

Fixed Wireless to the MDU – A Case Study in Detroit

In an effort to deliver gigabit service to Detroit MDUs distant from its fiber backbone, Rocket Fiber experiments with millimeter-wave wireless delivery to the building.

By Marc Hudson and Emily Dabish / *Rocket Fiber*

All things innovation resonate with our team at Rocket Fiber. The company was founded in 2014 to bring Detroit the fastest internet in the country. Our mission is to advance the internet experience for all with dependable, unrestrained connectivity and helpful, authentic client service. This means we are constantly exploring new technology that can support that mandate.

Through our journey, Rocket Fiber has come to understand the benefits of hybrid deployment methods as well as the power of fixed wireless access to multiple-dwelling-unit properties (MDUs). Despite having “Fiber” in our name, Rocket Fiber is committed to outstanding client service, no matter the method or technology. From day one, Rocket Fiber’s mission has been to be a *for-more-than-profit* company by providing an outstanding product to the Detroit community as well as spreading information nationwide about the benefits of fiber.

Our residential clients receive 1 Gbps service to the home. Rocket Fiber intentionally offers only gigabit-level service to residential clients, which we initially provided exclusively via our pure fiber network. However, as we sought to rapidly expand our service availability, we began to explore the possibility that fixed wireless access could help provide service outside our current fiber footprint. Although we were bullish on the underlying technology, we believed it was paramount that the wireless

radios and unlicensed spectrum provide the same level of consistency as our traditional fiber-to-the-home product.

TAKING DETROIT FROM LAST TO FIRST

Rocket Fiber has consistently faced challenges involving legacy infrastructure when delivering service to MDUs. The lack of fiber infrastructure in Detroit served as a catalyst in forming the company. In a city where fewer than half the streetlights were operational in 2014, gigabit service delivered over a high-tech fiber network would be Detroit’s version of a moonshot infrastructure upgrade.

When Rocket Fiber began to lay its network four years ago, the company sought to access MDUs of all sizes and types in the footprint. Not all builds to MDUs were economically viable at the outset, but network upgrades had not been made in some areas of the footprint for decades. This had to change.

The company’s desire for unparalleled, future-proofed service led us to seek a creative strategy to deliver gigabit service to the home for Detroiters. The strategy of working with property owners large and small, without considering only the raw economics, heightened Rocket Fiber’s ability to create strong partnerships and lasting relationships with property managers that helped pave the way for future experimental deployments, such as fixed wireless.



Rocket Fiber millimeter-wave wireless backhaul on a crowded Detroit rooftop

ISLANDS OF DEMAND

Being a new market entrant with no legacy infrastructure allowed Rocket Fiber the flexibility to be creative and push the envelope with both outside- and inside-plant builds. The first MDUs to which Rocket Fiber deployed service mostly involved fiber to the unit or fiber to the communications room with a conversion to an existing Cat 5E or Cat 6 switched Ethernet plant. This was entirely new to the Detroit market. Beginning in late 2015, Rocket Fiber was the first to offer truly symmetrical gigabit service to residential units within our network area.

As Rocket Fiber's service rolled out, we found an overwhelming demand for gigabit service that far exceeded the geographic reach of the backbone ring we initially constructed to serve the greater downtown Detroit area. In many cases, the demand came from MDUs in less-dense areas of Detroit. The economics, even for a more-than-profit endeavor like Rocket Fiber, were difficult to justify. It became clear that

these islands of demand could be a win-win for consumer and provider alike if we could drive down the cost of access infrastructure needed to provide gigabit-capable backhaul to each MDU. The answer increasingly looked like a fixed wireless backhaul solution.

As we started to evaluate vendors and technologies, it soon became clear that regulatory considerations would play a major role in our procurement process. For instance, we not only needed to decide between unlicensed, lightly licensed and heavily licensed spectrum but also had to manage the fact that Detroit lies just a mile from Windsor, Ontario, on the U.S.-Canadian border. We found that both U.S. and Canadian regulatory issues came into play when dealing with high-powered fixed wireless near the border. Red tape and bureaucratic processes would litter our path if we chose the wrong platform.

After much trial and error, we decided to primarily deploy a lightly licensed, millimeter-wave solution capable of providing symmetrical

2 Gbps throughput reliably at a distance of about 2 miles. Once landed at the MDU, service is deployed similarly to our traditional fiber-to-the-unit or Cat 5E and Cat 6 deployments. In the case of fiber to the unit, however, a key difference included the on-site installation of an optical line terminal, as we leverage a GPON architecture for our fiber-to-the-unit deployments. With a completely new, fiber-rich network, we have traditionally kept our OLTs at main points of presence in our network for optimal port utilization, but this was not feasible when utilizing a wireless backhaul solution.

WHAT WE LEARNED

After our first pilot projects, much to our delight, we found that we could provide highly reliable gigabit service for several dozen residential clients with a wireless backhaul solution. We did it using a lightly licensed spectrum that was economical for the use case as well as palatable in terms of regulatory hoops, even on an international border.

MDU DEPLOYMENT

Armed with a new tool in our toolkit, Rocket Fiber has expanded the use of fixed wireless backhaul solutions to include many more MDUs, serving hundreds of clients. There certainly have been challenges in dealing with atmospheric interference, but in partnership with our vendors, we have been able to overcome all but the hardest rainstorms and the occasional Michigan blizzard. Fixed wireless backhaul has helped us advance our mission of bringing gigabit internet to the masses and is, in our view, a true complement, not a competitor, to fiber-based broadband. ❖

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A 200-plus-unit MDU in Detroit's Rivertown District is powered by a 2 Gbps symmetrical wireless backhaul solution.

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