Today’s economic environment poses significant challenges for mapping companies. Numerous operational constraints, combined with growing competition, are squeezing companies’ profitability. In order to compete effectively, mapping companies must boost their operating efficiency and offer customers a truly superior value proposition.

VisionMap’s A3 Digital Mapping System empowers mapping companies to collect and process premium digital mapping products in the most cost-effective way. This case study describes how the A3 System can enable a NAIP project in Colorado to be completed in 60% less time and at 50% of the operational cost of a typical project, without compromising image quality or resolution.

The Challenge

A typical statewide NAIP project requires 1m GSD imagery to be acquired in either three bands (RGB) or four bands (RGBN). Data turnaround can be up to 45 days after the end of the flying season. The project has stringent color and contrast requirements, and cloud cover in the area to be acquired may not exceed 10%.

The state of Colorado is 380-miles wide and 280-miles long. A typical digital large-format camera can cover the entire state in about 120 hours of flight, accounting for 30% of a camera’s average annual operating time of 400 hours. As such, acquisition alone can take almost four months, with data processing and turnaround adding another eight months or more. It is not unusual for a typical project to span more than a year before products are delivered to the customer.
The highly efficient VisionMap A3 Camera can acquire the full area of Colorado in a mere 46 hours of flying, less than 40% of the time required by a typical camera. With 60,000 pixels across track, a flying altitude of 35,000 feet and acquisition velocity of 380 knots, A3 can cover the target area quickly and efficiently while delivering ground resolution of 35cm. With required resolution of only 1m, the raw data can be processed into high resolution products without re-flying the area of interest for further savings.

Using the A3 LightSpeed Processing System, all Colorado mapping data can be processed in 23 days, representing only 2.5 processing days for each day of flying - the fastest rate in the industry. A3 LightSpeed can produce RGB or RGBN orthophotos in any required resolution between 35cm-1m, and process dense DSM and stereo models for mapping purposes. Processing is highly automated and typically requires only one operator. Outputs can be easily ingested into a variety of legacy photogrammetric suites.

A3 offers numerous benefits including:

- **Operational cost reduction.** By cutting flying time from four months to ten days and using only one airplane and camera, the cost of statewide projects can suddenly be made affordable. Fast data turnaround—less than a month rather than the year required by competitive solutions—provided by the automatic processing system further reduces the time to market and cost. A3 requires minimal staff, even for large projects.

- **Multiple products from a single flight.** A3 imagery is processed by A3 LightSpeed into AT, mapping models, DSMs, and orthophotos. RGB/RGBN products are available as well. Producing a variety of products in a single flight reduces cost per product and boosts return on investment. For example, the Colorado flight yielded 1m DSM as well as 35cm GSD orthophotos and allows the client to up-sell additional photogrammetric products.

- **Independent of a priori data.** A3 does not require a DGPS base station or ground control points in order to achieve ~2 pixel RMSE accuracy. The NAIP results can be processed without any survey for control points or deployment of DGPS station, since the 6m horizontal accuracy is easily obtained without any DGPS station or ground controls. Data independence further reduces operational costs and turnaround time.

- **Versatility.** A3 can be deployed on a Learjet in order to cover a large area in 35cm GSD as quickly as possible. Its light weight (~90 pounds), small size, and low power consumption (<160W) also allow it to be deployed on a Cessna 172 or Diamond DA42. This very wide envelope of operation enables it to deliver resolutions ranging from 1inch to 3 ft without FMC constraints.

**Conclusion**

A3 systems operating worldwide have dramatically reduced their operators' project costs. Processing and turnaround time were significantly reduced by A3 Lightspeed. The unique characteristics and capabilities of VisionMap’s A3 System make it ideal for NAIP and similar statewide projects.