

TIME SAVINGS AND COST COMPARISON IN SETTING AERIAL TARGETS

In the field of drone mapping and surveying, efficiency and accuracy in placing Ground Control Points (GCPs) significantly impact project timelines and budgets. This study compares the time and cost of setting two types of aerial targets: traditional 2x2 targets and DronePoints, under realistic field conditions on a 50-acre mapping project.

TEST SCENARIO: SETTING 16 AERIAL TARGETS

Methodology:

Both target types were set by a single survey technician using a truck to drive between preplanned target locations. Timing began upon exiting the vehicle and ended when the worker returned to the truck after setting each target. Each target type was placed in separate trials to ensure consistency and simulate actual fieldwork conditions. The study measures only the time required to set 16 targets, excluding: Travel time between locations; GPS coordinate observations; Target retrieval.

Key Conditions:

- Light soil or vegetation compaction was required for some target placements, especially for larger targets.
- Targets were surveyed the following day by the project surveyor, with coordinate observation times not considered in this analysis.
- The DronePoints stencil feature was not used to maintain consistent target placement methodologies.
- Common 800 nails (8-inch length) were used to secure both target types.



TIME COMPARISON: SETTING AERIAL TARGETS

Traditional 2x2 Aerial Targets

- **Description:** 2'x2' Vinyl black-and-white iron cross targets with a center passthrough and 4 fastening grommets in each corner.
- **Fastening Method:** 5 common 800 nails per target (4 corner nails + 1 center nail for the GPS observation rod rest).
- **Time Per Target:** ~4.08 minutes.
- **Material Costs:** \$12.65 per target with nails (\$10.00 per target, \$0.53 per nail).



Challenges:

- Frequent nail readjustment or target resetting was required due to subsurface obstructions.
- Uneven terrain and subsurface rocks required repositioning and added time.
- Soil or vegetation compaction added to overall effort.
- Extra time was required to properly tension the targets to avoid rod deflection and dynamic surface errors.

DRONEPOINTS AERIAL TARGETS

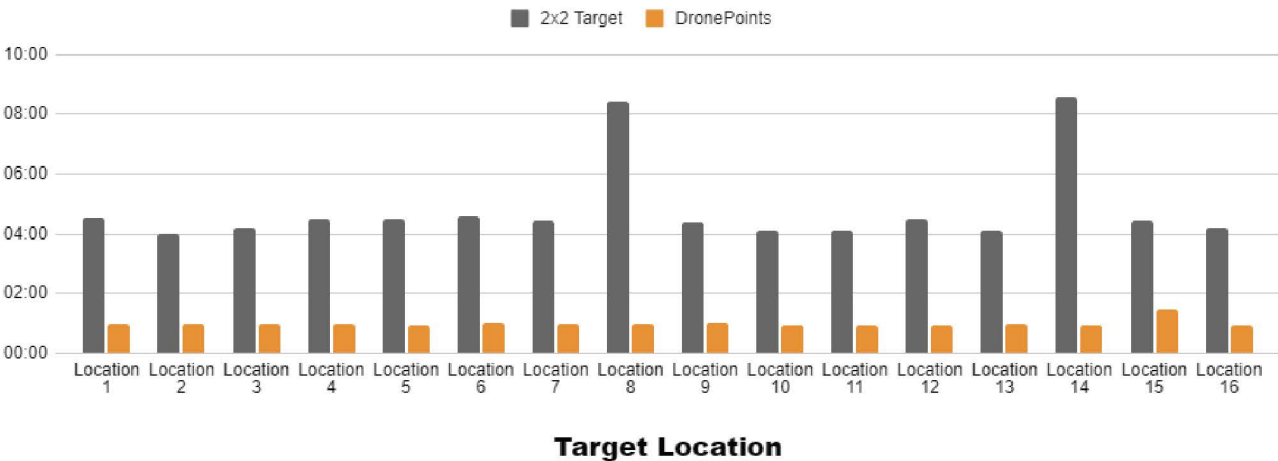
- **Description:** 12" white targets with black center markers, requiring a single 800 8" nail.
- **Fastening Method:** 1 800 8" common nail per target, used as GPS observation rod rest.
- **Time Per Target:** ~57 seconds.
- **Material Costs:** \$7.28 per target with nail (\$6.75 per target, \$0.53 per nail)



Advantages:

- A single nail vastly reduced setup time.
- Pre-installed nails required minimal hardware preparation.
- Minimal repositioning or adjustments due to fewer subsurface obstructions.
- The carrying case kept materials organized and facilitated an efficient placement workflow.

2x2 vs. DronePoints Set Time



DRONEPOINTS

- Rigid target materials eliminated rod deflection and dynamic surface errors.

Time Summary:

- **Traditional 2x2 Targets:** Total setup time: ~77.5 minutes for 16 targets.
- **DronePoints Targets:** Total setup time: ~16 minutes for 16 targets.
- **Time Saved:** ~60 minutes per 16-target project (~80% reduction).

DURATION TO SET 2X2 VS. DRONEPOINTS AERIAL TARGETS		
Target Location	2x2 Target	DronePoints
Location 1	04:33	00:58
Location 2	04:00	00:57
Location 3	04:12	00:58
Location 4	04:29	00:59
Location 5	04:29	00:54
Location 6	04:34	01:02
Location 7	04:27	00:59
Location 8	08:26	00:58
Location 9	04:22	01:00
Location 10	04:05	00:55
Location 11	04:30	00:55
Location 12	04:05	00:56
Location 13	04:30	00:57
Location 14	08:34	00:56
Location 15	04:27	01:27
Location 16	04:13	00:54
Total	1:17:33	0:15:45
Average	04:51	00:59

Superior Consistency and Efficiency

DronePoints offer unmatched consistency, averaging 59 seconds per setup, nearly 5x faster than 2x2 targets. The single 800 nail eliminates the need for multiple fasteners, reducing

DRONEPOINTS

repositioning delays and errors. This efficiency is crucial in hazardous or rugged environments, where survey technicians face rough terrain, extreme weather, and tight deadlines. Faster setup means less exposure to risks, improved productivity, and greater overall field safety.

Overall Cost Comparison

For the labor rate calculations, we applied an hourly billable rate of \$75 per hour for a Survey Technician in the Denver Metro region. Labor costs were determined by multiplying this hourly rate by the calculated average setup time per target (as outlined in Table 1). The resulting figure was then multiplied by 16 to reflect the total labor cost associated with setting all target locations.

Category	Material Cost (\$)	Labor Cost (\$)	Total Cost (\$)	Percentage
Traditional 2x2 Targets	\$185.92	\$97.00	\$282.92	-
DronePoints Targets	\$116.48	\$18.75	\$135.23	-
Savings	\$69.44	\$78.25	\$147.69	52.30%

- Efficiency:** DronePoints reduced setup time by approximately 55%, allowing crews to allocate more time to other critical tasks such as data acquisition.
- Material Cost Effectiveness:** DronePoints reduced material costs by 40% per 16-target project, largely due to the higher cost of 2x2 targets and additional nails required.
- Field Performance:** DronePoints required fewer readjustments and performed consistently across uneven terrain.

RECOMMENDATIONS FOR SURVEYING PROFESSIONALS

- Adopt DronePoints for projects requiring efficient GCP setup, particularly in challenging terrain or on tight schedules.
- Leverage Cost Savings by utilizing the pre-packaged hardware and avoiding additional material preparation.
- Ensure Data Integrity through consistent and precise placement methods supported by DronePoints' durable and easy-to-use design.

Visit our website and learn more.