

Table 1: High Level Coverage Impacts of Various Technology Transitions

Transition From	Transition To	Coverage Impact
Analog FM Wideband (25-kHz, 5 kHz Deviation)	Analog FM NPSPAC (12.5-kHz, 4 kHz Deviation)	Some Coverage Loss
Analog FM Wideband (25-kHz, 5 kHz Deviation)	Analog FM Narrowband (6.25-kHz, 2.5 kHz Deviation)	Significant Coverage Loss
Analog FM Wideband (25-kHz, 5 kHz Deviation)	Digital Project 25 Phase I (12.5-kHz, FDMA)	Little Impact
Analog FM Wideband (25-kHz, 5 kHz Deviation)	Digital Project 25 Phase II (12.5-kHz, TDMA)	Little Impact
Analog FM NPSPAC (12.5-kHz, 4 kHz Deviation)	Analog FM Narrowband (6.25-kHz, 2.5 kHz Deviation)	Some Coverage Loss
Analog FM NPSPAC (12.5-kHz, 4 kHz Deviation)	Digital Project 25 Phase I (12.5-kHz, FDMA)	Little Impact
Analog FM Narrowband (12.5-kHz, 4 kHz Deviation)	Digital Project 25 Phase II (12.5-kHz, TDMA)	Little Impact
Digital Project 25 Phase I (12.5-kHz, FDMA)	Digital Project 25 Phase II (12.5-kHz, TDMA)	Little Impact

Fireground Noise continued from previous page

Evaluating Communication Systems: NIST Testing

The test to evaluate the intelligibility of communication systems evaluated three systems. Two vocoder technologies—the baseline Project 25 (P25) Full Rate vocoder and the P25 Enhanced Full Rate vocoder—were compared against a 25 kHz analog FM pair under nine different noise conditions. In three of the background noise conditions, testers also evaluated 12.5 kHz analog FM to determine whether or not that might be a viable alternative to meet the FCC’s narrowbanding mandate while still providing a required level of intelligibility to the user. The communication systems were tested in the following conditions.

- No mask, background noise
- No mask, fire truck pump panel
- Mask, with no background noise
- Mask, two PASS alarms
- In-mask low air alarm
- Mask, rotary saw cutting metal garage door
- Mask, chainsaw cutting wood

- Mask, 2½” hose with fog nozzle
- Amplified mask, rotary saw cutting metal garage door

ITS engineers, in collaboration with the Testing Subcommittee, decided upon a protocol known as the Modified Rhyme Test (MRT) to evaluate the behavior of digital and analog communication systems in the presence of fireground noise. In this type of test, each tester listens to a sentence asking the individual to select a word from a list. The intelligibility of a communication system can be difficult to quantify since it is a subjective issue, relying on an individual’s ability to discern words. The listeners’ ability to select the correct word is averaged across a panel of test listeners and produces a percentage of intelligibility score. The NIST report and a full report of the DPWG including analysis of the test results, suggested best practices, and recommendations will be issued later this summer.

Charles Werner is Chief of the Charlottesville (VA) Fire Department and DPWG Chair.