NV5 GEOSPATIAL
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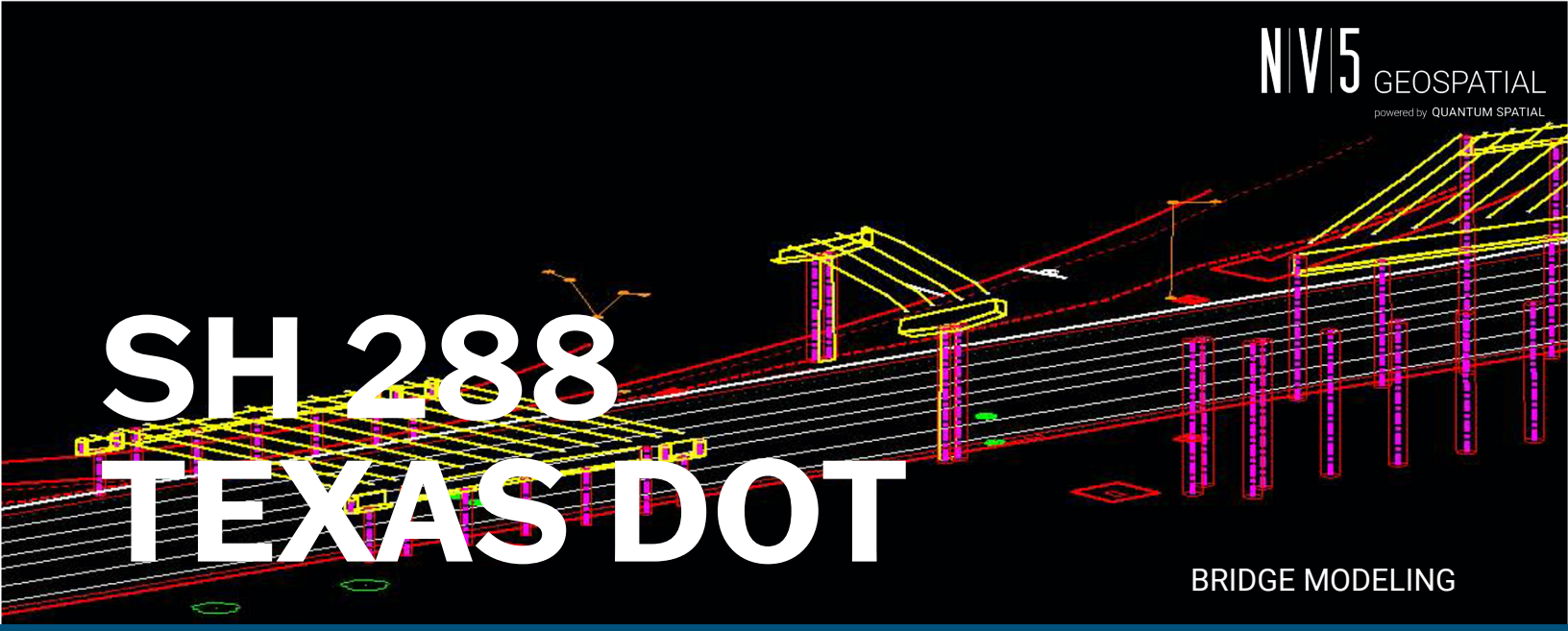

SH 288 TEXAS DOT

BRIDGE MODELING

ACQUIRE ANALYZE ANSWER

NV5G EDGE

NV5 Geospatial, powered by Quantum Spatial, is North America's largest provider of geospatial services, providing end-to-end solutions and insights. We combine the widest array of advanced remote sensing technologies with proprietary processes, analytics tools, algorithms, and analysis tailored to meet our clients' needs.

BACKGROUND

As the geospatial subconsultant to the SH 288 Design Build team, NV5 Geospatial (formerly Quantum Spatial) was tasked to provide mapping of a 10.3-mile (12-miles with major roadway crossings) segment of SH 288. The alignment extends from north of US 59 near downtown Houston, TX, south past Beltway 8. We were task to create an as-built survey of the 12-mile by 1,600' wide roadway corridor. Data were to be used for the design of the Harris County Toll Authority's $1,063.5 million dollar Lane Expansion project.

CHALLENGE

NV5 Geospatial's challenge was to complete the as-built survey within forty-five days from NTP and acquisition of remote sensing data. Projects of this magnitude this should normally take about six months to complete.

Initially NV5 Geosptatial was tasked to provide the aerial mapping. However, with the extremally compressed project schedule, NV5 Geospatial prepared a technical proposal for addressing the project's expedited scope which included the use of three separate geospatial

technologies:

- Aerial photography which was used for orthophotography and planimetric feature development
- Helicopter-based lidar for terrain modeling of the project corridor
- Mobile lidar for modeling of bridge sub-structures, overhead structures, and overhead utilities

SUMMARY

- Imagery using an UltraCAM Eagle multispectral camera at a 0.25' GSD
- Rotary lidar using a RIEGL 480i sensor at 40 ppsm
- Mobile lidar acquired at a point density of 1,000 ppsm
- Curbs within the right-of-way were modeled from the lidar data
- Planimetric mapping of the 1,600' wide corridor was compiled from the stereo photography
- Bridge substructure and surfaces of the 50 bridges were modeled from the lidar
- Sign and low wire utility data were vectorized into CADD files
- Clearance information of bridges, signs, and utilities were provided
- Lidar data were merged/fused per the client specifications

For more information or to schedule a meeting contact transportation@quantumspatial.com

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SCOPE

The project ground control was established by the Design Build Team's surveyors. Forty-three (43) aerial mapping control points and one hundred nine (109) bridge modeling control points were set prior to remote sensing data acquisition.

Collection of 5cm, color, stereo aerial photography was performed and used to develop planimetric features of the approximately 1,000' wide corridor. Orthophotos of an approximately 1,600' wide corridor were also developed from the photography.

Helicopter lidar data were collected at approximately 40 points per square meter and used to develop a digital terrain model of the approximately 1,000' wide mapping corridor. Breakline data collection was performed for the corridor which included curb modeling of areas within the existing roadway right-of-way.

Due to time constraints, mobile lidar was the preferred method of data acquisition for fifty plus bridge structures within the roadway corridor. These data sets were used to model bridge substructures including bents, beams, columns, abutments and low cord data. Low wire, above ground utility information was extracted from the lidar data as well as overhead sign location and clearance.

NV5 Geospatial worked with the team surveyors to perform data fusion of not only our geospatial data sets, but supplemental field survey data.

DELIVERABLES

All return LiDAR point file in LAS format

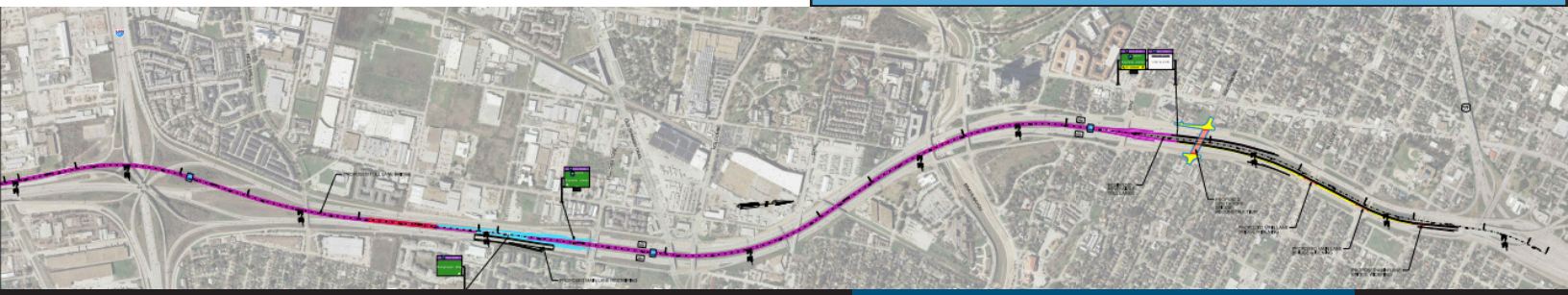
- Planimetric mapping in 2D MicroStation V8I format
- Terrain surface DTM and contour data in 3D MicroStation V8I format
- Terrain surface TIN data in GeoPak format
- Digital orthophoto in TIF and ECW compressed format

Bridge Surfaces

- Bridge surface DTM and contour data in 3D MicroStation V8I format
- Bridge surface TIN data in GeoPak format file

Mobile LiDAR

- Overhead sign vector information in 3D MicroStation V8I format
- Overhead utility vector information in 3D MicroStation V8I format
- Bridge undercarriage vector information in 3D MicroStation V8 format



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