

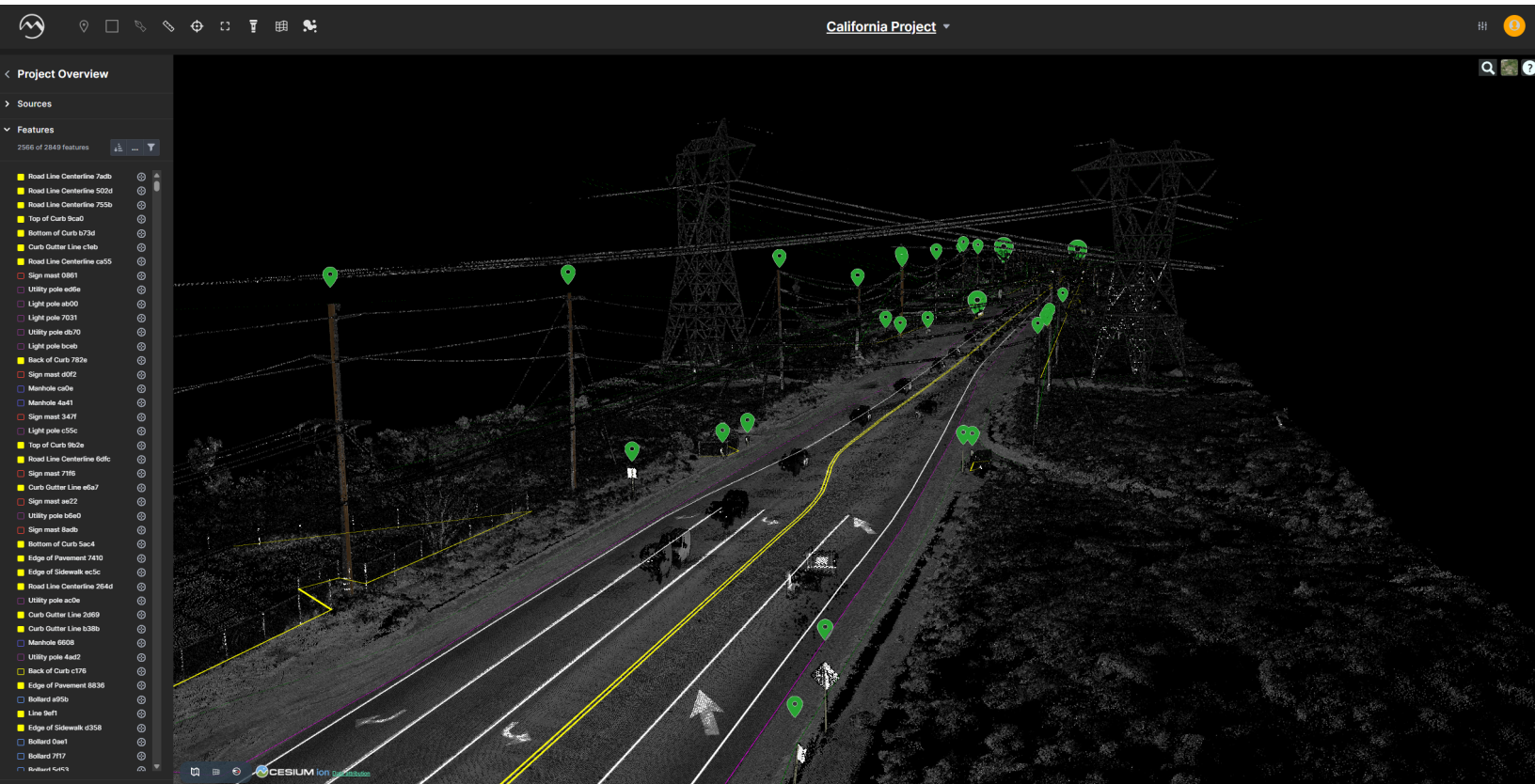
## Case Study

# Taking a Topographic Survey Start-to-Finish with Mach9 Digital Surveyor

Langan Engineering and Environmental Services successfully completed a complex survey project from start-to-finish in Mach9's Digital Surveyor. The Langan team efficiently navigated the challenges of the California desert terrain environment while delivering accurate and high quality planimetric maps for a 9-mile infrastructure design-grade project. Feature extraction for the entire project was completed in Digital Surveyor, demonstrating the production platform's capability to support survey-grade projects with comprehensive geospatial workflows.

## Key Info

- Customer:** Langan Engineering
- Scope:** 9-mile infrastructure design-grade project
- Location:** California
- Challenge:** Need for precise mapping in a desert area with irregular topography and poor delineation
- Solution:** Mobile mapping with Leica Pegasus TRK700 NEO and automated feature extraction with QA/QC tools in Mach9 Digital Surveyor
- Result:** On schedule delivery of the survey project using Digital Surveyor start-to-finish



End-to-end California project in Digital Surveyor

## The Challenge

Surveying in California's desert areas presents unique challenges, such as broken lines, poor delineation, and irregular topography. This project required precise mapping of:

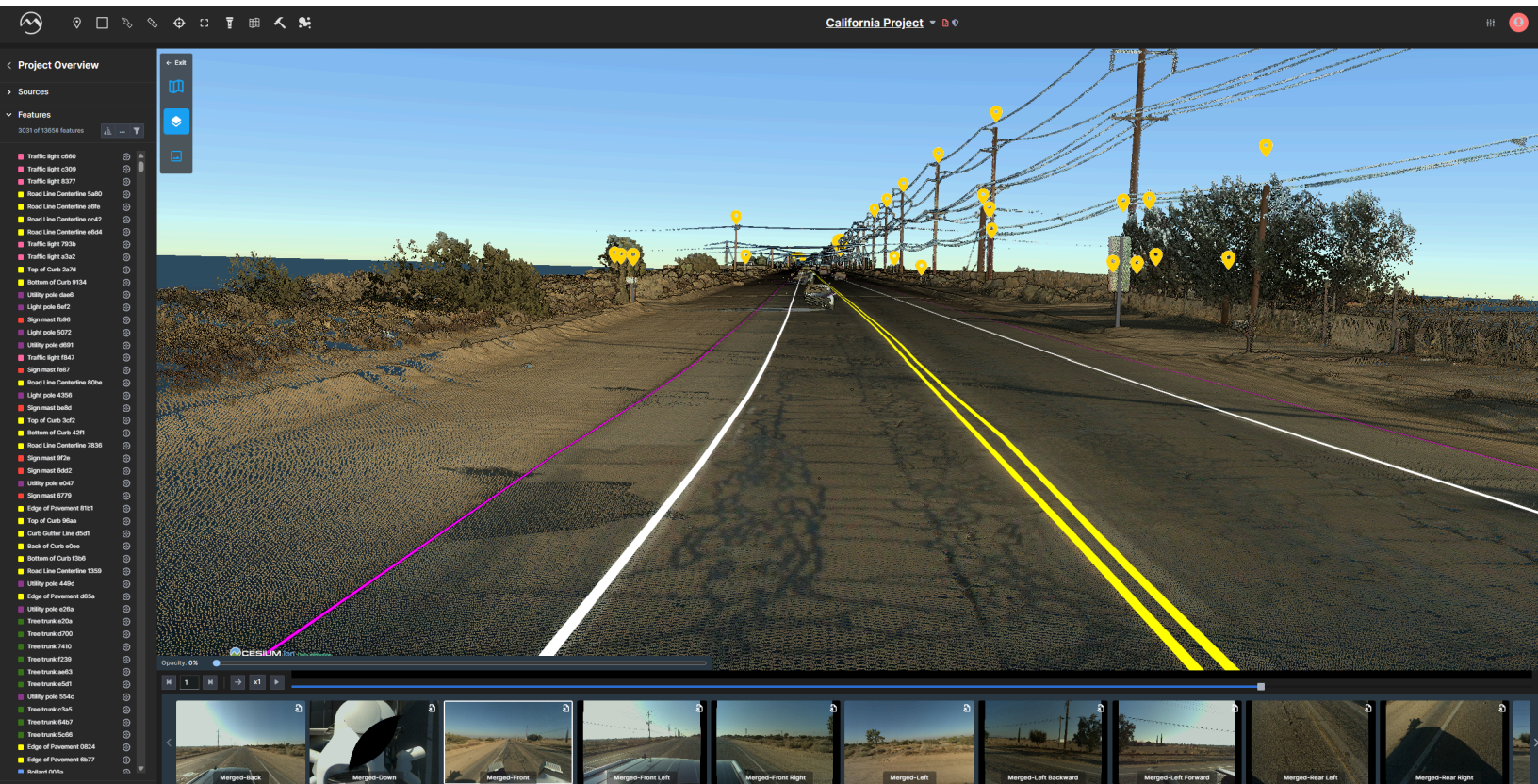
- Curbs
- Edges of pavement
- Road centerlines
- Utility poles
- Manholes
- Additional point and vector features

## The Solution

Russell Hall, PLS (Langan's Mobile Mapping Manager), and his team strive to use the latest technology hardware and software to accelerate project timelines. That's why, on this project, they combined the power of Leica Pegasus TRK700 NEO, which offers dual scanners with 1,000,000 measurements per second, with the speed of automated feature extraction in Mach9's Digital Surveyor.

The entire survey feature extraction process was completed in Digital Surveyor, combining automation with manual QA/QC and drafting workflows to deliver high accuracy planimetrics. Key aspects of the workflow included:

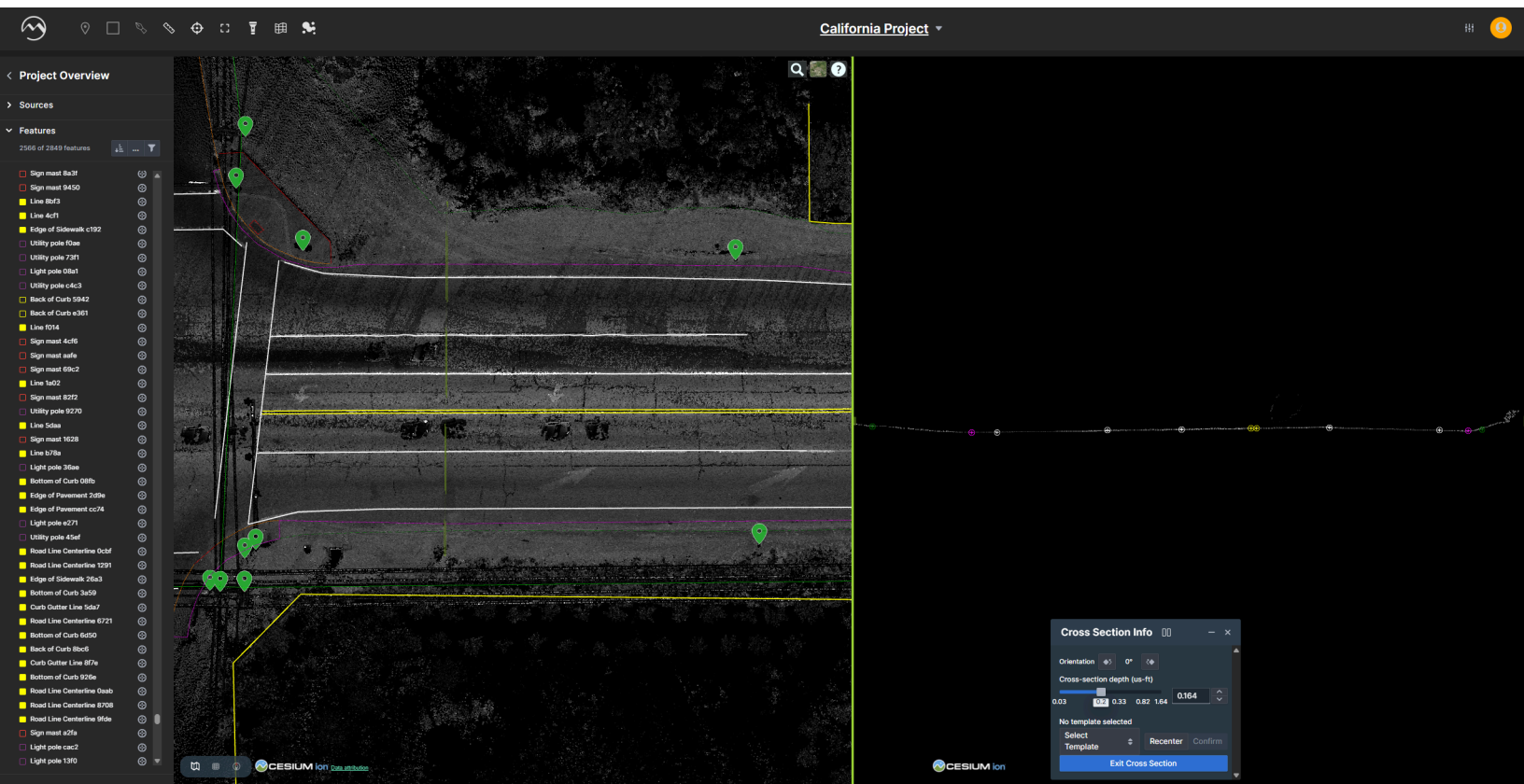
- **Automated feature extraction:** Digital Surveyor was able to automatically extract features including pavement striping, utility poles, manholes, bollards and more.



Automated feature extraction in Digital Surveyor with Quick Images



- **Manual extraction for detailed features:** Digital Surveyor offers manual alternatives for tasks not yet automated, allowing users to stay in one tool throughout the project. Hall's team used the Manual Extraction Tool to convert complex structures into accurate 2D lines.
- **Integrated QA/QC workflow:** Some features (such as edges of pavement) required manual clean-up to ensure accurate delineation. The Cross-Section Tool provided reliable elevation points, offering high confidence in vertical measurements even when lines were broken or uneven.



Cross-Section tool in Digital Surveyor

The combination of automated extraction and manual workflows allowed the Langan mobile mapping team to efficiently navigate the challenges of the sandy terrain while maintaining control over feature accuracy.

## The Result

Hall and his team completed the challenging project end-to-end in Mach9's Digital Surveyor, delivering ahead of schedule, without sacrificing accuracy. Digital Surveyor enabled rapid, automated feature extraction from mobile mapping systems delivering high-fidelity vector data in a fraction of the time. Manual QA/QC and cleanup workflows ensured a smooth transition for export to CAD, supporting seamless integration into existing engineering design environments.



***We have encountered never before seen terrain difficulties, and yet, we managed to finish the project a week before the original deadline and 30% under budget.***  
**– Russell Hall, PLS**

## Looking Ahead

Hall and his team have been providing valuable feedback on functionality as they continue to expand their use of Digital Surveyor. Based on their feature requests, the Mach9 team developed new functionality such as global resampling, to more efficiently refine perception results, and global merging to streamline joining of broken line cases.

At Mach9, we are committed to continuous improvement and are actively incorporating feedback from users like Hall and his team to address the needs of the surveying and geospatial industry.

For more information, visit us at [www.mach9.ai](http://www.mach9.ai) or contact us at [info@mach9.ai](mailto:info@mach9.ai).

## About

**Langan Engineering** provides an integrated mix of engineering and environmental consulting services in support of land development projects, corporate real estate portfolios, and the energy industry. Their clients include developers, property owners, public agencies, corporations, institutions, and energy companies around the world.

**Mach9** is a geospatial technology company focused on automating feature extraction from mobile mapping data. Designed for engineering teams, Mach9's AI-driven tools help convert LiDAR and imagery into accurate, actionable GIS and CAD-ready outputs, improving asset visibility, accelerating project timelines, and enhancing infrastructure management. Mach9 supports clients across transportation, utilities, and public works sectors seeking to scale asset intelligence and automate survey-grade data processing.