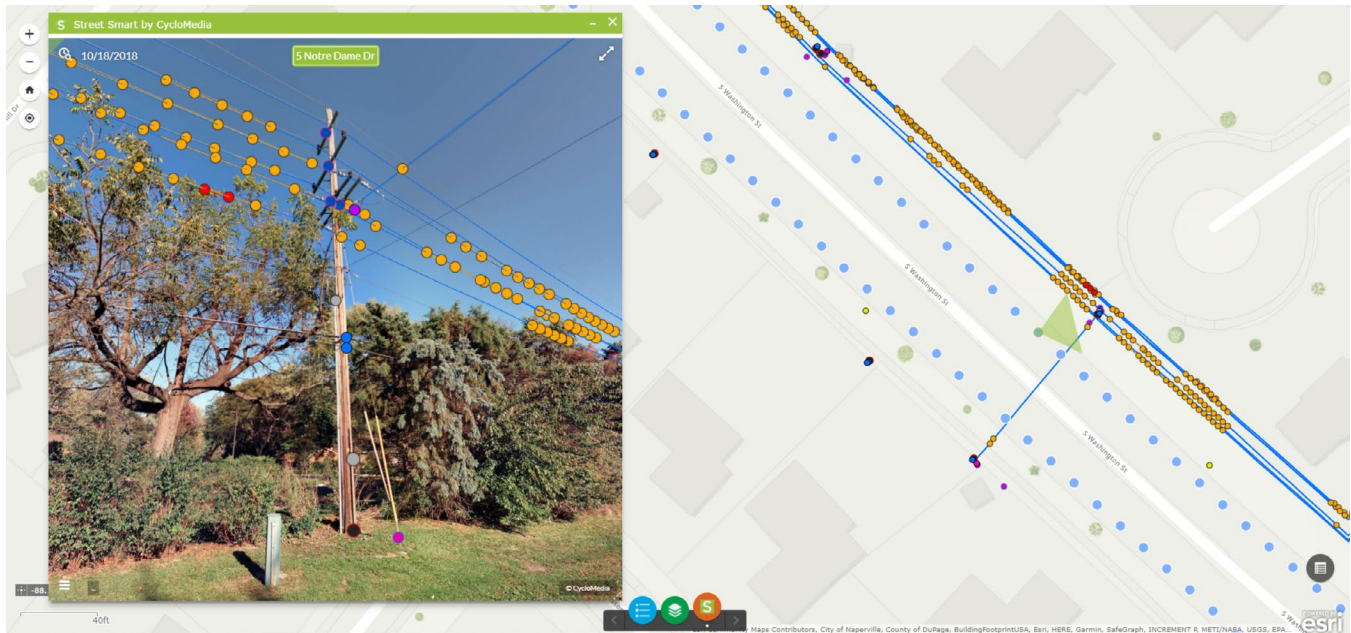


## How Automated Data Collection Optimizes Engineering Workflows



Communications network engineering is a highly detailed and complex process that involves many diverse work activities and requires carefully orchestrated collaboration. When we ask our customers and colleagues to identify the largest challenges to successfully completing a project, the overwhelming response is “balancing and trading off time, cost, and quality.” As a result, fiber engineering projects tend to be besieged by project delays and budget overruns due to unwelcome “surprises” in the field that require painfully slow rework and remediation. The common thread that enables these problems is poor information related to field conditions and details, which often stems from over reliance on historical, traditional methods of manual “boots on the ground” data collection.

With a strategic and tactical focus in addressing and solving these challenges, Cyclomedia began working with a high profile client in 2018 and has since successfully completed a number of projects. Cyclomedia’s imagery, LiDAR, and data analytics solutions helped this client reduce the cycle time of a large-scale fiber back haul engineering project, by 45% and significantly reducing costs and resource deployments that would normally have been required for manual fielding. The project schedule and quality improvements also allowed them to over deliver and delight their customer in turn.

## Project Summary

In 2019, a prominent engineering firm that designs, builds and maintains communications networks across North America solicited Cyclomedia for assistance on a large-scale fiber backhaul and access project in a major metro area. Our client had an immense amount of design and engineering work to complete in a dramatically short amount of time. In this industry, and in our world today, time is everything. Traditionally, fielding-to-scale on a project of this size, approximately 4,000 route-miles, requires considerable office manpower, field resources, logistics planning and lead time. Quickly mobilizing on this project as a team was straightforward since the client and Cyclomedia had previously collaborated on a similar project. Leveraging a mobile, vehicle-based system to collect imagery and LiDAR data allowed Cyclomedia to cover large geographic areas in a short amount of time while also capturing ground truth accurate, very high quality data. With a fleet of vehicles operating in the US, and each vehicle averaging 40-50 miles per day, Cyclomedia was well positioned to scale the effort to meet the tight timelines and specific project needs. As all network engineering professionals know, faster field data turnaround accelerates all downstream engineering functions and workflows.

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*"Mobilizing on this project as a team was straightforward since this client and Cyclomedia had previously collaborated on a similar project."*

- Jill Scharbarth, Solution Specialist, Cyclomedia

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In addition to compressing the project timeline, another major goal for our client was to reduce the amount of "boots on the ground" manual fielding. That goal was addressed via Cyclomedia's up-front field data capture and online visualization tool, Street Smart™, which allows users to perform remote, virtual desktop verification on the high-resolution 360° imagery and take real-world measurements using the 3D depth surface model. The ability to perform remote desktop verification reduced trips to the field with residual benefits of improving worker safety in addition decreasing transportation and potential incident costs. With much of the work force now virtual, the ability to perform remote verification is particularly pertinent both now and in the future. In instances where manual fielding was absolutely necessary, Street Smart™ was used to assess ground conditions and gain insight into what workers should expect before they go to the actual site.

## Results

In addition to the high-resolution street-level imagery, our client required details on key asset locations and attributes including the road base, surface features, poles, overhead lines, major structures, and trees. After reviewing the project with our client to fully understand the requirements and workflows,



Cyclomedia committed to running analytics to identify 37 unique feature types within the collected imagery and LiDAR. Cyclomedia's ability to extract asset data from the LiDAR is optimized with advanced AI and machine learning techniques. The high-accuracy and high-resolution of Cyclomedia's data quickly elevated the level of confidence within our client's planning and engineering team. Though hesitant at first, they gave the thumbs up after they were able to validate the data within the Street Smart™ online 3D visualization app. Beginning a new project with out of date or inaccurate data will only exacerbate issues downstream, causing design flaws and requiring additional trips out to the field for verification or remediation. Building up a reliable source-of-truth dataset of features from the start, with absolute positional accuracies of  $\leq 10$  centimeters ( $\leq 4$  inches), makes the entire engineering and design process much easier and smoother.

	Manual Fielding	Cyclomedia's Automated Solution
Project Timeline	9 months	5 months
Fielding Cost*	25 - 40%	5 - 10%
Data Accuracy	1 meter	10 centimeters

\* Field cost as a percentage of the total planning and engineering project costs – "boots on the ground" vs. vehicle data capture and analytics automation.

Cyclomedia's solution saved our client a tremendous amount of time, money and resources for field survey, assessment and inventory compared with traditional manual efforts while improving the quality of source data. In turn this improved the quality of permits and engineering designs. Since the successful completion of this major project, this client and Cyclomedia have established an innovative best practice and continue to work on numerous FTTX (fiber to the home, premise, node, etc.) and 5G backhaul design projects as a team.

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