



The Smarter Way:

Automating Underground Fiber Engineering to Drive Speed & Accuracy Forward



THE CASE FOR: Harnessing Drones & eSpeed to Accelerate and Optimize Underground Fiber Projects

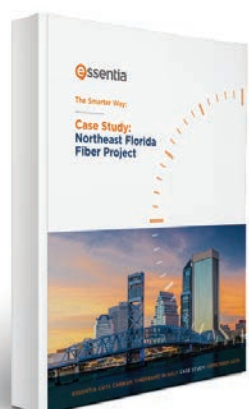
The implementation of high-capacity fiber networks is far from light speed.

Telecom Carriers, Cable TV companies, utilities and other verticals that rely on underground fiber engineering to deliver data have long struggled to level up their speed and efficiencies.

From sending teams into the field with notepads and pens to manually importing and assembling drawings, traditional underground fiber engineering remains a highly imperfect process wrought with inefficiencies.

In this White Paper, we assert that a forward-thinking approach to underground Fiber engineering — from drone data collection to automated drawings and onsite construction upgrades — significantly compresses the time required for such deployments while elevating accuracy.

This is not doing it the same old way; this is a cutting-edge approach that's proven its high reliability from the field to the drawing room. We reached this milestone by scrutinizing every step of the status quo, seeking out existing tech to elevate processes — and inventing proprietary tools and techniques when they simply didn't exist.



Essentia's innovative approach to Fiber engineering is being deployed right now all over the country, including a compelling proof of concept in Northeast Florida. Here, we stepped in at the 11th hour, cutting a major Carrier's timeframe in half while achieving record-setting quality scores — outperforming hundreds of vendors in thousands of audits working in America's 60 largest cities.

[READ THE CASE STUDY](#)

This new, proven approach has powerful applications and implications throughout telecom and beyond — for FTTC, FTTH, FTTB, long haul, metro rings, smart cities, and more. Any entity or industry seeking hugely impactful data delivery upgrades via underground fiber engineering should dig in and will benefit from learning how Essentia has dialed up speed, accuracy, and efficiencies.

FIRST THINGS FIRST: THE eSPEED TECHNOLOGY PLATFORM:

The hub of Essentia's innovative capabilities is the eSpeed Technology platform. A cloud-based solution, eSpeed automates functions that were long managed through high-touch, manual processes. And it's not just designed for speed; by evolving these error-prone, legacy methods, it drives accuracy and efficiency, too.

Specifically, eSpeed is defined as a set of different technologies — hardware and software — wrapped around efficient processes through proprietary programming and workflows.

Here's a breakdown of the myriad functions eSpeed manages:

essentia technology platform

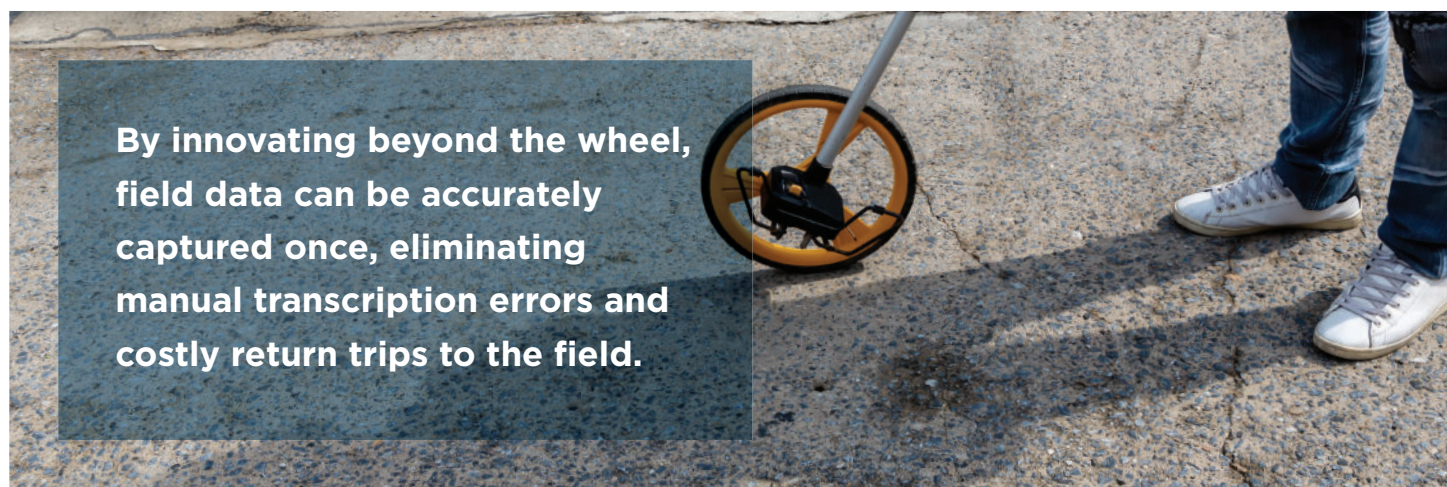


“[eSpeed] wraps various technologies and best practices around efficient processes, creating unparalleled efficiencies in data integrity, management, and automation— much like Uber, whose novelty lies in creating an efficient method to streamline hailing a cab.”

Inside Towers

When it comes to Fiber engineering, eSpeed is there from the moment a project takes off, collecting data via drone flights. Its next function is to automate the import of key data into the Fiber drawings, finally synching up with Carrier systems for seamless back-and-forth communication. Here's a closer look at how we've advanced each phase of Fiber engineering, thanks to eSpeed and the innovative team behind it.

ELEVATING FIELD DATA COLLECTION WITH DRONES & ESPEED:



By innovating beyond the wheel, field data can be accurately captured once, eliminating manual transcription errors and costly return trips to the field.

When it comes to the tools and methods deployed for Fiber engineering field data collection, the industry's recent history is also ancient history.

This traditional approach entails sending a team of engineers out to the field to canvas the project site, handwriting notes and manually taking measurements. Depending on the size and scope of the project, it can be a multi-week assignment or more, drawing budget for vehicles, room and board for field personnel, and other costs. Then, depending on a host of factors, there are numerous return trips for follow-up measurements.

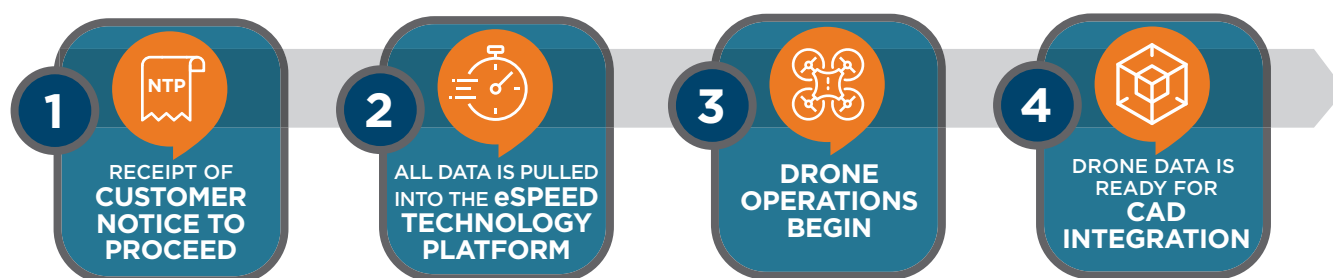
It's not exactly state of the art, is it?

Essentia has taken to the skies to address the rampant inefficiencies of underground Fiber field data collection. By pioneering the advancement of data collection using drones, we have compressed field engineering time by 90%. We've also heightened accuracy by removing human error from the equation, while driving efficiency up and costs down.

Case in point: you receive a change request to cross the road 500 feet before the original design indicated. There's no need to return to the field when you have a comprehensive record of all needed measurables. After all, drones can capture 1,000 site photos per mile traveled — and they don't require a per diem.

The real power of automating field data collection comes with eSpeed integration, when data is seamlessly shared with Essentia's technology platform as well as customer systems so that all stakeholders can simultaneously gain access.

HERE'S A STEP-BY-STEP SNAPSHOT OF THE PROCESS:



FAST-FORWARDING ENGINEERING DRAWINGS WITH AUTOMATED IMPORTATION

With a traditional approach to Fiber network engineering, there's a hard stop between the field data collection and drawing package phases. Managing an abundance of data and data sources can be a cumbersome, error-prone process when conducted manually.

But by embracing automation and leveraging the capabilities of eSpeed, once you wrap data collection, you already have a sizable head start on drawing package completion.

In fact, by implementing the automated imports described below via eSpeed, and depending on the project scope, Essentia can complete at least 30 percent of the drawing before it's touched by a human.

- **Ortho Mosaic Import:** Aggregation of photos captured from drone photos.
- **Right of Way Import:** Detailing all rights of way impacting Fiber routes and equipment.
- **Utility Import:** Adding manholes, sewer, water, etc. with appropriate stamping.
- **Project Import:** Project-specific details provided on the NTP such as start and end coordinates, notes to follow carrier preferences, local ordinances, etc.
- **“Algo-Pager”/Sheet Import:** Automatically creates and matches scaled site plans from route beginning to end, optimizing page assembly
- **Route & Vicinity Import:** Brings in Google maps and/or other 3rd-party maps to include roads, sidewalks, etc.

Not only is drawing package completion sped up when utilizing these automated imports, but they also drive data integrity forward, giving you a highly reliable final product. This approach reduces tedious QA work and time-consuming error reconciliation, while also eliminating costly return trips to the field to verify or locate missing data.

Essentia can complete
UP TO 30%
of the drawing before it's
touched by a human.

EXPANDING THE FIELD: CREATING CONSTRUCTION SITE TRANSPARENCY

While drones provide eyes in the sky for the field data collection phase, Essentia leans on other cutting-edge tools to provide eyes on the ground during the construction phase of underground Fiber engineering.

The idea behind each of these is simple: Essentia can be “on site” without physically being there.

These tools include:

- **Field App:** This resource handles daily reporting — taking photos and collecting GPS coordinates, and then relaying them back via eSpeed. This capability enables the construction team to maintain transparency with project managers and assists with close-outs.
- **Bore Logs:** These chart the location and depth of boring, again syncing up with eSpeed.
- **Shipment Receipt App:** Tracks receipt of onsite materials to maintain inventory integrity.



FAST-FORWARDING FIBER ENGINEERING

Innovations and automations designed to throttle speed and elevate accuracy

DRONE DATA COLLECTION

BENEFITS:

- 1,000 photos per mile traveled
- Cuts initial engineering time by 90%

espeed DRAWING AUTOMATIONS

BENEFITS:

- Produce highly accurate, 30% drawing before a human touches it

CONSTRUCTION TOOLS

BENEFITS:

- Capture photos & collect GPS coordinates
- Syncs with eSpeed to monitor job & help with close-outs
- Auto-syncs boring depth & location.

CLOSING ARGUMENT:

WHY AUTOMATING UNDERGROUND FIBER ENGINEERING IS THE SMARTER WAY

Automation puts on a great show, but does it work?

Quite simply and resoundingly, yes.

First, let's circle back to our two key stats quantifying how this approach compresses the traditional Fiber engineering timeframes:

90% PLUS reduction of Field engineering time — thanks to drones and eSpeed,

30% PLUS completion of drawings — before a human steps into the process — again, thanks to eSpeed and automated drawing imports.

These aren't just gains measured in the lab. This approach is field tested and proven. And that's not just in Northeast Florida, where we shared our [**CASE STUDY**](#) of achieving record-setting quality scores, but around the country. We should add that, while the focus of this white paper is on Fiber Engineering, we've also employed these same drawing tools to evolve Small Cells, providing a proof of concept comprising hundreds of projects.

Also know that these data points and even the suite of solutions we're detailing only references a moment in time. Every day, we're relentlessly expanding and enhancing our approach to Fiber engineering. In fact, right now we're focused on integrating Machine Learning into the process, an advancement — that once brought out of R&D and into the real world — will significantly expedite the already accelerated drawing process.

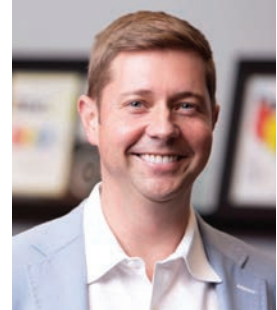
We've spent years and invested robust resources into rethinking every aspect of Fiber engineering. It's toolbox and process that can't easily be replicated. And while there are certainly best practices you can glean and imitate, we believe that the smarter way to integrate automation is by plugging into eSpeed and partnering with Essentia.

This doesn't just apply to telecom Carriers. These methodologies can benefit utility design, Cable providers and other industries. Just as we are reimagining the ways in which we implement the 4G/5G network, we're also breaking down walls and inviting other industries to benefit from moving at the speed of 'e.'

Ready to Take the Next Step?

Essentia has been evolving the traditional approach to Fiber projects for two decades — incorporating drones, leveraging relationships, and integrating automation to drive speed, accuracy, and Carriers' bottom line.

We welcome the opportunity to be your go-to partner for Fiber and Small Cell. Please contact Essentia CEO Lindon Hayes today to discuss how we can help deliver game-changing results.



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