THE MULTIPHASE APPROACH TO BRIDGE DECK NDE IS A METHODOLOGY IN WHICH AERIAL IMAGING, VEHICLE-BASED NDE SCANNING, AND TRADITIONAL TESTING METHODS ARE STRATEGICALLY COMBINED TO DELIVER QUANTITATIVE INFORMATION FOR IMPROVED ASSET MANAGEMENT.

### PHASE 0

**FIXED WING OR UNMANNED AERIAL SYSTEM (UAS)**

Infrared and visual imaging to provide quantities of:

- Shallow delamination
- Overlay debonding
- Spalling and patching

### PHASE 1

**HIGHWAY SPEED VEHICLE-BASED SCANNING**

Ground penetrating radar (GPR), infrared thermography (IR), and high resolution visual (HRV) data are analyzed to quantify and map:

- Delamination at top rebar
- Overlay debonding
- Corrosion activity
- Spalling, patching, and cracking
DECK ACOUSTIC RESPONSE (SOUNDAR)

SounDAR collects rolling-speed acoustic data through a programmed array of impactors and customized microphones. The recorded data is similar in principle to chain-drag and impact-echo, and is analyzed to identify areas of decreased structural integrity including delaminations throughout the bridge deck.

VALIDATION & MONITORING

Validation
+ Chloride ion penetration testing
+ Petrographic analysis of core samples
+ Half-cell potential measurements
+ Manual chain-drag

Monitoring
Performance of structures can be monitored through repeated Phase 0, I, and/or II surveys or via dedicated on-site data collection systems.

BDI’s modular structural monitoring system can be applied in laboratory or field settings allowing for research projects or large scale, high-speed, permanent monitoring systems. With simple power and communication options coupled with easy-to-configure software, these systems can be designed and installed efficiently to provide owners with effective monitoring of their assets.