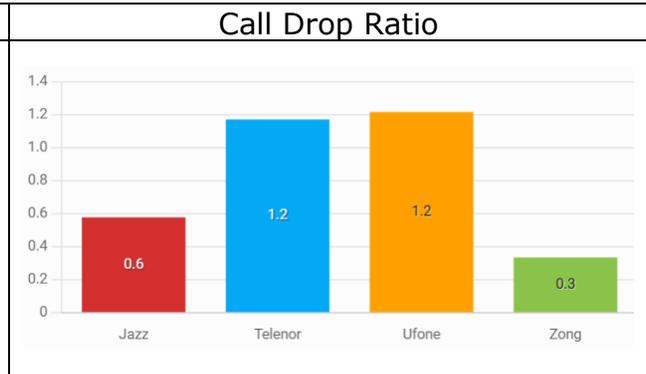
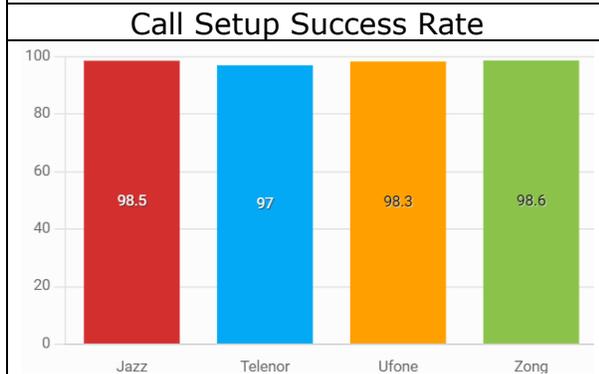
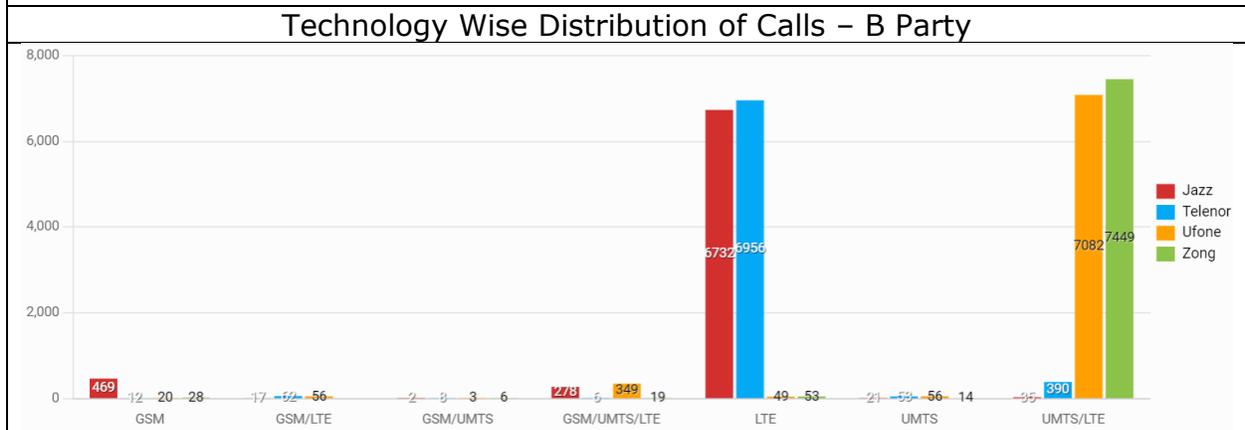
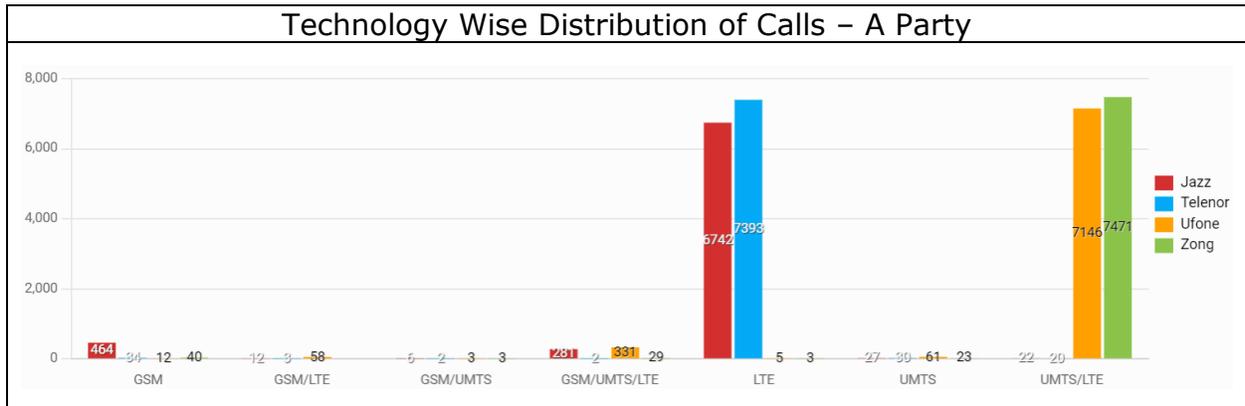
Table 9.4: Voice QoS KPIs Compliance Level

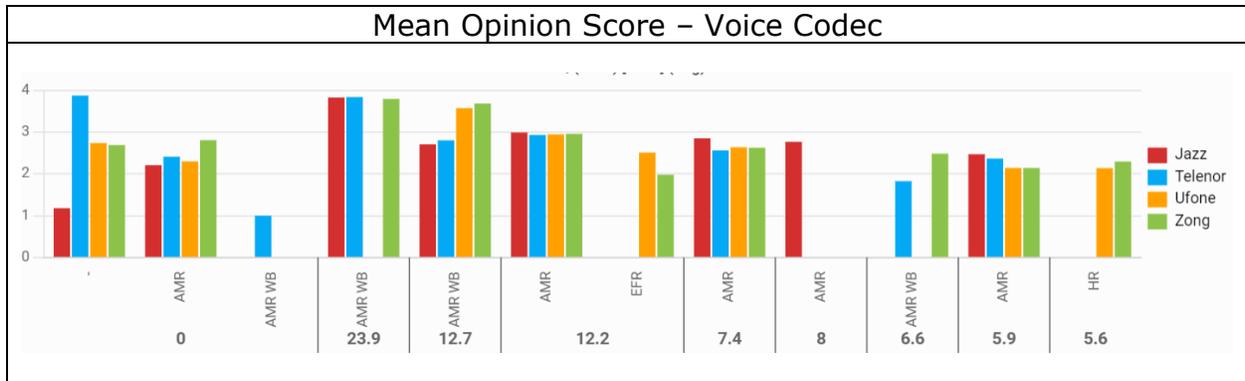
CMO	KPIS	Mian Channu	TandoAdam	Sanghar	Vehari	SHINKIARI
Jazz	NA	Yes	Yes	Yes	Yes	Yes
	CSSR	No	Yes	Yes	No	Yes
	CCT	Yes	Yes	Yes	Yes	Yes
	CCR	Yes	Yes	Yes	Yes	Yes
	MOS	Yes	Yes	Yes	Yes	Yes
Telenor	NA	Yes	Yes	Yes	Yes	Yes
	CSSR	No	Yes	Yes	Yes	Yes
	CCT	Yes	Yes	Yes	Yes	Yes
	CCR	Yes	Yes	Yes	Yes	Yes
	MOS	Yes	Yes	Yes	Yes	Yes
Ufone	NA	Yes	Yes	Yes	Yes	Yes
	CSSR	Yes	Yes	Yes	Yes	No
	CCT	Yes	Yes	Yes	Yes	Yes
	CCR	Yes	Yes	Yes	Yes	Yes
	MOS	Yes	Yes	Yes	Yes	Yes
ZonG	NA	Yes	Yes	Yes	Yes	Yes
	CSSR	Yes	Yes	Yes	Yes	Yes
	CCT	Yes	Yes	Yes	Yes	Yes
	CCR	Yes	Yes	Yes	Yes	Yes
	MOS	Yes	Yes	Yes	Yes	Yes

* Note Voice QoS KPIs: Network Accessibility (NA), Call Setup Success Rate (CSSR) > 98%, Call Connection Time (CCT), Call Completion Ratio (CCR), Mean Opinion Score (MOS)

Table 9.5 Voice QoS KPIs Compliance Level

Overall survey results of Voice Services for each Mobile Operator are shown in the below graphs.





10. SMS SERVICE

A total of 28,713 SMS sending attempts were conducted, out of which 28,626 SMS were successfully transmitted by A-Party while 28,310 SMS were successfully received at B-Party. The 2 x SMS QoS KPIs (i.e. Success Rate and Delivery Time) have been measured while testing SMS services in the surveyed cities. Company wise SMS statistics are shown in Table 10.1: SMS Statistics, while the compliance in each surveyed city is shown in Table 10.2: SMS QoS KPIs Compliance Level.

Description	Jazz	Telenor	Ufone	Zong
SMS Send Request	7253	7176	7284	7000
SMS Successfully Transmitted	7222	7134	7278	6992
SMS Successfully Received	7195	6968	7240	6907
SMS Receive Success Rate (%)	99.2	97.1	99.4	98.67
End-To-End Delivery Time (Sec)	3.75	3.37	2.7	2.75

Table 10.1: SMS Statistics

Operator	Jazz		Telenor		Ufone		ZonG		
	SMS KPI	SR	DT	SR	DT	SR	DT	SR	DT
Surveyed Cities	DALBANDIN	Yes	No	Yes	Yes	Yes	Yes	No	Yes
	D.I KHAN	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
	HALA	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
	PAHARPUR	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	PISHIN	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
	DG KHAN	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	RAWALPINDI	Yes	Yes	No	Yes	Yes	Yes	No	Yes
	WAH / TAXILA	Yes	Yes	No	Yes	Yes	Yes	No	Yes
	MINGORA	Yes	Yes	No	Yes	Yes	Yes	No	Yes
	KOTRI	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
	KEEMARI	Yes	Yes	No	Yes	Yes	Yes	No	Yes
	JARANWALA	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	SHIKARPUR	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
	NOUSHKI	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
ISLAMABAD	Yes	Yes	No	Yes	Yes	Yes	No	Yes	
FEROZWALA	Yes	Yes	No	Yes	Yes	Yes	No	Yes	

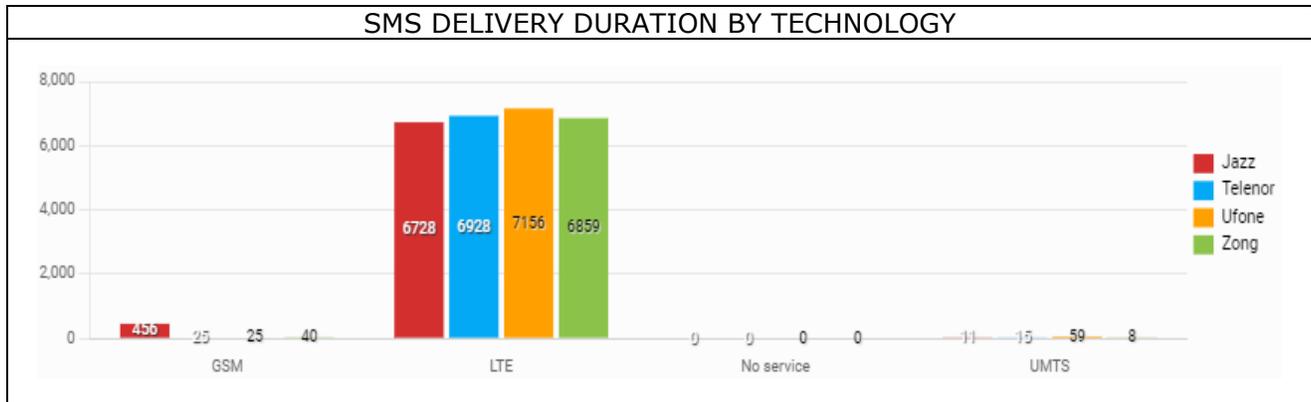
Operator	Jazz	Telenor	Ufone	ZonG
GUJRANWALA	No	Yes	No	Yes
HARIPUR	Yes	Yes	No	Yes
MIAN CHANNU	Yes	Yes	No	Yes
TANDO ADAM	Yes	Yes	Yes	Yes
SANGHAR	Yes	Yes	Yes	Yes
VEHARI	Yes	Yes	No	Yes
SHINKIARI	Yes	Yes	No	Yes

** Note SMS QoS KPIs: Success Rate (SR), Delivery Time (DT)*

Table 10.2: SMS QoS KPIs Compliance Level

Overall survey results of SMS Services for each Mobile Operator are shown in the below graphs.





11. SURVEY STANDING - MOBILE NETWORK COVERAGE

The categorization of CMOs in Mobile Network Coverage i.e. Signal Strength of 4G/LTE and 3G Networks (in case of fallback) measured in Technology Auto Detect Mode is shown in Table 11.1: CMOs Standing in Mobile Network Coverage – Technology Auto Detect.

S. #.	Operator	Compliance Level – Number of Cities Technology Auto Detect Mode						Standing
		Compliant			Non-Compliant			
		4G	3G	Total	4G	3G	Total	
1.	Ufone	20	19	39	3	-	3	1 st
2.	ZonG	20	11	31	3	2	5	2 nd
3.	Jazz	18	9	27	3	3	6	3 rd
4.	Telenor	16	12	28	7	4	11	4 th

Table 11.1: CMOs Standing in Mobile Network Coverage – Technology Auto Detect Mode

12. SURVEY STANDING - MOBILE BROADBAND SERVICE

The categorization of each CMOs in Mobile Broadband Service is as under:

- i. Download Data Throughput (Auto Mode). The Download Data Throughput, as per the highest to lowest obtained results, is shown in Table 12.1: CMOs Standing in Download Data Throughput – Auto Mode Testing.

S. #	Operator	Highest Download Throughput – Number of Cities				Standing
		1 st	2 nd	3 rd	4 th	
1.	Jazz	13	8	-	2	1 st
2.	Zong	10	13	-	-	2 nd
3.	Ufone	-	2	11	10	3 rd
4.	Telenor	-	-	12	11	4 th

Table 12.1: CMOs Standing in Download Data Throughput– Auto Mode Testing

- ii. Upload Data Throughput (Auto Mode). The Upload Data Throughput, as per the highest to lowest obtained results, is shown in Table 12.2: CMOs Standing in Upload Data Throughput – Auto Mode Testing.

S. #	Operator	Highest Upload Throughput – Number of Cities				Standing
		1 st	2 nd	3 rd	4 th	
1.	Zong	11	10	2	-	1 st
2.	Jazz	11	8	2	-	2 nd
3.	Ufone	1	5	17	-	3 rd
4.	Telenor	-	-	2	21	4 th

Table 12.2: CMOs Standing in Download Data Throughput– Auto Mode Testing

- iii. Webpage Loading Time. The categorization of each CMOs, as per the maximum compliant of Webpage Loading Time, is shown in Table 12.3: CMOs Standing in Webpage Loading Time.

S. #	Operator	Webpage Loading Time - Number of Cities		Standing
		Compliant	Non-Compliant	
1.	Zong	14	9	1 st
2.	Jazz	10	13	2 nd
3.	Telenor	9	14	3 rd
4.	Ufone	8	15	4 th

Table 12.3: CMOs Standing in Webpage Loading Time

- iv. Latency (Ookla). The categorization of each CMOs, as per the maximum compliant of cities in terms of Latency, is shown in Table 12.4: CMOs Standing in Latency (Ookla).

S. #	Operator	Latency - Number of Cities		Standing
		Compliant	Non-Compliant	
1.	Telenor	22	1	1 st
2.	ZonG	21	2	2 nd
3.	Jazz	20	1	3 rd
4.	Ufone	20	3	4 th

Table 12.4: CMOs Standing in Latency (Ookla)

- v. Latency (Automode). The categorization of each CMOs, as per the maximum compliant of cities in terms of Latency, is shown in Table 12.5: CMOs Standing in Latency (Automode).

S. #	Operator	Latency - Number of Cities		Standing
		Compliant	Non-Compliant	
1.	Ufone	7	16	1 st
2.	Telenor	5	18	2 nd
3.	ZonG	4	19	3 rd
4.	Jazz	-	21	4 th

Table 12.5: CMOs Standing in Latency (Automode)

- vi. Download Data Throughput (Ookla). The Ookla Download Throughput, as per the highest to lowest obtained results, is shown in Table 12.6: CMOs Standing in Download Throughput – Ookla.

S. #	Operator	Highest Download Throughput – Number of Cities				Standing
		1 st	2 nd	3 rd	4 th	
1.	Jazz	12	8	1	-	1 st
2.	Zong	10	13	-	-	2 nd
3.	Ufone	1	1	15	6	3 rd
4.	Telenor	-	1	7	15	4 th

Table 12.6: CMOs Standing in Download Throughput – Ookla

- vii. Upload Data Throughput (Ookla). The Ookla Upload Throughput, as per the highest to lowest obtained results, is shown in Table 12.7: CMOs Standing in Upload Throughput – Ookla.

S. #	Operator	Highest Upload Throughput – Number of Cities				Standing
		1 st	2 nd	3 rd	4 th	
1.	Jazz	13	7	1	-	1 st
2.	Zong	9	11	3	-	2 nd
3.	Ufone	1	4	17	1	3 rd
4.	Telenor	-	1	2	20	4 th

Table 12.7: CMOs Standing in Upload Throughput – Ookla

13. SURVEY STANDING – VOICE & SMS SERVICE

The categorization of each CMOs, as per the maximum compliant of Voice and SMS QoS KPIs are shown in (i) Table 13.1: CMOs Standing in Voice Service & (ii) Table 13.2: CMOs Standing in SMS Service

S.#	Operator	Voice QoS KPIs		Standing
		Compliant	Non-Compliant	
1.	Zong	109	6	1 st
2.	Jazz	105	10	2 nd
3.	Ufone	100	15	3 rd
4.	Telenor	100	15	3 rd

Table 13.1: CMOs Standing in Voice Service

S. #	Operator	SMS QoS KPIs		Standing
		Compliant	Non-Compliant	
1.	Ufone	44	2	1 st
2.	Jazz	43	3	2 nd
3.	Zong	37	9	3 rd
4.	Telenor	31	15	4 th

Table 13.2: CMOs Standing in SMS Service

14. SURVEY STANDING - OVERALL

The overall standing of each CMOs in different category of services is mentioned in Table 14.1: CMOs Overall Standing in QoS Survey. Wherein, the Signal Strength maps are shown at Annex-A (Coverage Maps).

S. #.	Service		STANDING			
			1 st	2 nd	3 rd	4 th
1.	Mobile Network Coverage		Ufone	ZonG	Jazz	Telenor
2.	Automode	Download	Jazz	ZonG	Ufone	Telenor
		Upload	ZonG	Jazz	Ufone	Telenor
	Ookla	Download	Jazz	ZonG	Ufone	Telenor
		Upload	Jazz	ZonG	Ufone	Telenor
	Web Page Loading Time		ZonG	Jazz	Telenor	Ufone
	Latency	Automode	Ufone	Telenor	ZonG	Jazz
Ookla		Telenor	ZonG	Jazz	Ufone	
3.	Voice		Zong	Jazz	Ufone, Telenor	-
4.	SMS		Ufone	Jazz	Zong	Telenor

Table 14.1: CMOs Overall Standing in QoS Survey

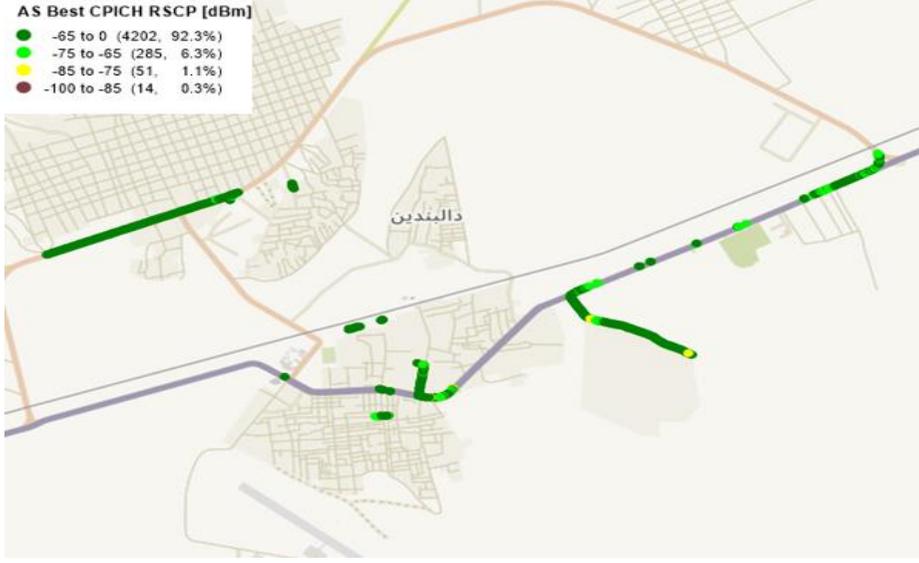
AUTOMODE

AUTOMODE MOBILE COVERAGE – SIGNAL STRENGTH (RSRP)

JAZZ NETWORK COVERAGE – DALBANDIN

AS Best CPICH RSCP [dBm]

- -65 to 0 (4202, 92.3%)
- -75 to -65 (285, 6.3%)
- -85 to -75 (51, 1.1%)
- -100 to -85 (14, 0.3%)



TELENOR NETWORK COVERAGE – DALBANDIN

Serving RS RP [dBm]

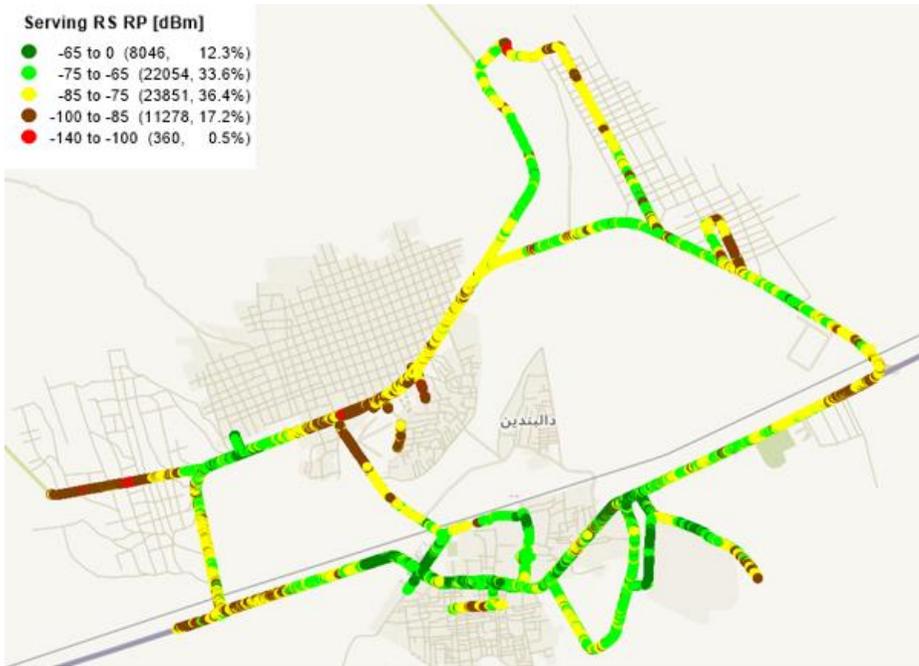
- -65 to 0 (727, 1.0%)
- -75 to -65 (14038, 19.7%)
- -85 to -75 (26717, 37.5%)
- -100 to -85 (23765, 33.3%)
- -140 to -100 (6061, 8.5%)



UFONE NETWORK COVERAGE – DALBANDIN

Serving RS RP [dBm]

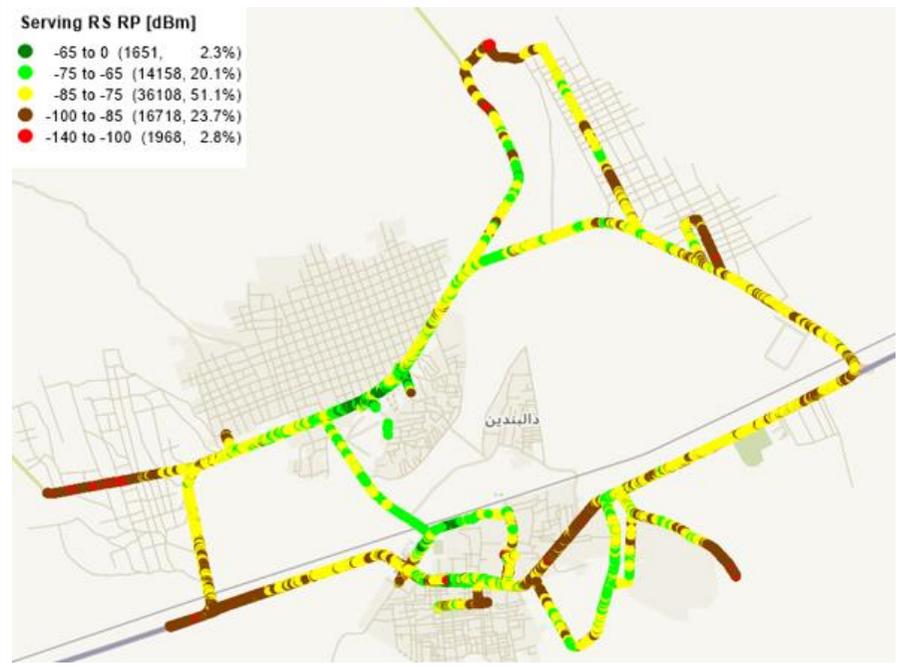
- -65 to 0 (8046, 12.3%)
- -75 to -65 (22054, 33.6%)
- -85 to -75 (23851, 36.4%)
- -100 to -85 (11278, 17.2%)
- -140 to -100 (360, 0.5%)



ZONG NETWORK COVERAGE – DALBANDIN

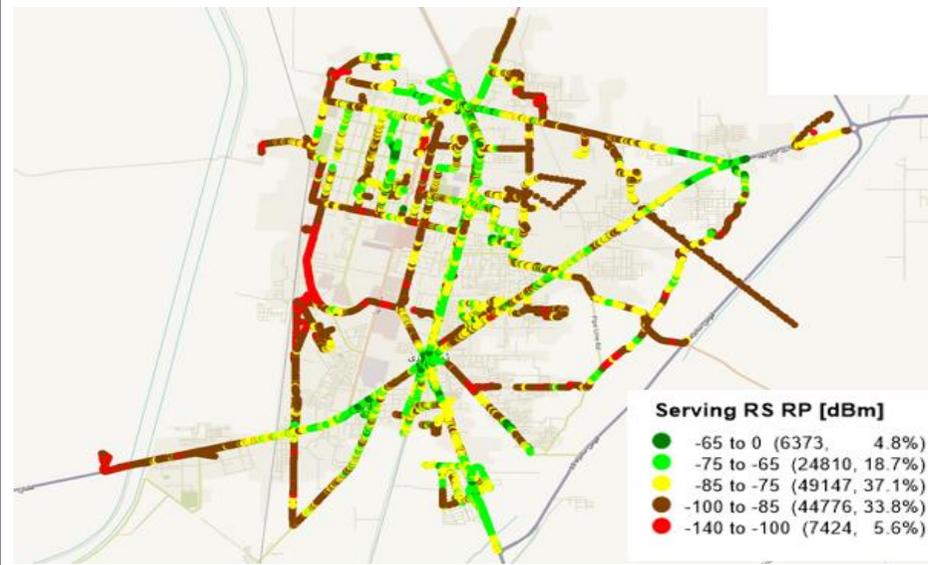
Serving RS RP [dBm]

- -65 to 0 (1651, 2.3%)
- -75 to -65 (14158, 20.1%)
- -85 to -75 (36108, 51.1%)
- -100 to -85 (16718, 23.7%)
- -140 to -100 (1968, 2.8%)

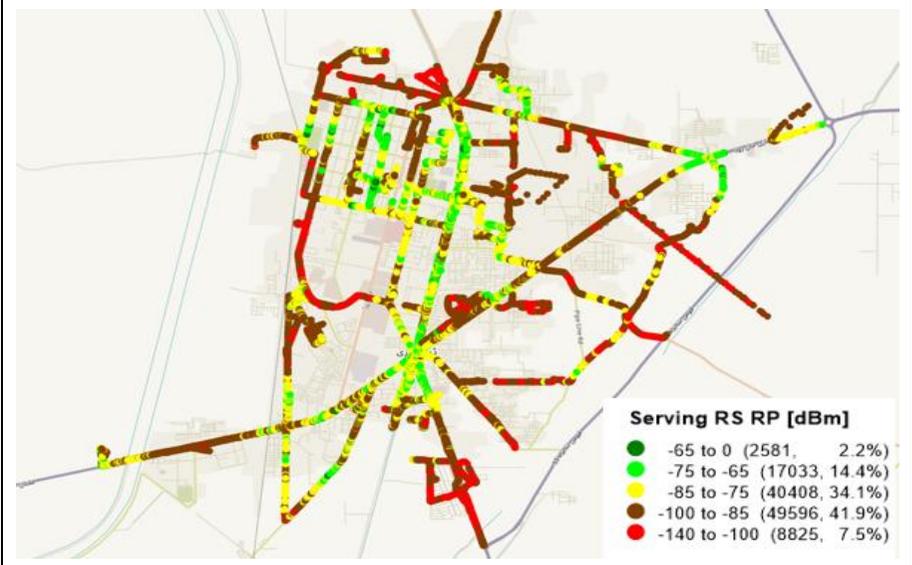


AUTOMODE MOBILE COVERAGE – SIGNAL STRENGTH (RSRP)

JAZZ NETWORK COVERAGE – D.G KHAN



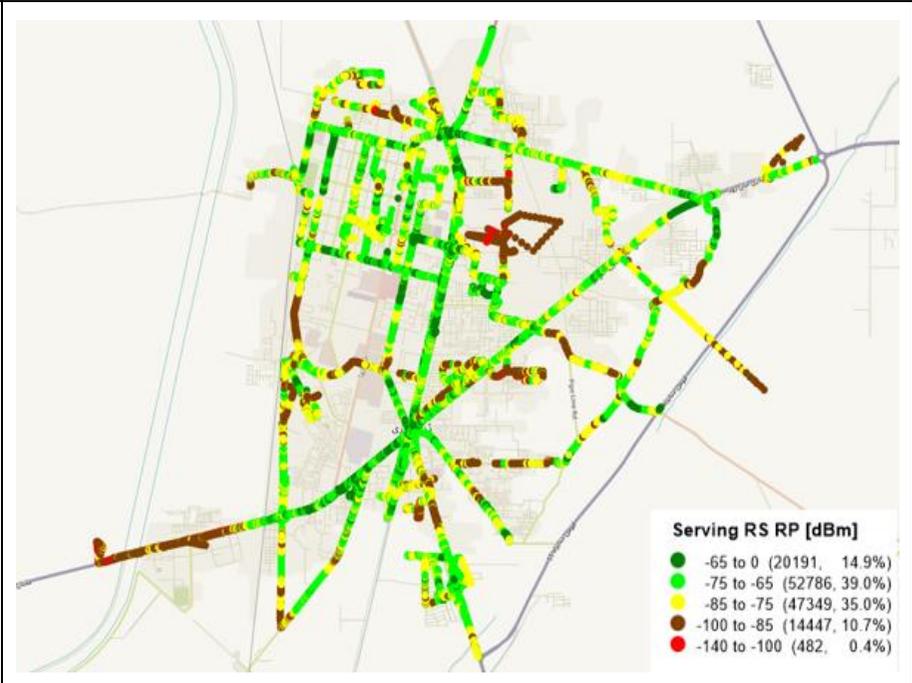
TELENOR NETWORK COVERAGE – D.G KHAN



UFONE NETWORK COVERAGE – D.G KHAN



ZONG NETWORK COVERAGE – D.G KHAN

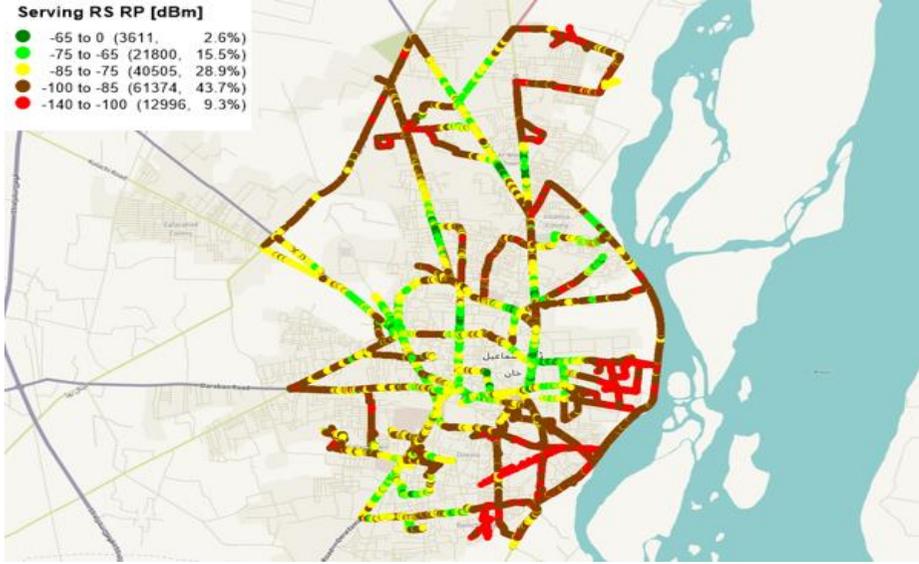


AUTOMODE MOBILE COVERAGE – SIGNAL STRENGTH (RSRP)

JAZZ NETWORK COVERAGE – D.I KHAN

Serving RS RP [dBm]

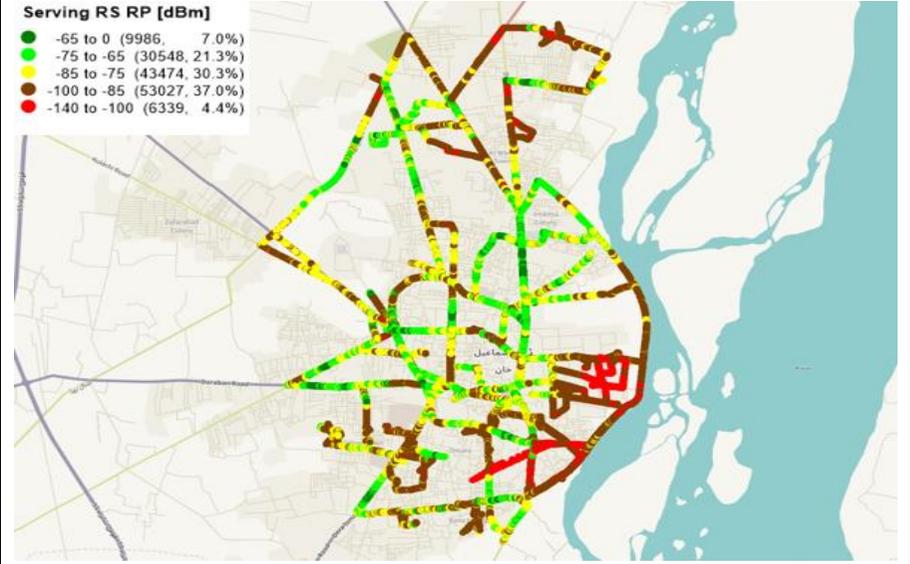
● -65 to 0	(3611, 2.6%)
● -75 to -65	(21800, 15.5%)
● -85 to -75	(40505, 28.9%)
● -100 to -85	(61374, 43.7%)
● -140 to -100	(12996, 9.3%)



TELENOR NETWORK COVERAGE – D.I KHAN

Serving RS RP [dBm]

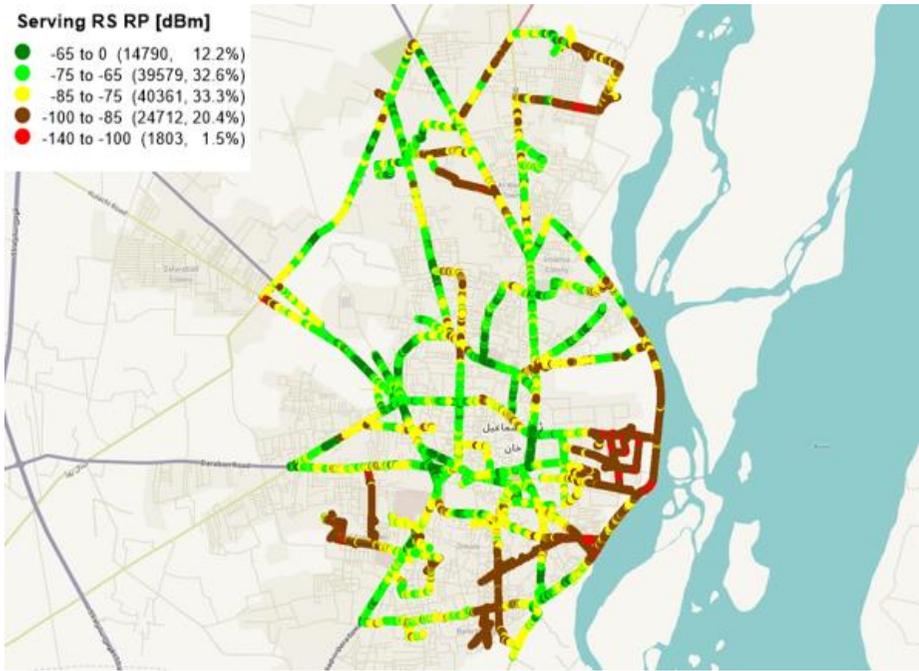
● -65 to 0	(9986, 7.0%)
● -75 to -65	(30548, 21.3%)
● -85 to -75	(43474, 30.3%)
● -100 to -85	(53027, 37.0%)
● -140 to -100	(6339, 4.4%)



UFONE NETWORK COVERAGE – D.I KHAN

Serving RS RP [dBm]

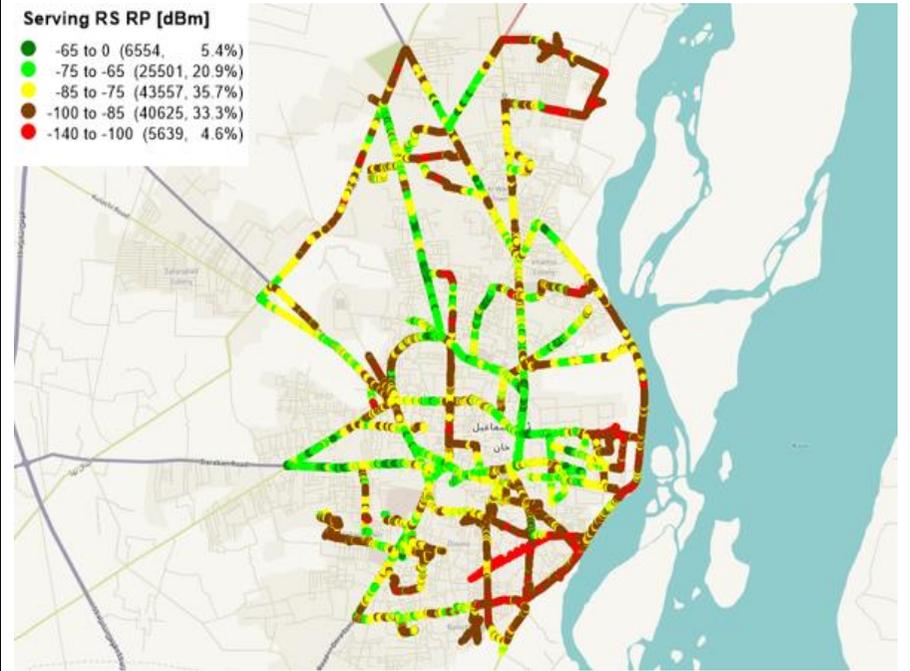
● -65 to 0	(14790, 12.2%)
● -75 to -65	(39579, 32.6%)
● -85 to -75	(40361, 33.3%)
● -100 to -85	(24712, 20.4%)
● -140 to -100	(1803, 1.5%)



ZONG NETWORK COVERAGE – D.I KHAN

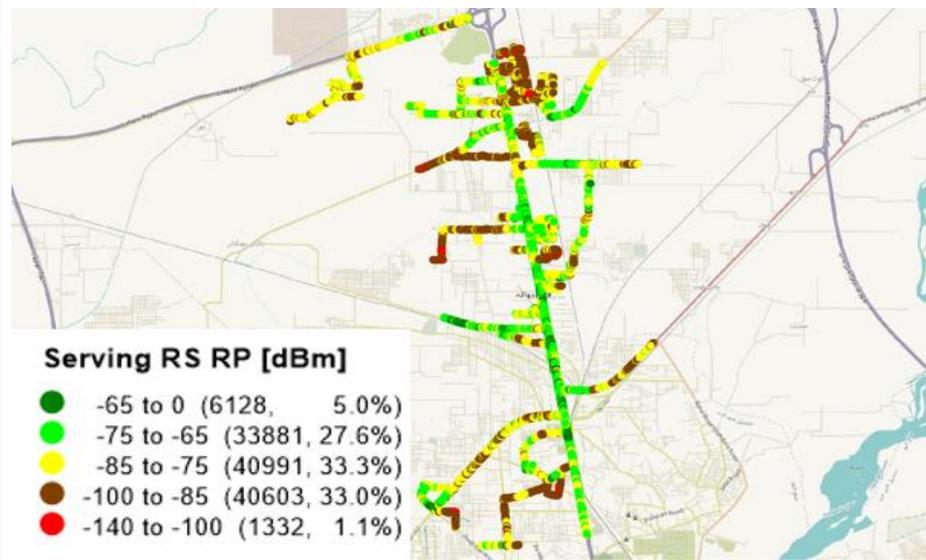
Serving RS RP [dBm]

● -65 to 0	(6554, 5.4%)
● -75 to -65	(25501, 20.9%)
● -85 to -75	(43557, 35.7%)
● -100 to -85	(40625, 33.3%)
● -140 to -100	(5639, 4.6%)

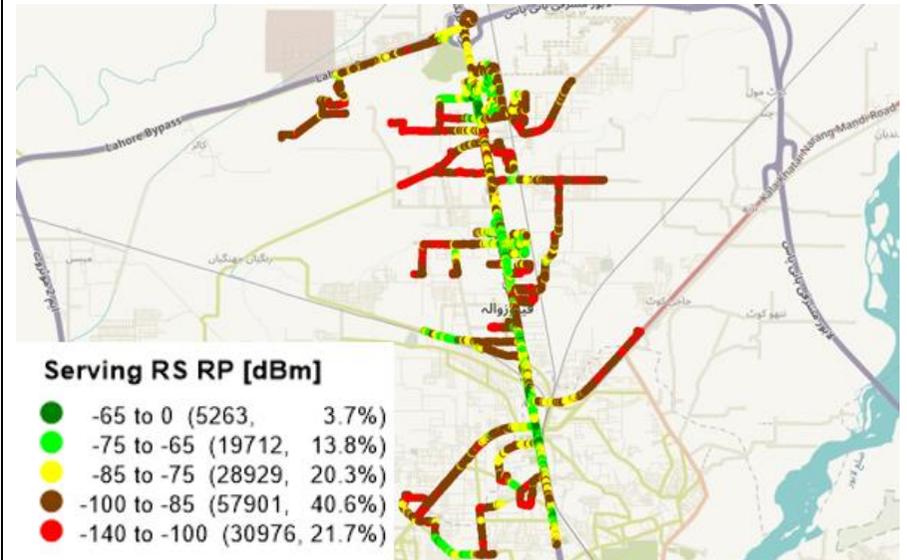


AUTOMODE MOBILE COVERAGE – SIGNAL STRENGTH (RSRP)

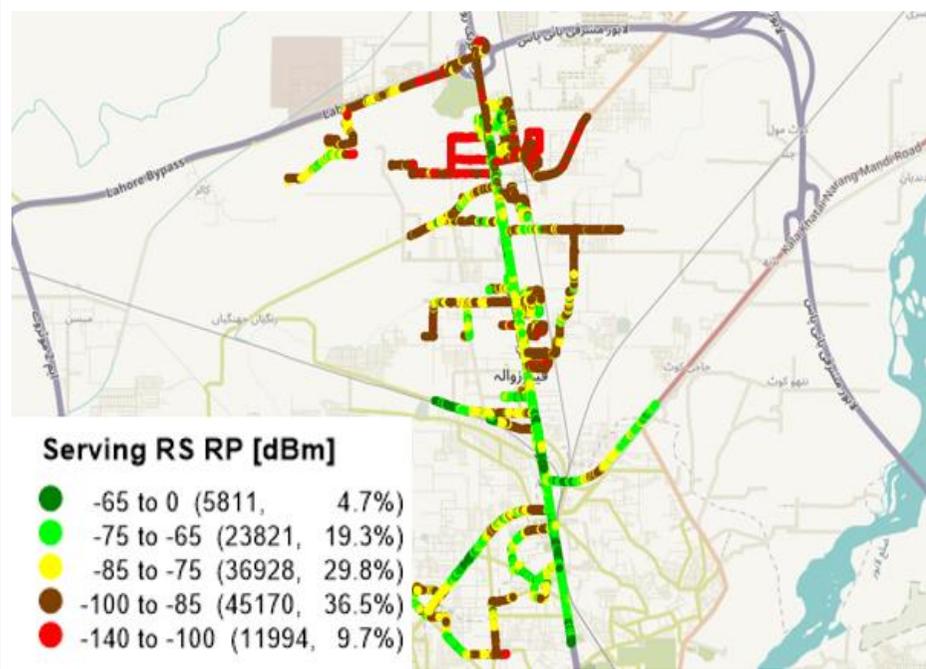
JAZZ NETWORK COVERAGE – FEROZWALA



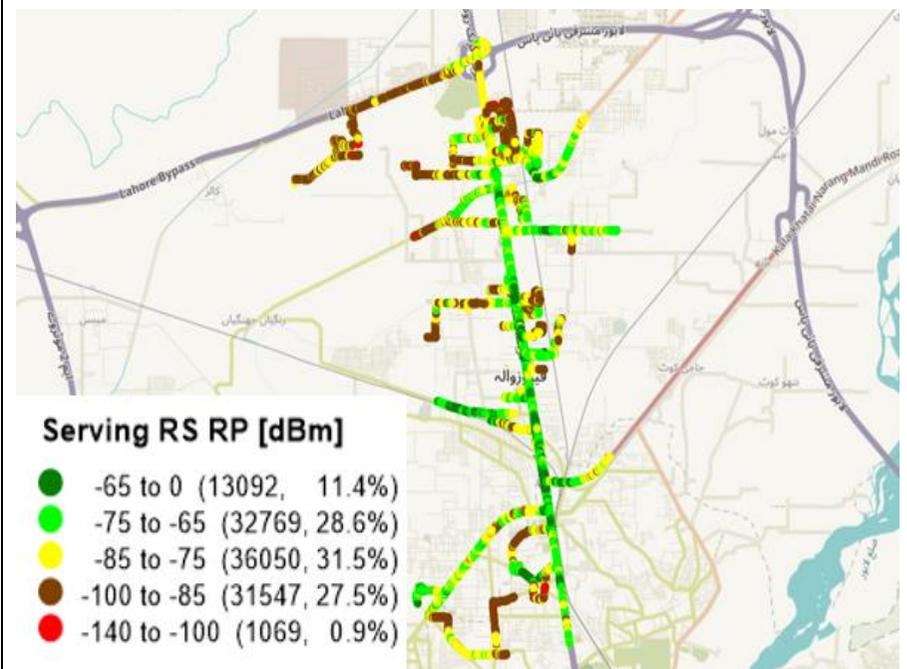
TELENOR NETWORK COVERAGE – FEROZWALA



UFONE NETWORK COVERAGE – FEROZWALA

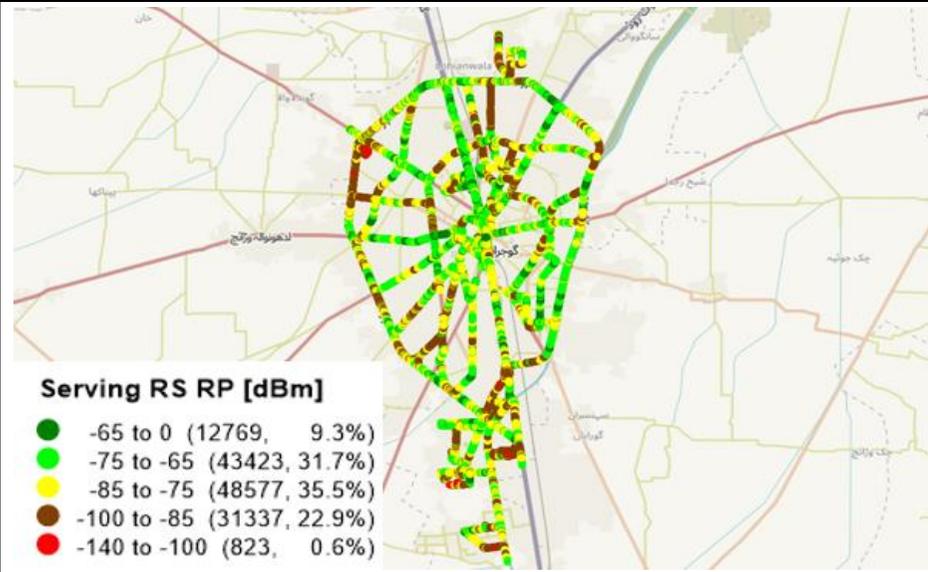


ZONG NETWORK COVERAGE – FEROZWALA

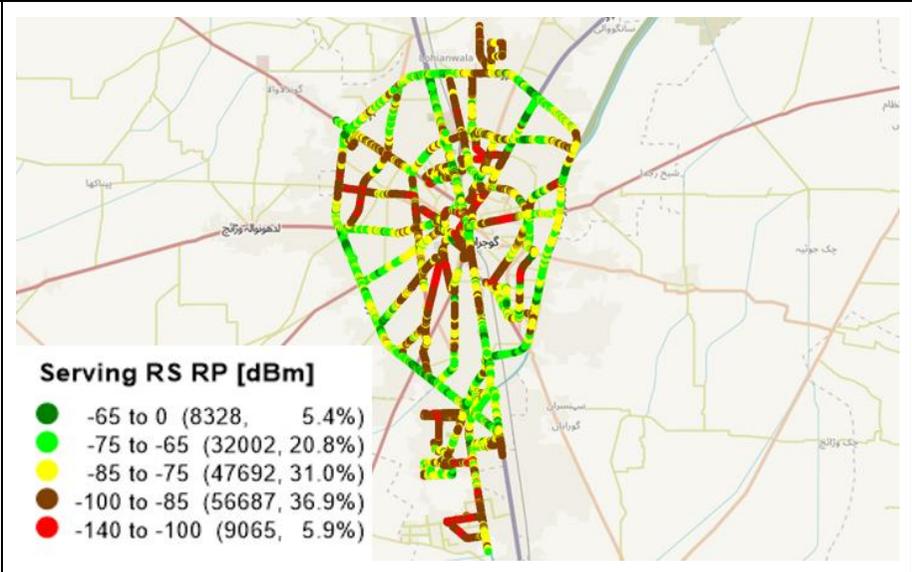


AUTOMODE MOBILE COVERAGE – SIGNAL STRENGTH (RSRP)

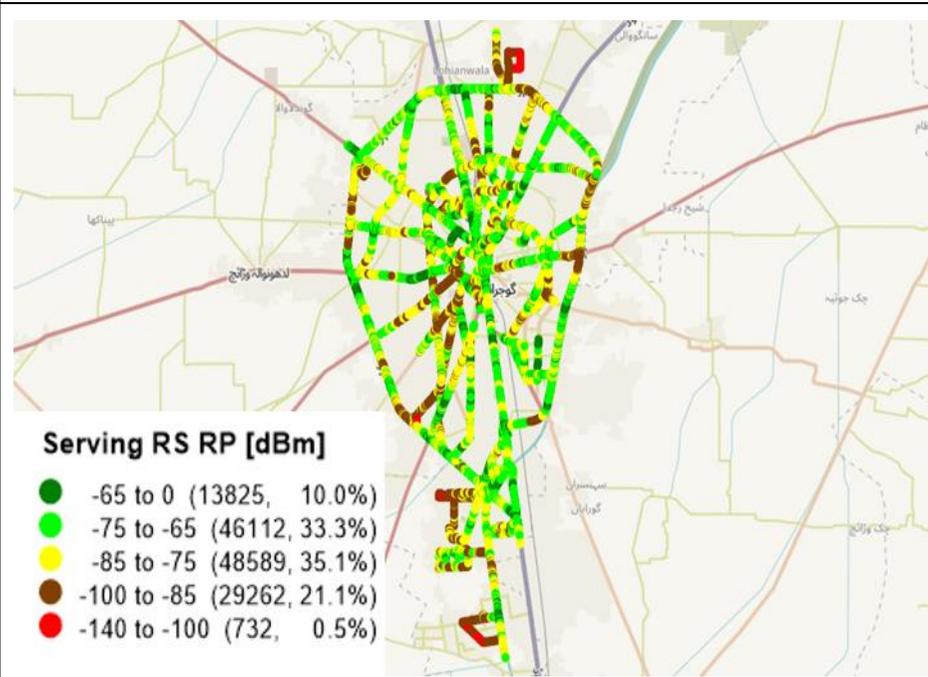
JAZZ NETWORK COVERAGE – GUJRANWALA



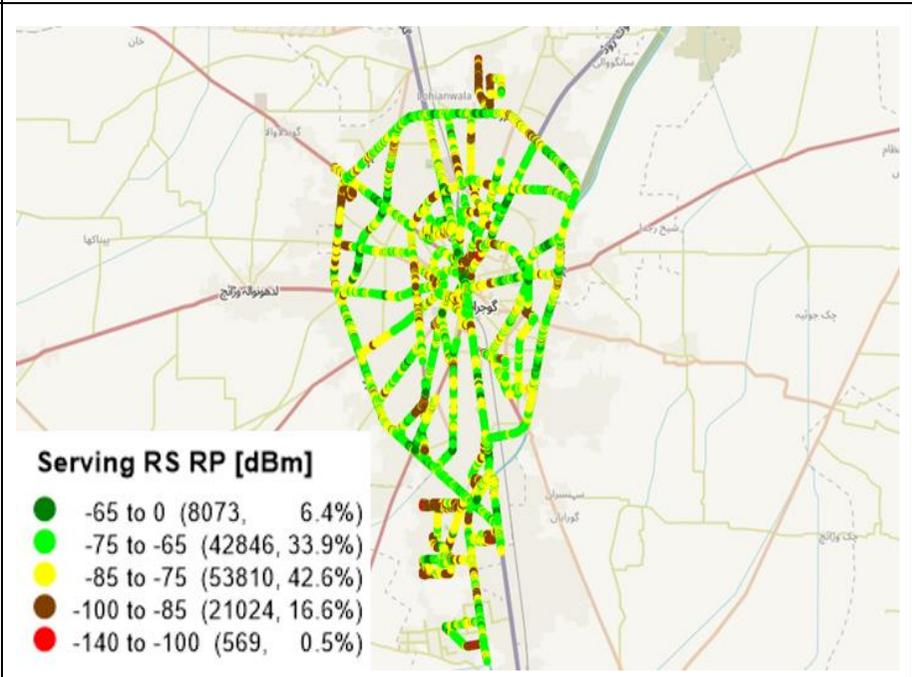
TELENOR NETWORK COVERAGE – GUJRANWALA



UFONE NETWORK COVERAGE – GUJRANWALA



ZONG NETWORK COVERAGE – GUJRANWALA

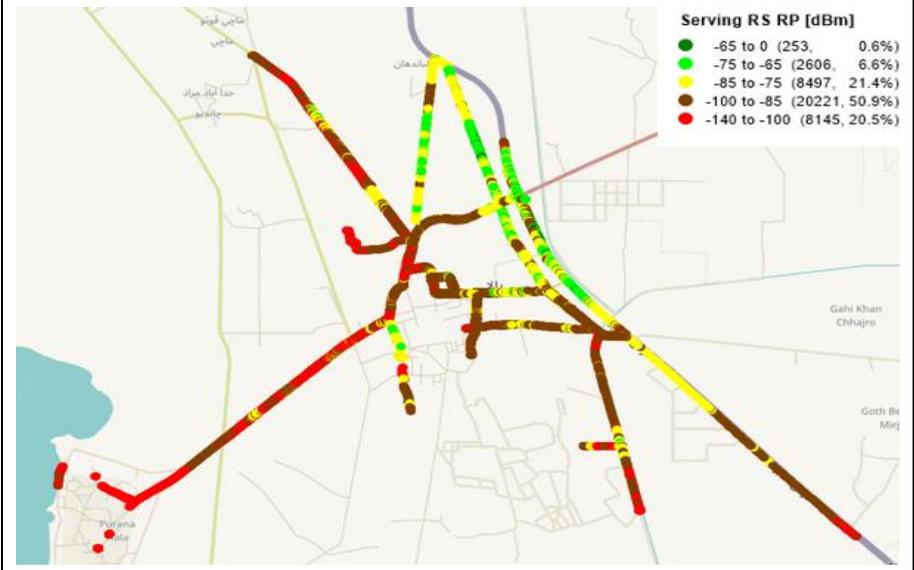


AUTOMODE MOBILE COVERAGE – SIGNAL STRENGTH (RSRP)

JAZZ NETWORK COVERAGE – HALA



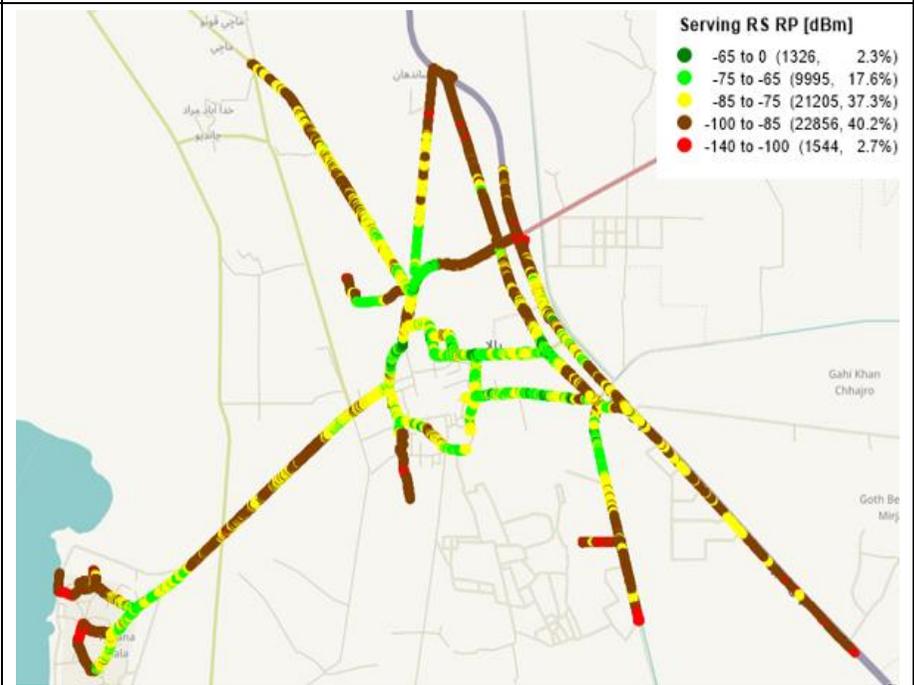
TELENOR NETWORK COVERAGE – HALA



UFONE NETWORK COVERAGE – HALA



ZONG NETWORK COVERAGE – HALA

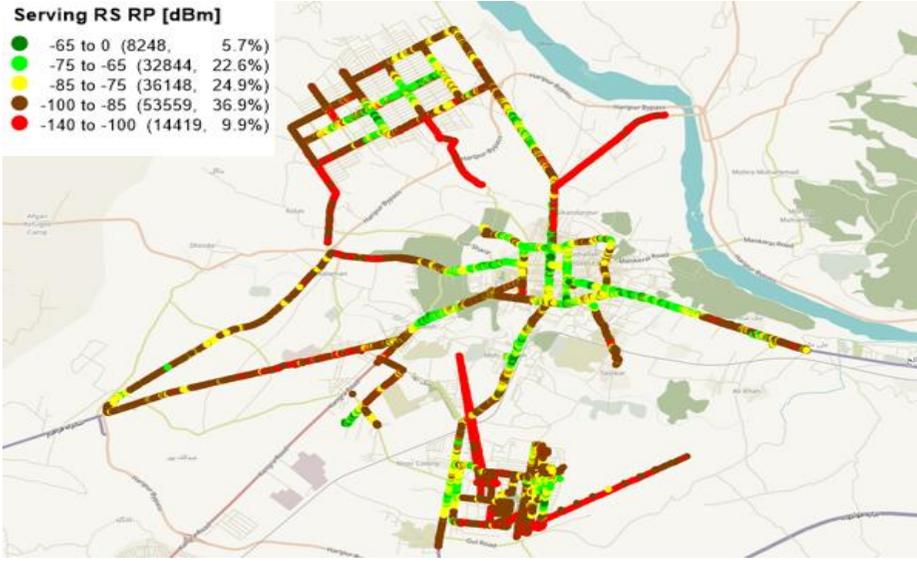


AUTOMODE MOBILE COVERAGE – SIGNAL STRENGTH (RSRP)

JAZZ NETWORK COVERAGE – HARIPUR

Serving RS RP [dBm]

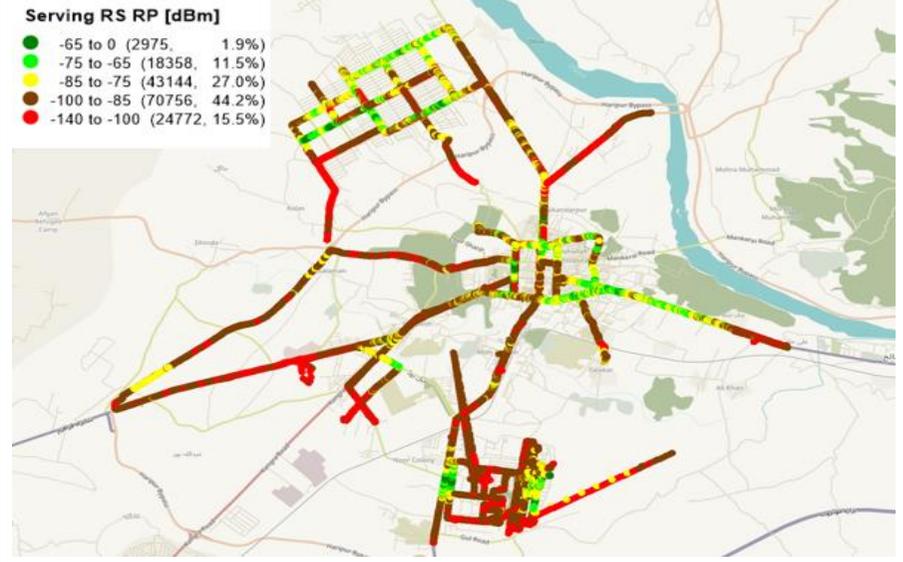
- -65 to 0 (8248, 5.7%)
- -75 to -65 (32844, 22.6%)
- -85 to -75 (36148, 24.9%)
- -100 to -85 (53559, 36.9%)
- -140 to -100 (14419, 9.9%)



TELENOR NETWORK COVERAGE – HARIPUR

Serving RS RP [dBm]

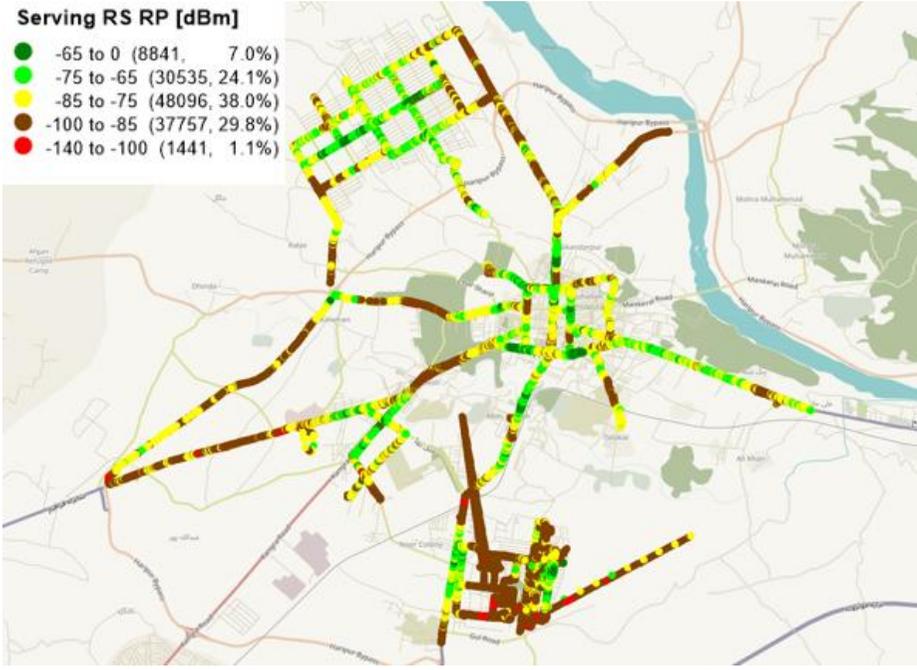
- -65 to 0 (2975, 1.9%)
- -75 to -65 (18358, 11.5%)
- -85 to -75 (43144, 27.0%)
- -100 to -85 (70756, 44.2%)
- -140 to -100 (24772, 15.5%)



UFONE NETWORK COVERAGE – HARIPUR

Serving RS RP [dBm]

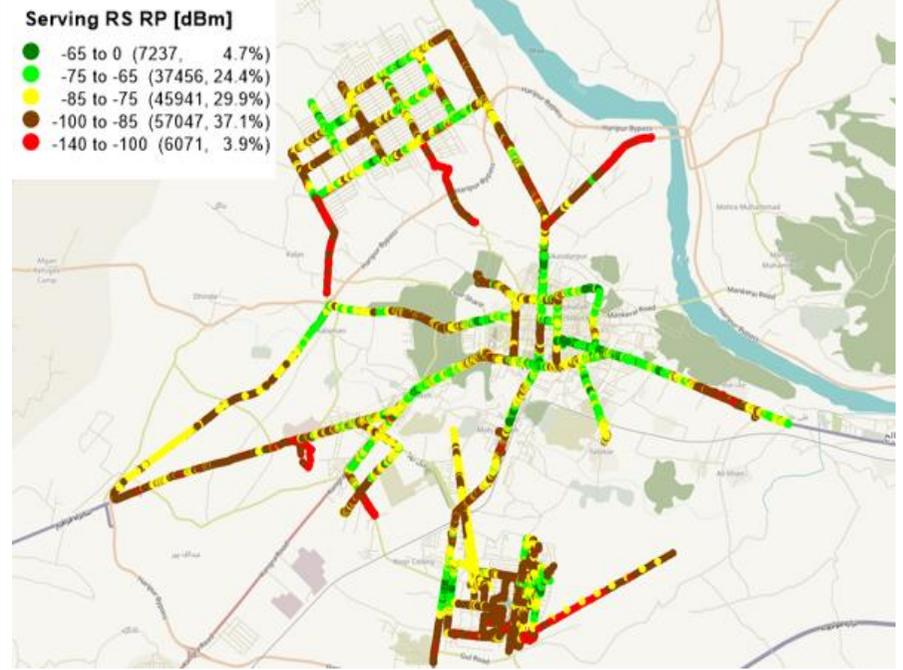
- -65 to 0 (8841, 7.0%)
- -75 to -65 (30535, 24.1%)
- -85 to -75 (48096, 38.0%)
- -100 to -85 (37757, 29.8%)
- -140 to -100 (1441, 1.1%)



ZONG NETWORK COVERAGE – HARIPUR

Serving RS RP [dBm]

- -65 to 0 (7237, 4.7%)
- -75 to -65 (37456, 24.4%)
- -85 to -75 (45941, 29.9%)
- -100 to -85 (57047, 37.1%)
- -140 to -100 (6071, 3.9%)

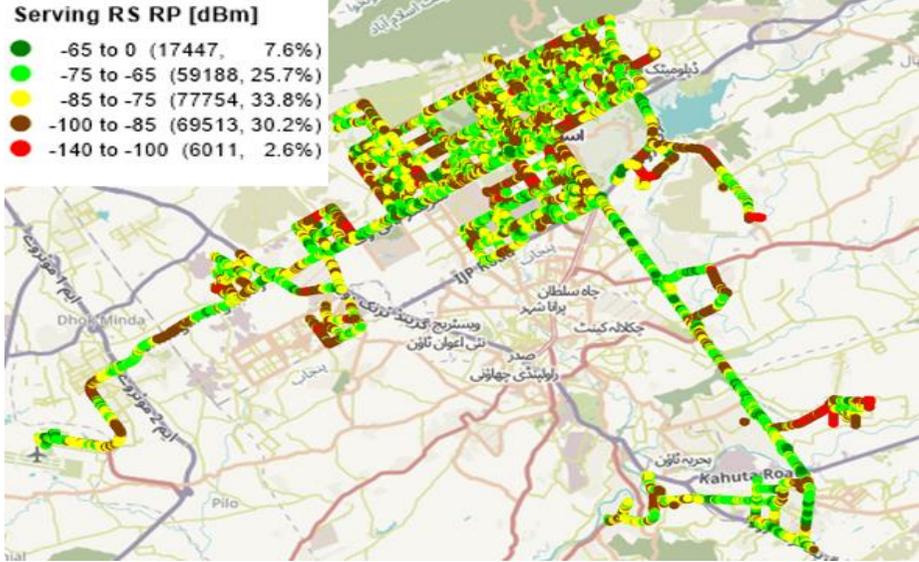


AUTOMODE MOBILE COVERAGE – SIGNAL STRENGTH (RSRP)

JAZZ NETWORK COVERAGE – ISLAMABAD

Serving RS RP [dBm]

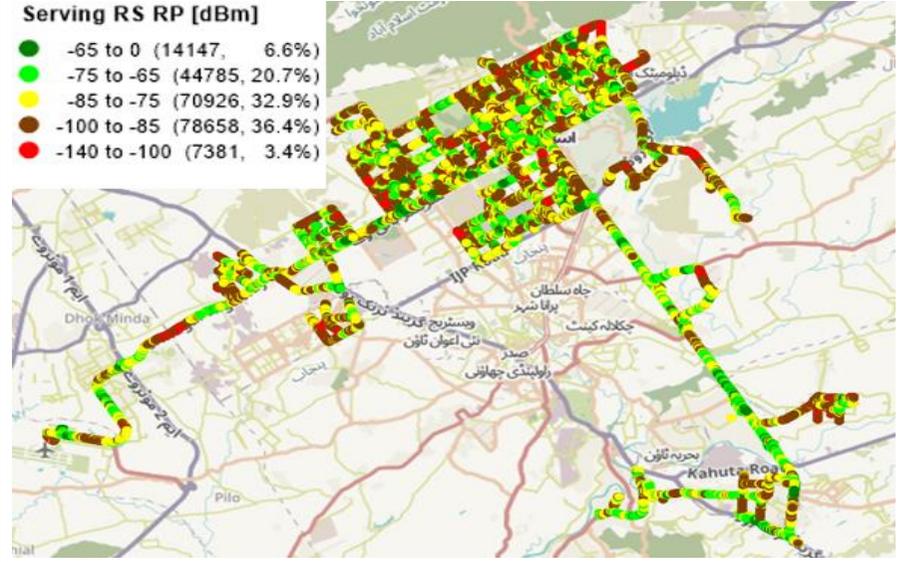
- -65 to 0 (17447, 7.6%)
- -75 to -65 (59188, 25.7%)
- -85 to -75 (77754, 33.8%)
- -100 to -85 (69513, 30.2%)
- -140 to -100 (6011, 2.6%)



TELENOR NETWORK COVERAGE – ISLAMABAD

Serving RS RP [dBm]

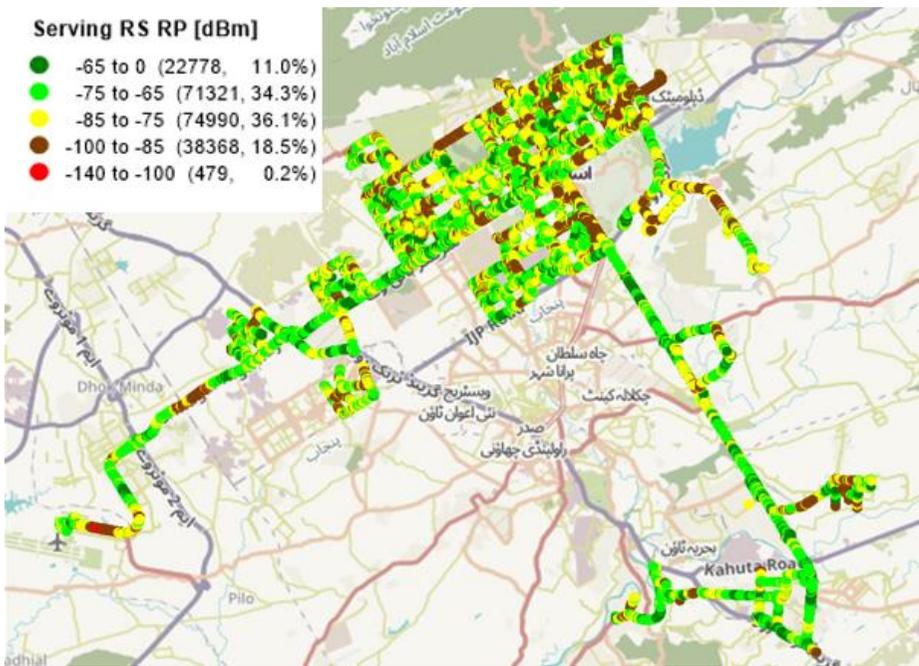
- -65 to 0 (14147, 6.6%)
- -75 to -65 (44785, 20.7%)
- -85 to -75 (70926, 32.9%)
- -100 to -85 (78658, 36.4%)
- -140 to -100 (7381, 3.4%)



UFONE NETWORK COVERAGE – ISLAMABAD

Serving RS RP [dBm]

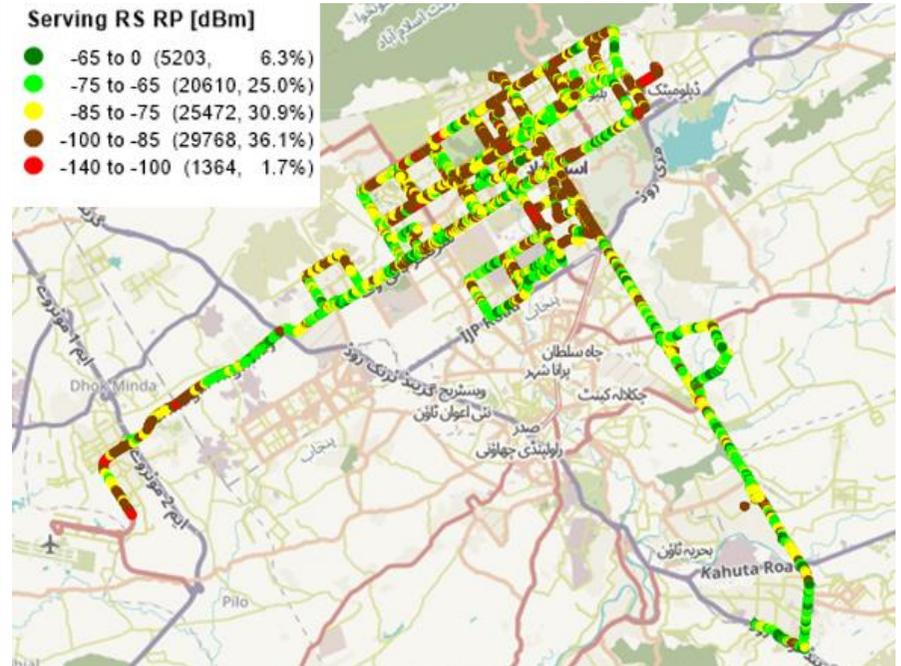
- -65 to 0 (22778, 11.0%)
- -75 to -65 (71321, 34.3%)
- -85 to -75 (74990, 36.1%)
- -100 to -85 (38368, 18.5%)
- -140 to -100 (479, 0.2%)



ZONG NETWORK COVERAGE – ISLAMABAD

Serving RS RP [dBm]

- -65 to 0 (5203, 6.3%)
- -75 to -65 (20610, 25.0%)
- -85 to -75 (25472, 30.9%)
- -100 to -85 (29768, 36.1%)
- -140 to -100 (1364, 1.7%)

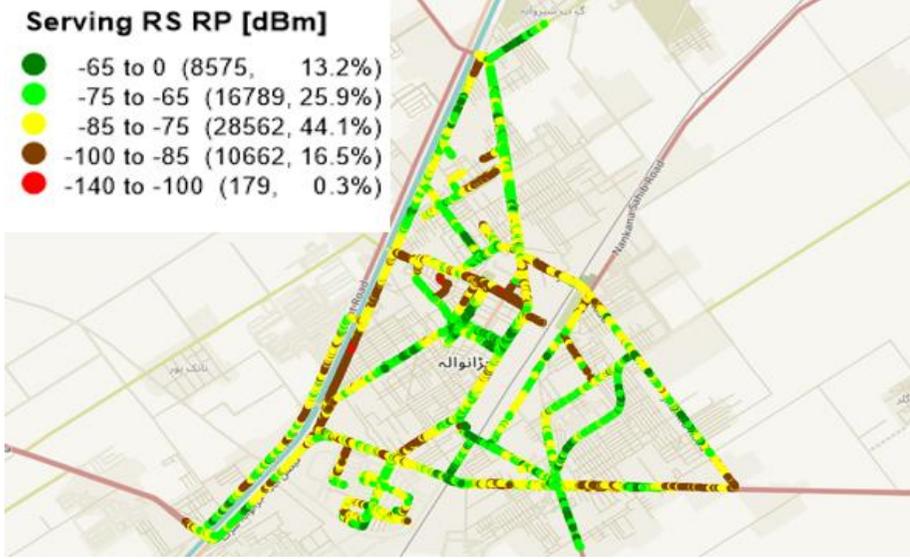


AUTOMODE MOBILE COVERAGE – SIGNAL STRENGTH (RSRP)

JAZZ NETWORK COVERAGE – JARANWALA

Serving RS RP [dBm]

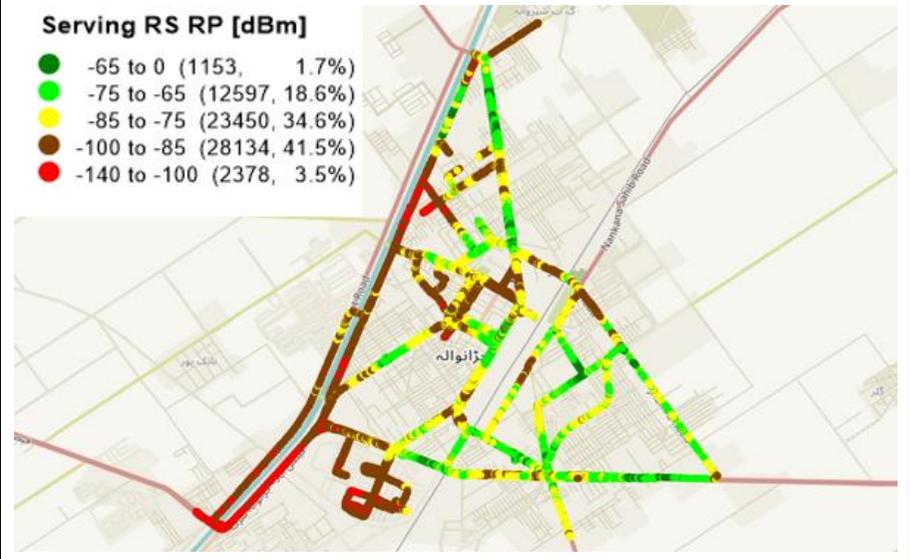
- -65 to 0 (8575, 13.2%)
- -75 to -65 (16789, 25.9%)
- -85 to -75 (28562, 44.1%)
- -100 to -85 (10662, 16.5%)
- -140 to -100 (179, 0.3%)



TELENOR NETWORK COVERAGE – JARANWALA

Serving RS RP [dBm]

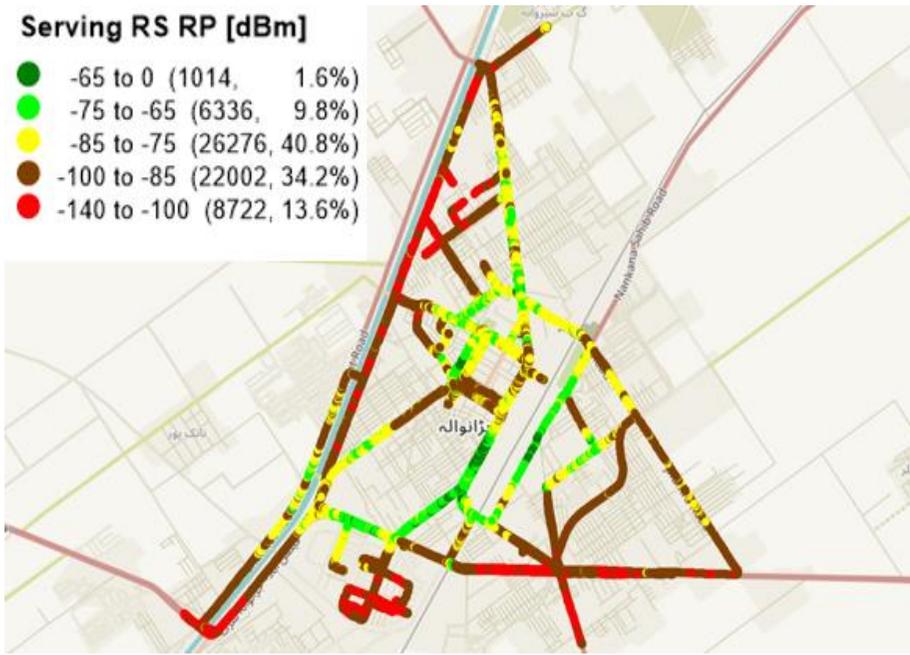
- -65 to 0 (1153, 1.7%)
- -75 to -65 (12597, 18.6%)
- -85 to -75 (23450, 34.6%)
- -100 to -85 (28134, 41.5%)
- -140 to -100 (2378, 3.5%)



UFONE NETWORK COVERAGE – JARANWALA

Serving RS RP [dBm]

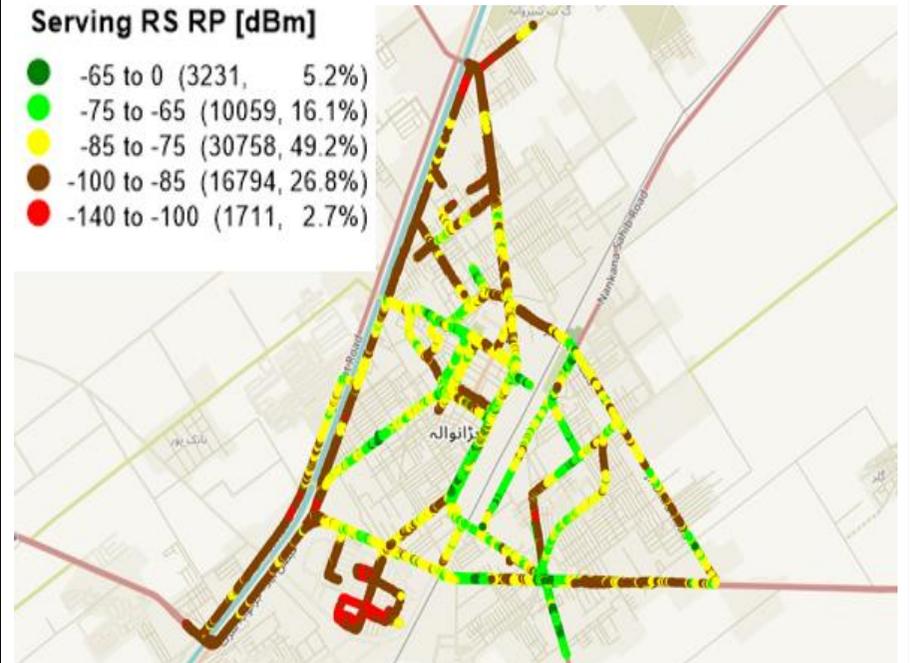
- -65 to 0 (1014, 1.6%)
- -75 to -65 (6336, 9.8%)
- -85 to -75 (26276, 40.8%)
- -100 to -85 (22002, 34.2%)
- -140 to -100 (8722, 13.6%)



ZONG NETWORK COVERAGE – JARANWALA

Serving RS RP [dBm]

- -65 to 0 (3231, 5.2%)
- -75 to -65 (10059, 16.1%)
- -85 to -75 (30758, 49.2%)
- -100 to -85 (16794, 26.8%)
- -140 to -100 (1711, 2.7%)

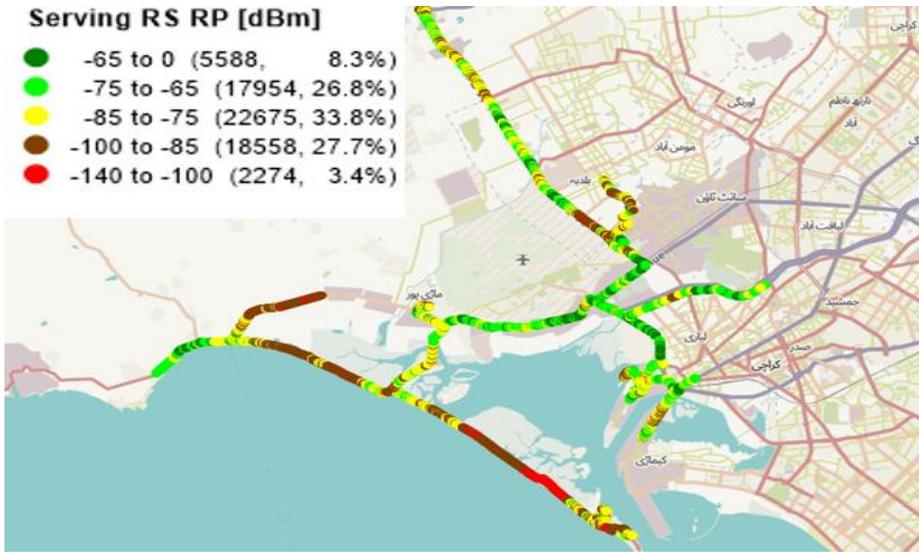


AUTOMODE MOBILE COVERAGE – SIGNAL STRENGTH (RSRP)

JAZZ NETWORK COVERAGE – KEEMARI

Serving RS RP [dBm]

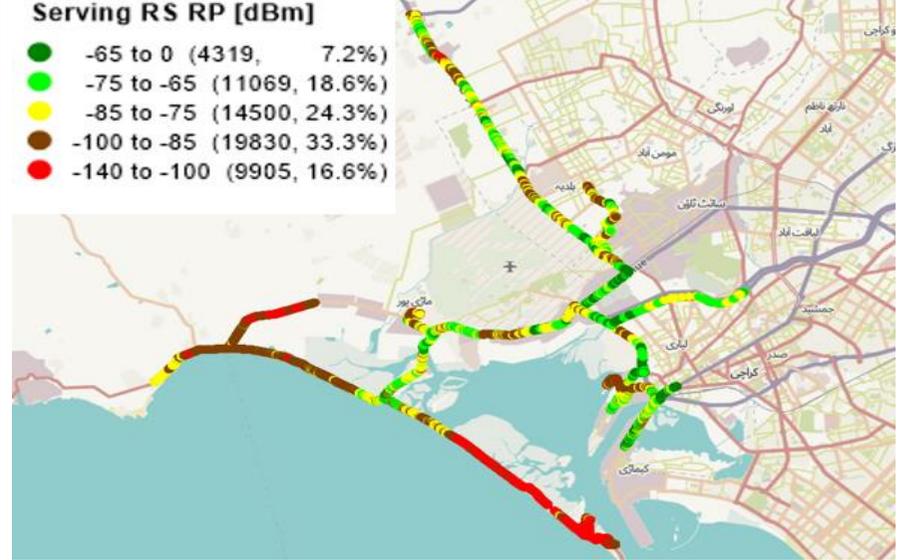
- -65 to 0 (5588, 8.3%)
- -75 to -65 (17954, 26.8%)
- -85 to -75 (22675, 33.8%)
- -100 to -85 (18558, 27.7%)
- -140 to -100 (2274, 3.4%)



TELENOR NETWORK COVERAGE – KEEMARI

Serving RS RP [dBm]

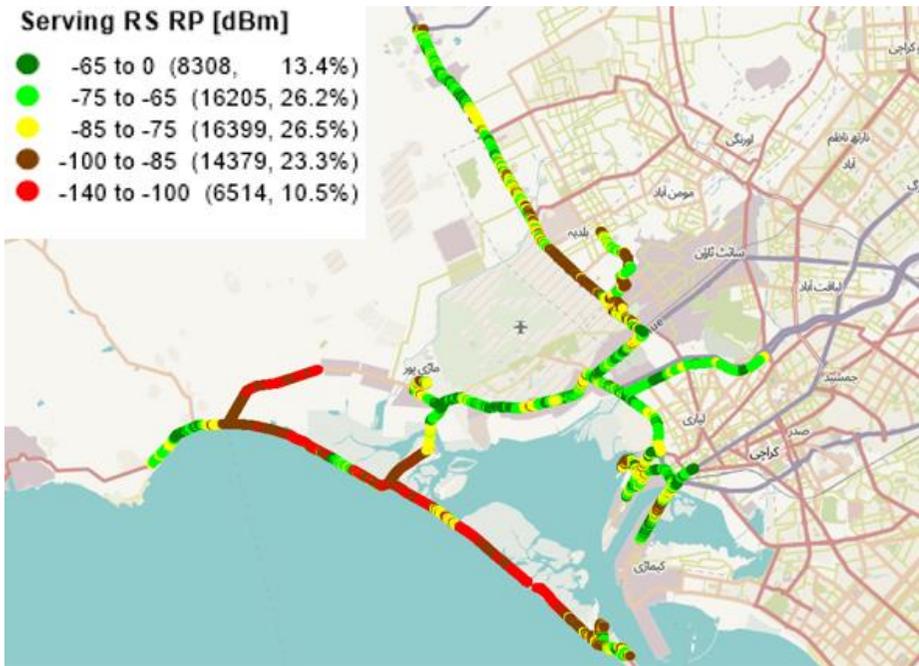
- -65 to 0 (4319, 7.2%)
- -75 to -65 (11069, 18.6%)
- -85 to -75 (14500, 24.3%)
- -100 to -85 (19830, 33.3%)
- -140 to -100 (9905, 16.6%)



UFONE NETWORK COVERAGE – KEEMARI

Serving RS RP [dBm]

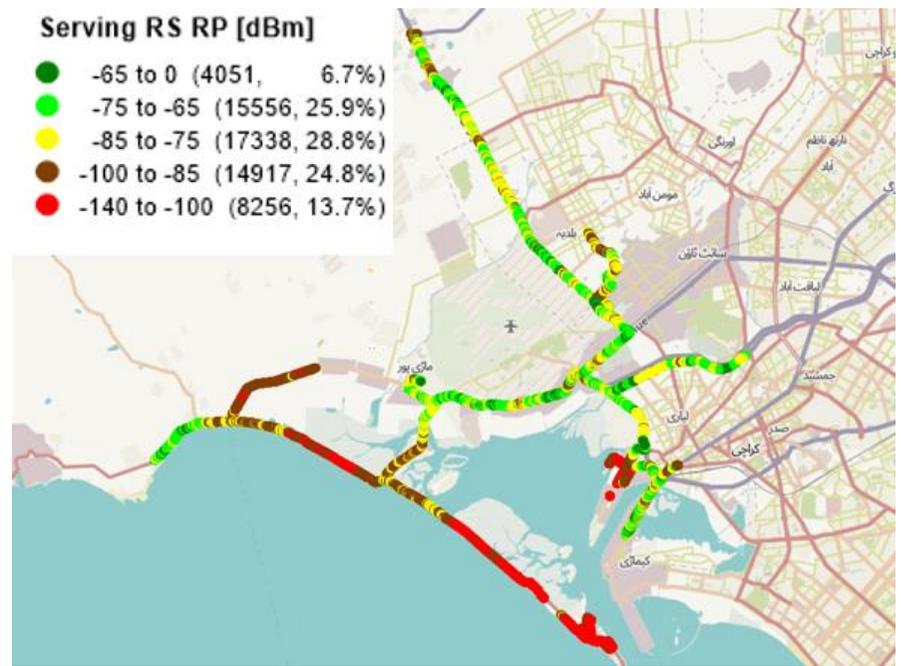
- -65 to 0 (8308, 13.4%)
- -75 to -65 (16205, 26.2%)
- -85 to -75 (16399, 26.5%)
- -100 to -85 (14379, 23.3%)
- -140 to -100 (6514, 10.5%)



ZONG NETWORK COVERAGE – KEEMARI

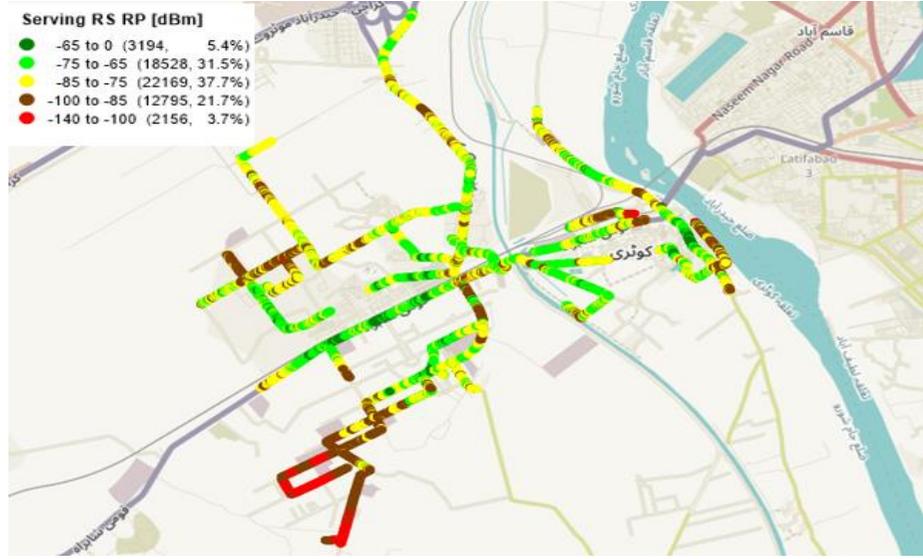
Serving RS RP [dBm]

- -65 to 0 (4051, 6.7%)
- -75 to -65 (15556, 25.9%)
- -85 to -75 (17338, 28.8%)
- -100 to -85 (14917, 24.8%)
- -140 to -100 (8256, 13.7%)

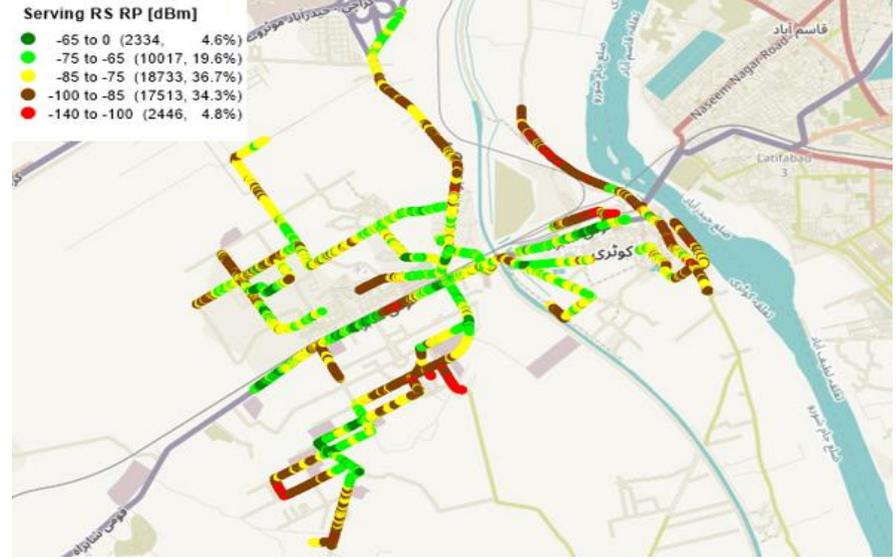


AUTOMODE MOBILE COVERAGE – SIGNAL STRENGTH (RSRP)

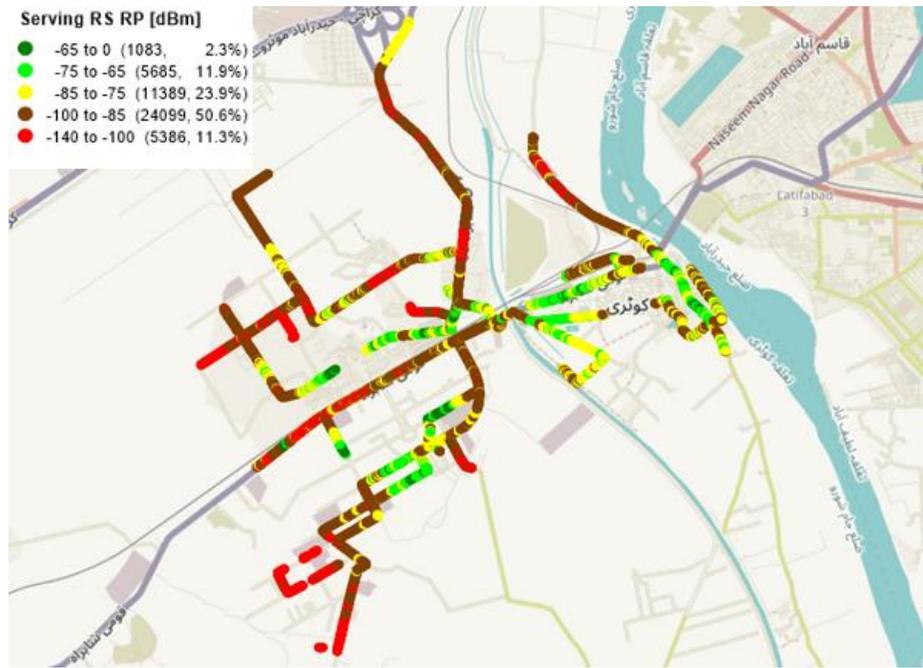
JAZZ NETWORK COVERAGE – KOTRI



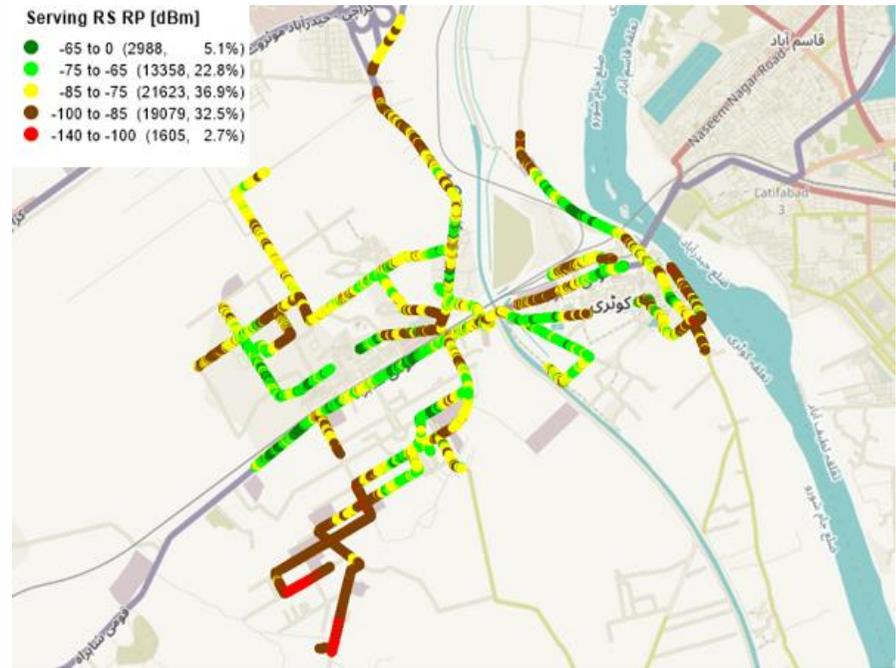
TELENOR NETWORK COVERAGE – KOTRI



UFONE NETWORK COVERAGE – KOTRI



ZONG NETWORK COVERAGE – KOTRI

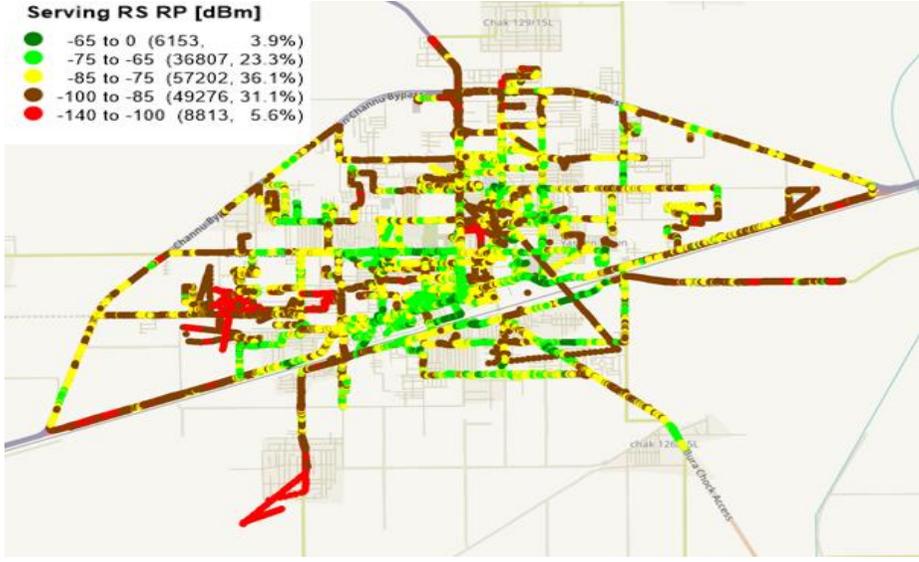


AUTOMODE MOBILE COVERAGE – SIGNAL STRENGTH (RSRP)

JAZZ NETWORK COVERAGE – MIAN CHANNU

Serving RS RP [dBm]

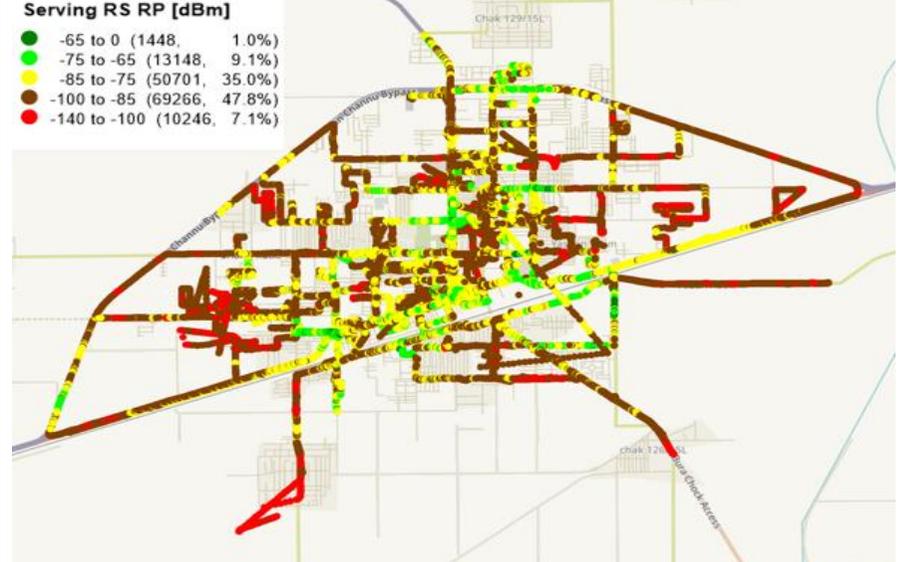
- -65 to 0 (6153, 3.9%)
- -75 to -65 (36807, 23.3%)
- -85 to -75 (57202, 36.1%)
- -100 to -85 (49276, 31.1%)
- -140 to -100 (8813, 5.6%)



TELENOR NETWORK COVERAGE – MIAN CHANNU

Serving RS RP [dBm]

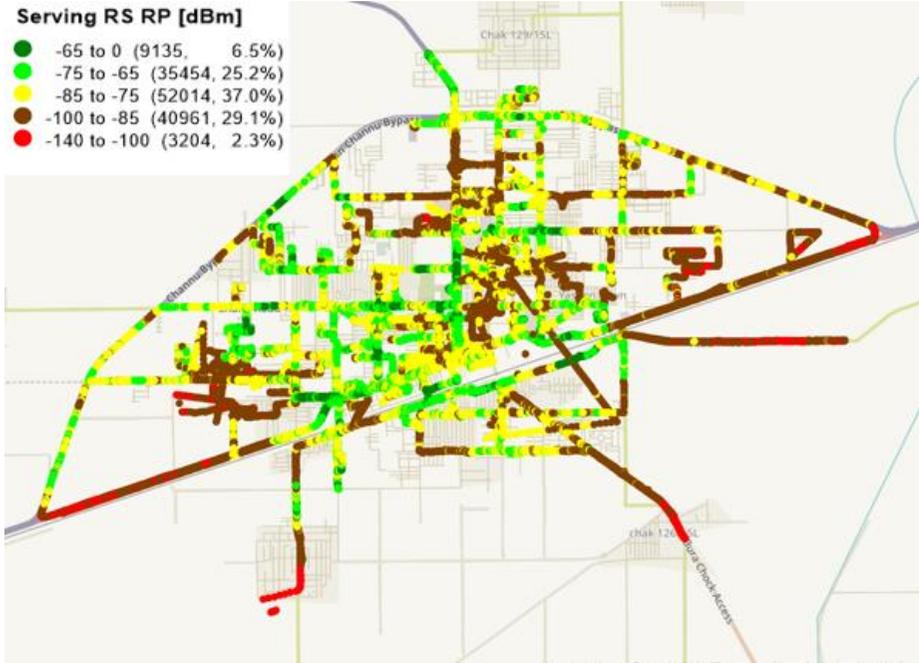
- -65 to 0 (1448, 1.0%)
- -75 to -65 (13148, 9.1%)
- -85 to -75 (50701, 35.0%)
- -100 to -85 (69266, 47.8%)
- -140 to -100 (10246, 7.1%)



UFONE NETWORK COVERAGE – MIAN CHANNU

Serving RS RP [dBm]

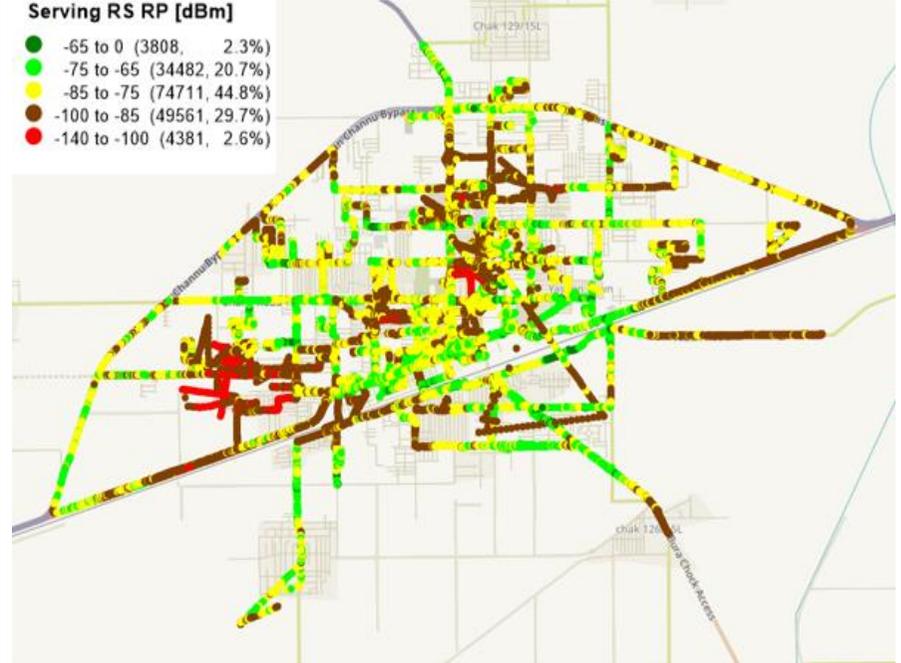
- -65 to 0 (9135, 6.5%)
- -75 to -65 (35454, 25.2%)
- -85 to -75 (52014, 37.0%)
- -100 to -85 (40961, 29.1%)
- -140 to -100 (3204, 2.3%)



ZONG NETWORK COVERAGE – MIAN CHANNU

Serving RS RP [dBm]

- -65 to 0 (3808, 2.3%)
- -75 to -65 (34482, 20.7%)
- -85 to -75 (74711, 44.8%)
- -100 to -85 (49561, 29.7%)
- -140 to -100 (4381, 2.6%)

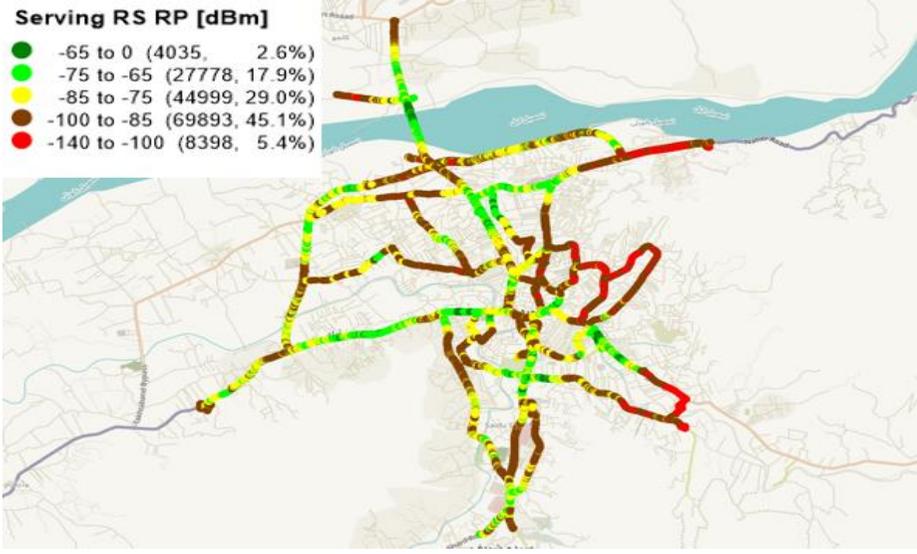


AUTOMODE MOBILE COVERAGE – SIGNAL STRENGTH (RSRP)

JAZZ NETWORK COVERAGE – MINGORA

Serving RS RP [dBm]

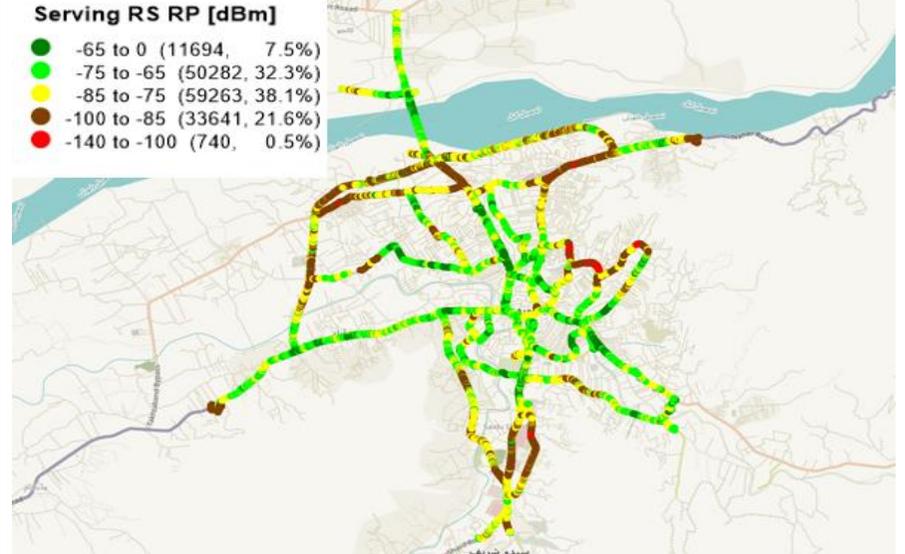
- -65 to 0 (4035, 2.6%)
- -75 to -65 (27778, 17.9%)
- -85 to -75 (44999, 29.0%)
- -100 to -85 (69893, 45.1%)
- -140 to -100 (8398, 5.4%)



TELENOR NETWORK COVERAGE – MINGORA

Serving RS RP [dBm]

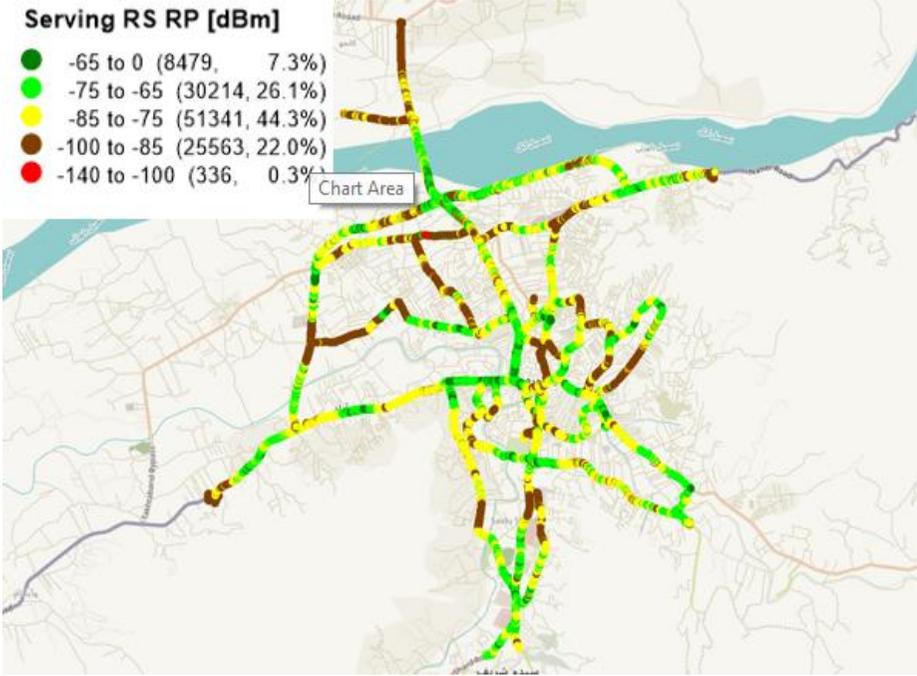
- -65 to 0 (11694, 7.5%)
- -75 to -65 (50282, 32.3%)
- -85 to -75 (59263, 38.1%)
- -100 to -85 (33641, 21.6%)
- -140 to -100 (740, 0.5%)



UFONE NETWORK COVERAGE – MINGORA

Serving RS RP [dBm]

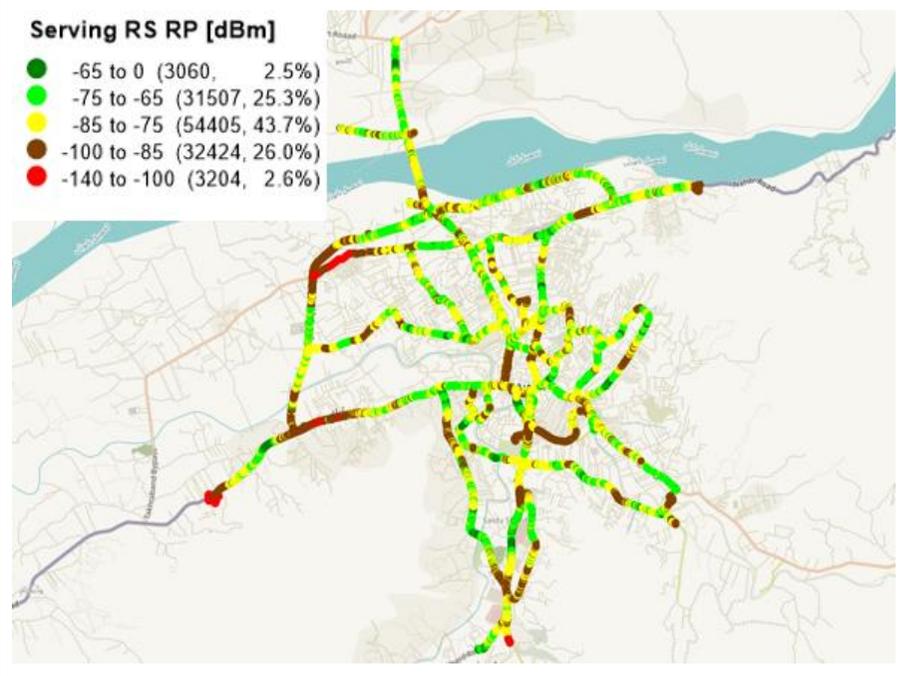
- -65 to 0 (8479, 7.3%)
- -75 to -65 (30214, 26.1%)
- -85 to -75 (51341, 44.3%)
- -100 to -85 (25563, 22.0%)
- -140 to -100 (336, 0.3%)



ZONG NETWORK COVERAGE – MINGORA

Serving RS RP [dBm]

- -65 to 0 (3060, 2.5%)
- -75 to -65 (31507, 25.3%)
- -85 to -75 (54405, 43.7%)
- -100 to -85 (32424, 26.0%)
- -140 to -100 (3204, 2.6%)

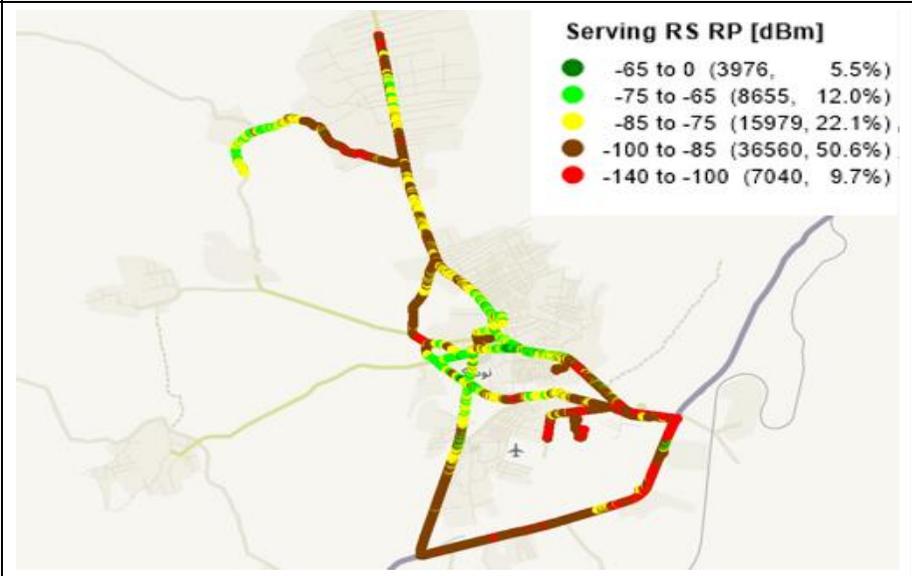


AUTOMODE MOBILE COVERAGE – SIGNAL STRENGTH (RSRP)

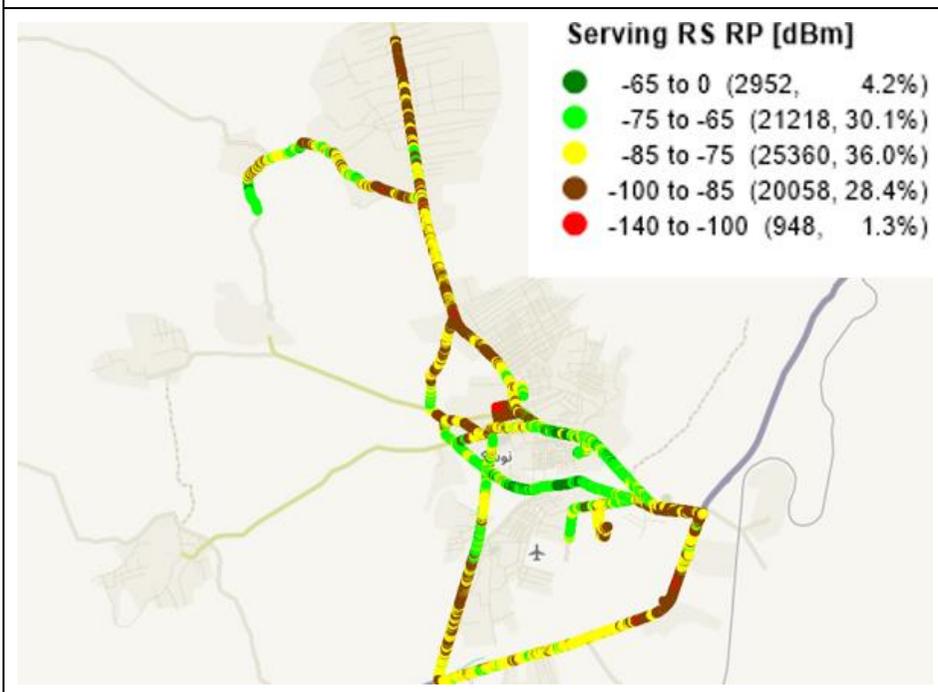
JAZZ NETWORK COVERAGE – NOUSHKI



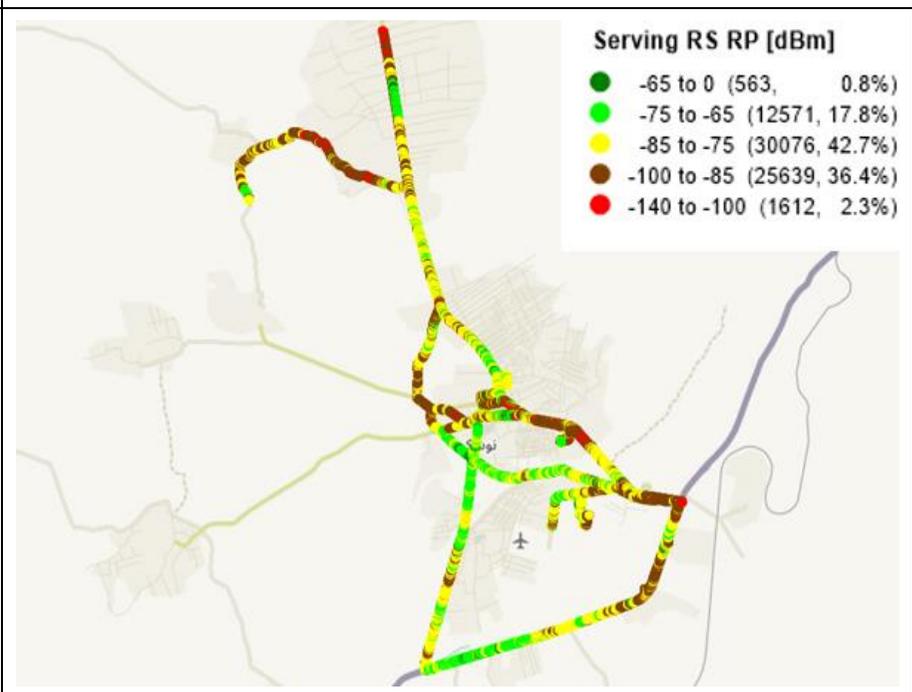
TELENOR NETWORK COVERAGE – NOUSHKI



UFONE NETWORK COVERAGE – NOUSHKI

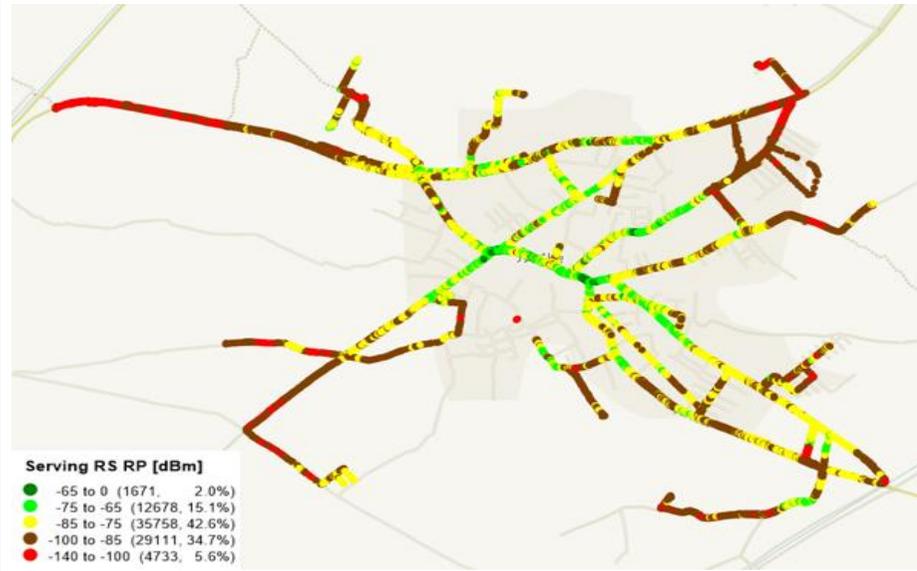


ZONG NETWORK COVERAGE – NOUSHKI

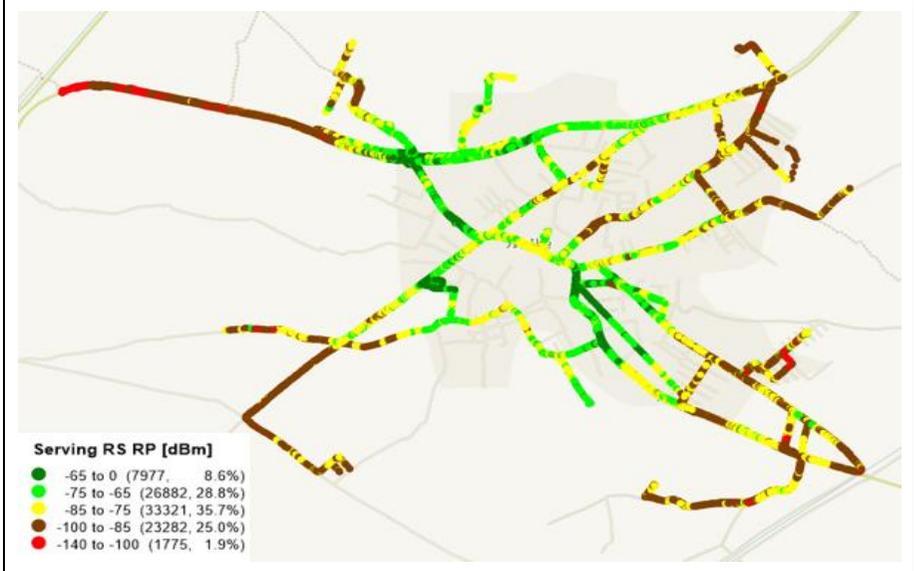


AUTOMODE MOBILE COVERAGE – SIGNAL STRENGTH (RSRP)

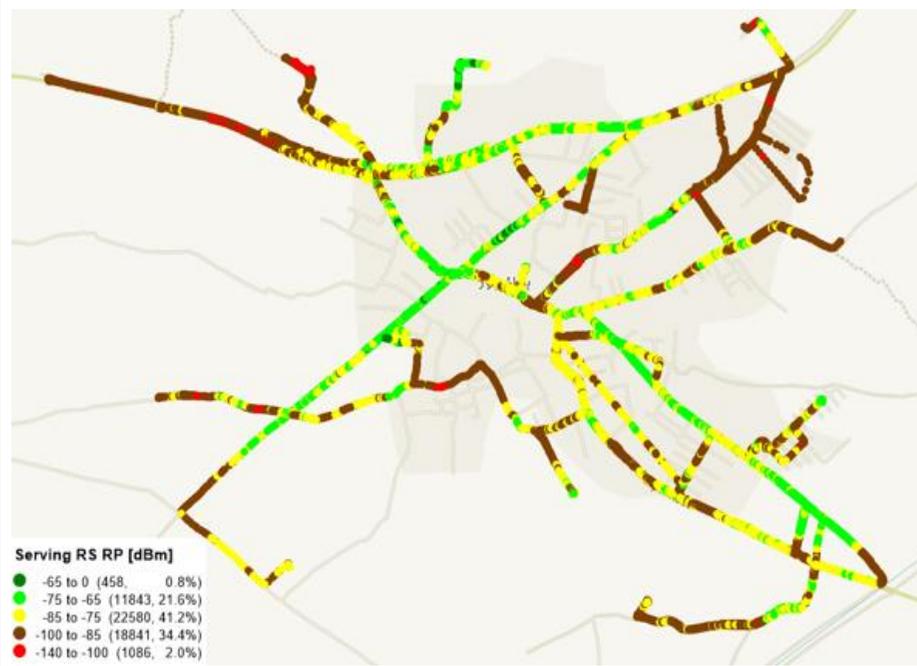
JAZZ NETWORK COVERAGE – PHARPUR



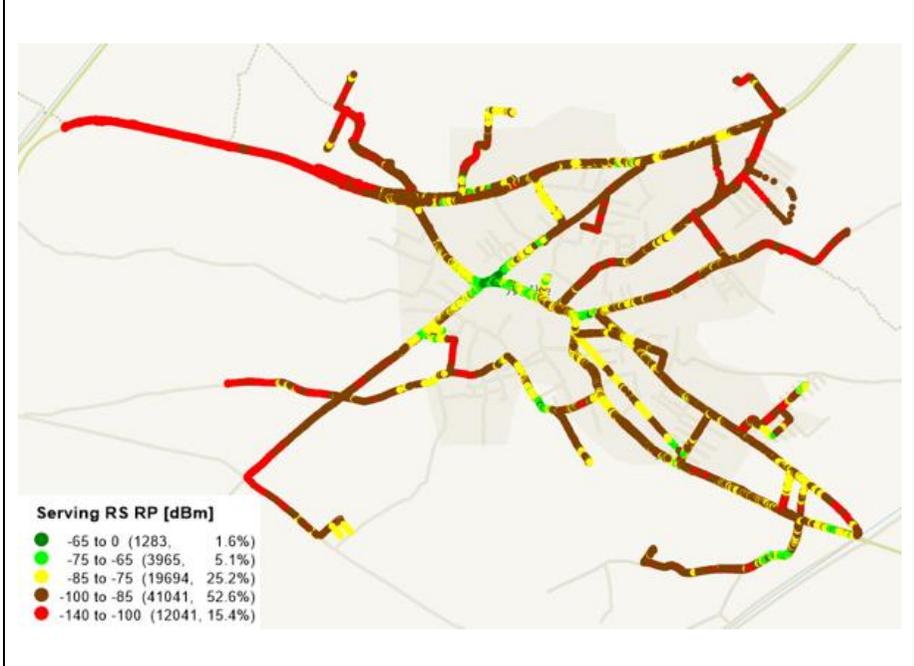
TELENOR NETWORK COVERAGE – PHARPUR



UFONE NETWORK COVERAGE – PHARPUR

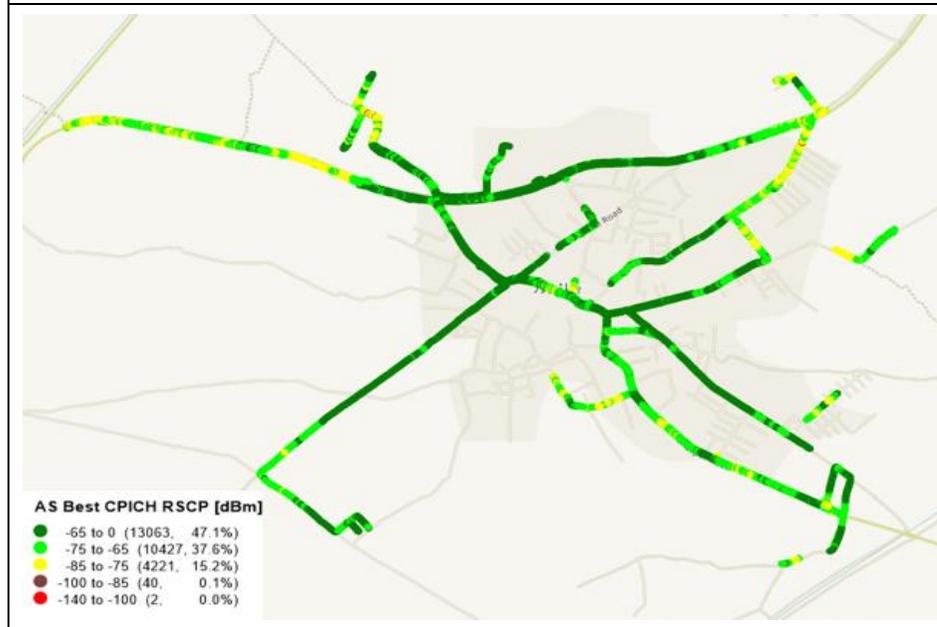


ZONG NETWORK COVERAGE – PHARPUR



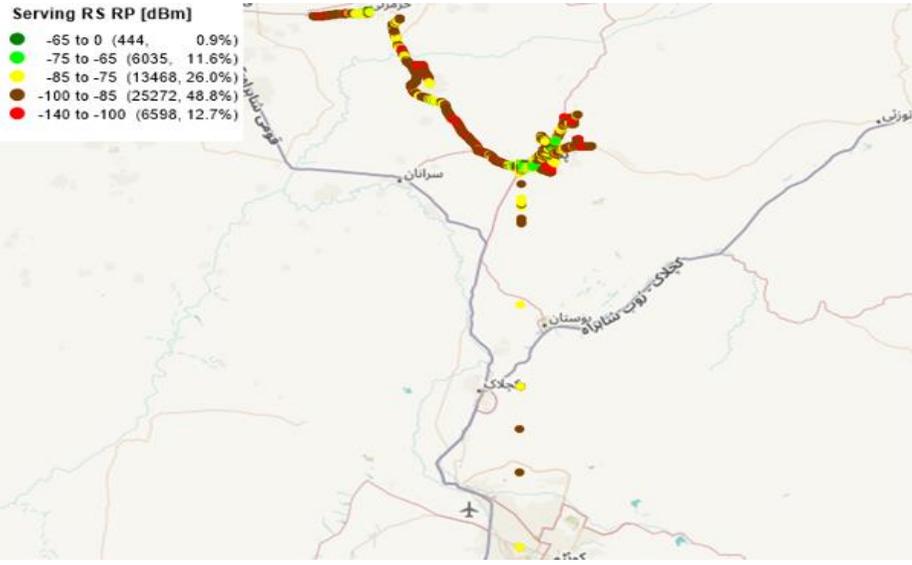
AUTOMODE MOBILE COVERAGE – SIGNAL STRENGTH (RSCP)

UFONE NETWORK COVERAGE – PHARPUR

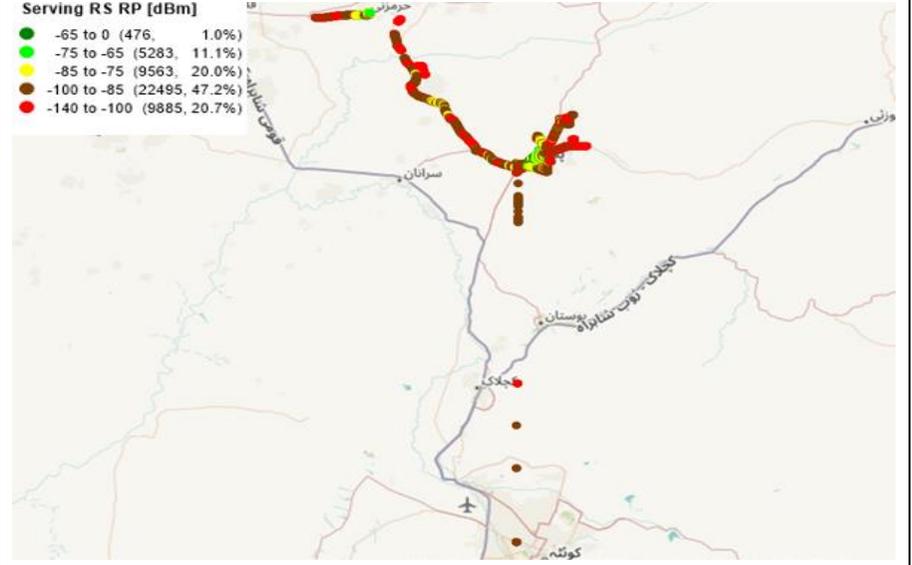


AUTOMODE MOBILE COVERAGE – SIGNAL STRENGTH (RSRP)

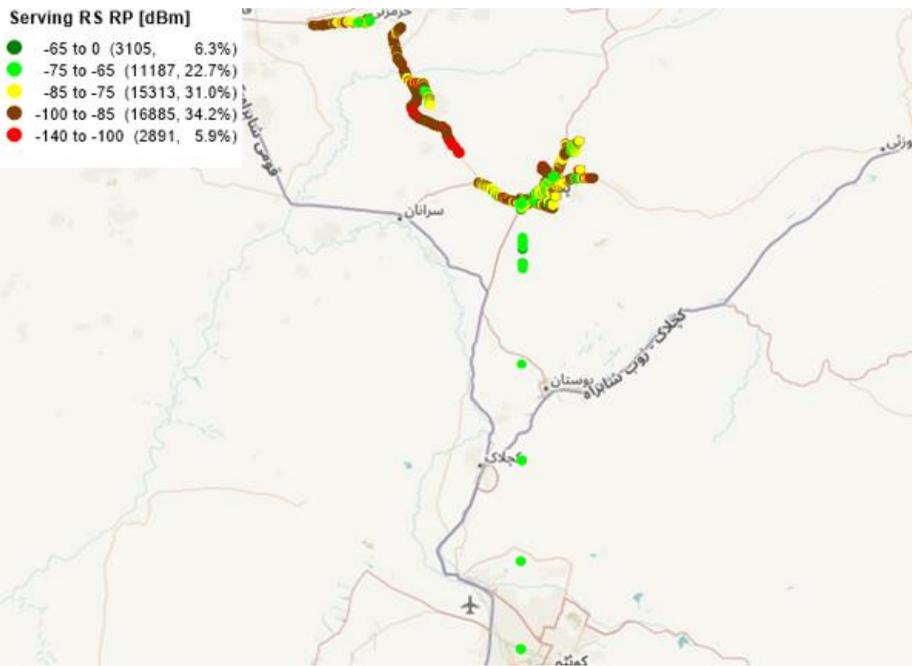
JAZZ NETWORK COVERAGE – PISHIN



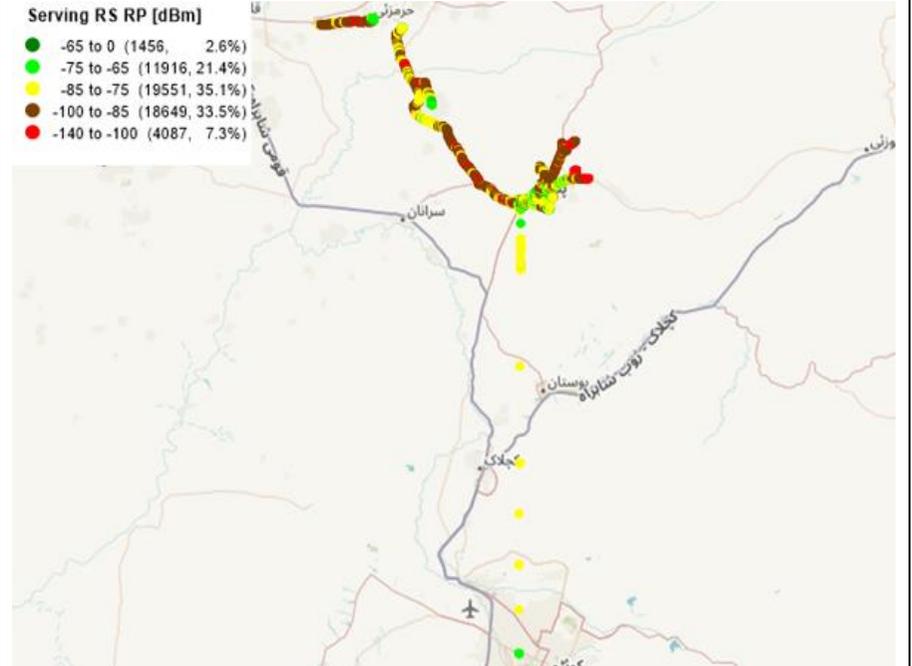
TELENOR NETWORK COVERAGE – PISHIN



UFONE NETWORK COVERAGE – PISHIN

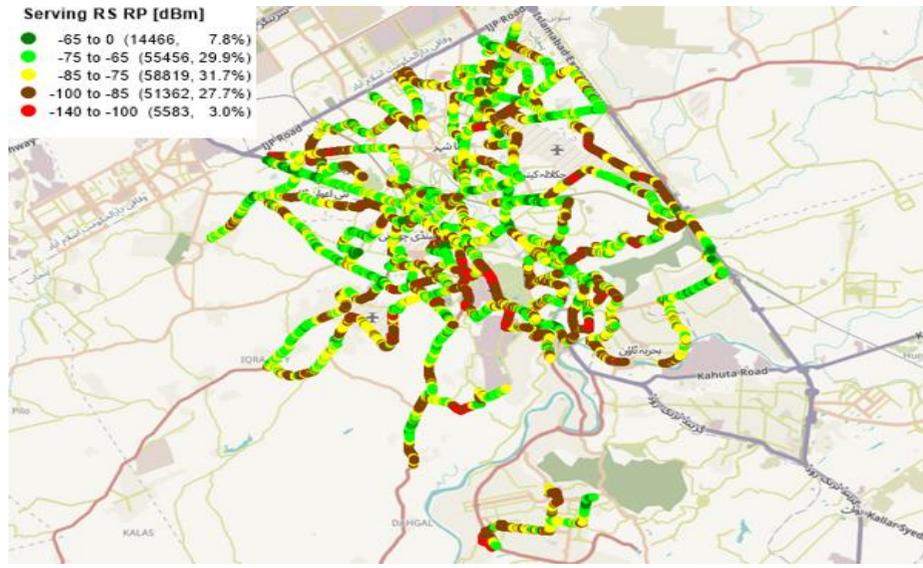


ZONG NETWORK COVERAGE – PISHIN

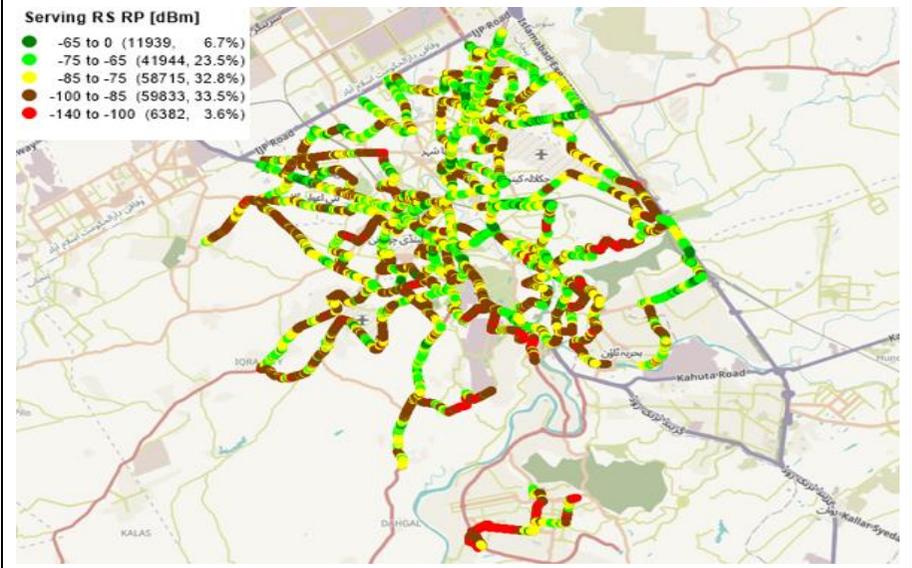


AUTOMODE MOBILE COVERAGE – SIGNAL STRENGTH (RSRP)

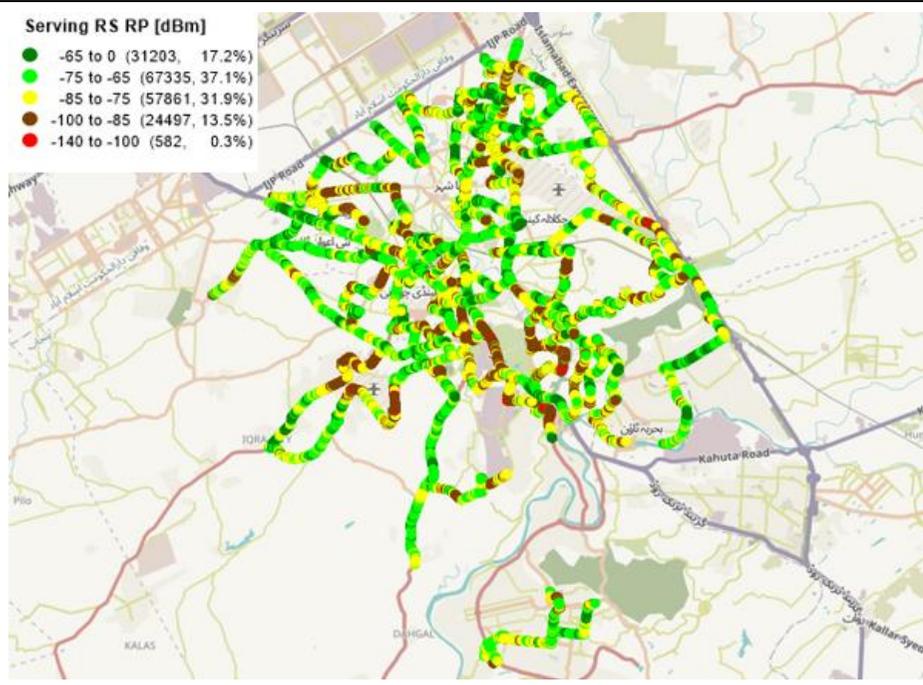
JAZZ NETWORK COVERAGE – RAWALPINDI



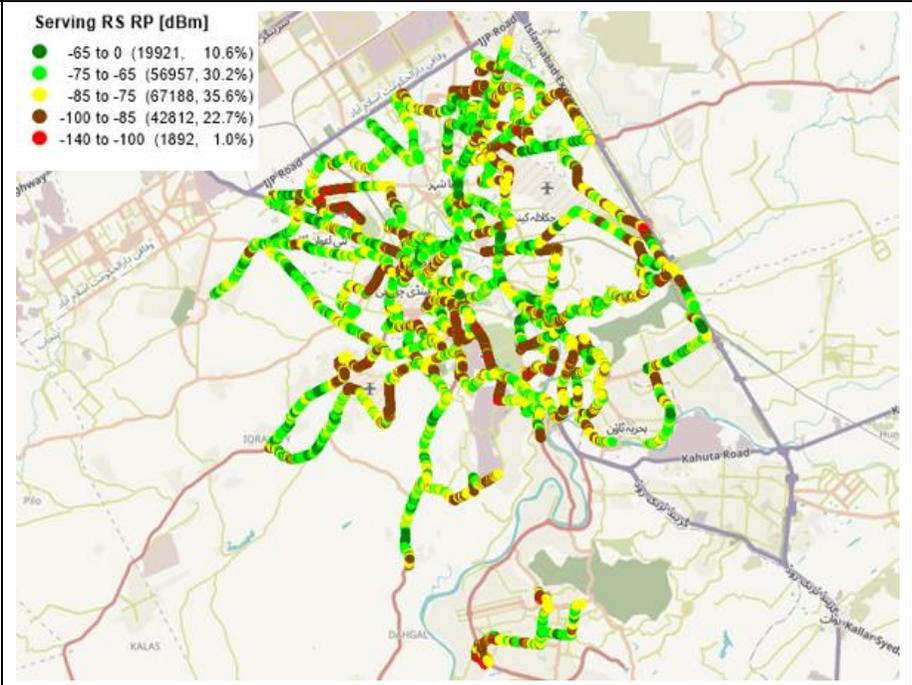
TELENOR NETWORK COVERAGE – RAWALPINDI



UFONE NETWORK COVERAGE – RAWALPINDI

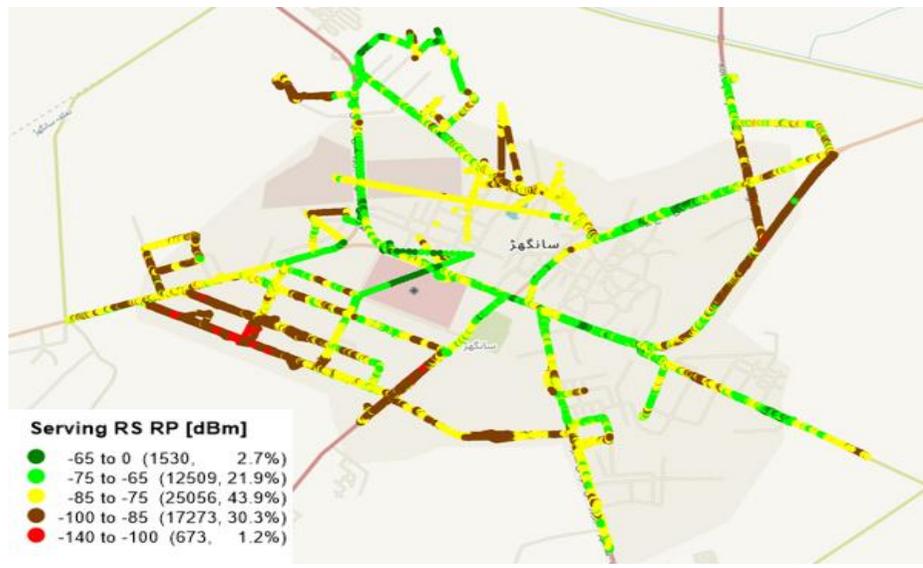


ZONG NETWORK COVERAGE – RAWALPINDI

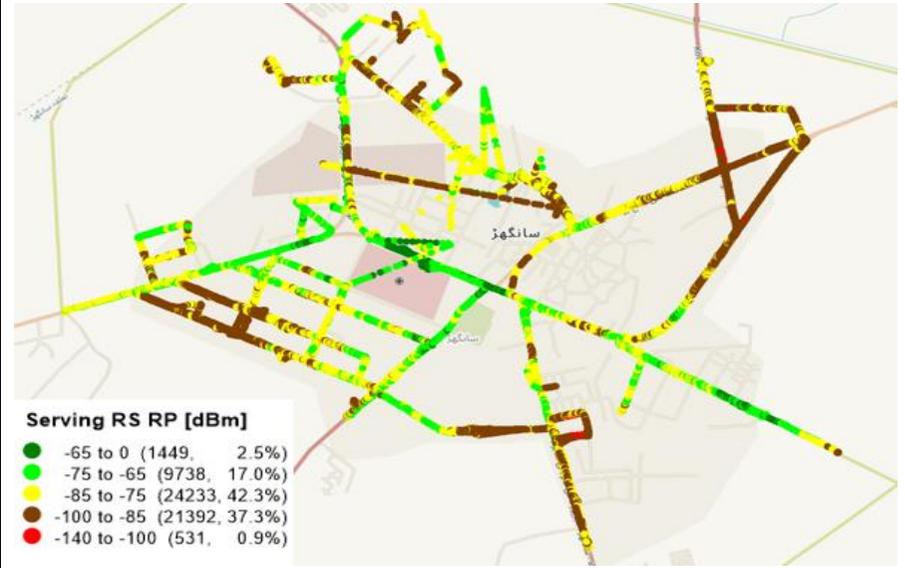


AUTOMODE MOBILE COVERAGE – SIGNAL STRENGTH (RSRP)

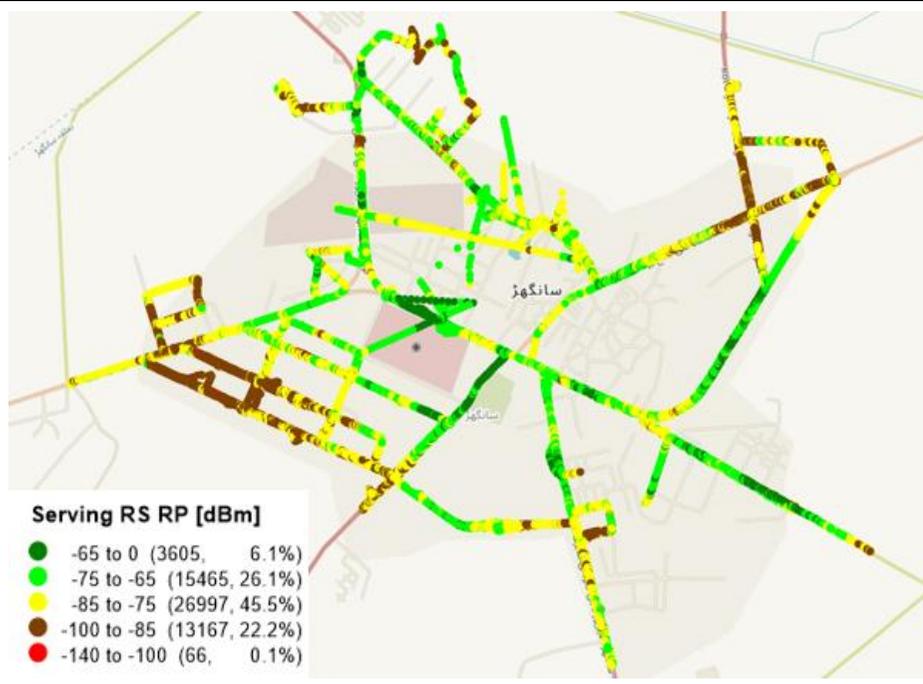
JAZZ NETWORK COVERAGE – SANGHAR



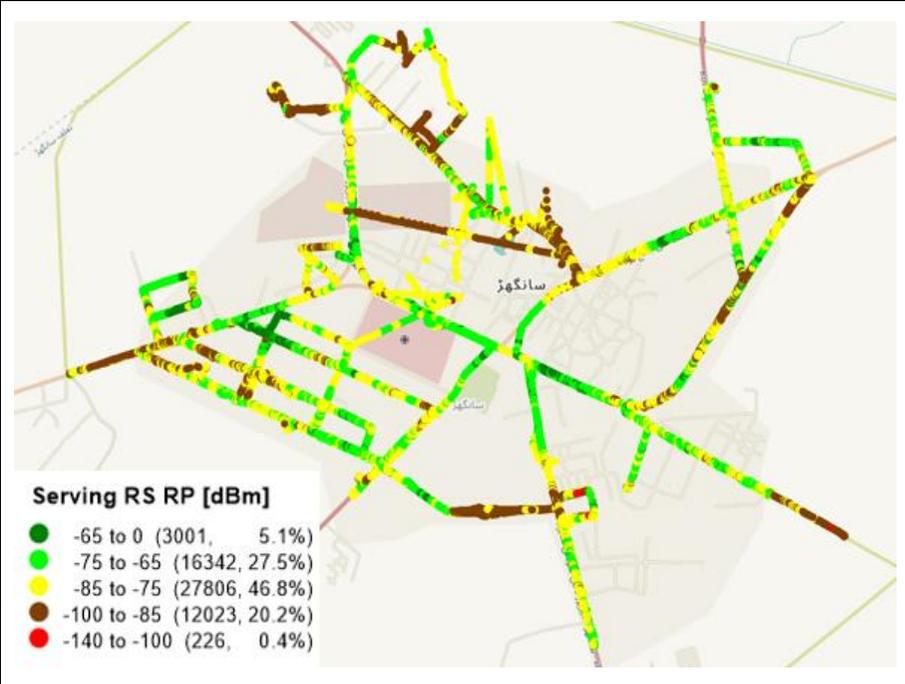
TELENOR NETWORK COVERAGE – SANGHAR



UFONE NETWORK COVERAGE – SANGHAR

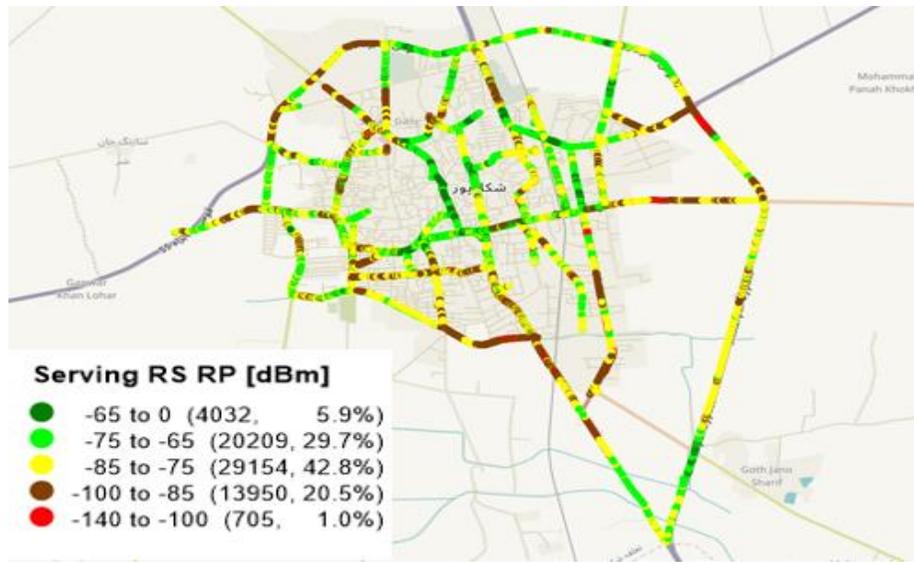


ZONG NETWORK COVERAGE – SANGHAR

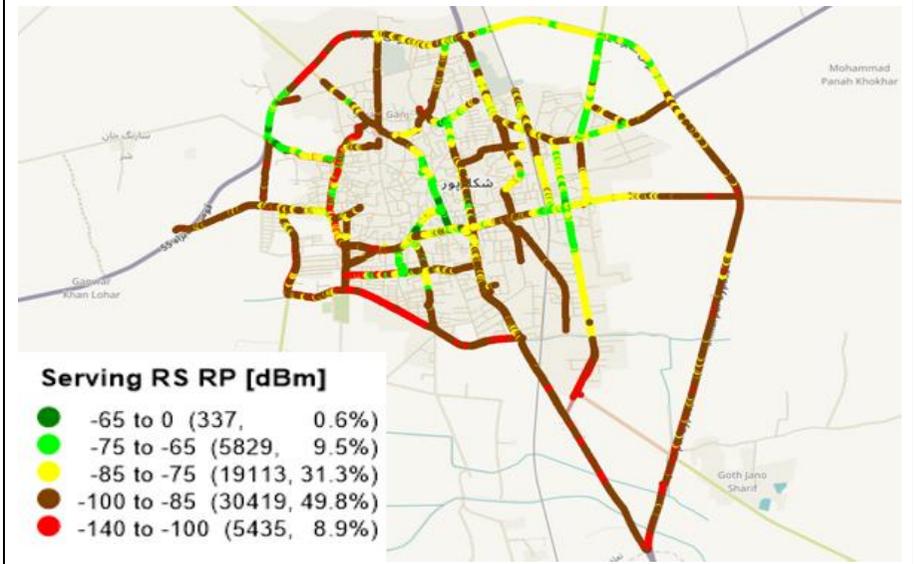


AUTOMODE MOBILE COVERAGE – SIGNAL STRENGTH (RSRP)

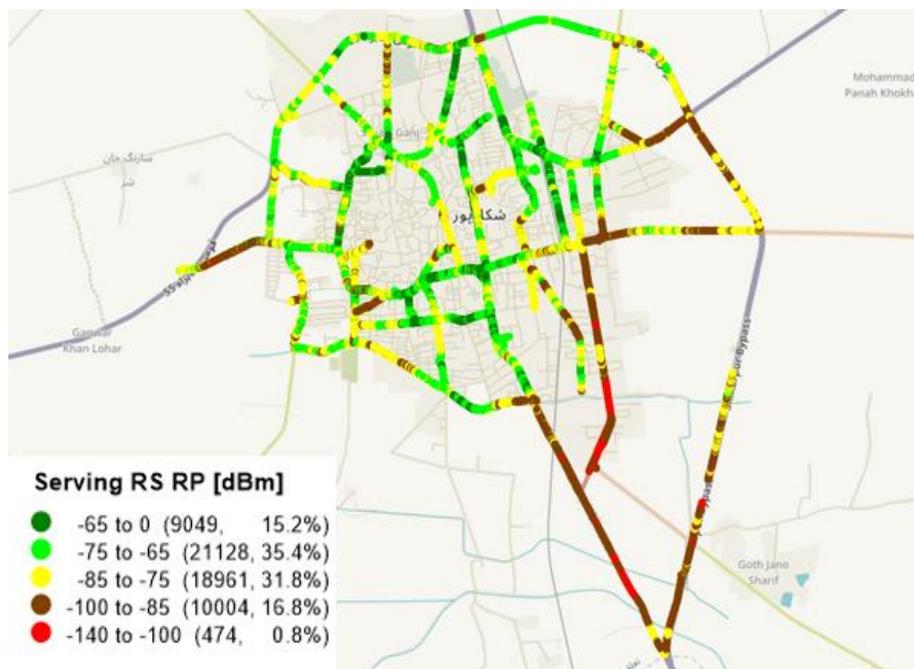
JAZZ NETWORK COVERAGE – SHIKARPUR



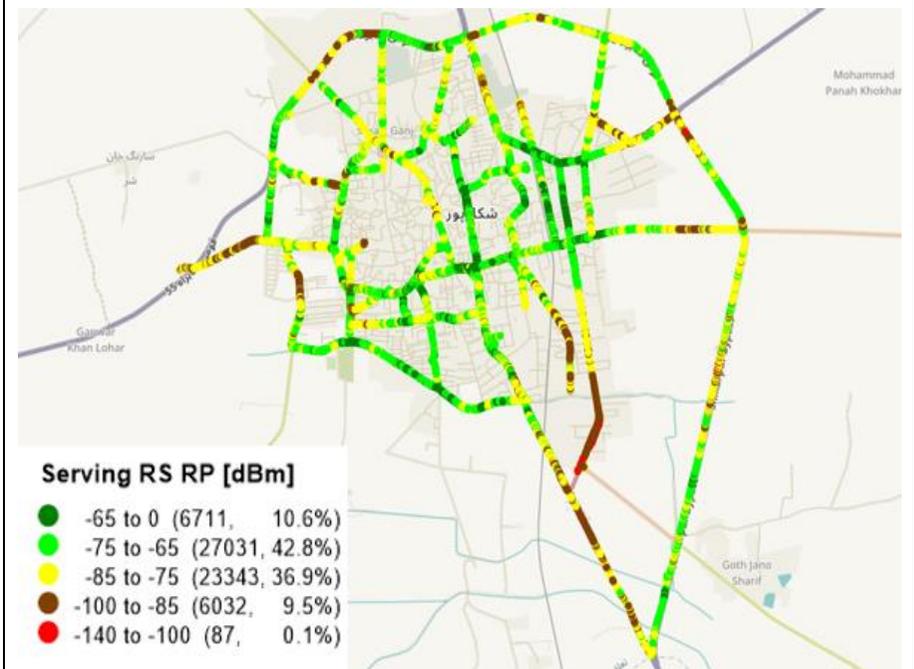
TELENOR NETWORK COVERAGE – SHIKARPUR



UFONE NETWORK COVERAGE – SHIKARPUR



ZONG NETWORK COVERAGE – SHIKARPUR

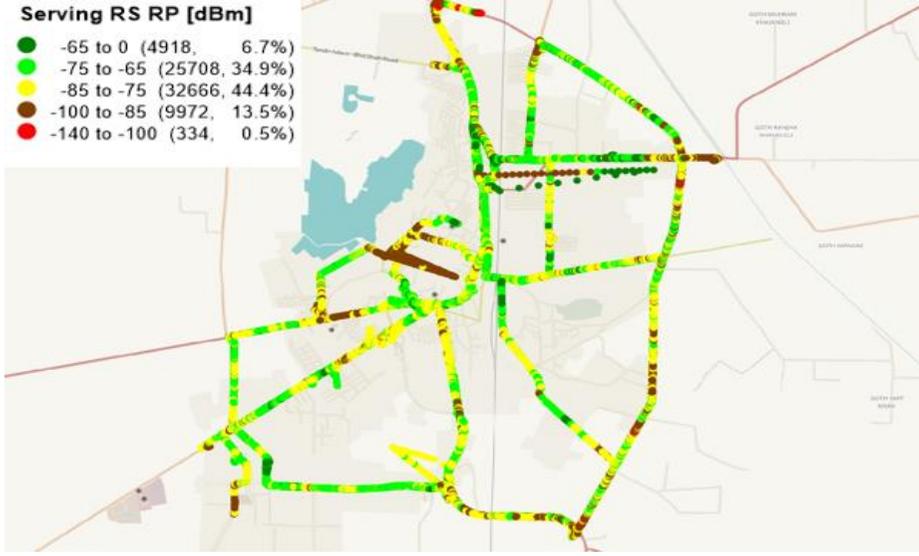


AUTOMODE MOBILE COVERAGE – SIGNAL STRENGTH (RSRP)

JAZZ NETWORK COVERAGE – TANDO ADAM

Serving RS RP [dBm]

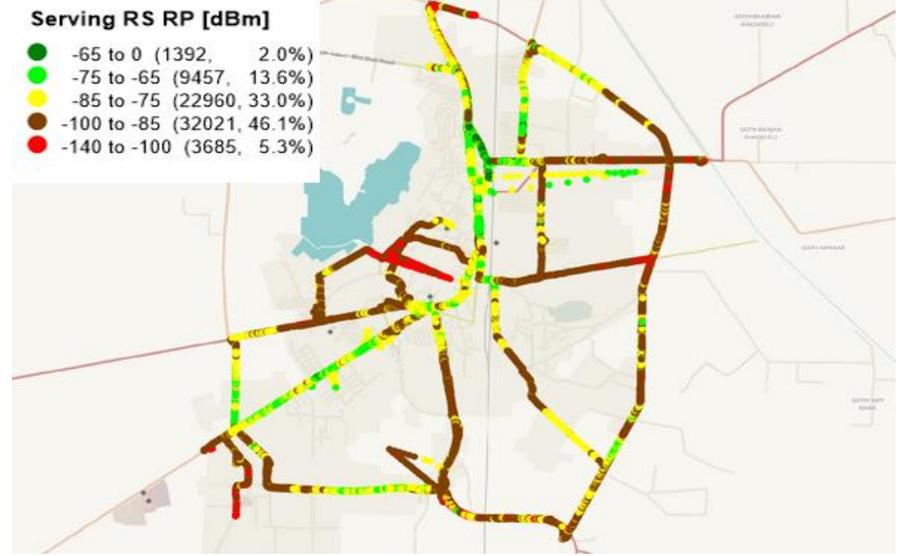
- -65 to 0 (4918, 6.7%)
- -75 to -65 (25708, 34.9%)
- -85 to -75 (32666, 44.4%)
- -100 to -85 (9972, 13.5%)
- -140 to -100 (334, 0.5%)



TELENOR NETWORK COVERAGE – TANDO ADAM

Serving RS RP [dBm]

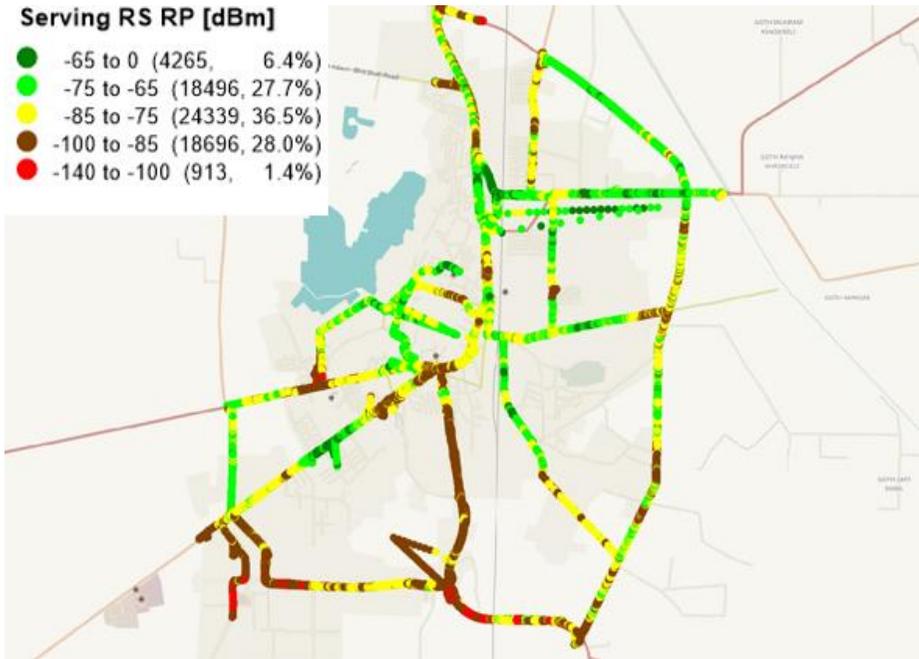
- -65 to 0 (1392, 2.0%)
- -75 to -65 (9457, 13.6%)
- -85 to -75 (22960, 33.0%)
- -100 to -85 (32021, 46.1%)
- -140 to -100 (3685, 5.3%)



UFONE NETWORK COVERAGE – TANDO ADAM

Serving RS RP [dBm]

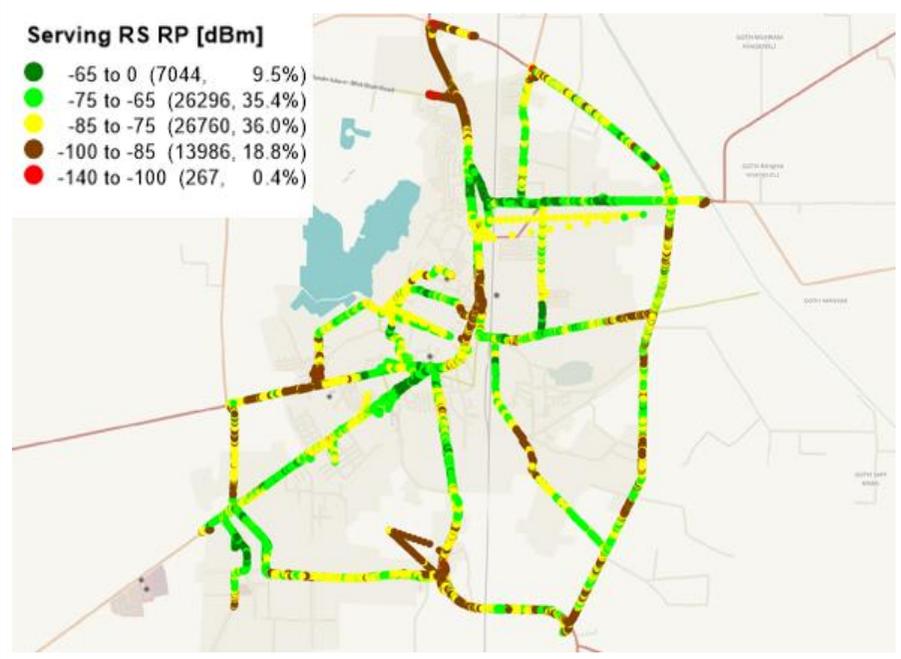
- -65 to 0 (4265, 6.4%)
- -75 to -65 (18496, 27.7%)
- -85 to -75 (24339, 36.5%)
- -100 to -85 (18696, 28.0%)
- -140 to -100 (913, 1.4%)



ZONG NETWORK COVERAGE – TANDO ADAM

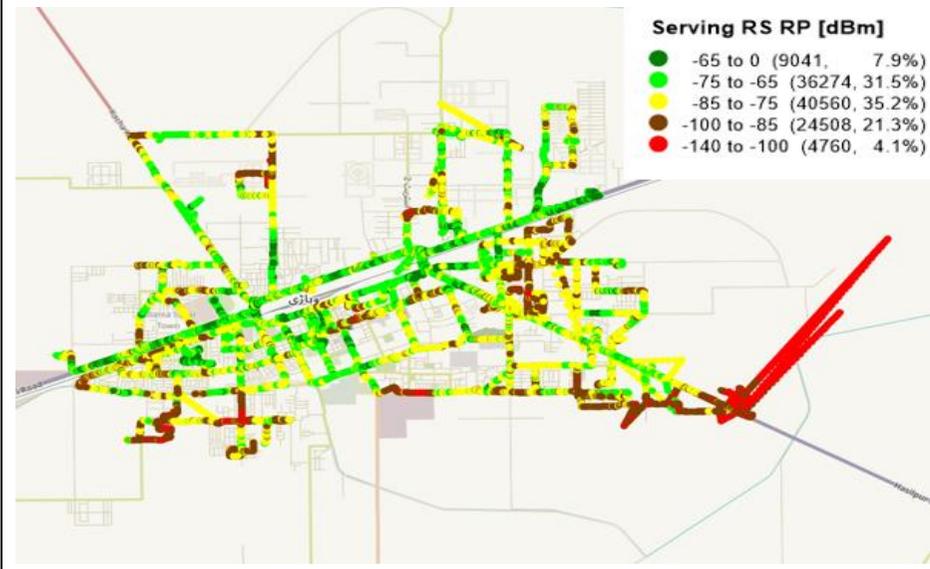
Serving RS RP [dBm]

- -65 to 0 (7044, 9.5%)
- -75 to -65 (26296, 35.4%)
- -85 to -75 (26760, 36.0%)
- -100 to -85 (13986, 18.8%)
- -140 to -100 (267, 0.4%)

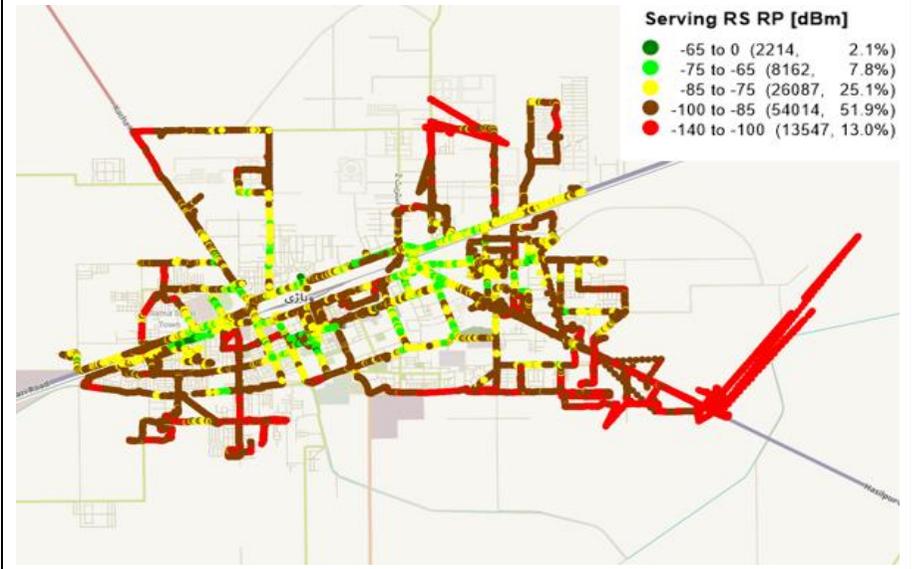


AUTOMODE MOBILE COVERAGE – SIGNAL STRENGTH (RSRP)

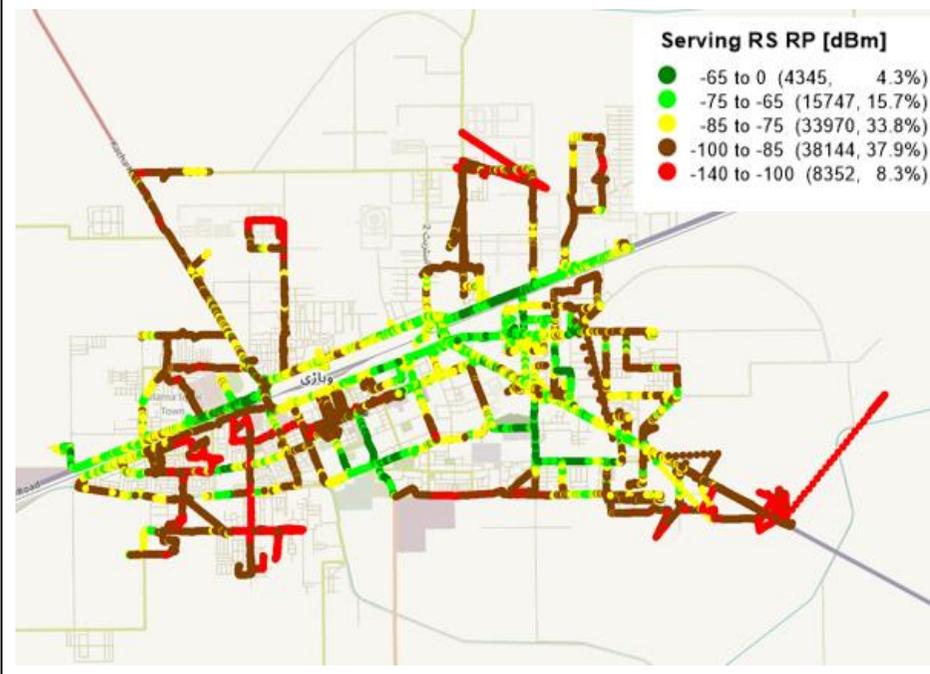
JAZZ NETWORK COVERAGE – VEHARI



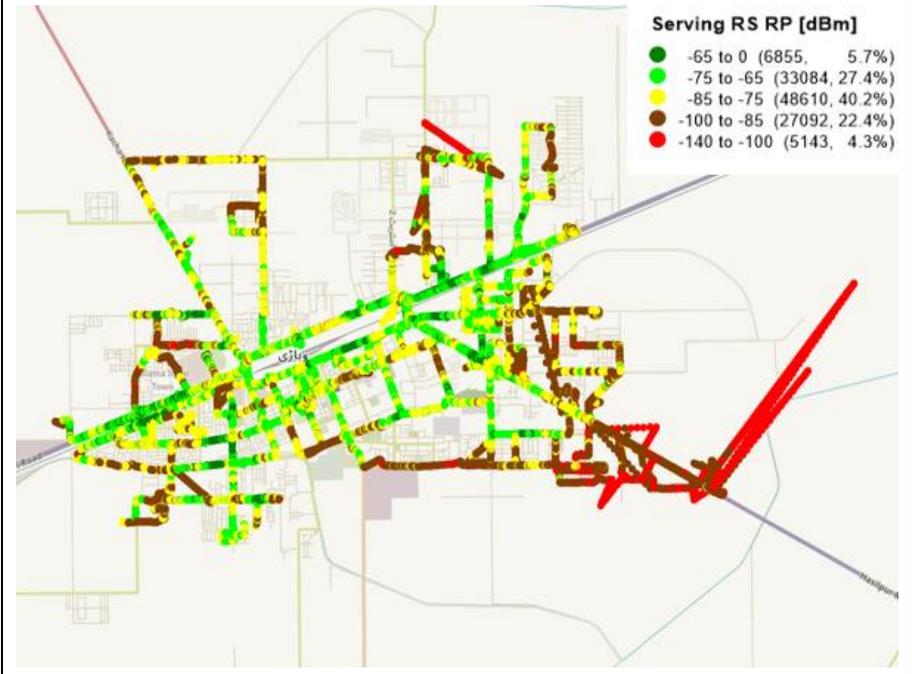
TELENOR NETWORK COVERAGE – VEHARI



UFONE NETWORK COVERAGE – VEHARI

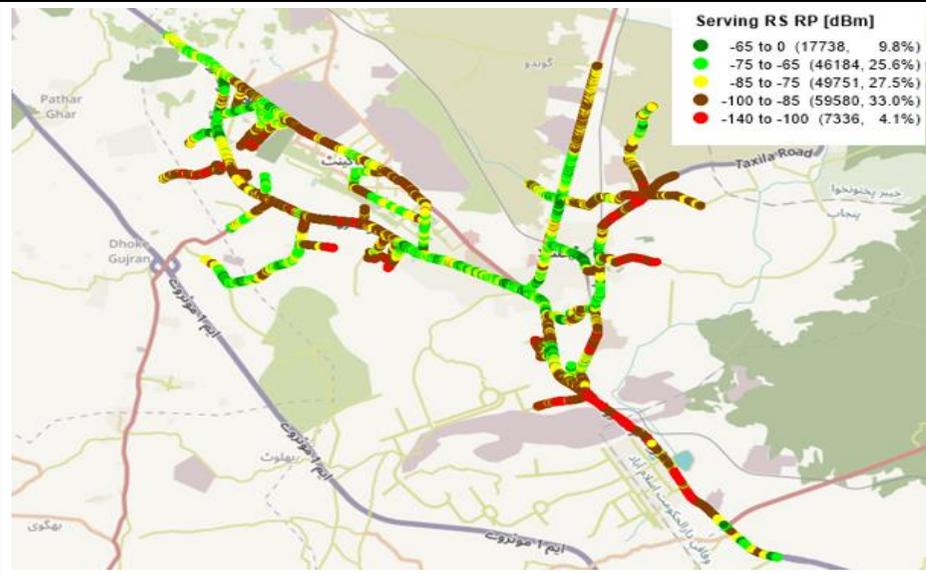


ZONG NETWORK COVERAGE – VEHARI

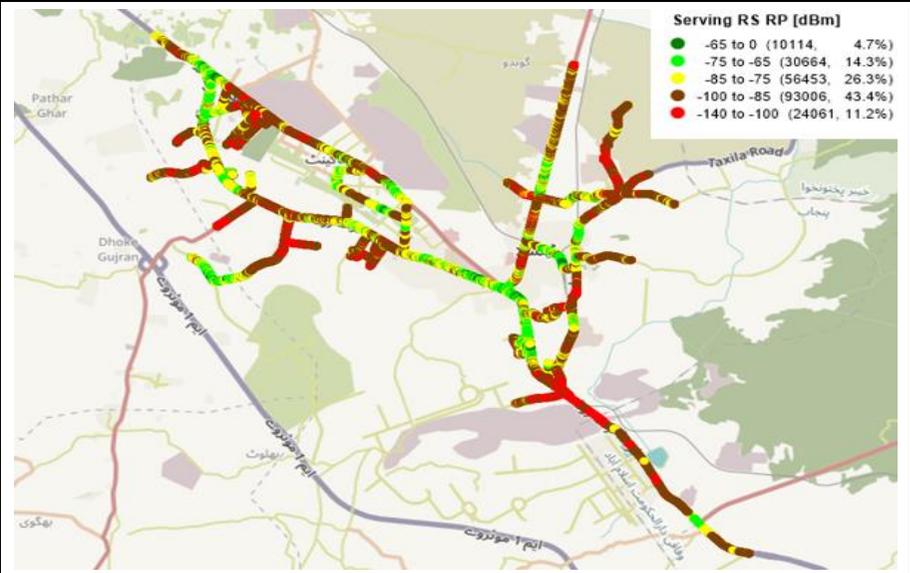


AUTOMODE MOBILE COVERAGE – SIGNAL STRENGTH (RSRP)

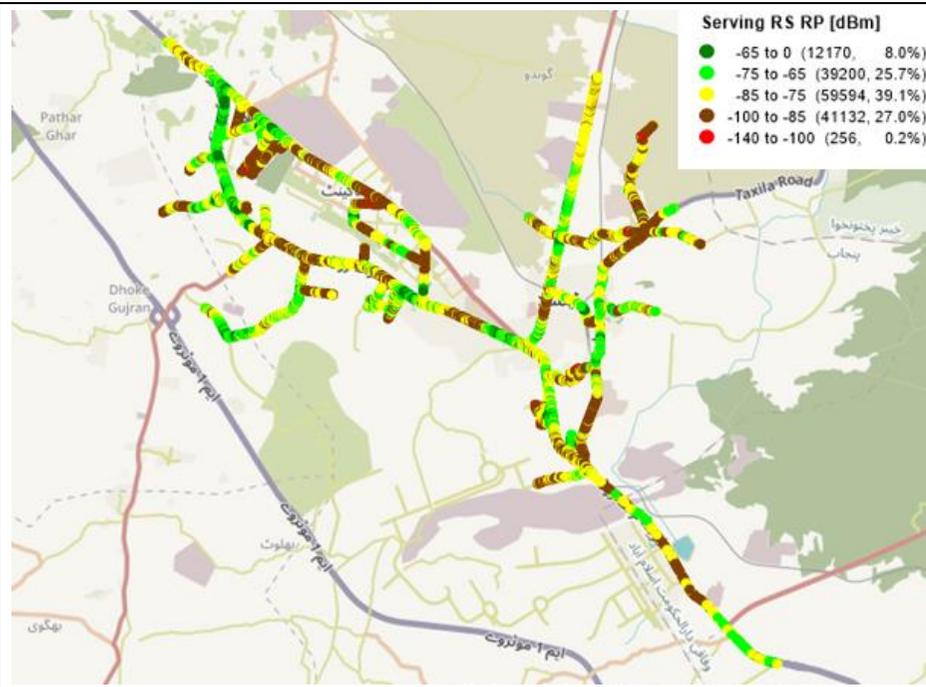
JAZZ NETWORK COVERAGE – WAH-TAXILA



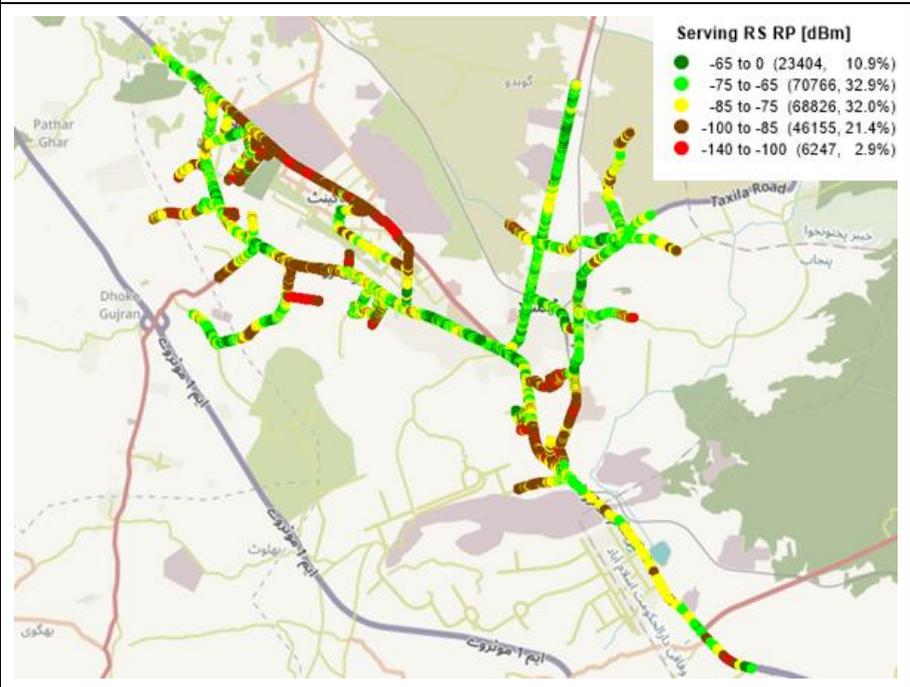
TELENOR NETWORK COVERAGE – WAH-TAXILA



UFONE NETWORK COVERAGE – WAH-TAXILA



ZONG NETWORK COVERAGE – WAH-TAXILA



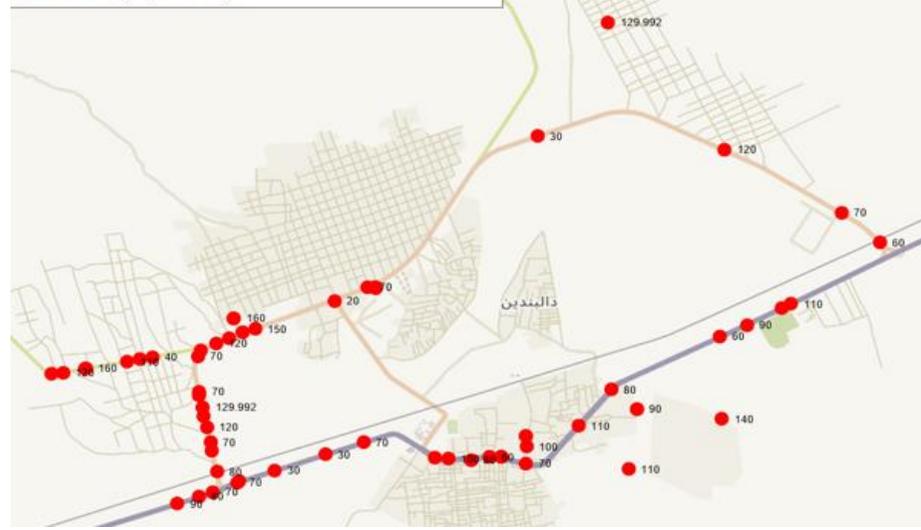
OOKLA

OOKLA SPEED TEST RESULTS

JAZZ DOWNLOAD THROUGHPUT – DALBANDIN

Layer: Ookla(R) - Ookla(R) Throughput DL [kbps]

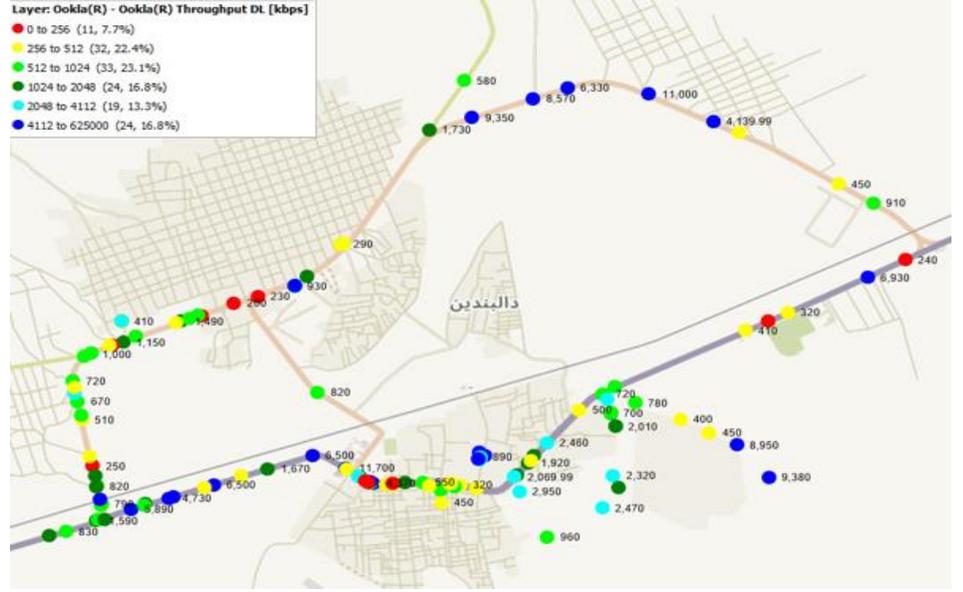
● 0 to 256 (65, 100.0%)



TELENOR DOWNLOAD THROUGHPUT – DALBANDIN

Layer: Ookla(R) - Ookla(R) Throughput DL [kbps]

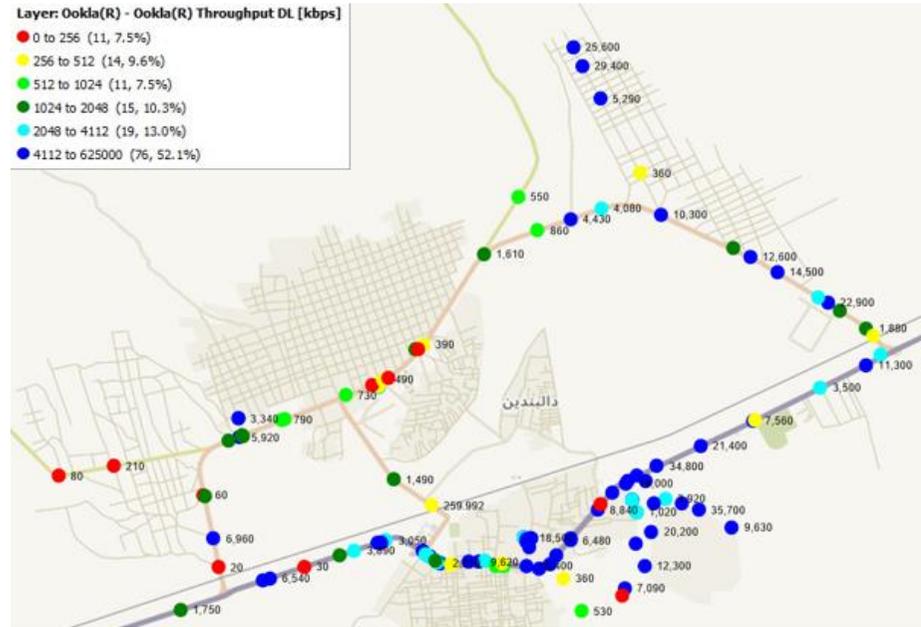
- 0 to 256 (11, 7.7%)
- 256 to 512 (32, 22.4%)
- 512 to 1024 (33, 23.1%)
- 1024 to 2048 (24, 16.8%)
- 2048 to 4112 (19, 13.3%)
- 4112 to 625000 (24, 16.8%)



UFONE DOWNLOAD THROUGHPUT – DALBANDIN

Layer: Ookla(R) - Ookla(R) Throughput DL [kbps]

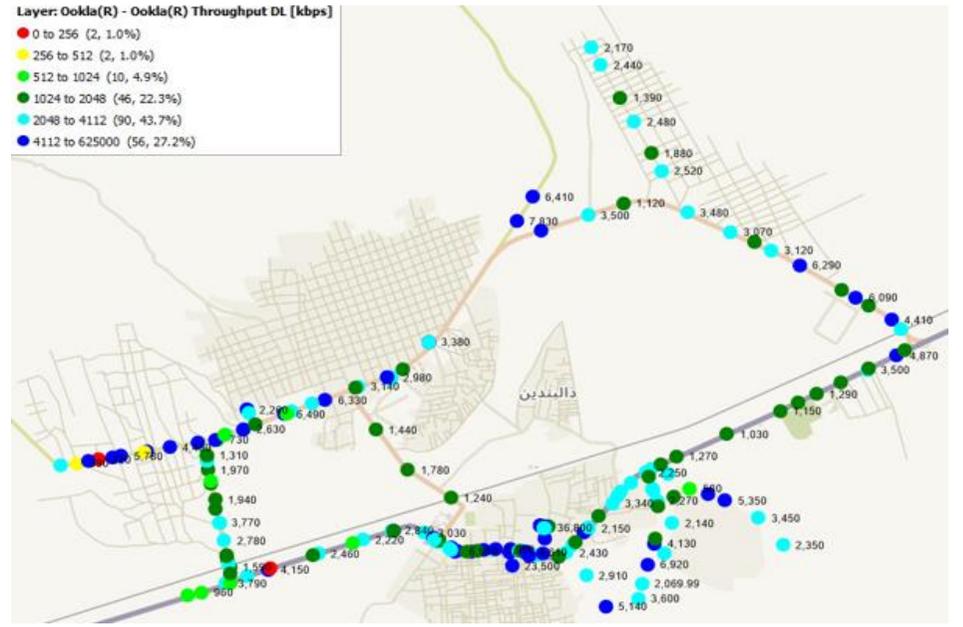
- 0 to 256 (11, 7.5%)
- 256 to 512 (14, 9.6%)
- 512 to 1024 (11, 7.5%)
- 1024 to 2048 (15, 10.3%)
- 2048 to 4112 (19, 13.0%)
- 4112 to 625000 (76, 52.1%)



ZONG DOWNLOAD THROUGHPUT – DALBANDIN

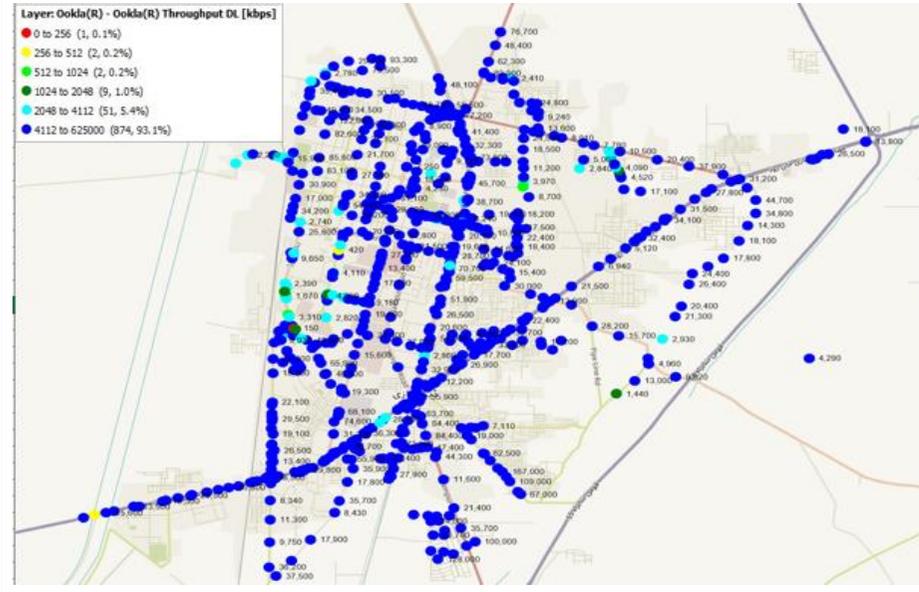
Layer: Ookla(R) - Ookla(R) Throughput DL [kbps]

- 0 to 256 (2, 1.0%)
- 256 to 512 (2, 1.0%)
- 512 to 1024 (10, 4.9%)
- 1024 to 2048 (46, 22.3%)
- 2048 to 4112 (90, 43.7%)
- 4112 to 625000 (56, 27.2%)

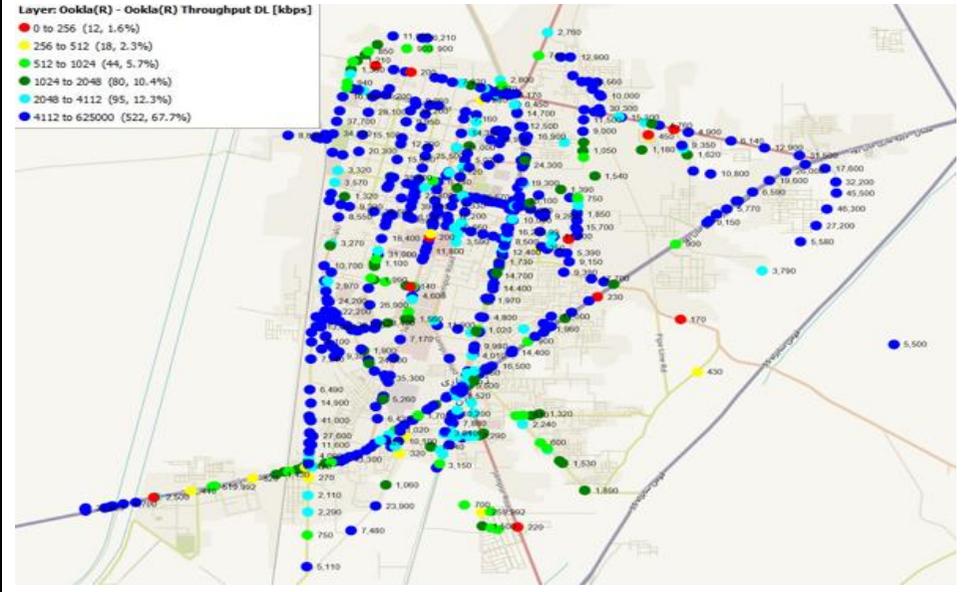


OOKLA SPEED TEST RESULTS

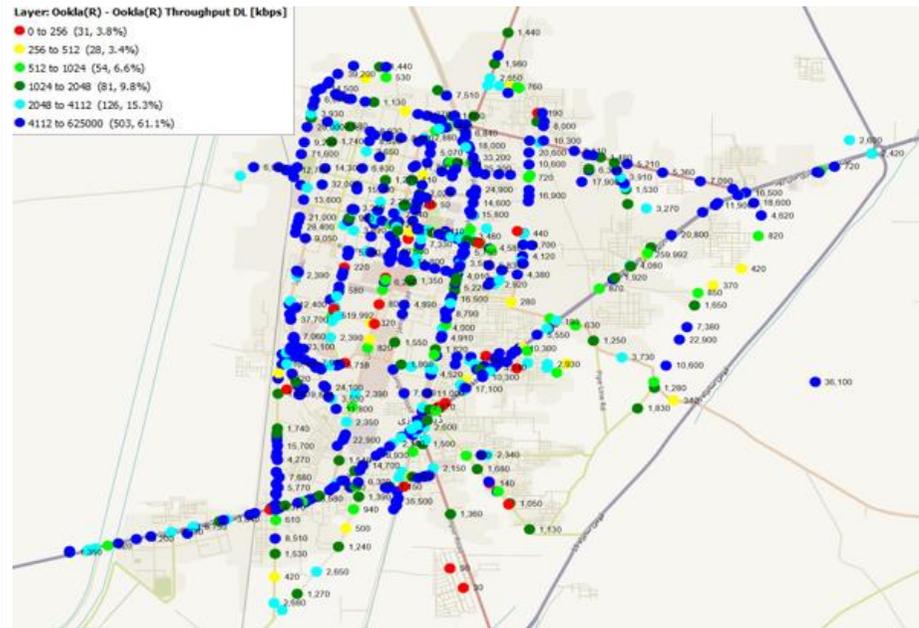
JAZZ DOWNLOAD THROUGHPUT – D.G KHAN



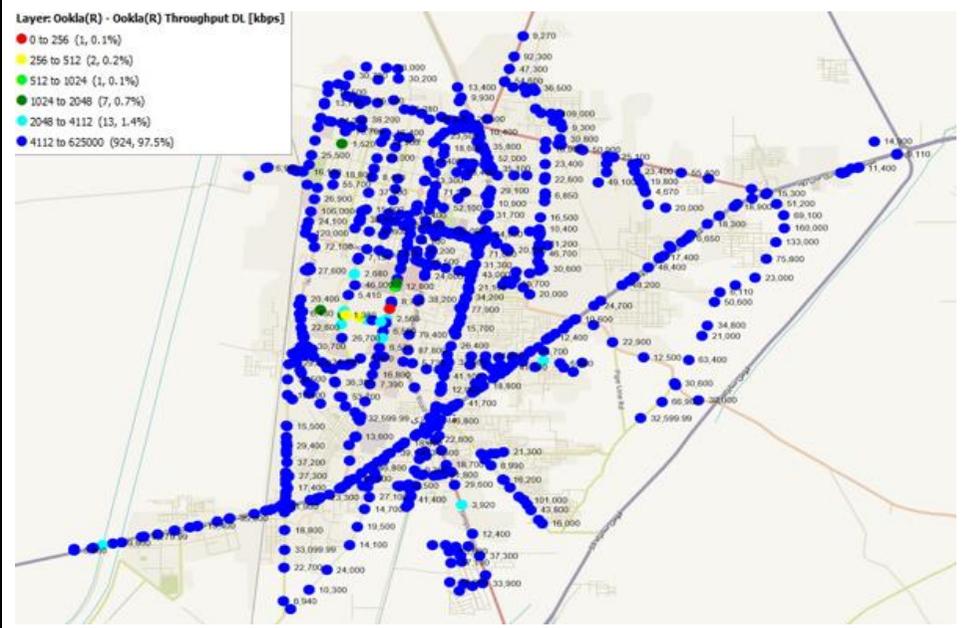
TELENOR DOWNLOAD THROUGHPUT – D.G KHAN



UFONE DOWNLOAD THROUGHPUT – D.G KHAN

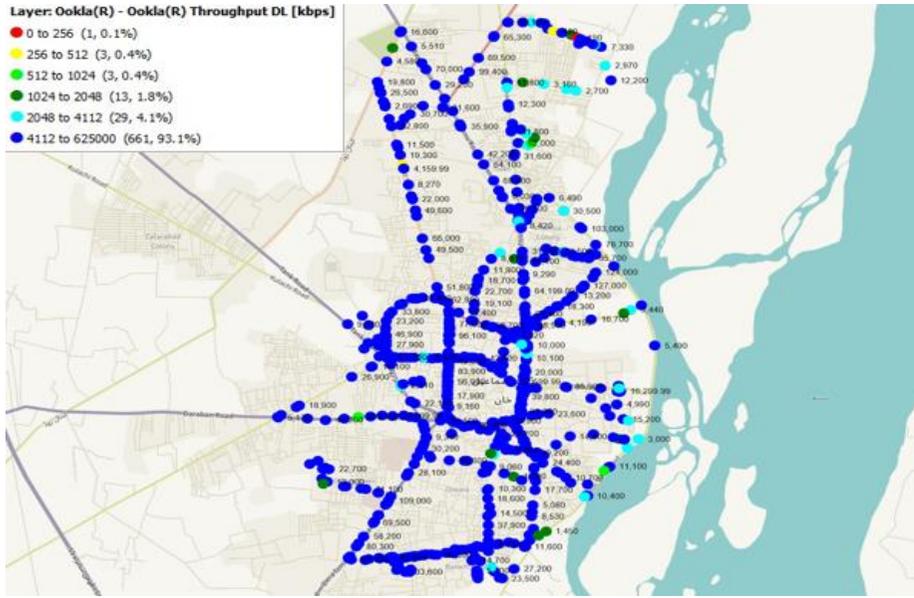


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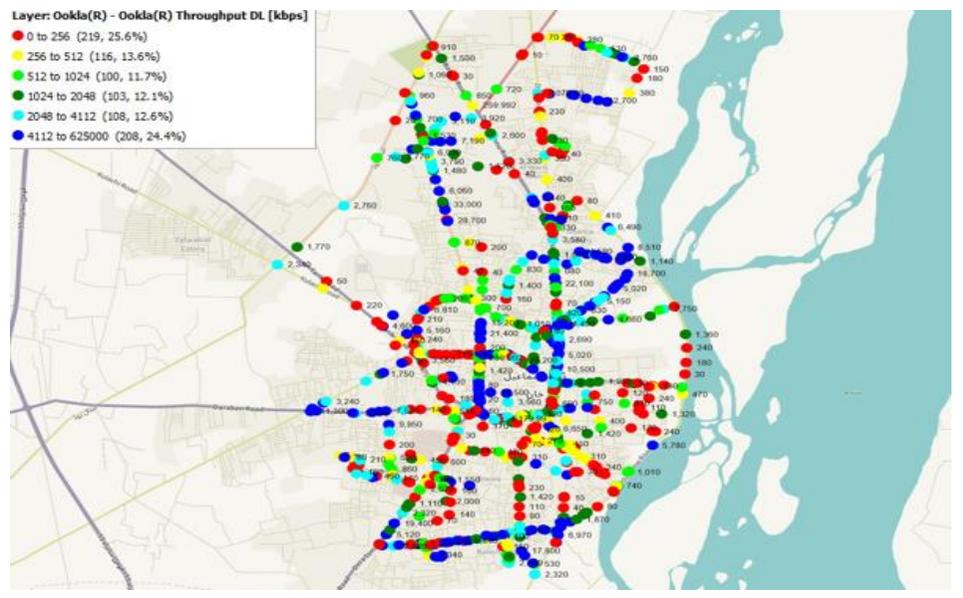


OOKLA SPEED TEST RESULTS

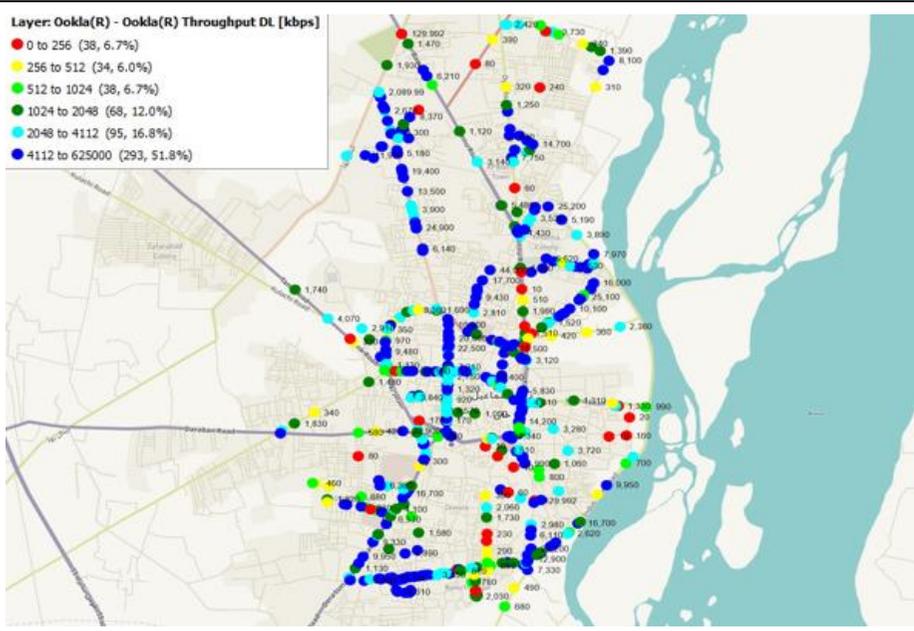
JAZZ DOWNLOAD THROUGHPUT - D.I KHAN



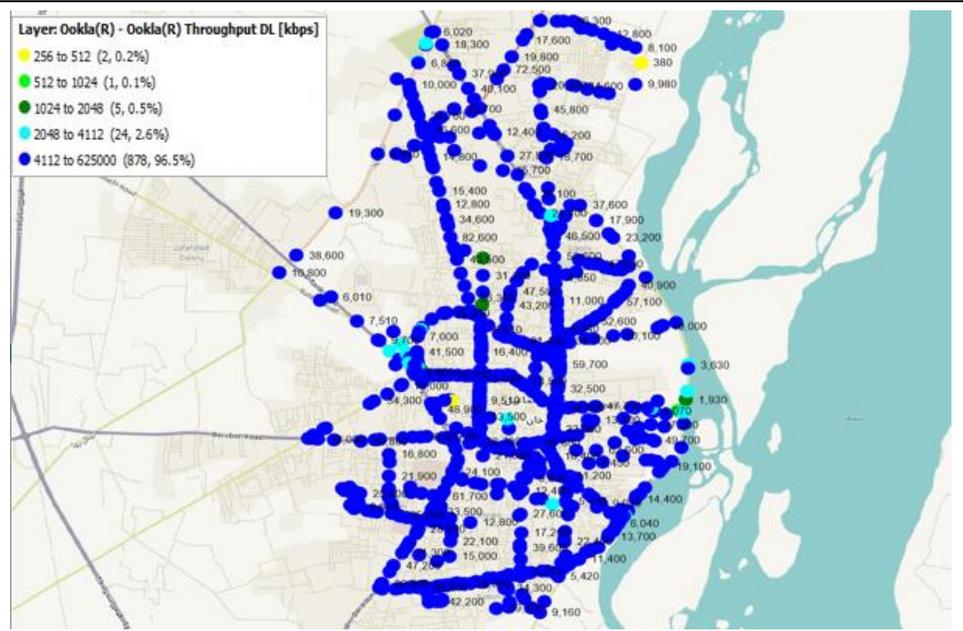
TELENOR DOWNLOAD THROUGHPUT - D.I KHAN



UFONE DOWNLOAD THROUGHPUT - D.I KHAN

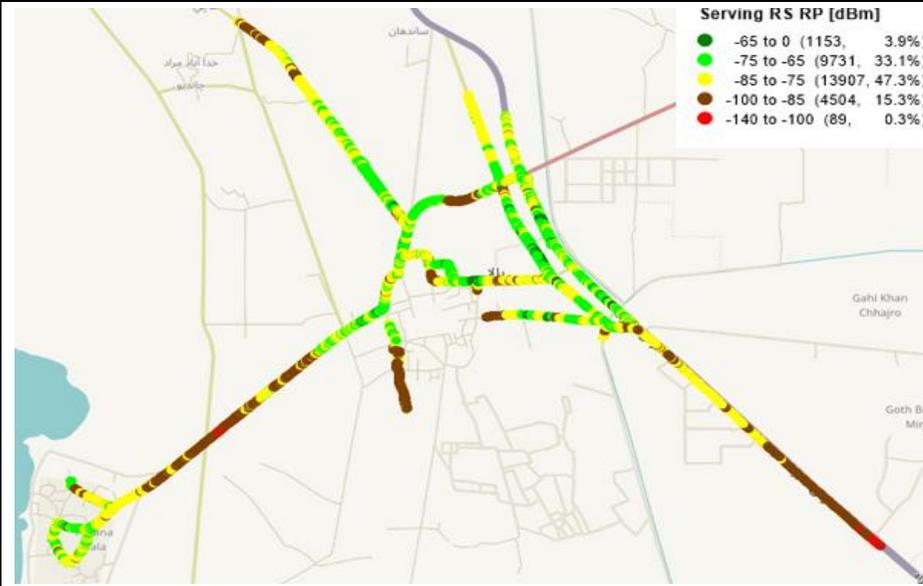


ZONG DOWNLOAD THROUGHPUT - D.I KHAN

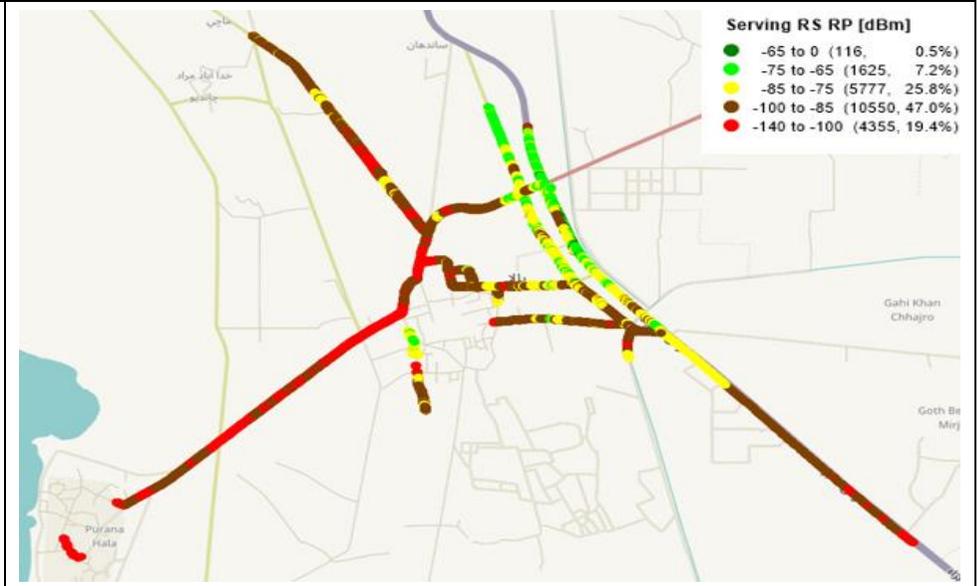


OOKLA SPEED TEST RESULTS

JAZZ DOWNLOAD THROUGHPUT - HALA



TELENOR DOWNLOAD THROUGHPUT - HALA



UFONE DOWNLOAD THROUGHPUT - HALA

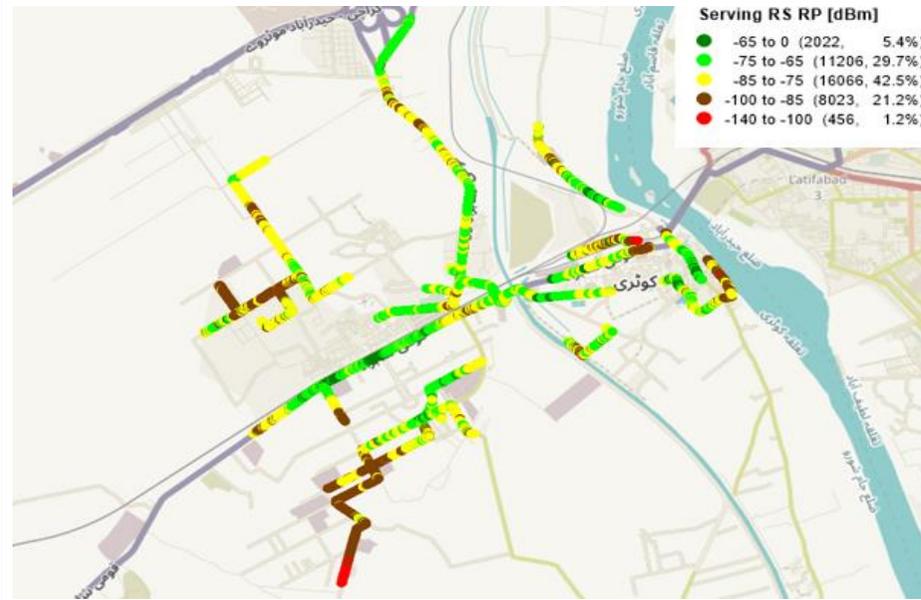


ZONG DOWNLOAD THROUGHPUT - HALA

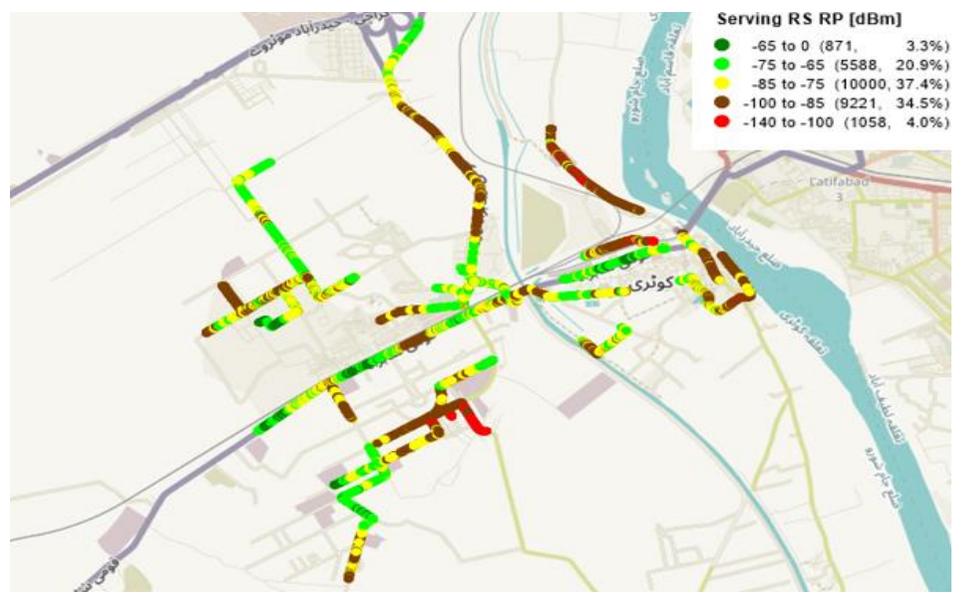


OOKLA SPEED TEST RESULTS

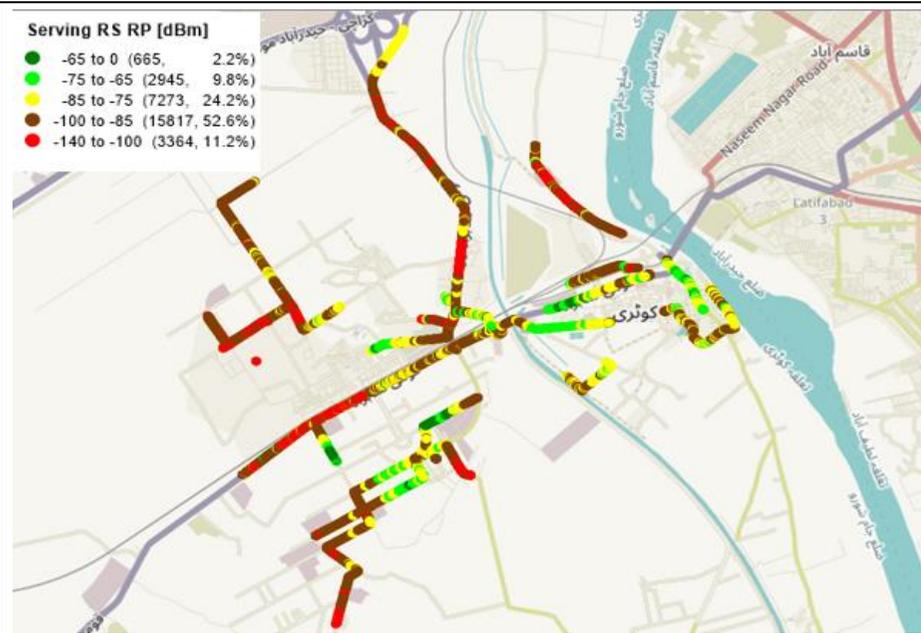
JAZZ DOWNLOAD THROUGHPUT – KOTRI



TELENOR DOWNLOAD THROUGHPUT – KOTRI



UFONE DOWNLOAD THROUGHPUT – KOTRI

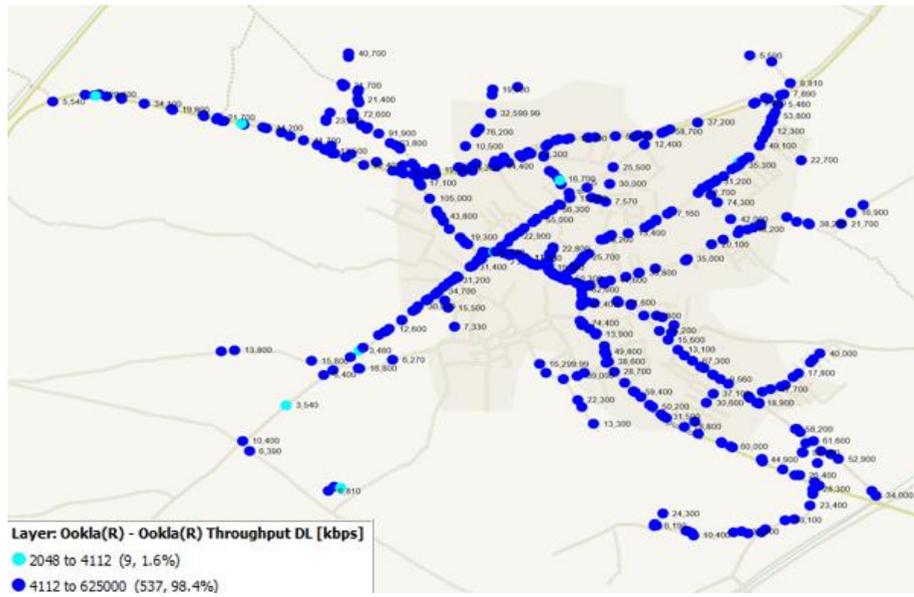


ZONG DOWNLOAD THROUGHPUT – KOTRI

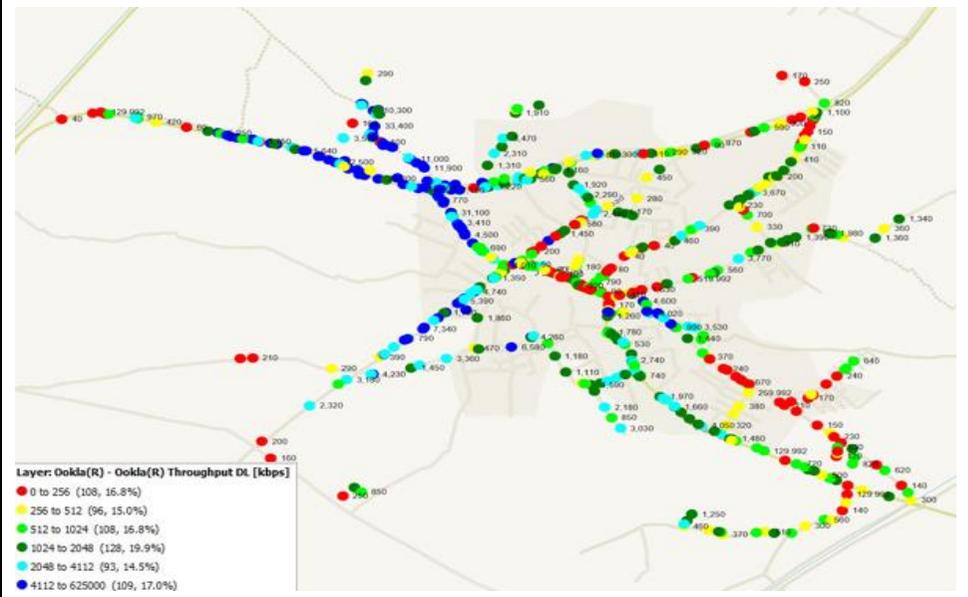


OOKLA SPEED TEST RESULTS

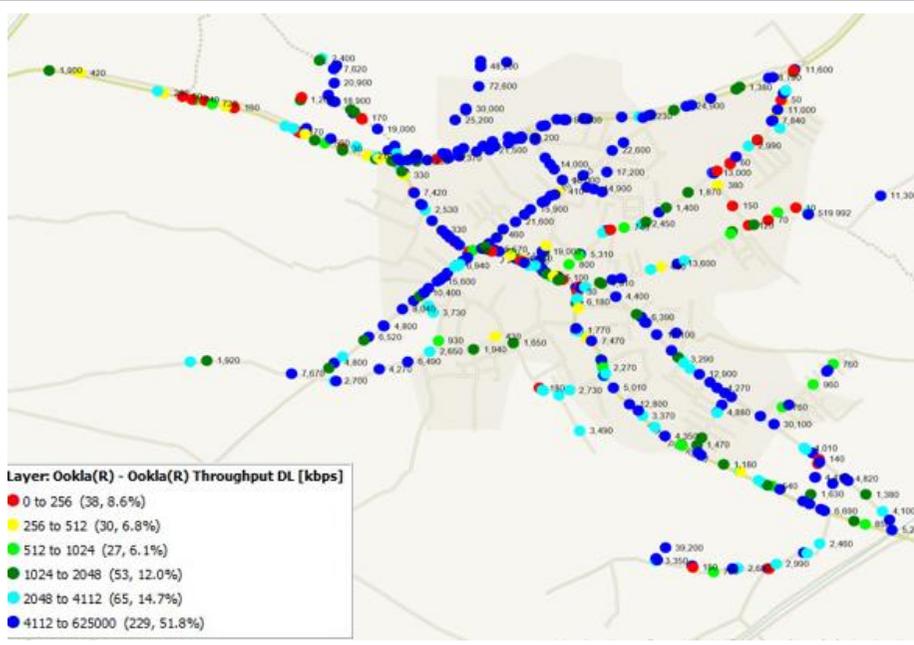
JAZZ DOWNLOAD THROUGHPUT – PHARPUR



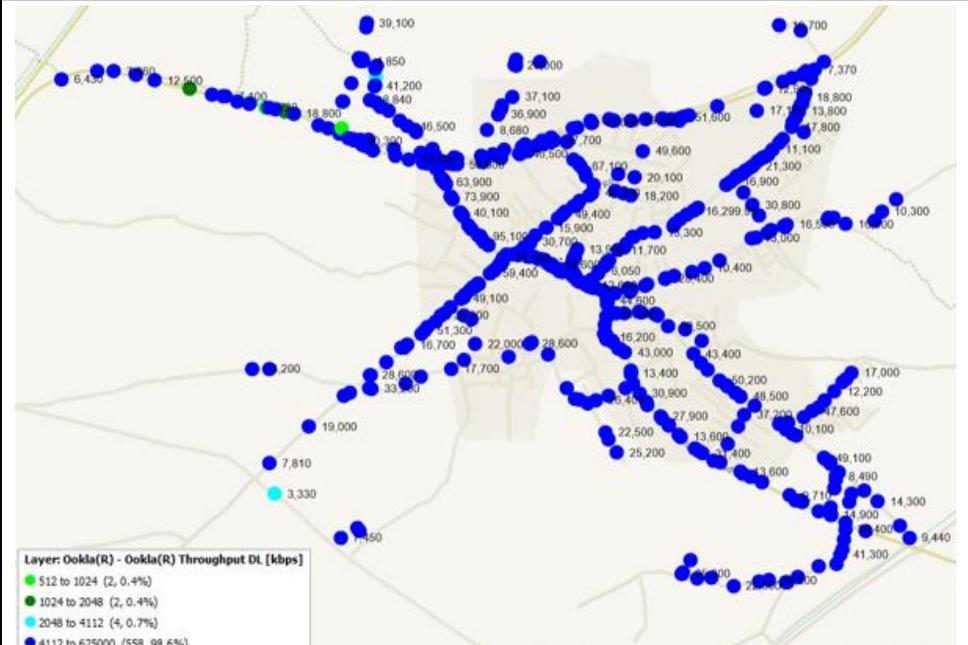
TELENOR DOWNLOAD THROUGHPUT – PHARPUR



UFONE DOWNLOAD THROUGHPUT – PHARPUR

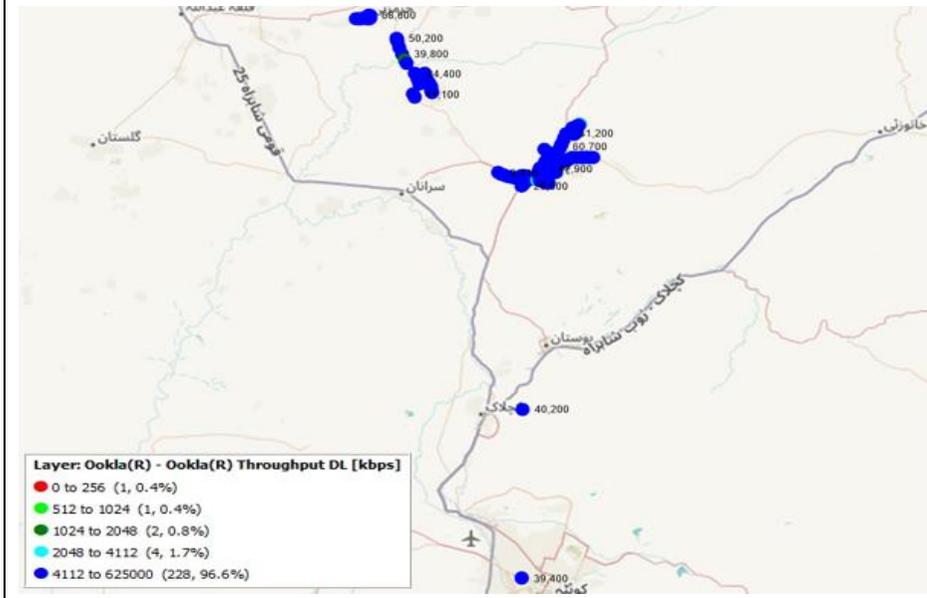


ZONG DOWNLOAD THROUGHPUT – PHARPUR

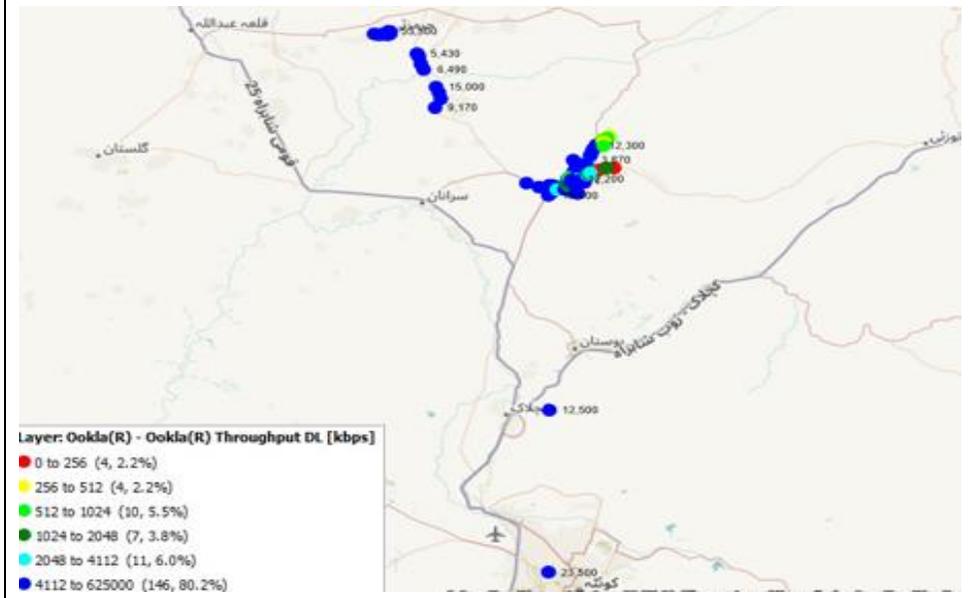


OOKLA SPEED TEST RESULTS

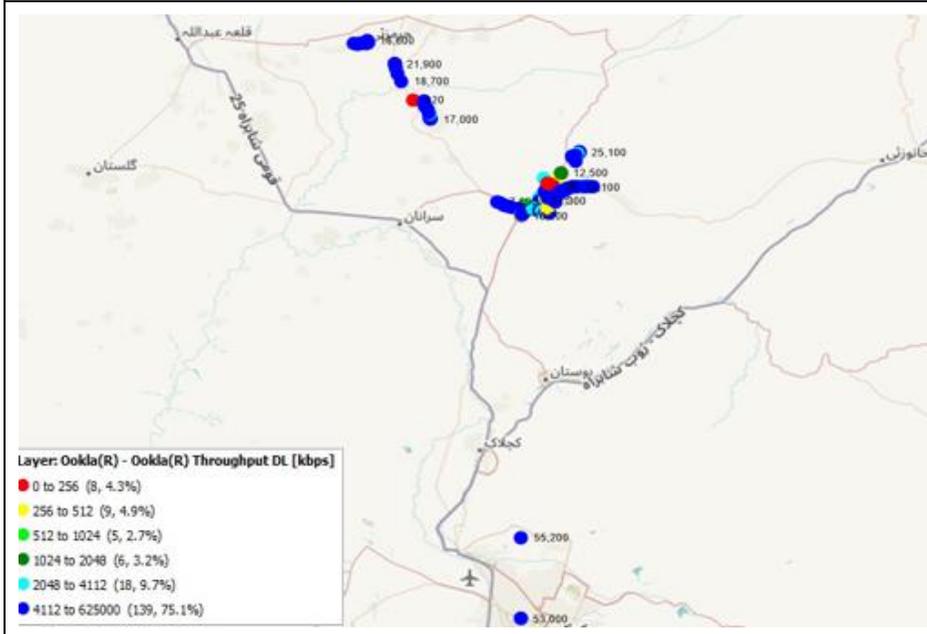
JAZZ DOWNLOAD THROUGHPUT – PISHIN



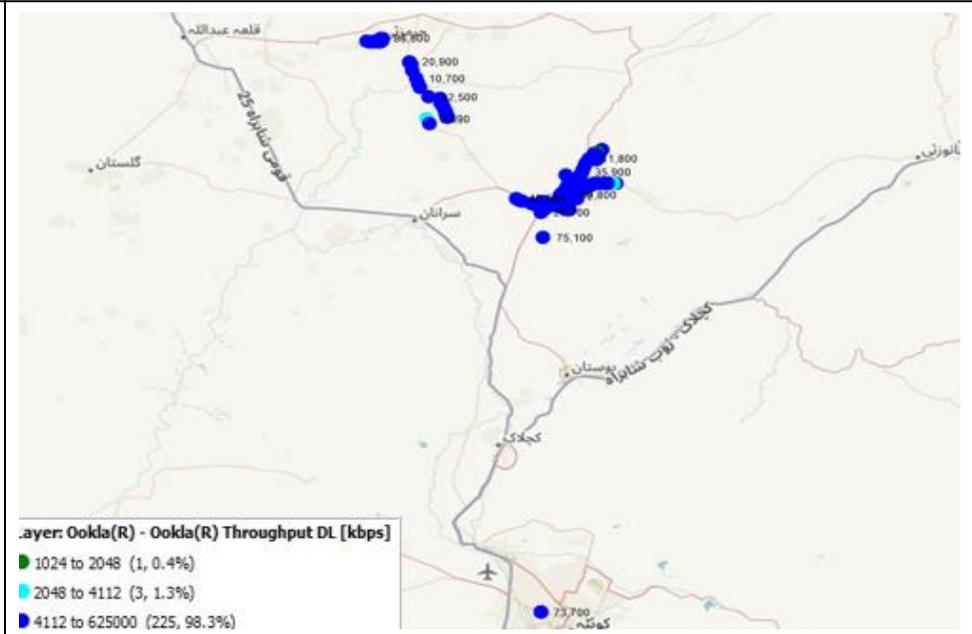
TELENOR DOWNLOAD THROUGHPUT – PISHIN



UFONE DOWNLOAD THROUGHPUT – PISHIN

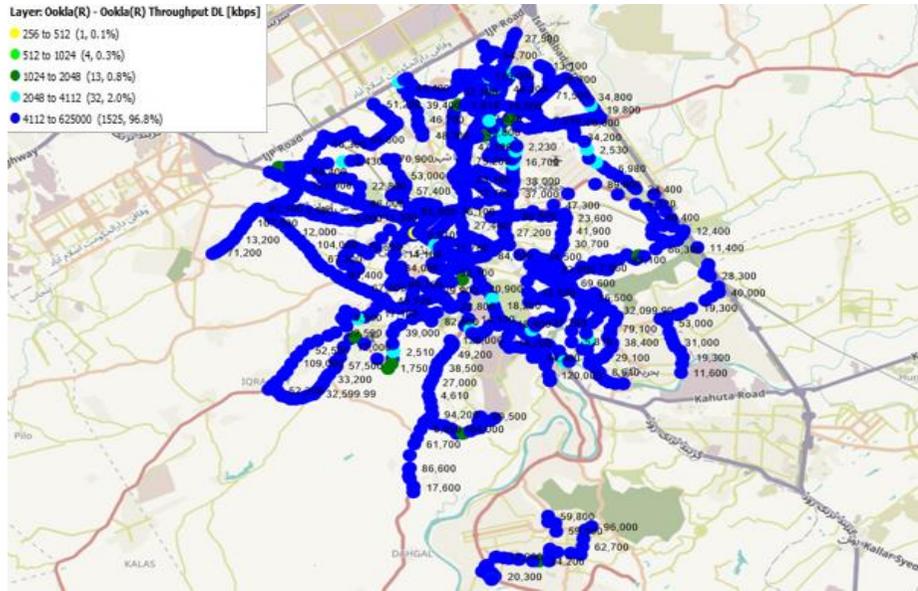


ZONG DOWNLOAD THROUGHPUT – PISHIN

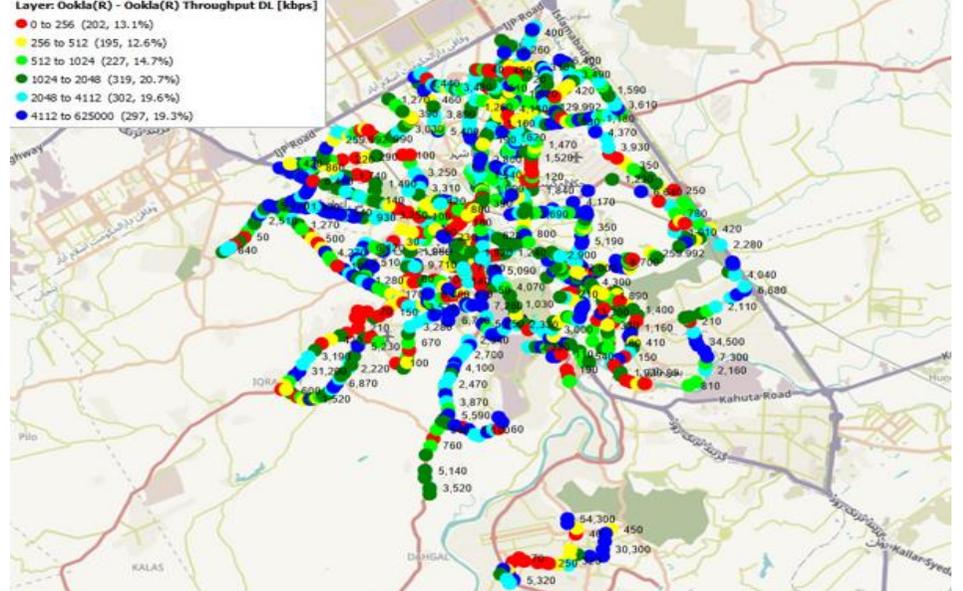


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JAZZ DOWNLOAD THROUGHPUT - RAWALPIDNI



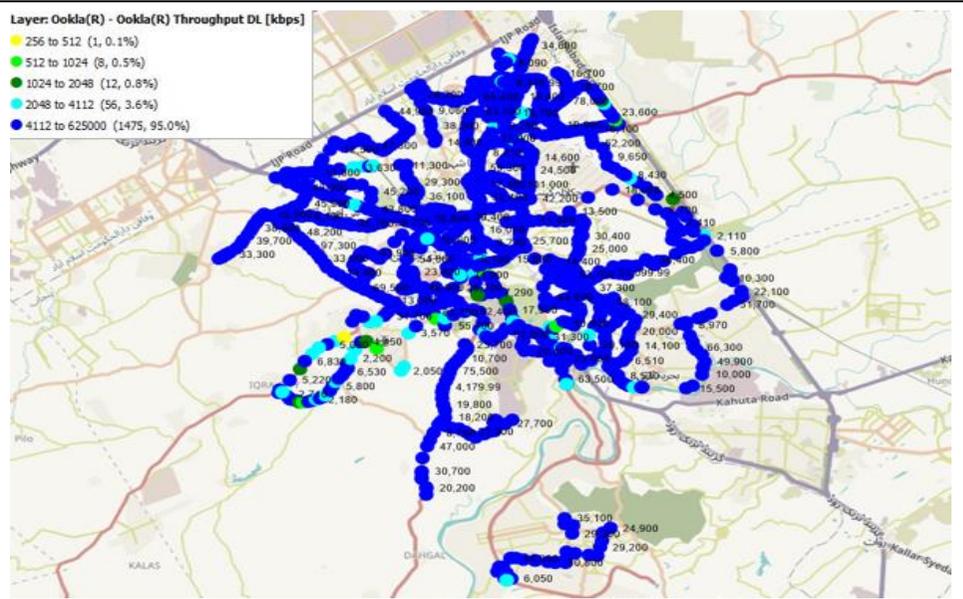
TELENOR DOWNLOAD THROUGHPUT - RAWALPIDNI



UFONE DOWNLOAD THROUGHPUT - RAWALPIDNI

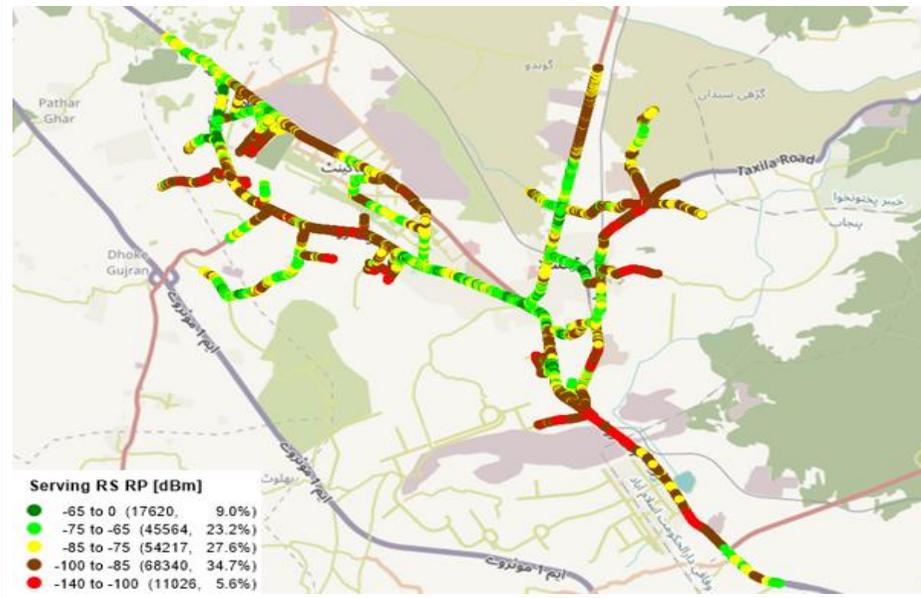


ZONG DOWNLOAD THROUGHPUT - RAWALPIDNI

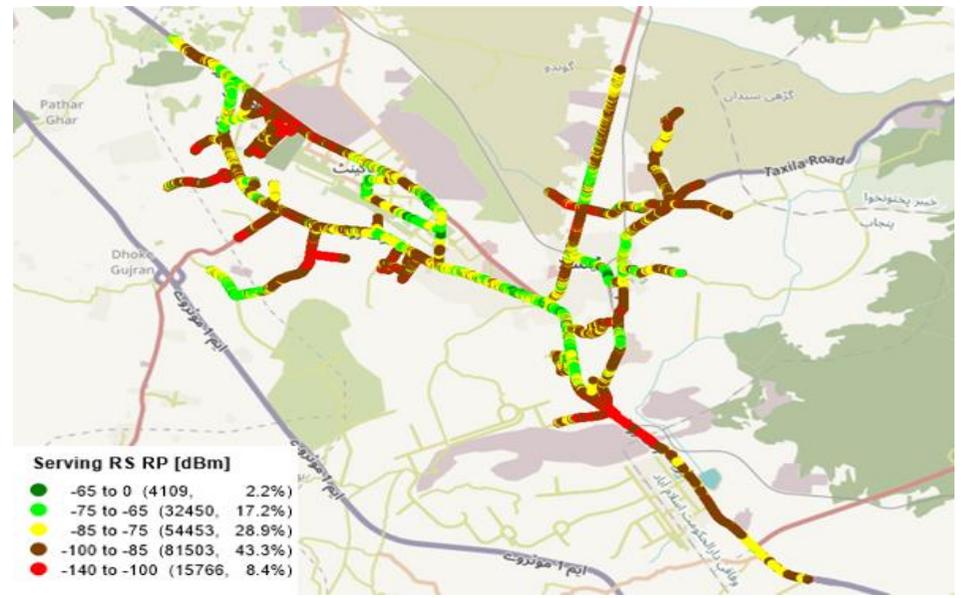


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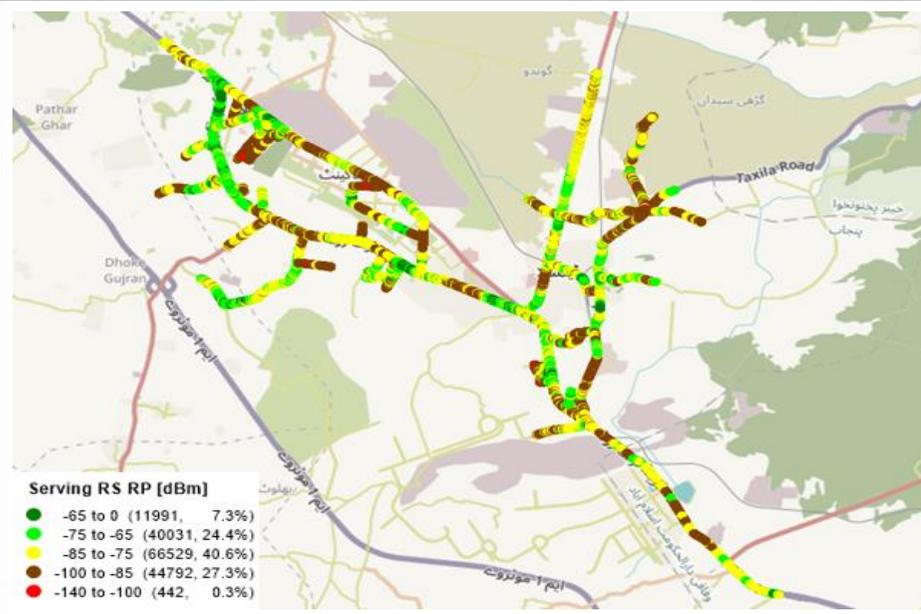
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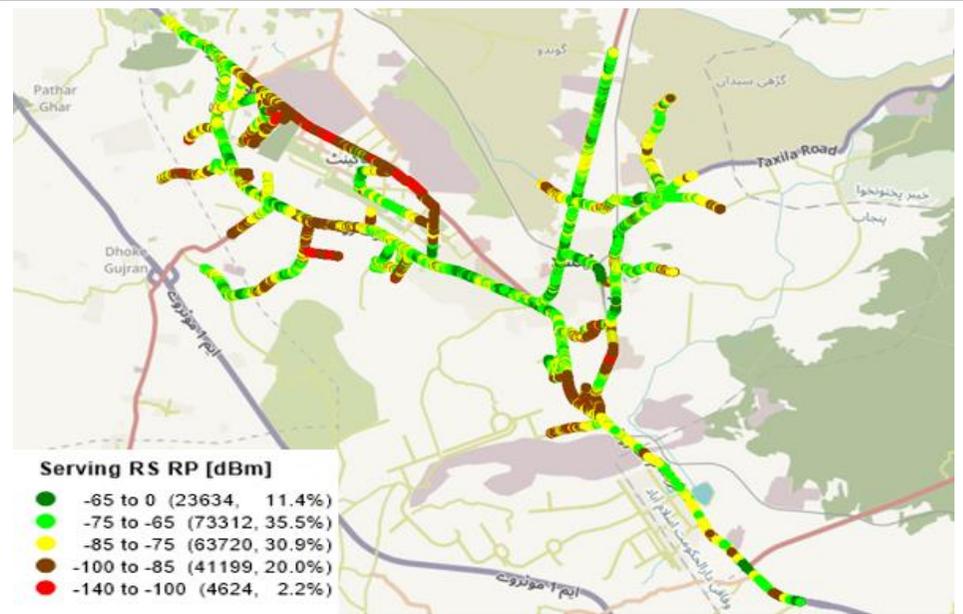
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UFONE DOWNLOAD THROUGHPUT - WAH-TAXILA

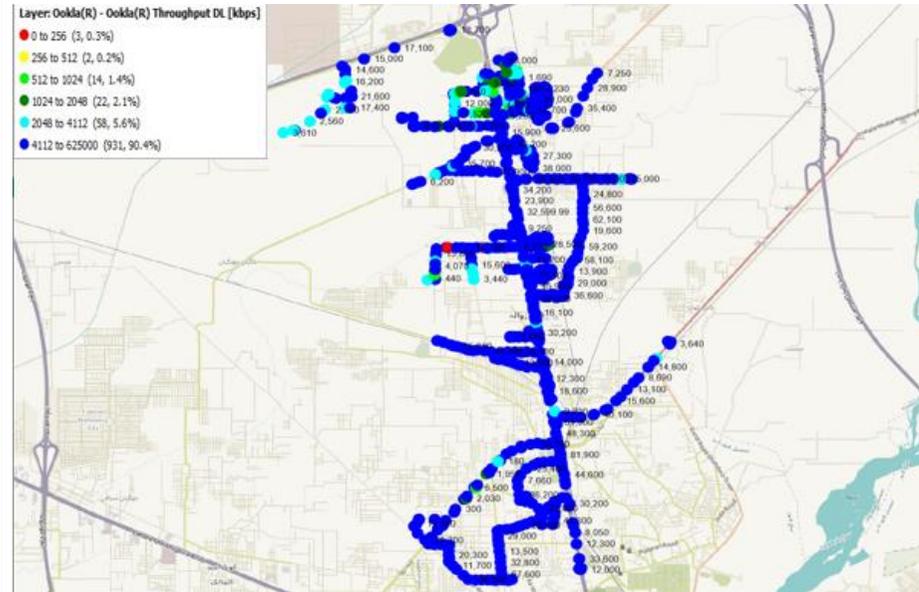


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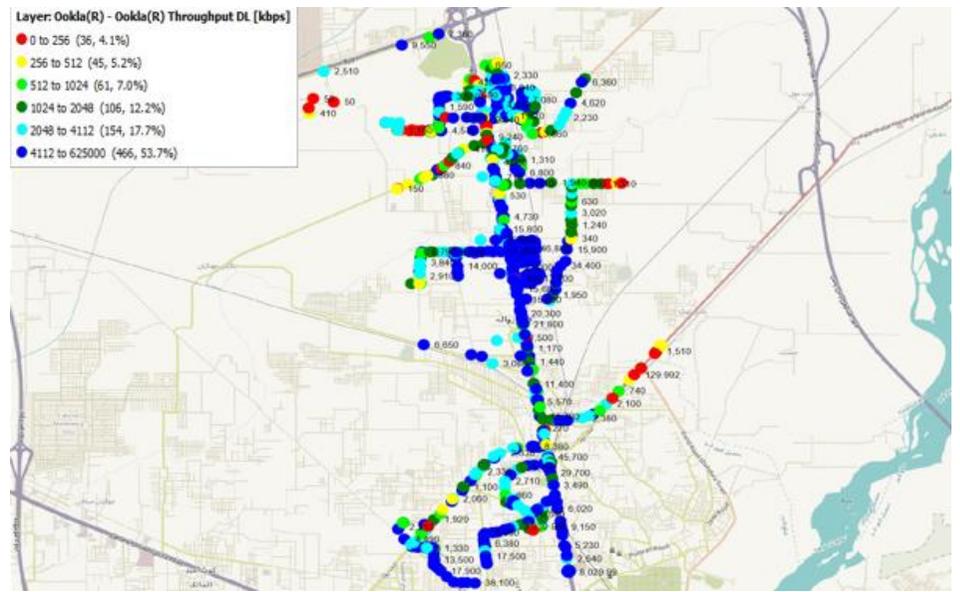


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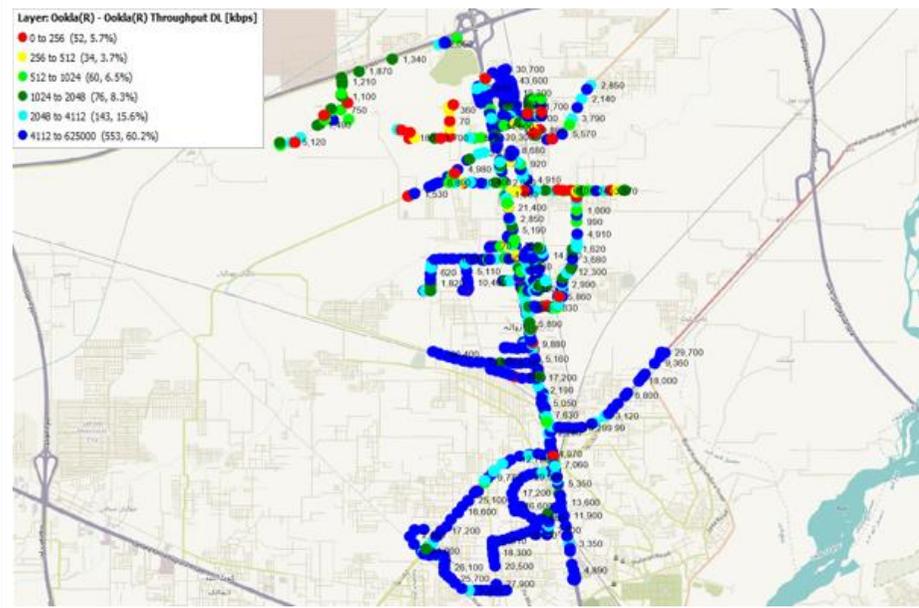
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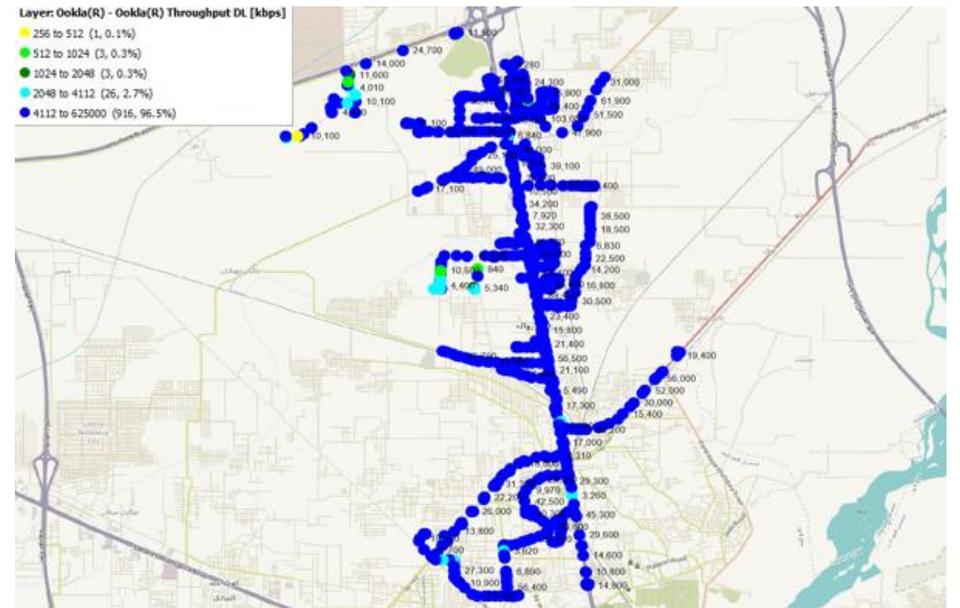
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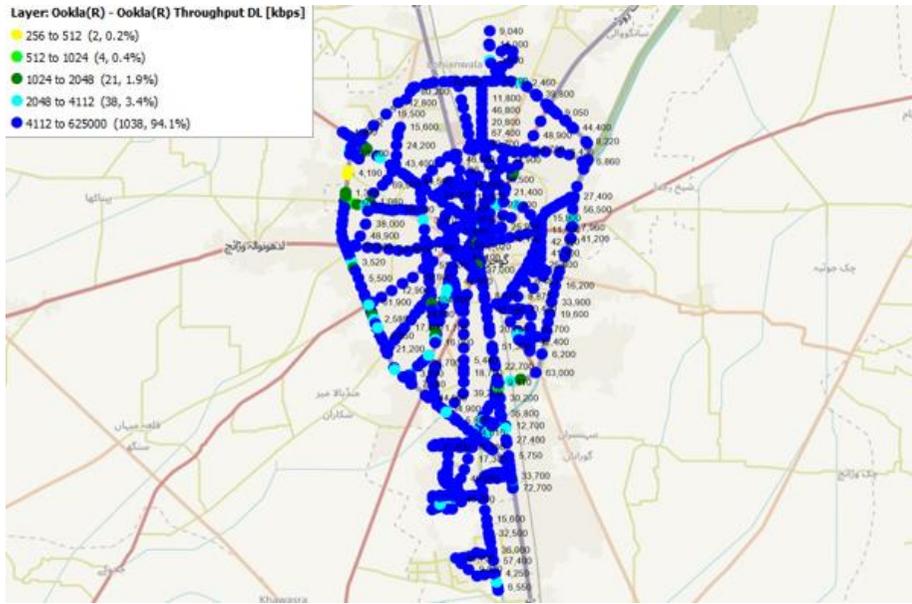


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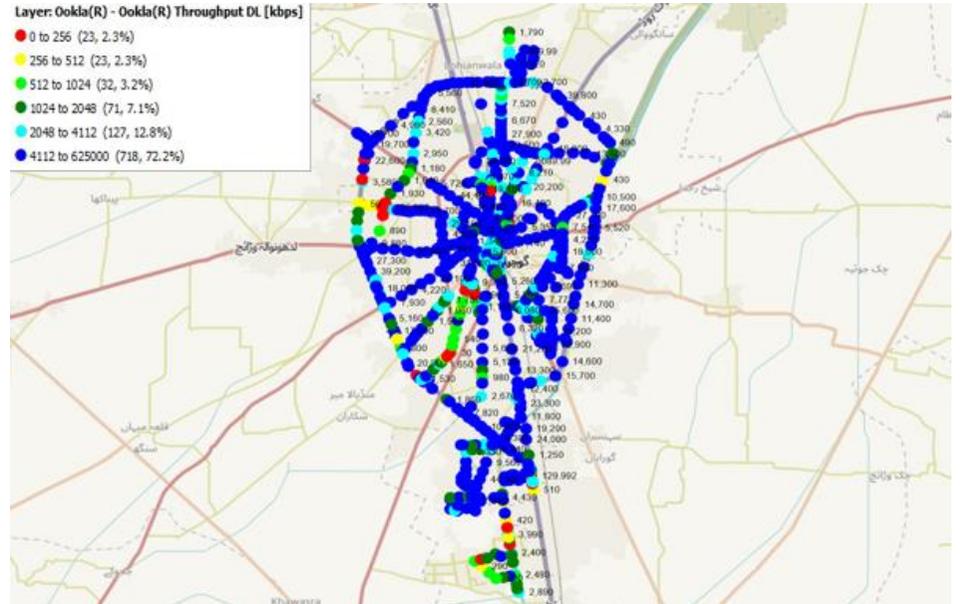


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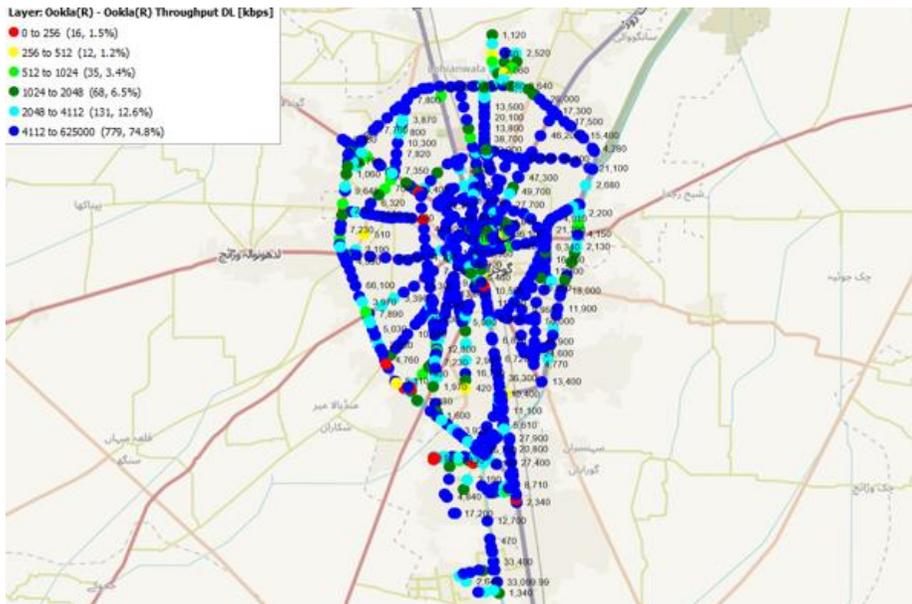
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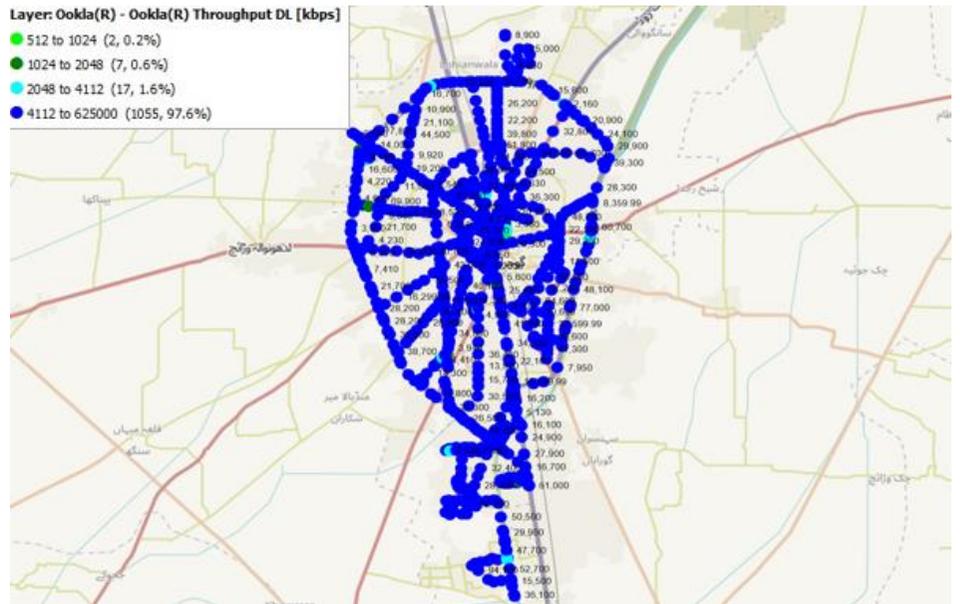
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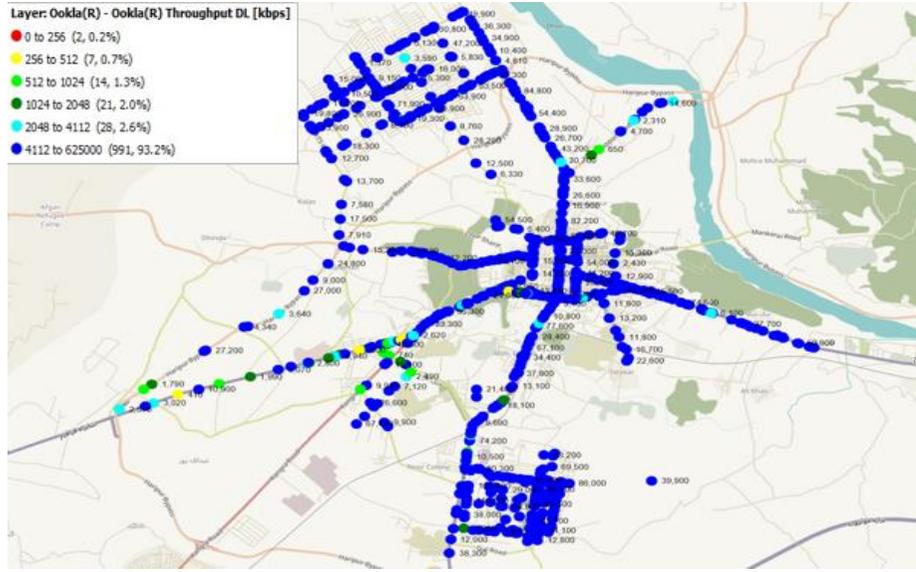


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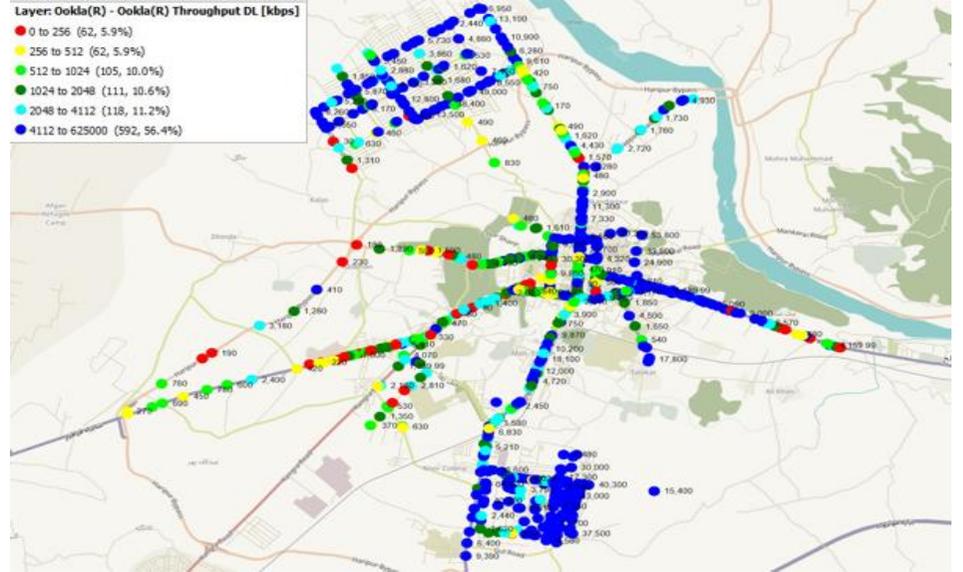


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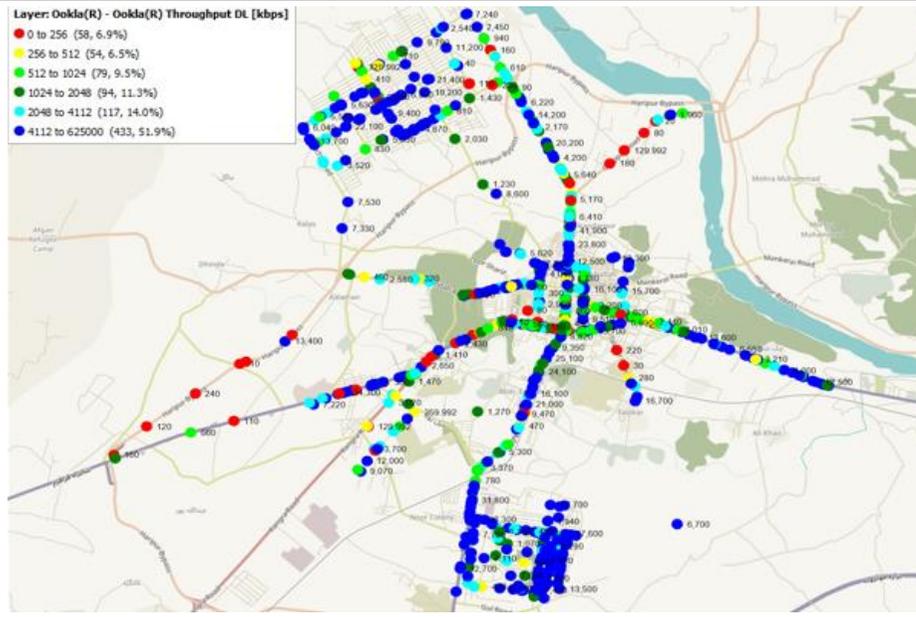
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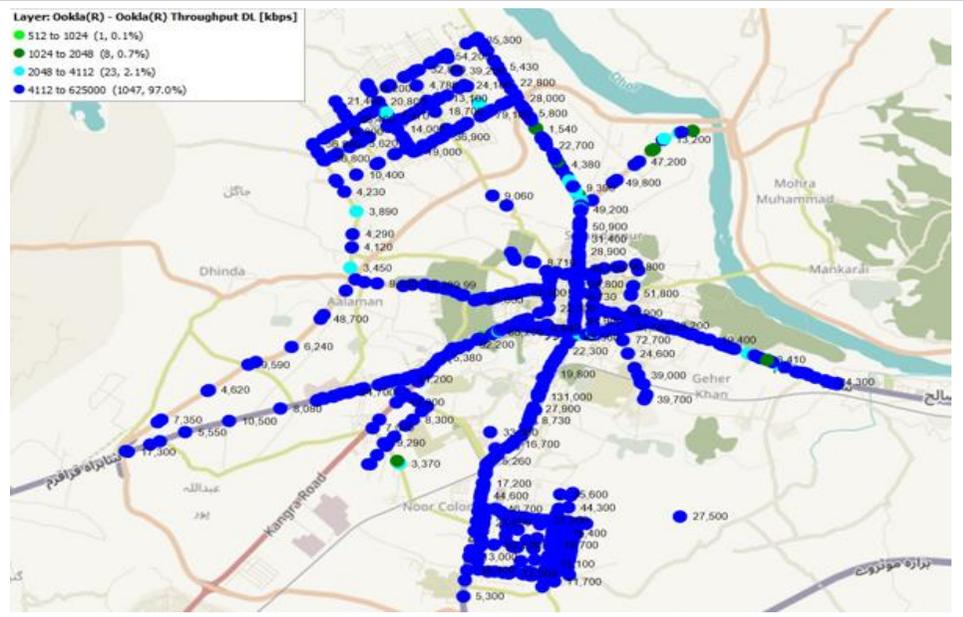
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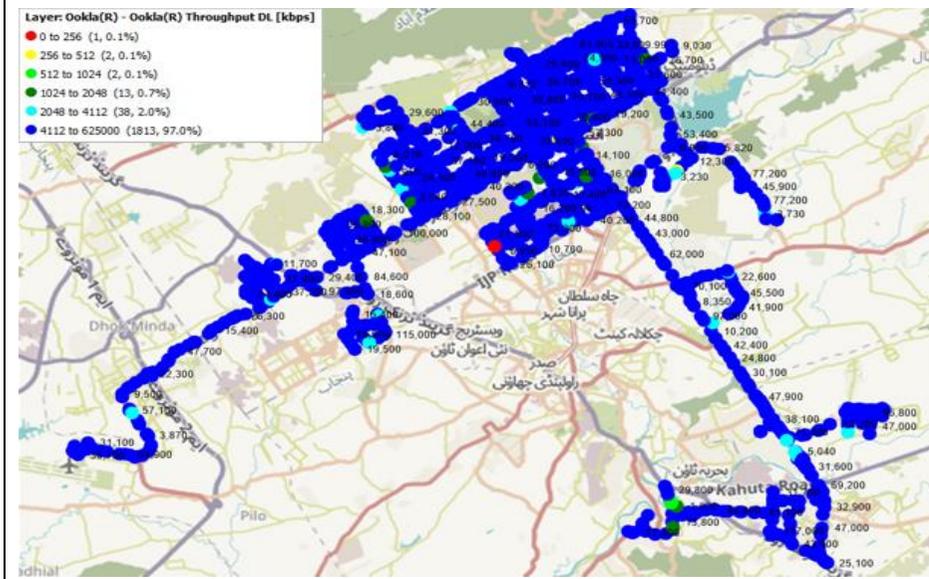


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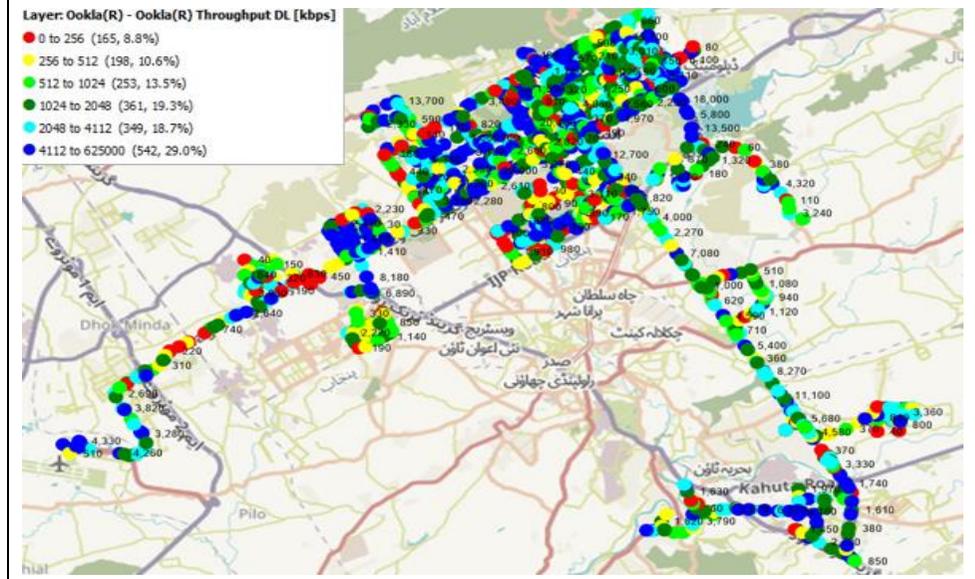


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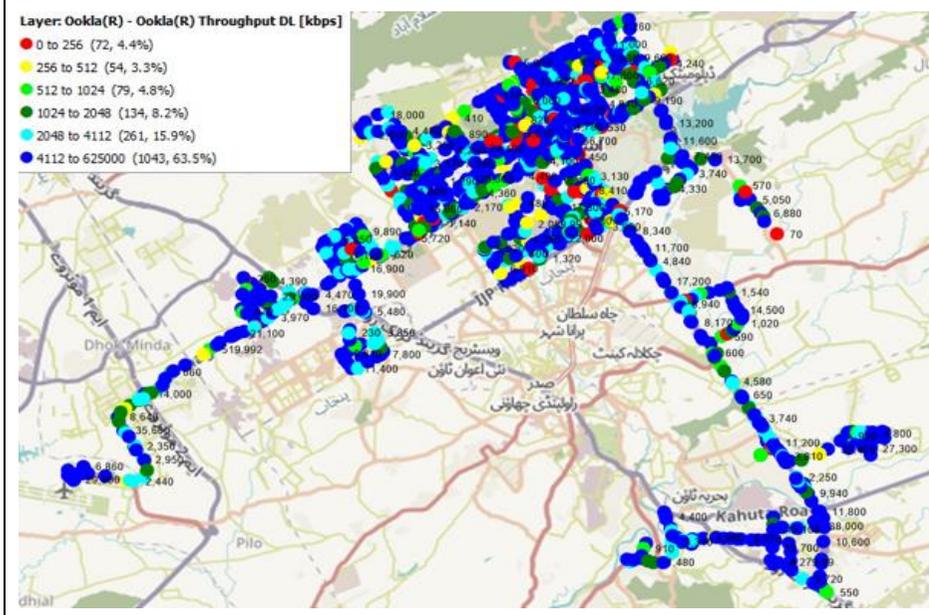
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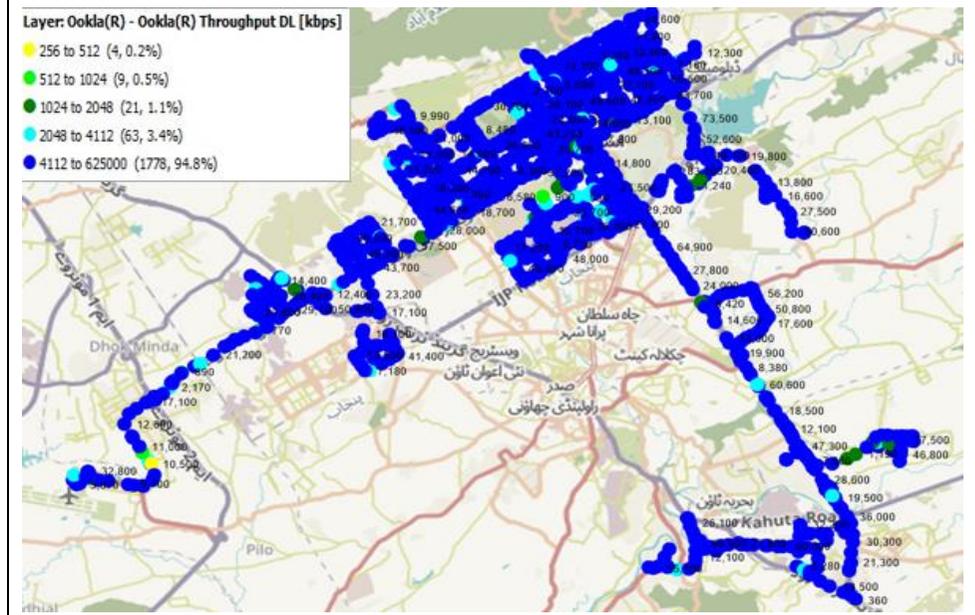
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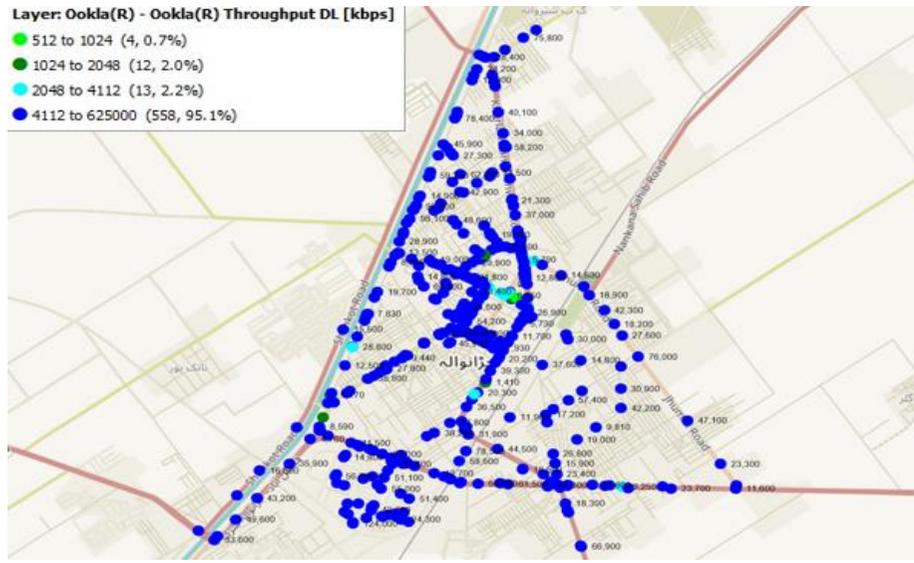


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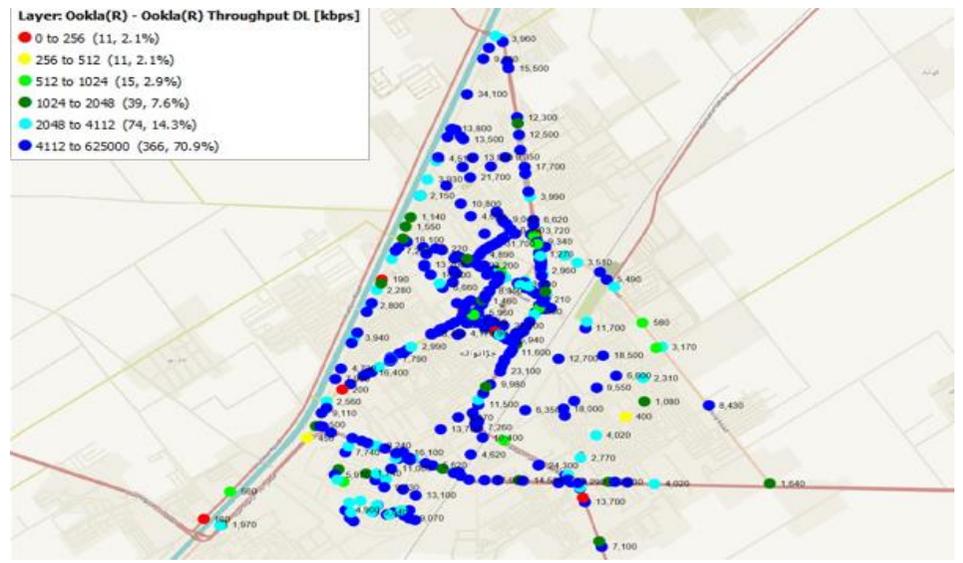


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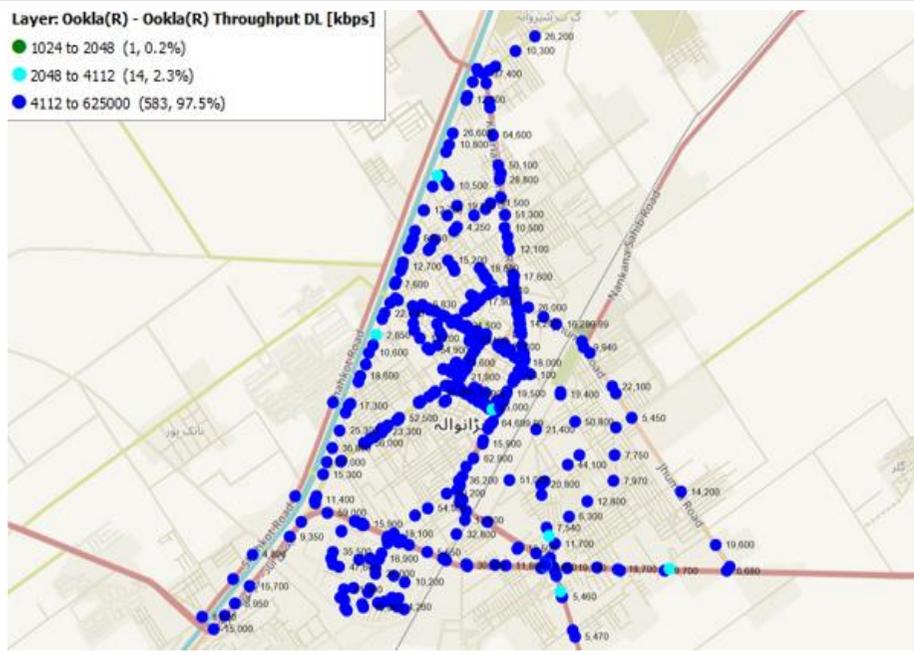
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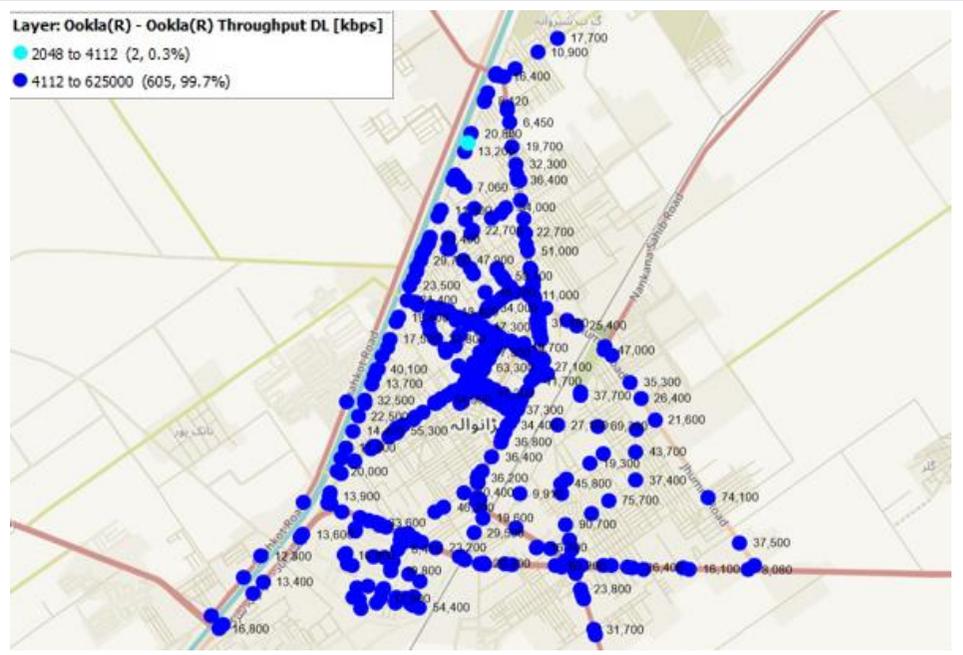
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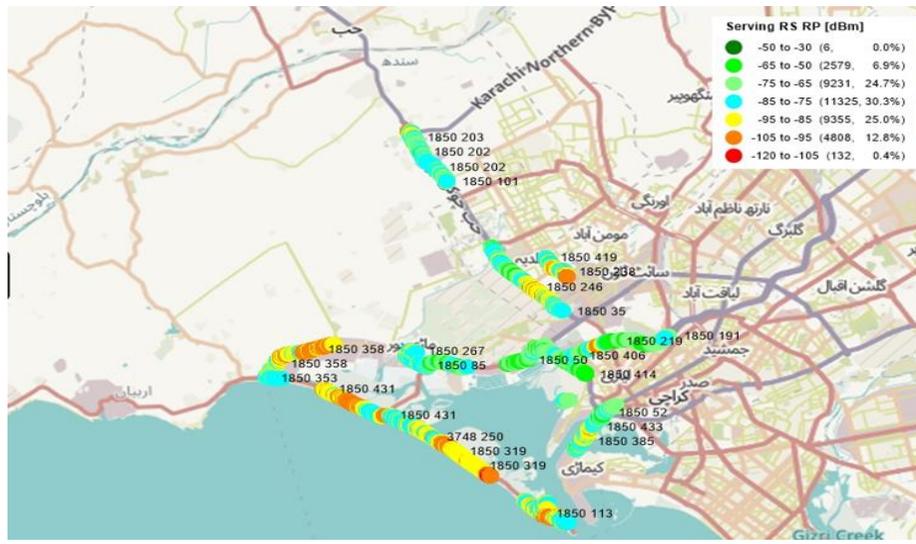


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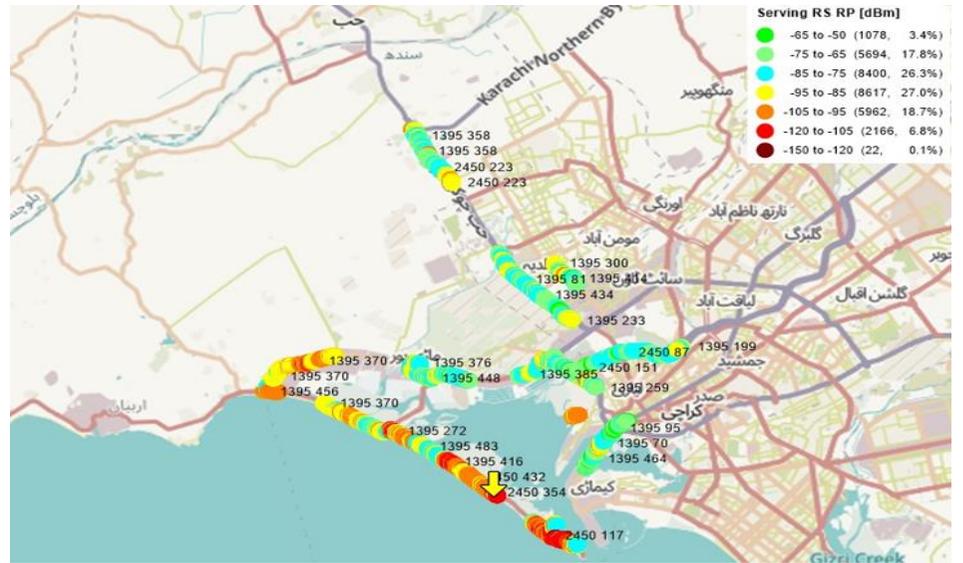


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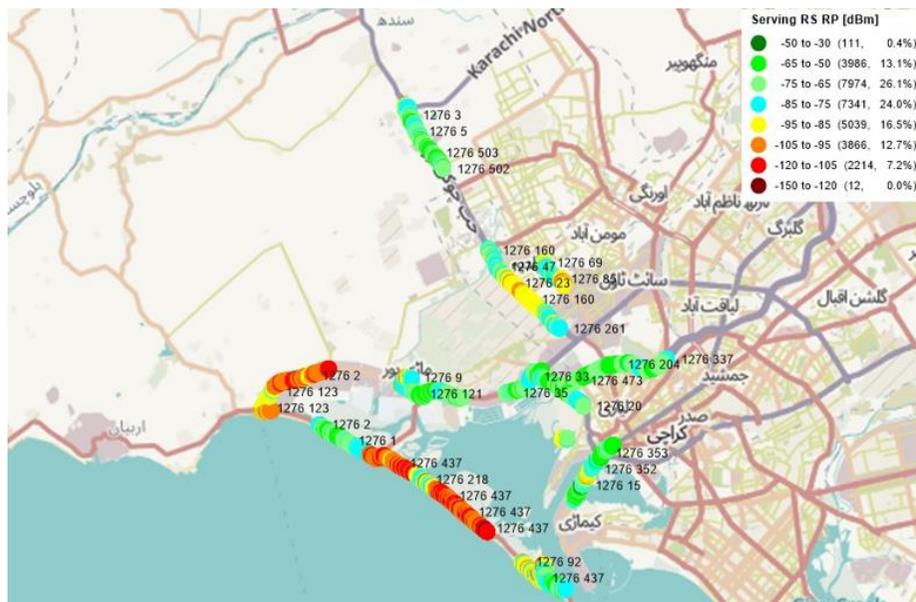
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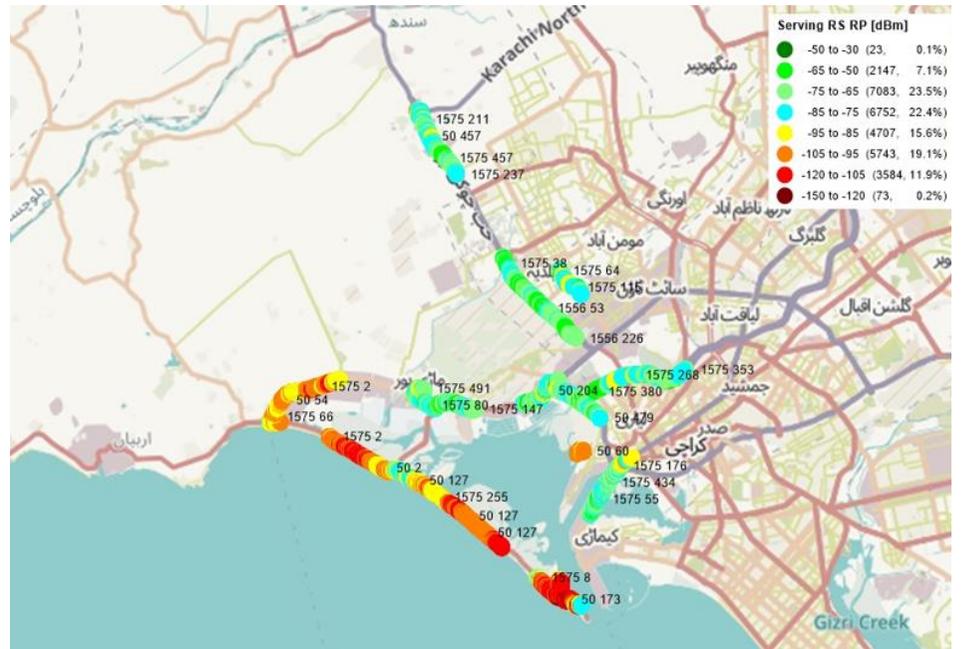
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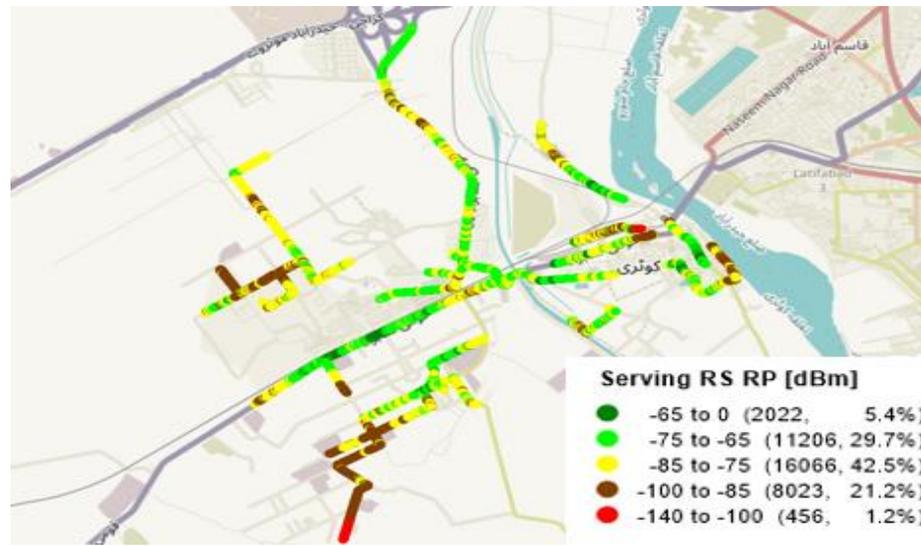


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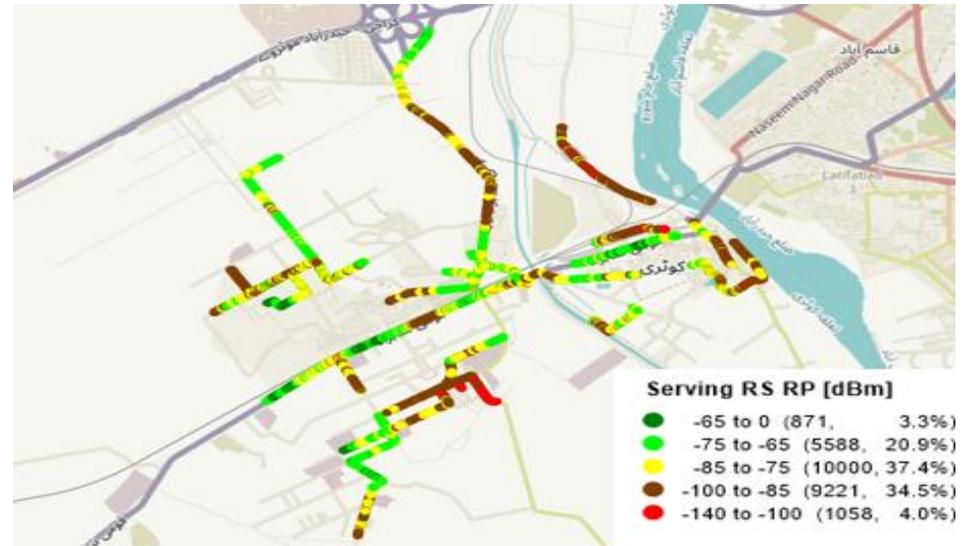


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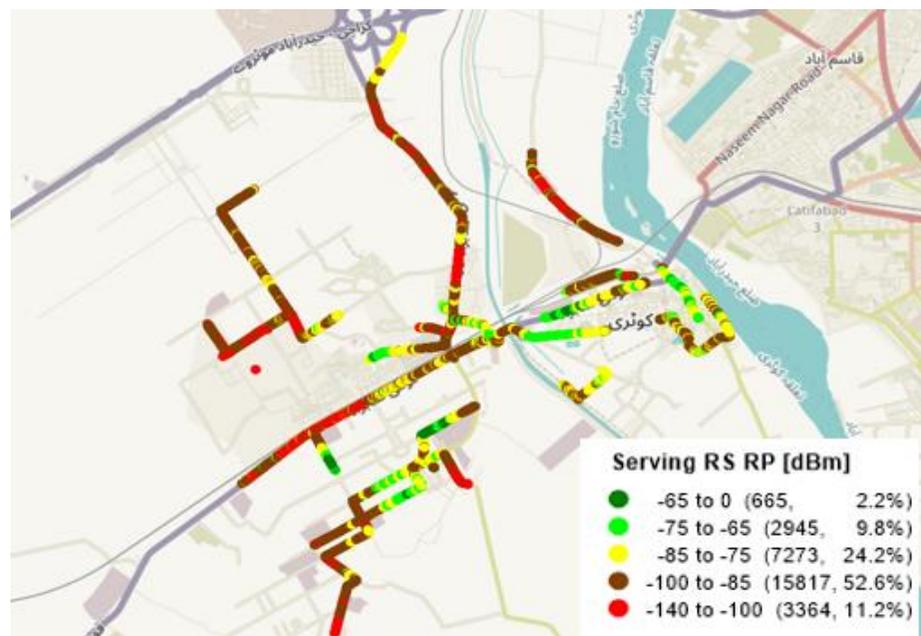
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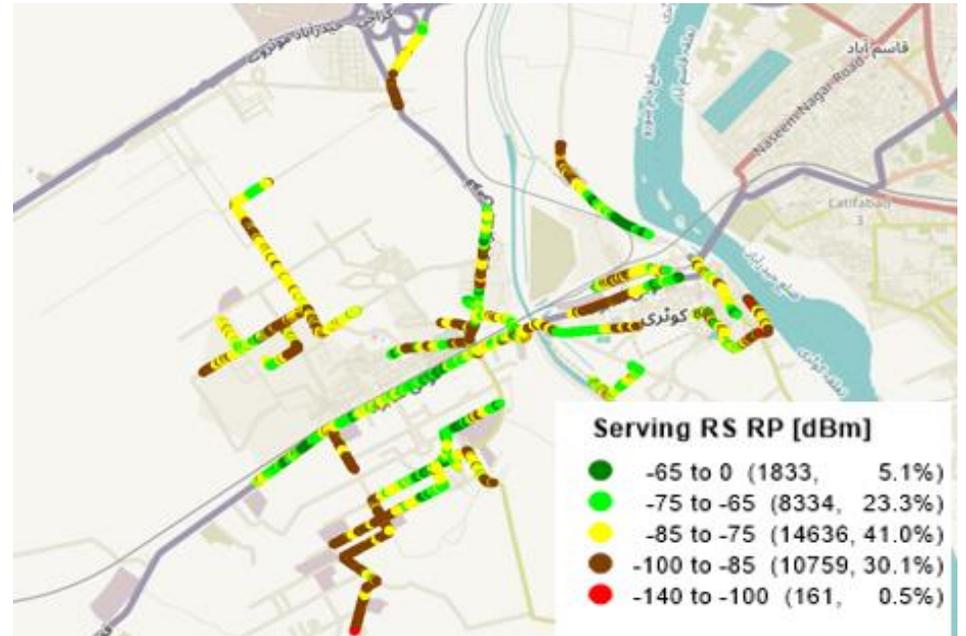
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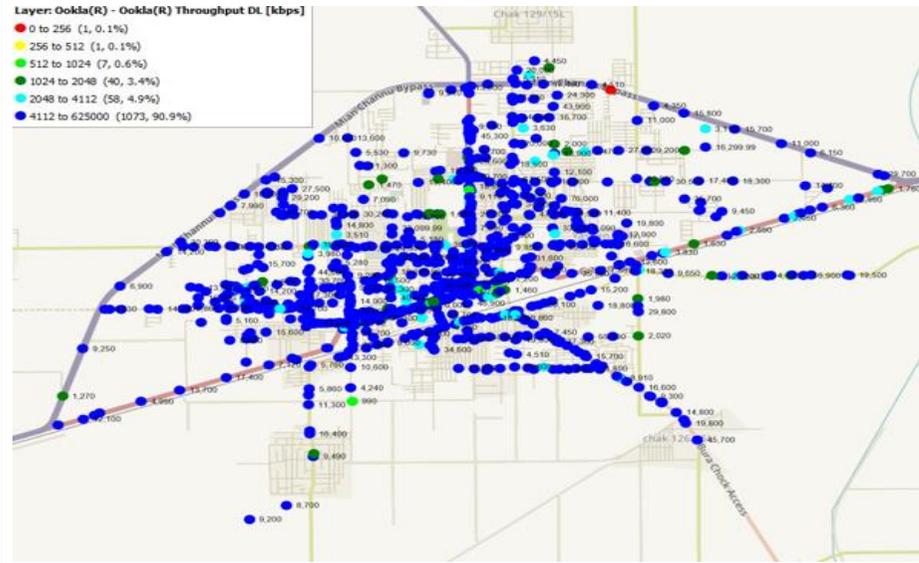


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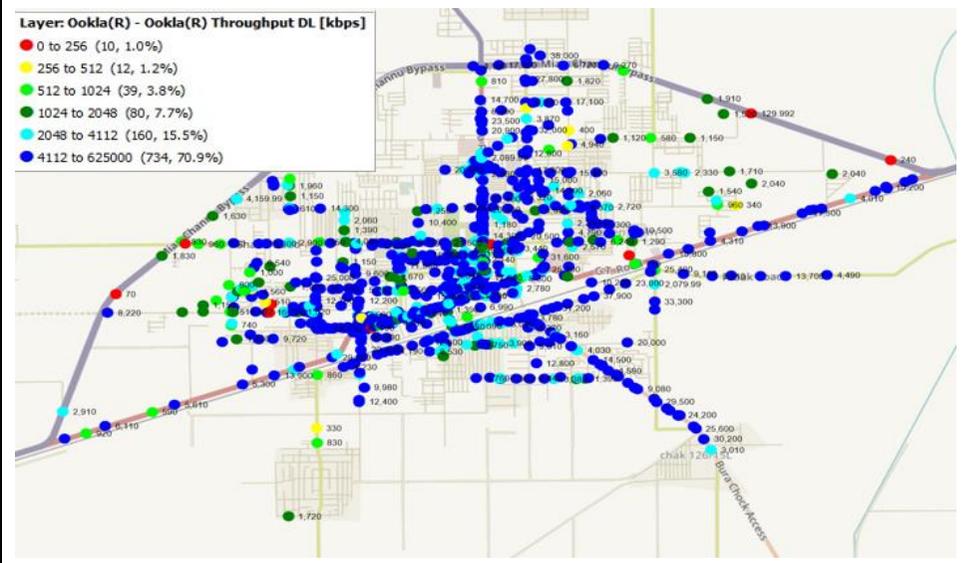


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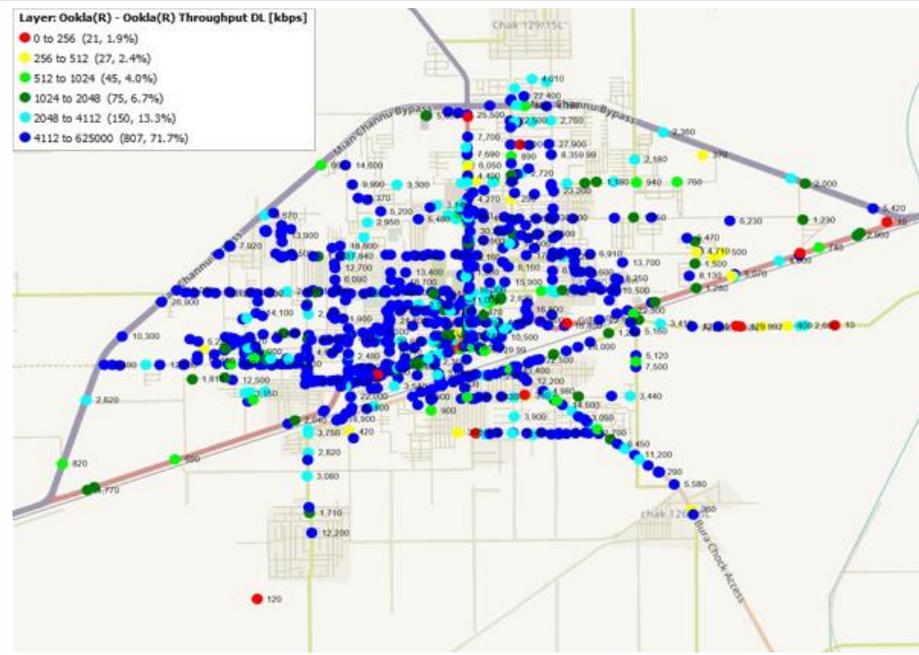
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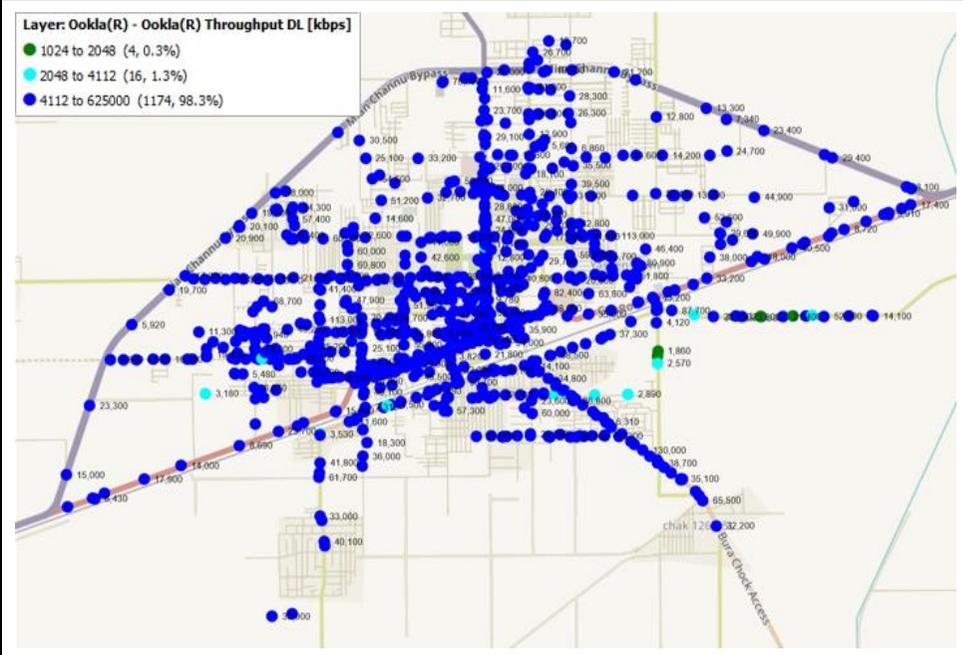
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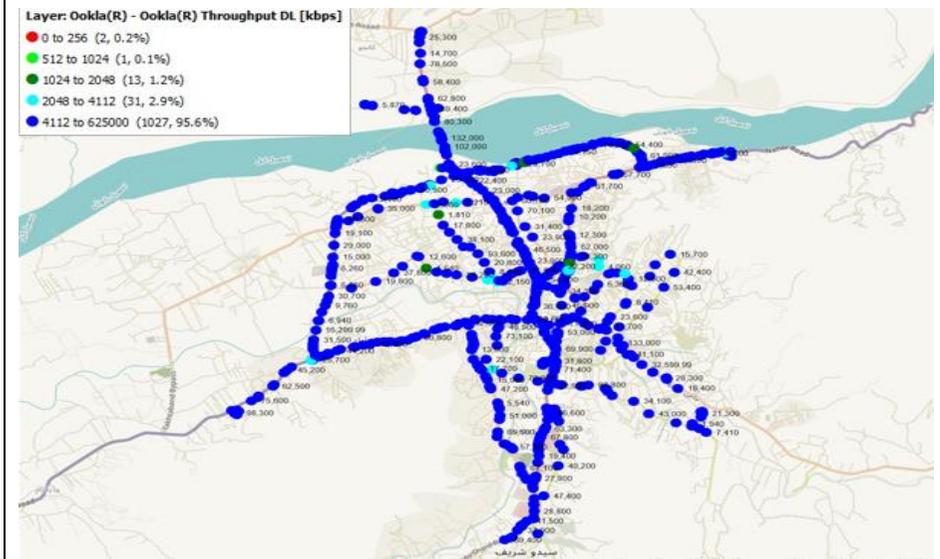


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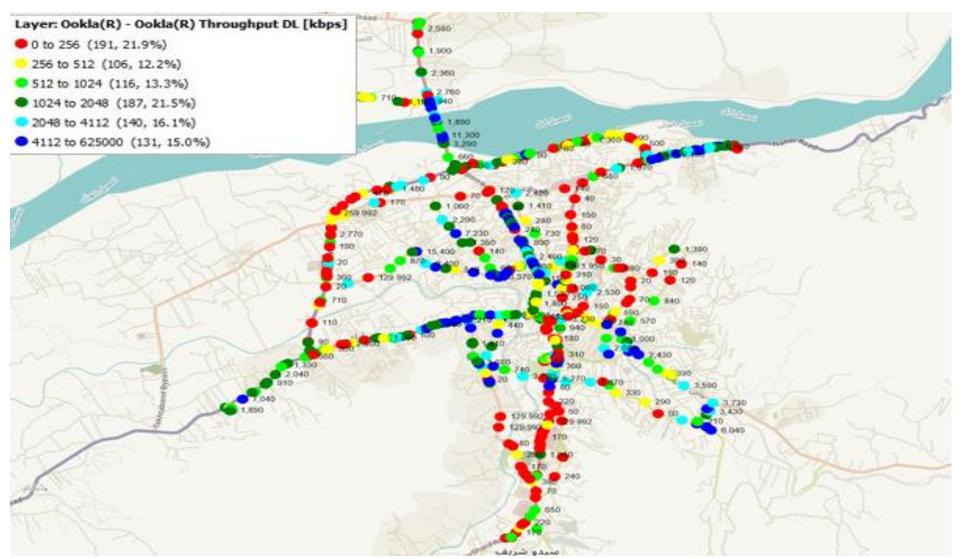


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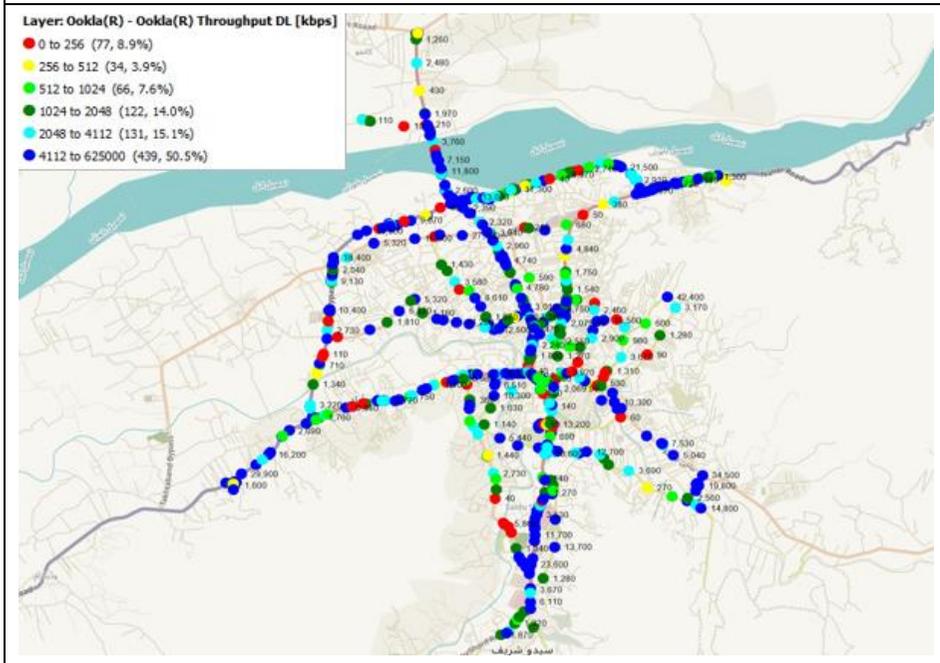
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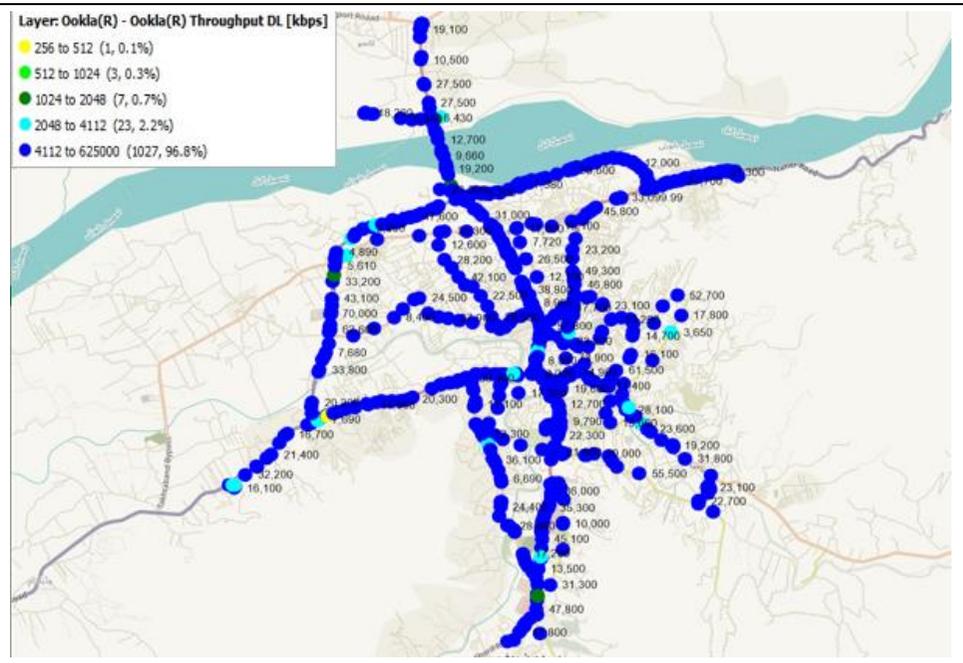
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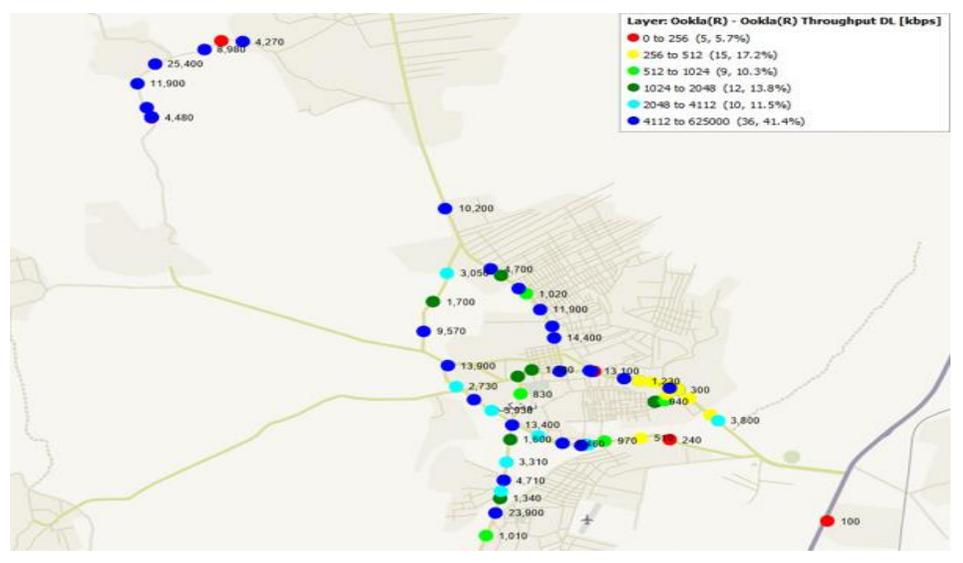


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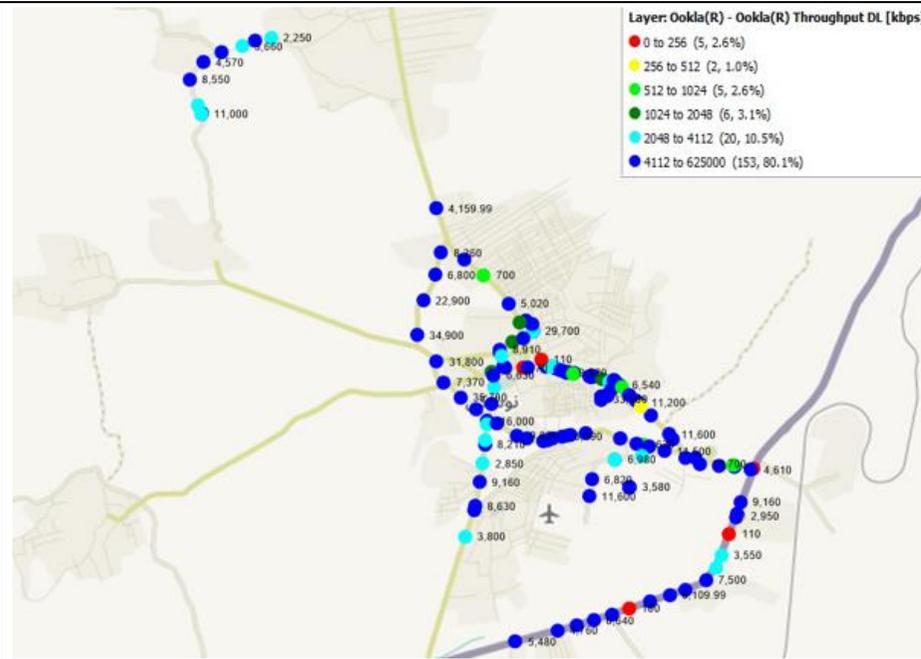
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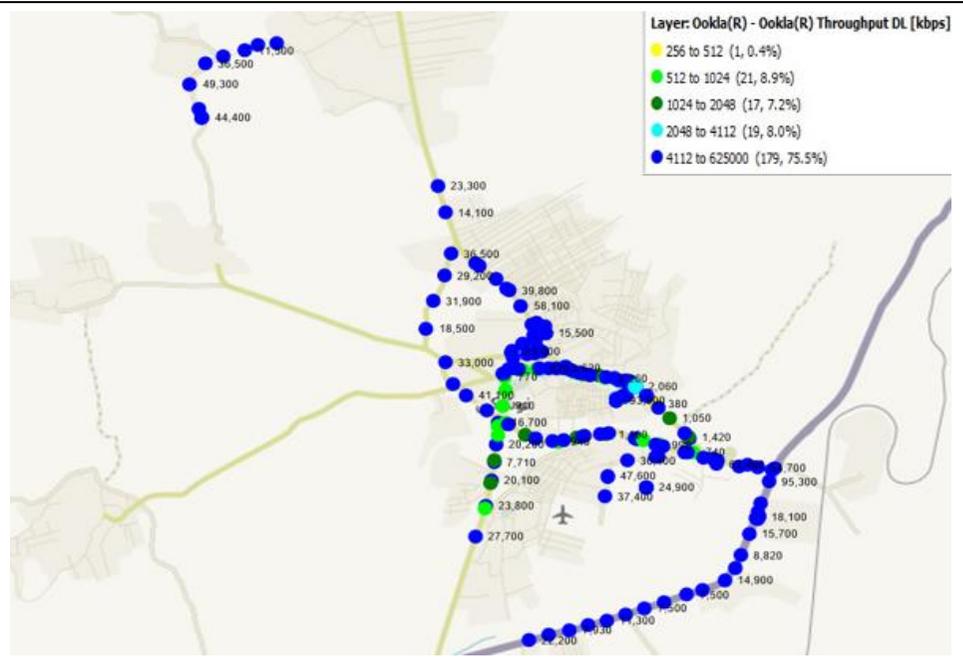
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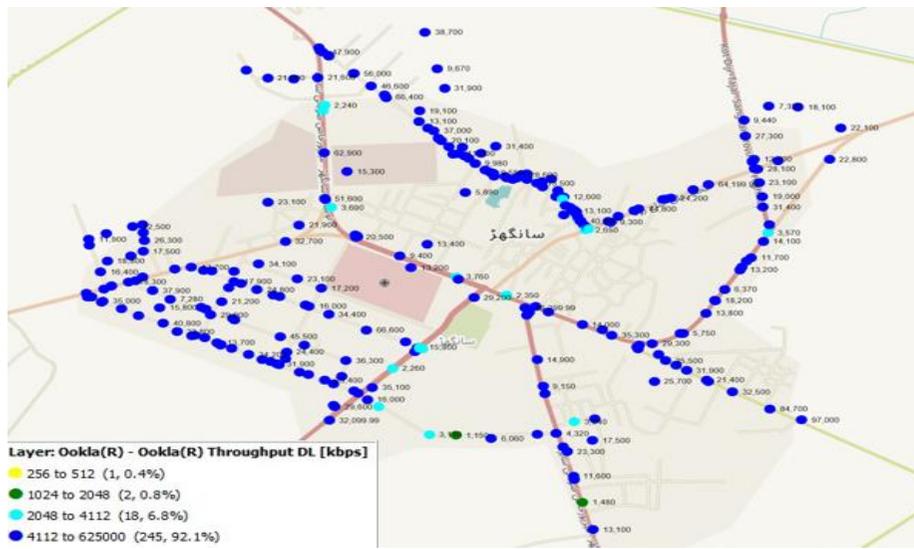


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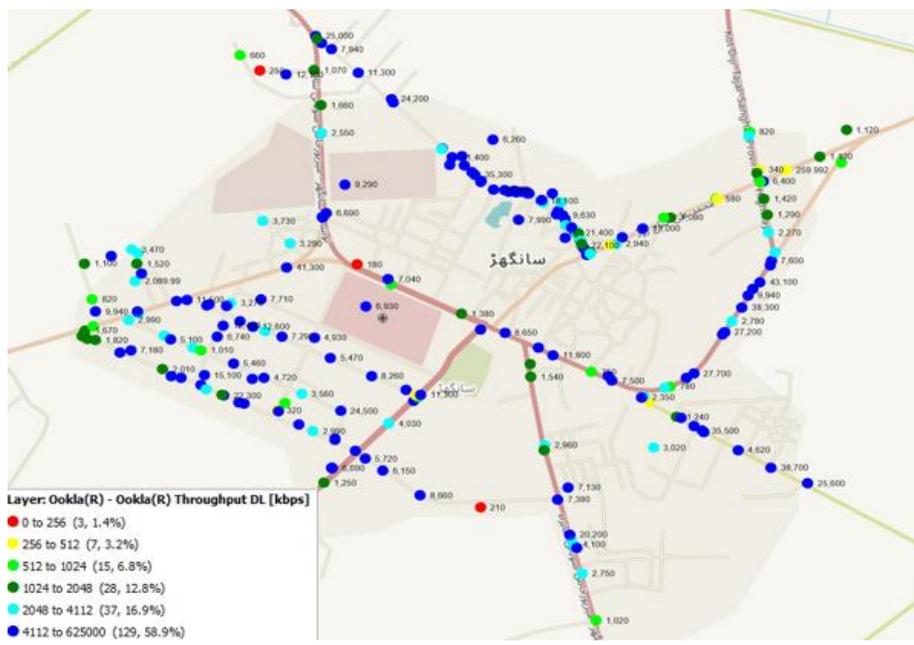
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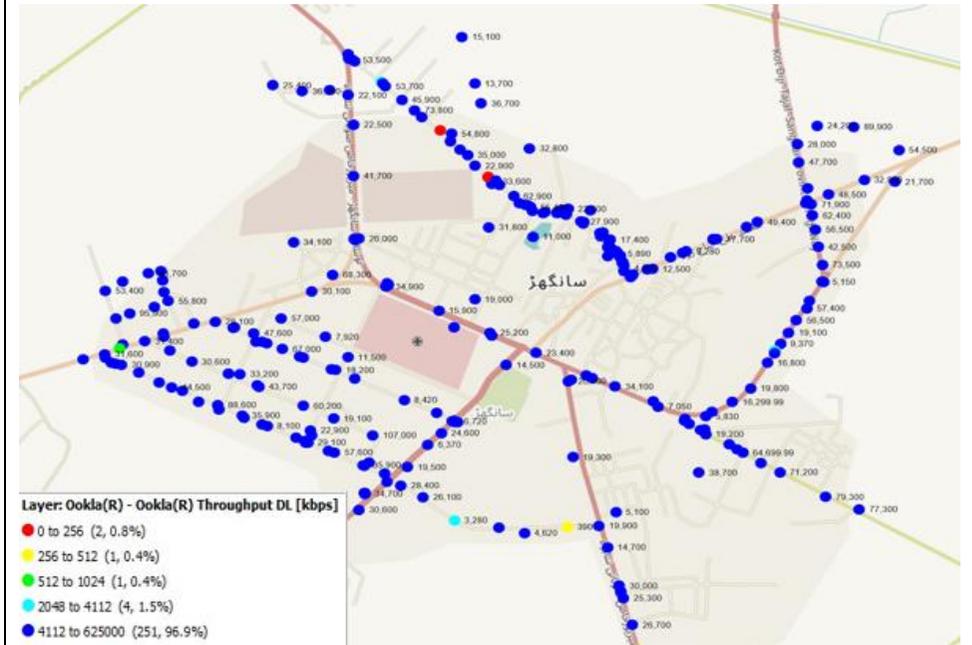
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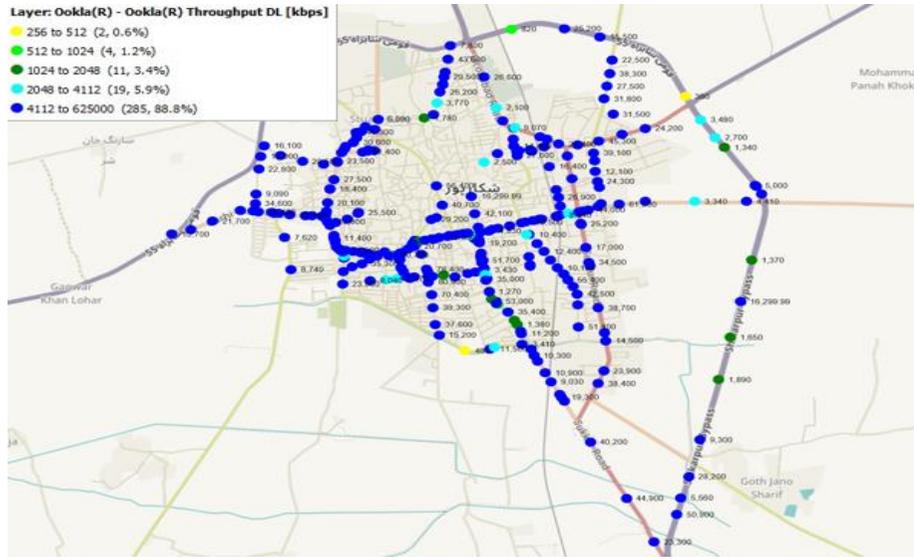


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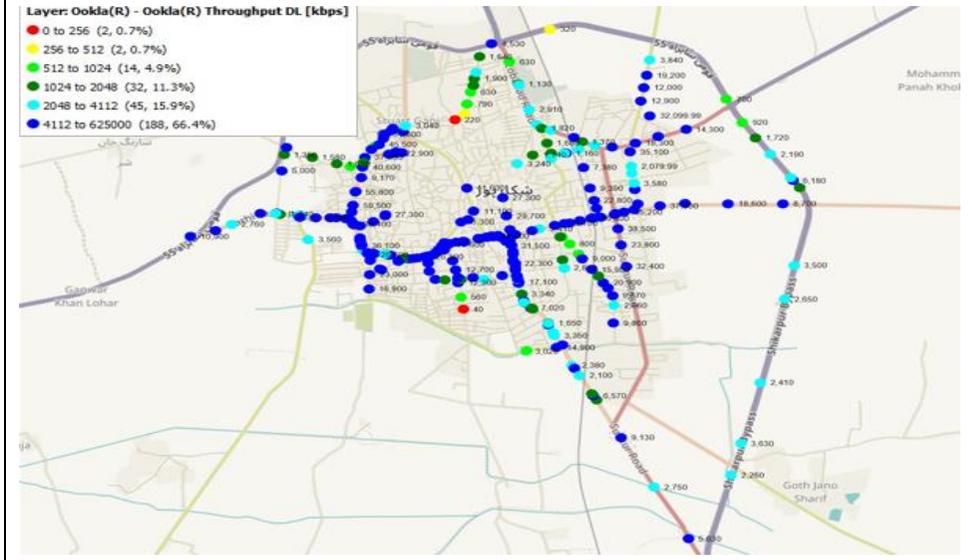


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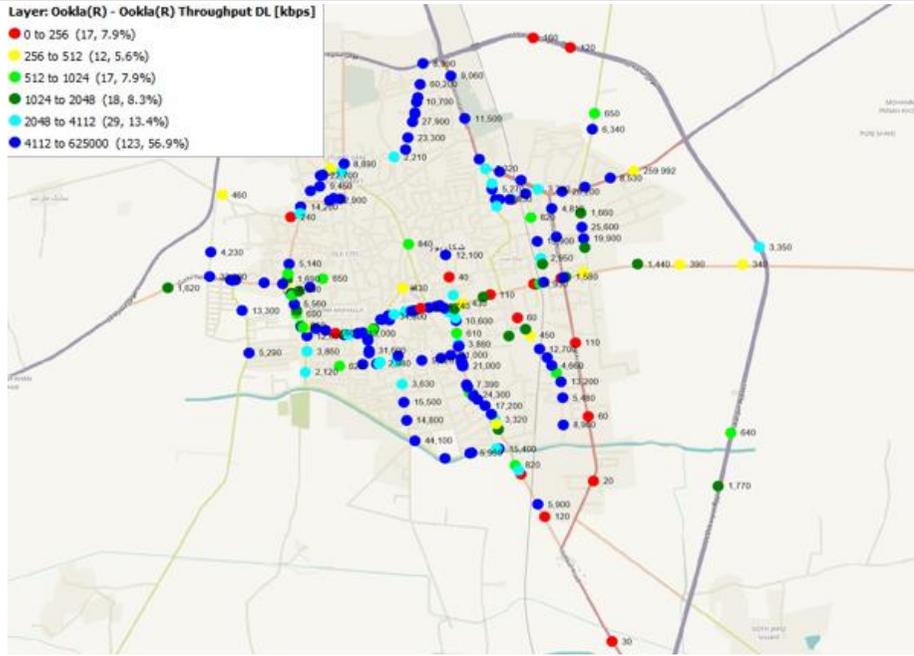
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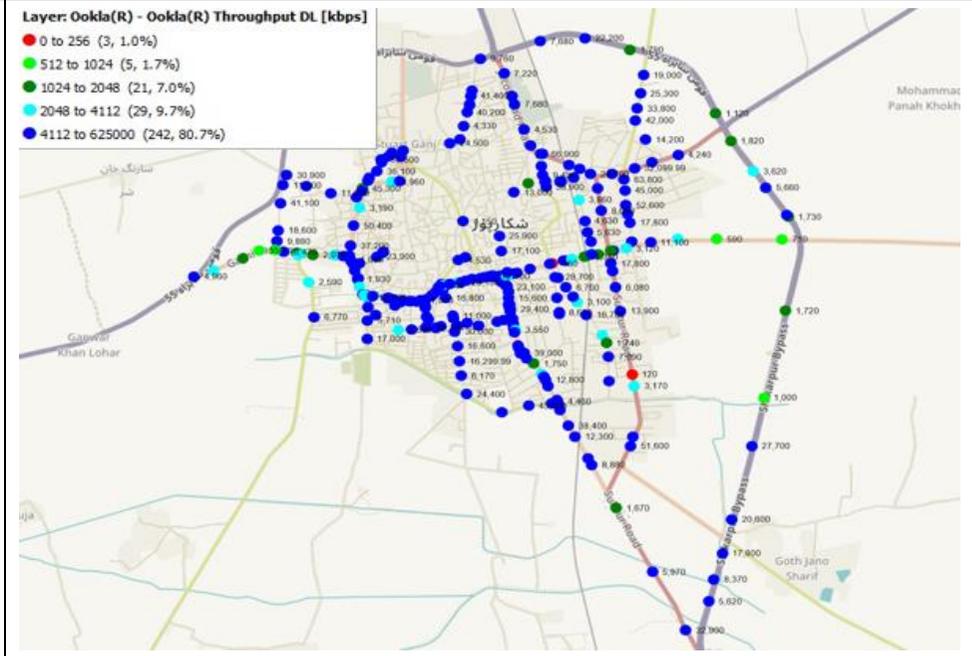
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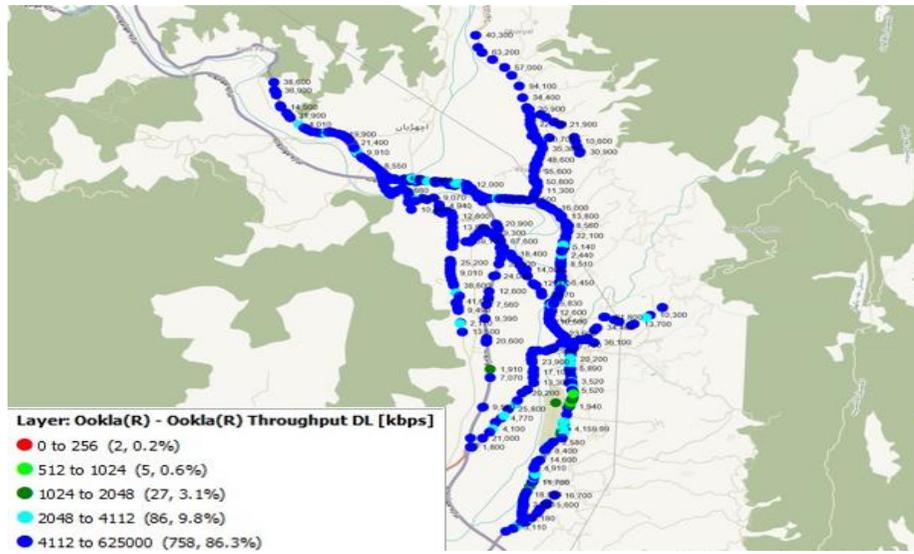


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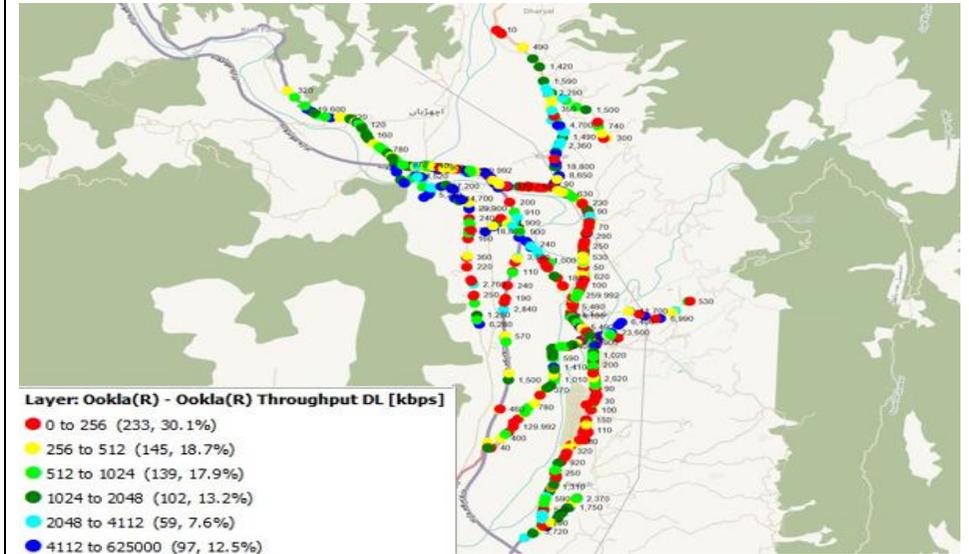


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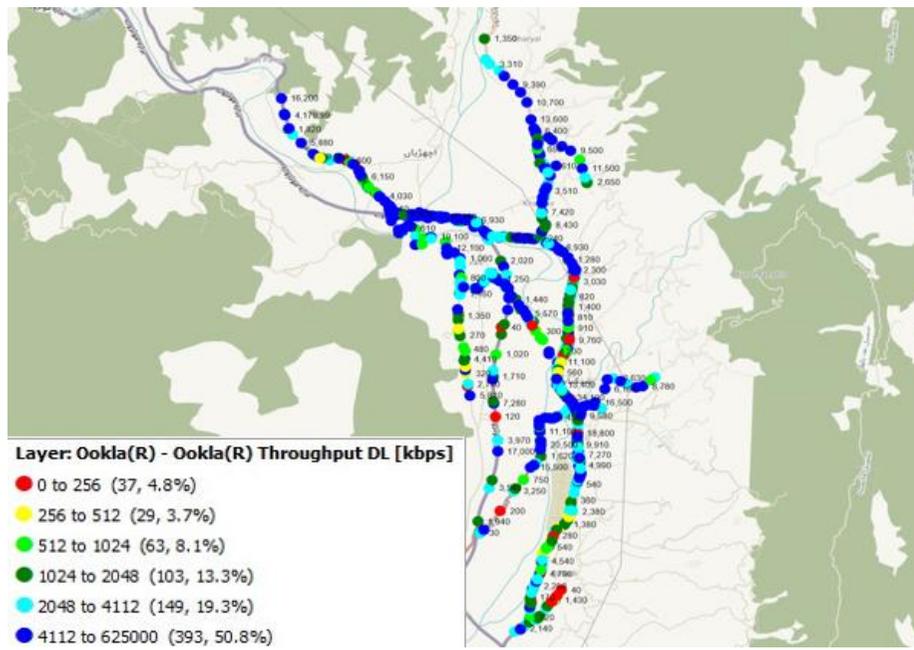
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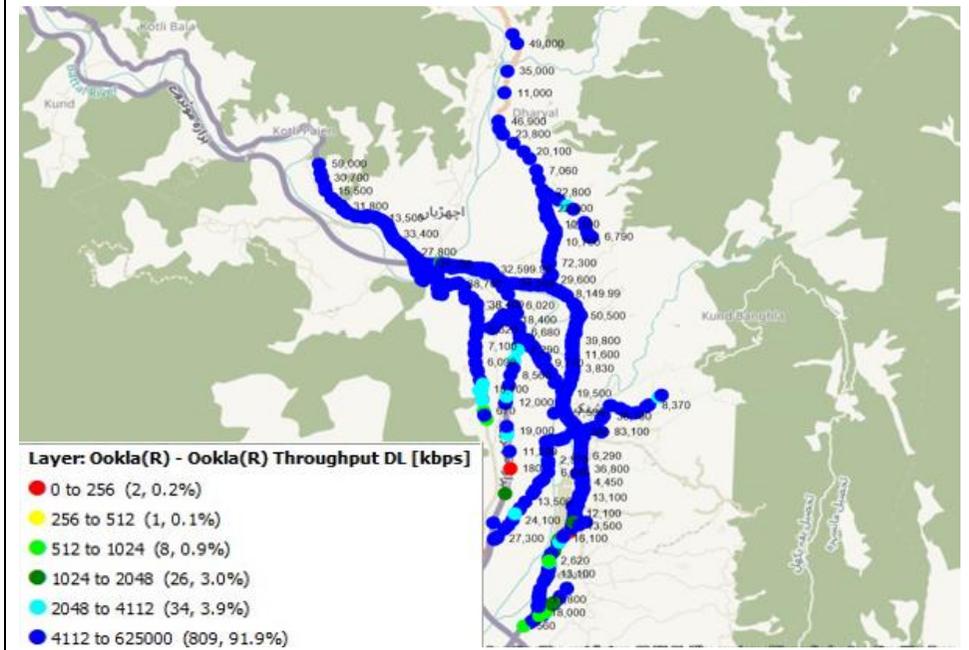
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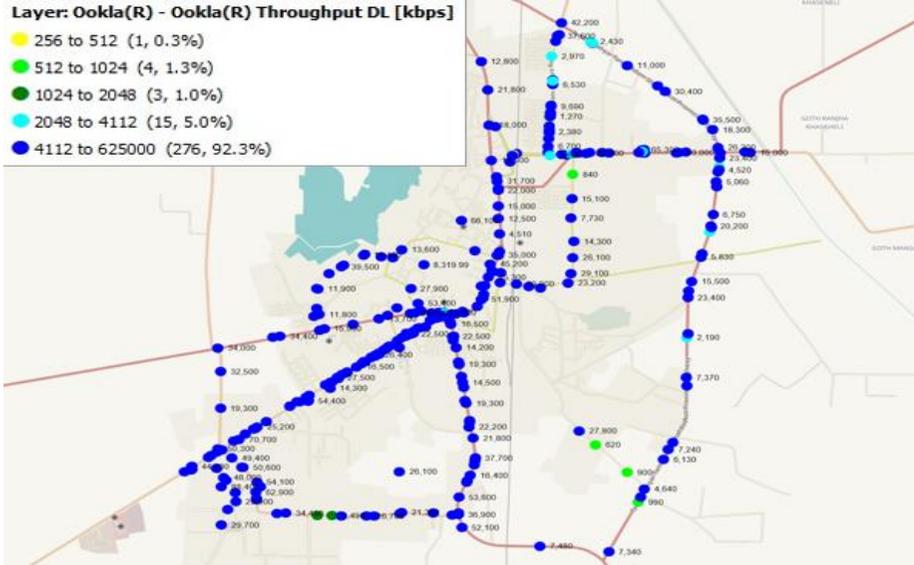


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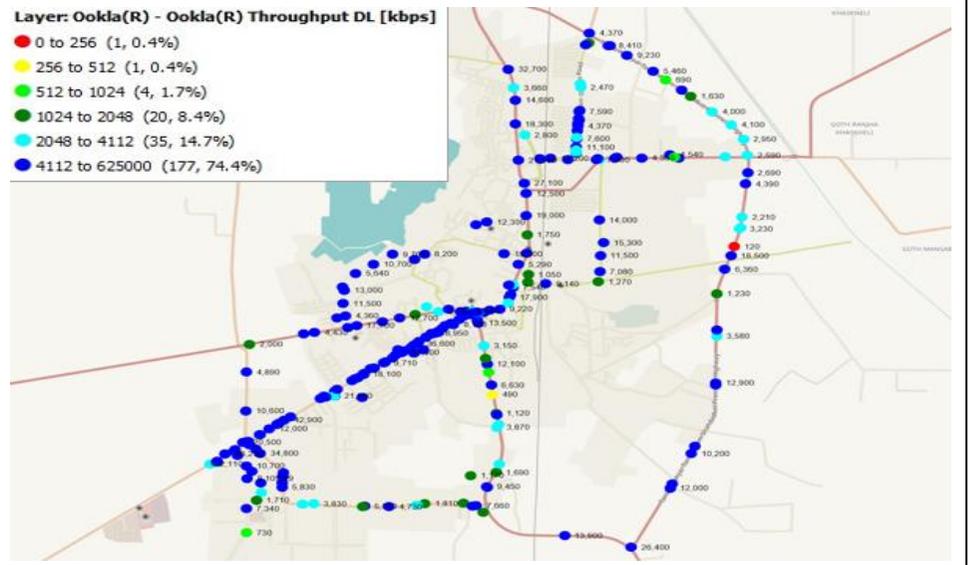


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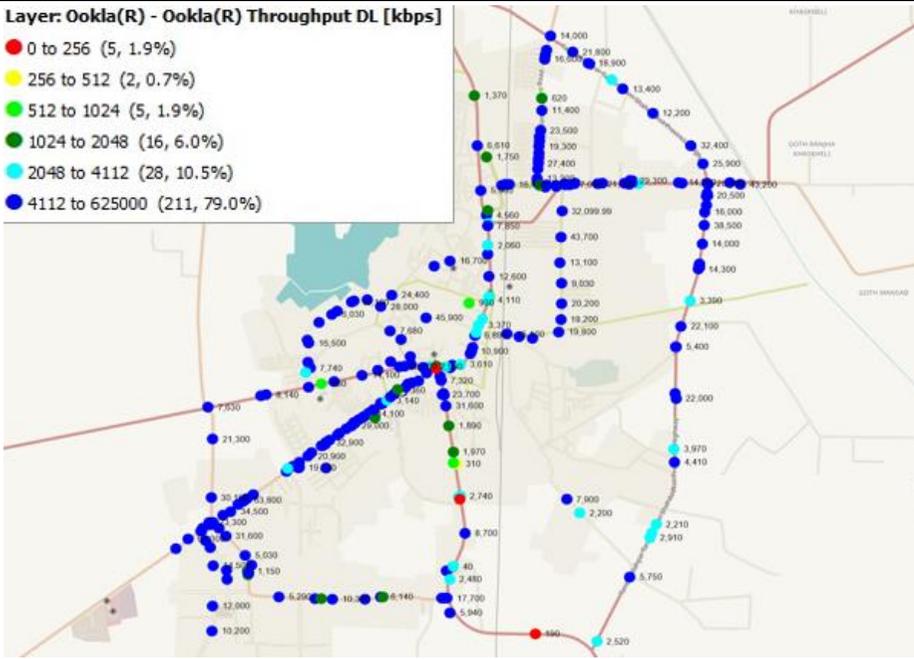
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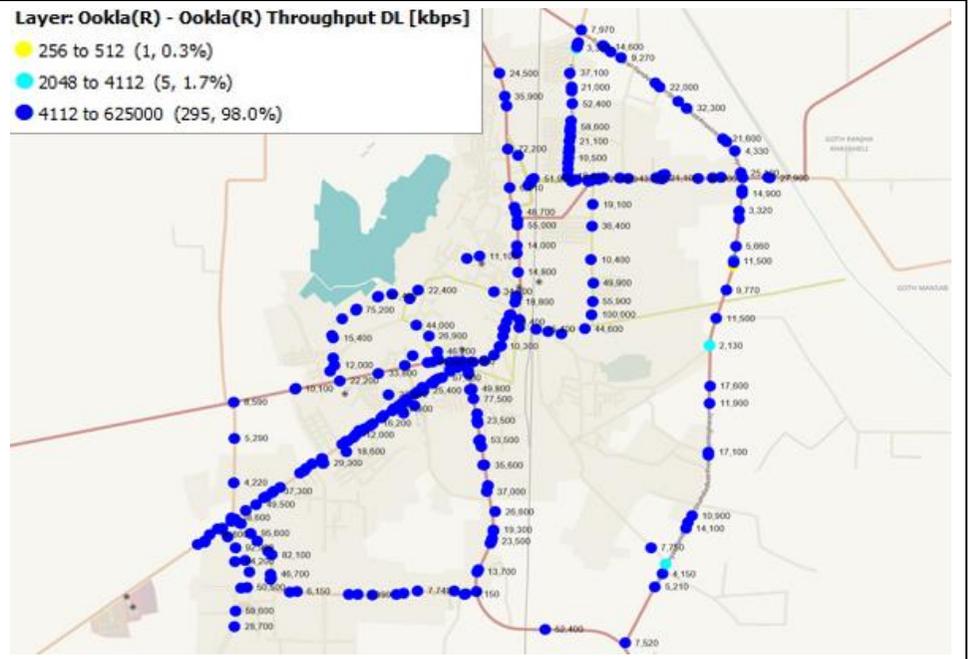
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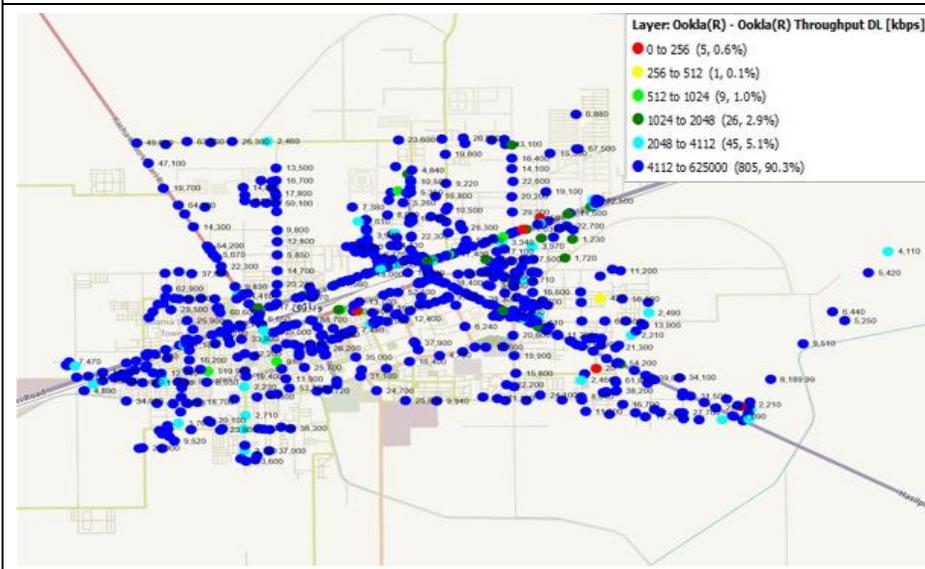


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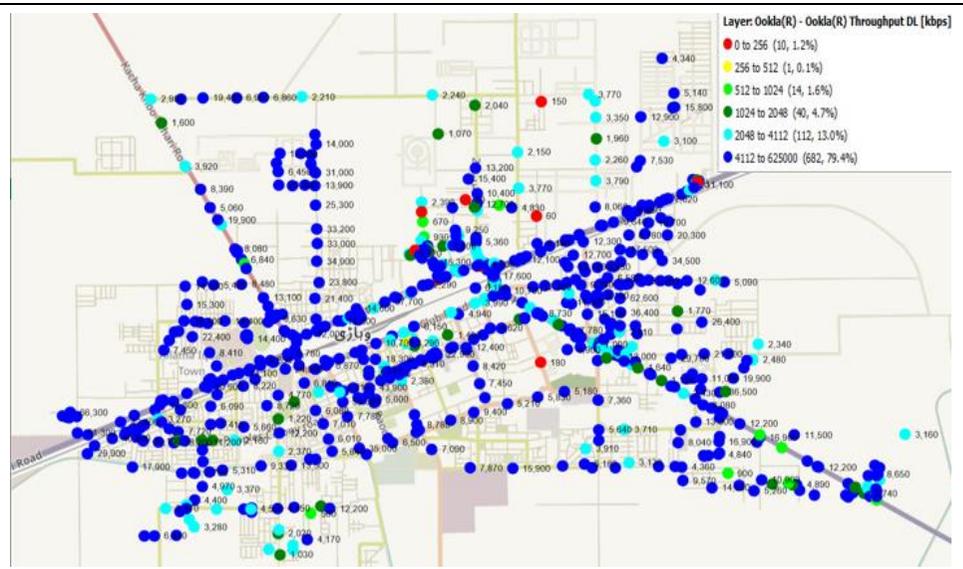


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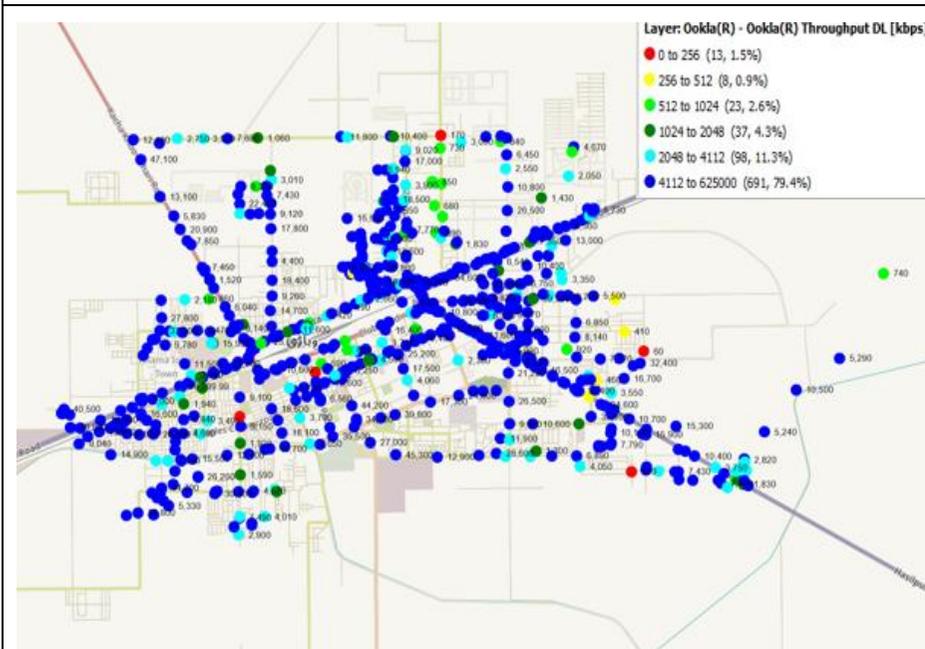
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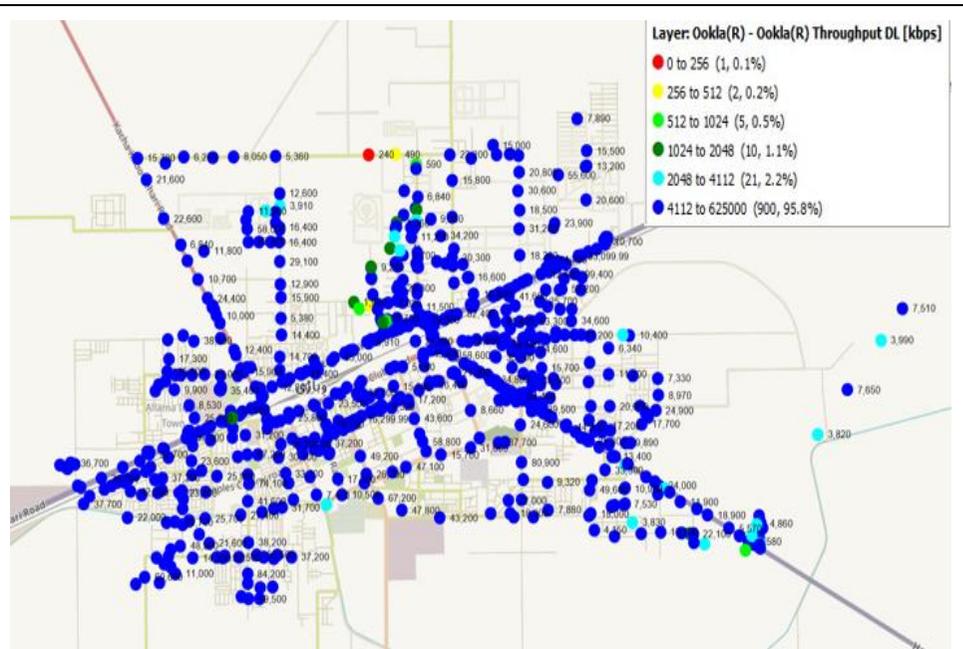
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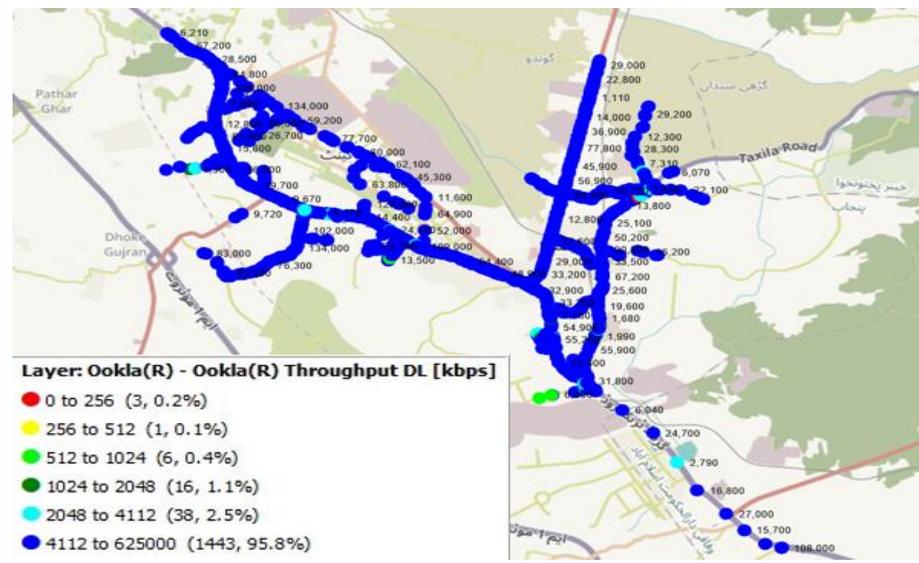


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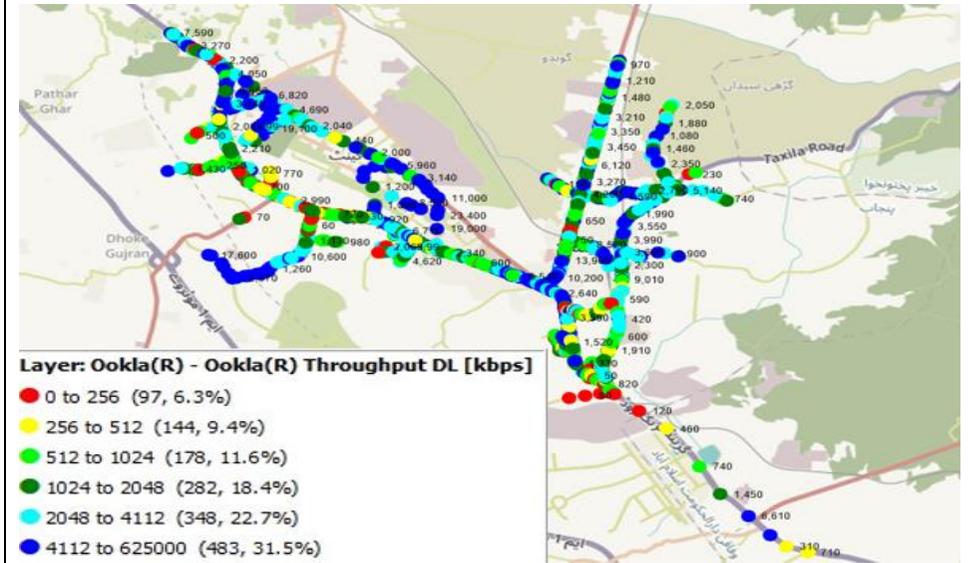


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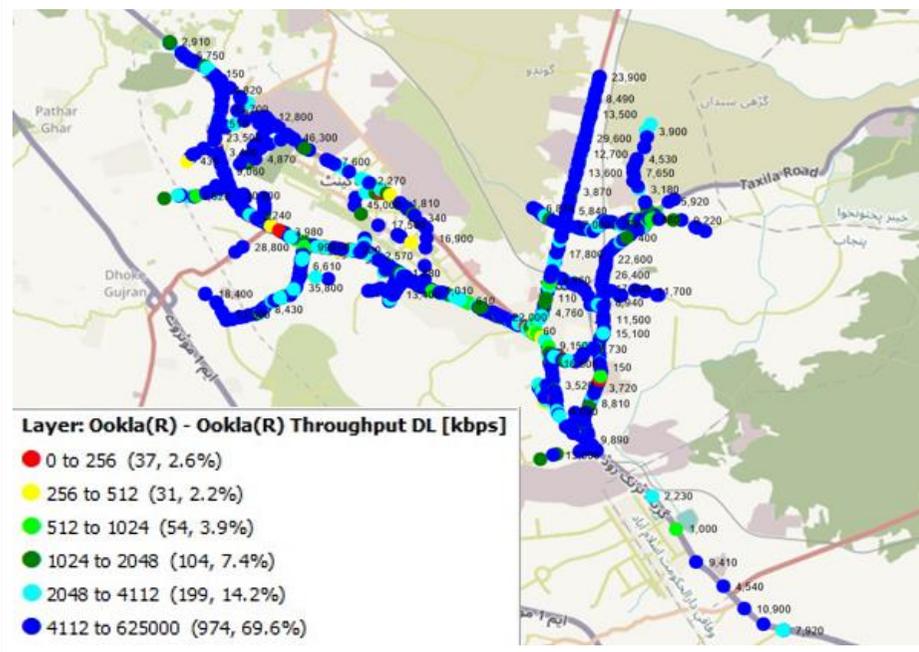
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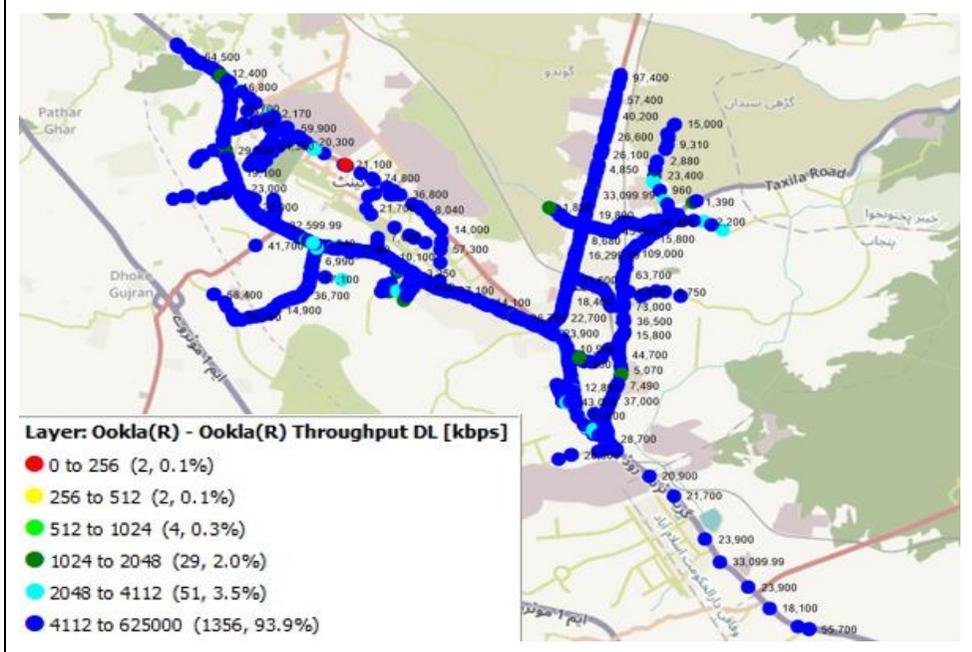
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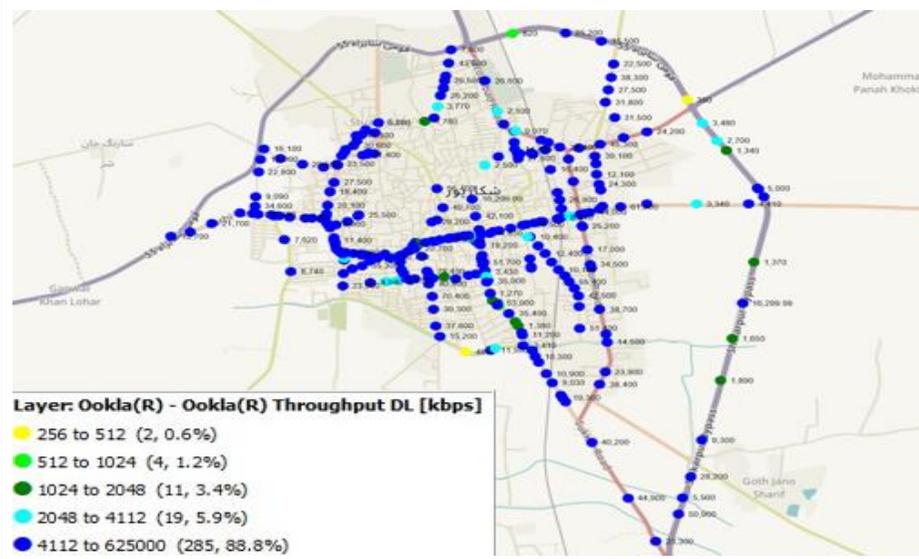


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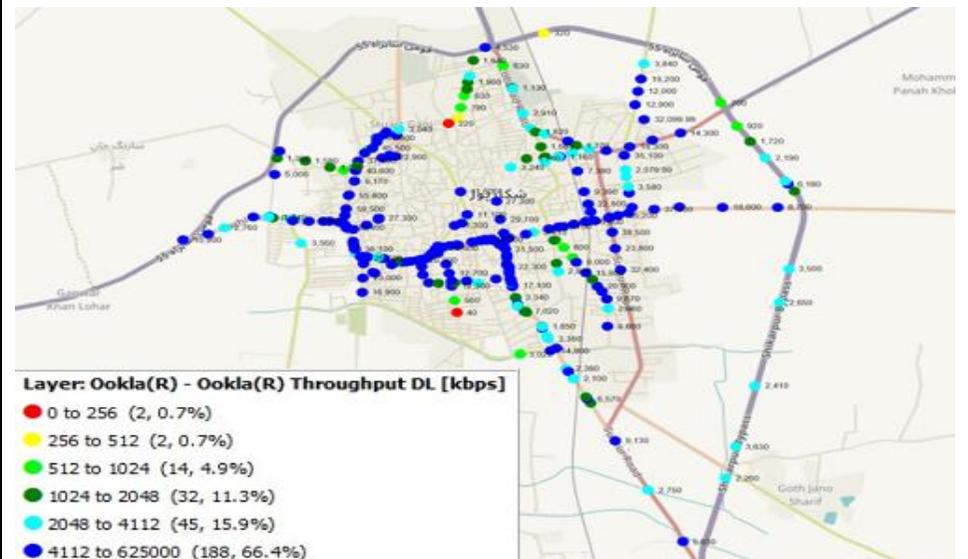


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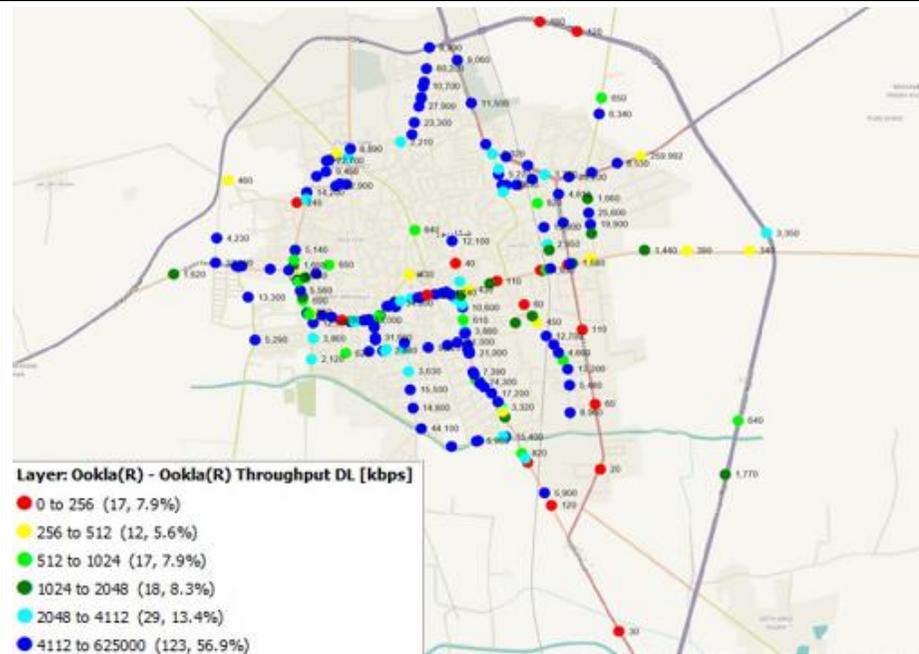
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