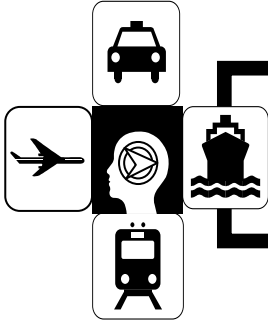


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Tech Brief

A Comparison and Analysis of KA-Band Radar vs. X-Band Radar

FHWA-NJ-2007-022

December 2007

PROBLEM:

The New Jersey State Police currently utilizes X-band traffic radar. New Ka-band radar technology allows smaller, safer and more versatile units to be employed. To successfully utilize the new Ka-band radar units their speed measurement accuracy must be established in a scientific manner that will be accepted by the New Jersey courts.



SOLUTION:

This research project

- 1) designed a program for testing the new Ka-band radar units,
- 2) monitored and assisted the implementation of this testing program,
- 3) reviewed and validated the test results,
- 4) provided conclusions on performance and
- 5) documented these conclusions in a form that should be accepted by the New Jersey courts.

APPROACH:

To evaluate the performance of Ka-band traffic radar, the most technologically advanced available units from the two leading traffic radar manufacturers were selected for field testing. The Ka-band radars chosen were a Stalker DSR 2X and an MPH BEE-III. These units were mounted

side-by-side with an MPH K55 X-band radar presently used by the New Jersey State Police and accepted as a standard by the New Jersey courts. Comparison tests were conducted in a variety of locations with actual road traffic under fair, rain and snow weather conditions. Tests were conducted when both stationary and moving.

RESULTS:

More than 1,000 measurements proved:

- 1) Ka-band radar speed measurements correlate very closely with the X-band measurements (mean difference 0.165 mph and standard deviation 0.762 mph),
- 2) Weather had minimal affect on the Ka-band performance, and
- 3) Indicated speeds are well within National Highway Traffic Safety Administration (NHTSA) standards.

The relative characteristics and performance of available laser speed detection units were also investigated. 200 independent laser measurements were taken that complimented and substantiated earlier work in New Jersey proving the accuracy of laser speed measurements (mean difference 0.125 mph and standard deviation 0.748 mph)..

TCNJ student research assistant Steve Mach taking a laser speed detection measurement



CONCLUSIONS AND FINDINGS:

New Ka-band traffic radar units offer advantages over old X-band radar in size, safety and versatility.

Both Ka-band traffic radars investigated and the laser-band unit were shown to be as reliable and accurate as the present X-band standard.

New and innovative programs like the introduction of the Ka-band radar speed detection devices will enable the State Police to enhance their speed enforcement program to better serve the motorists who travel New Jersey's highways.

FOR MORE INFORMATION CONTACT:

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A final report is available online at

<http://www.state.nj.us/transportation/refdata/research>

If you would like a copy of the full report, please FAX the NJDOT, Bureau of Research, Technology Transfer Group at (609) 530-3722, or send an e-mail to Research.Bureau@dot.state.nj.us and ask for:

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