

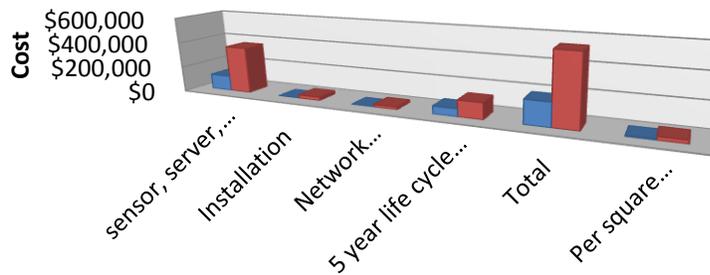


A Single-sensor, Long Range, Wide Field of View System (SSWFOV) is one producing a 4° x 90° FOV. This sensor is suitable for outdoor use in a temperature range of -30° to 50° C with a 200mm lens giving it a GSD of 2.3” at 1 mile.

A Camera Array (Array) is defined as a collection of sixty eight (2 x 34 Array), 5-Megapixel cameras - this is a color, COTs camera used for port security. The aggregate FOV is 4° x 90°. These cameras are suitable for outdoor use in a temperature range of at least -30° to 50° C providing a GSD of 2.2” at 1 mile. **The video from these cameras must be “stitched” together in order to form a panoramic view similar to the single large format camera. Camera placement and angular alignment relative to each other is vitally important to aligning the FOVs along the vertical boundaries where the “stitch” is made.**

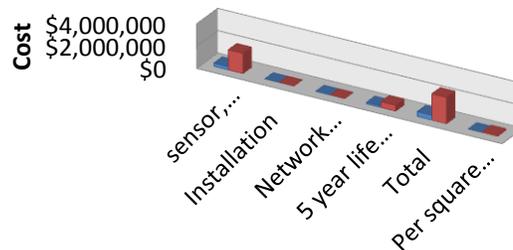
The SSWFOV and Array come in both Visible Light and Mid wave IR variations.

Visible Light System



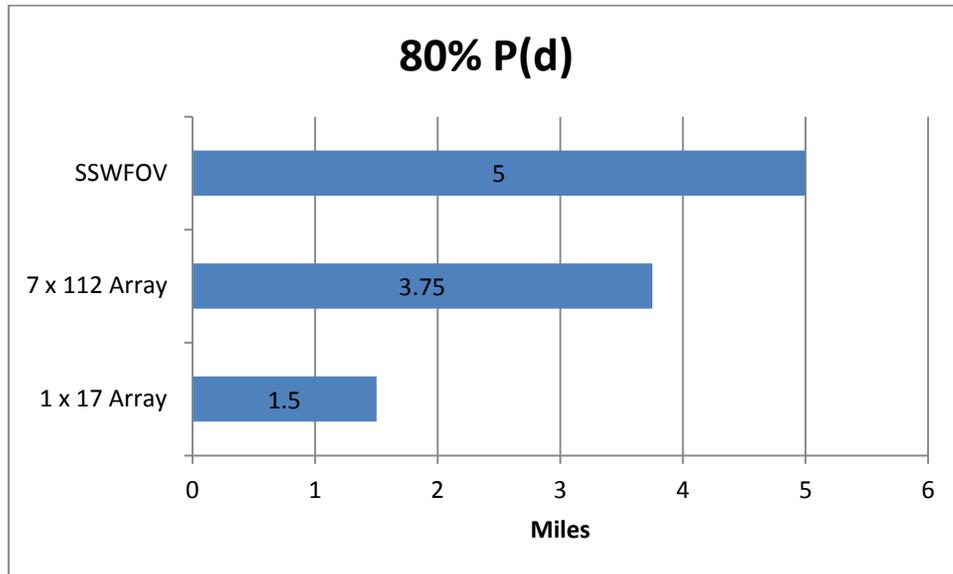
	sensor, server, software	Installation	Network infrastructure	5 year life cycle cost	Total	Per square mile coverage
■ SSWFOV	\$120,000	\$750	\$300	\$60,000	\$181,050	\$9,053
■ 68-Camera array	\$365,709	\$27,200	\$20,400	\$125,050	\$538,359	\$26,918

Midwave IR System



	sensor, server, software	Installation	Network infrastructure	5 year life cycle cost	Total	Per square mile coverage
■ SSWFOV	\$300,000	\$750	\$300	\$150,000	\$451,050	\$22,553
■ 15-Camera array	\$1,817,010	\$6,000	\$4,500	\$533,813	\$2,361,323	\$118,066

Optimum detection performance requires matching lens quality with camera and sensor pixel size and is dependent upon whether a color or monochrome sensor is used: The panoramic view of the visible light SSWFOV and the Array are very similar in physical size. However, the 5 MP camera used in the array has a smaller pixel pitch (2.2 micron) and requires a much higher quality lens to match the performance of the sensor (7.4 micron pixel pitch) in the SSWFOV. To demonstrate the effect of pixel pitch on detection performance, the spatial resolution of the two systems was modeled using the default lens quality in the Army's SSCAMIP model. **As a result, images resolved at distance with the Array will not be as clear as those resolved with the SSWFOV.** This "clarity" is technically referred to as "spatial resolution". The practical implications of this can be seen in the following P(d) chart.



The above chart shows the SSWFOV has an 80% probability of detecting a human-sized target at a **distance of 5 miles** while the 1 x 17 camera Array (60mm lens) has an 80% probability of detecting a human-sized target but only at a **distance of 1.5 miles.**

This brings up the question, "Why not put a larger zoom lens on the cameras within the Array in order to resolve human-sized targets at greater distances?" This chart also shows us that the use of a 400mm lens gives a P(d) of 80% at only 3.75 miles but has the unfortunate effect of increasing the number of cameras in the Array to 7 cameras high by 112 cameras wide. **A 7 x 112-camera Array (784 total cameras) is not a feasible solution.** For this reason, the TCO comparison was made with an Array of 2 x 34 cameras even though the 68-camera Array does not have the spatial resolution of the SSWFOV which means the 68-camera Array does not have the ability to detect human-sized targets at long distances.

Of the four systems examined in the full text of the TCO document, only the SSWFOV system has the ability to display and archive a persistent view of a very large area **AND** provide the ability to zoom in on a virtually unlimited number of targets with clarity and high resolution ranging from 650' to several miles away. **Simultaneous wide area and high resolution surveillance.**

Of the four systems examined in the full text of the TCO document, only the SSWFOV system provides an 80% probability of detection of human-sized targets at 5 miles while maintaining a persistent 90° HFOV.

Of the four systems, SSWFOV system meets all of the mission requirements and has the smallest TCO.

This datasheet is an excerpt of the *TCO Analysis for the Use of Wide Angle Video Sensors*.
Please consult the full text for details.