Broadband Mapus Cellular Network Topology | Applying Demographic Factors

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BACKGROUND

AT&T, T-Mobile, and Verizon stand out as dominant players in the United States mobile carrier landscape, each wielding distinct characteristics in cellular latency, upload speeds, and bandwidth availability. These discrepancies translate into varying user experiences, contingent upon their geographical whereabouts. The ongoing efforts of these carriers to refine and augment their services are evident, as they diligently address evolving consumer needs and data transmission experiences, even amid high traffic volumes. technological advancements. The advent of 5G and the emergence of 6E services underscore their commitment to fostering faster downloads, reduced latency, and heightened bandwidth, particularly in densely populated locales where network congestion is a perennial concern. By harnessing these advanced technologies, mobile carriers endeavor to offer seamless.

RESEARCH QUESTIONS

How does RSRP (Reference Signal Received Power) vary across different economic regions, and what factors contribute to these variations in cellular signal strength and quality?

How do demographic factors, such as population density and urbanization, influence the distribution and quality of cellular network infrastructure across different economic regions?

METHODS AND MATERIALS

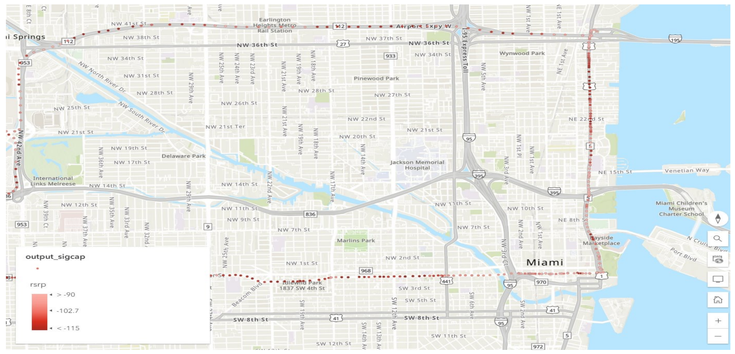
This inquiry entails a comprehensive examination of mobile carrier performance across different economic regions, focusing on cellular latency, upload speeds, and bandwidth availability. Utilizing ArcGIS mapping software and smartphone testing, the study aims to gather data on geospatial information such as cell tower locations, coverage maps, and population density within various economic regions. Field tests will be conducted using smartphones subscribed to different major carriers, in locations representing diverse economic regions, including urban, suburban, and rural areas. Measurement parameters will include cellular latency, upload speeds, and bandwidth availability, with data collected and analyzed to assess variations across economic regions. ArcGIS analysis will involve visualizing coverage maps and cell tower locations, identifying potential discrepancies in network infrastructure between different economic regions.

RESULTS AND DISCUSSION

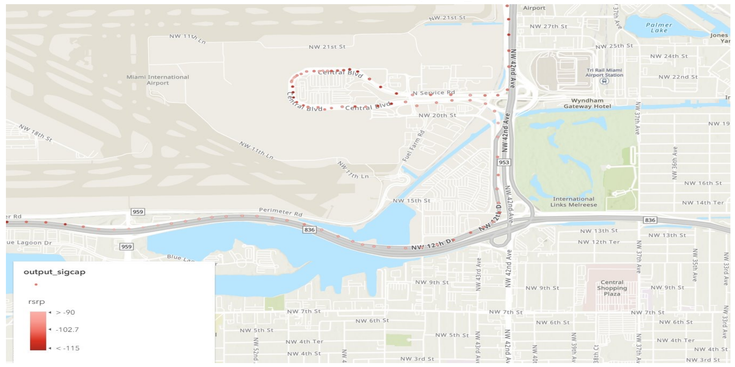
Census Breakdown

Location	Population	Median Household Income
Downtown Miami	80,017 People	$70,989
Everglades	12,644 People	$44,774
Homestead	81,562 People	$57,739
Miami International Airport	23.7 Million People Yearly	

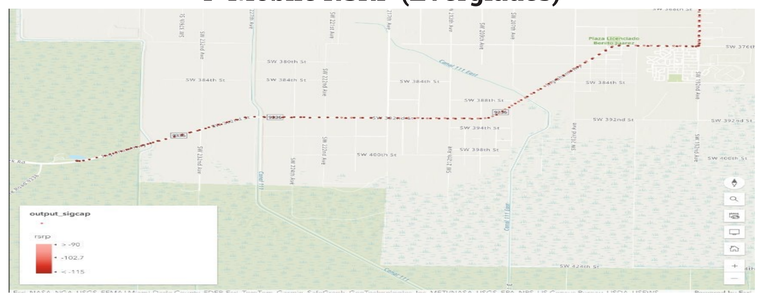
AT&T RSRP (Downtown Miami)



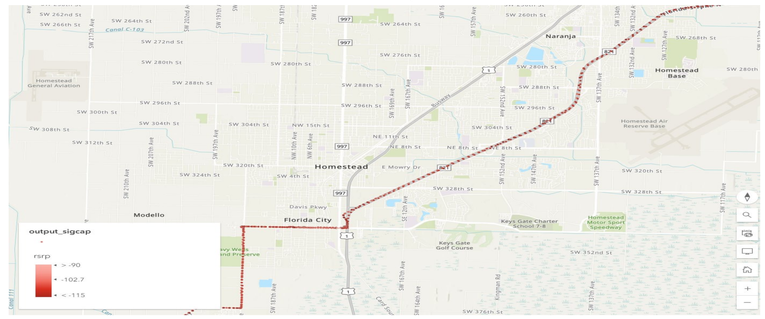
T-Mobile RSRP (Airport)



T-Mobile RSRP (Everglades)



Verizon RSRP (Homestead)



CONCLUSION

Our project's findings reveal disparities in cellular network infrastructure across economic regions, impacting user experiences. Recommendations are crucial for policymakers and stakeholders to address these gaps and enhance infrastructure in underserved areas. By investing in network expansion, promoting competition, and bridging the digital divide through targeted initiatives, policymakers can ensure equitable access to communication technologies. These efforts are essential for fostering socio-economic development and creating a more inclusive telecommunications ecosystems.

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