Nondestructive Testing for Tunnels (R06G)

Tool Selection Matrix
## Nondestructive Testing Techniques Versus Bridge Sounding

<table>
<thead>
<tr>
<th>NDT Technique</th>
<th>Mode of Deterioration Detected</th>
<th>System</th>
<th>Resolution</th>
<th>Lane Closure</th>
</tr>
</thead>
</table>
| IE            | 1) Deeper cracks - top and bottom rebar mat  
2) Shallow delamination  
3) Concrete degradation | 1) Scanning  
2) Point by Point | High Grid size | Yes          |
|               |                                                                                               |                            |            | Yes          |
| GPR           | 1) Rebar Mapping  
2) Cracks (if associated with moisture intrusion or deicing salt)  
3) Concrete degradation | 1) Air Coupled Scanning  
2) Ground coupled | Lower High | No/Maybe     |
|               |                                                                                               |                            |            | Yes          |
| LiDAR         | 1) Liner Distortion/Movement  
2) Asset Mapping  
3) Crack Mapping | 1) Scanning                  | High Low   | Yes          |
|               |                                                                                               |                            |            | No           |
| IR            | 1) Shallow/Tile delamination  
2) Moisture Intrusion | 1) Scanning  
2) Handheld | High High | No           |
|               |                                                                                               |                            |            | Yes          |
| SASW          | 1) Vertical cracks  
2) Concrete degradation | 1) Scanning  
2) Point by point | High Grid size | Yes          |
|               |                                                                                               |                            |            | Yes          |

### Sounding
- Only shallow delamination
- Manual
- Yes
Program vs Project NDT

Network wide level
- Air coupled GPR
- Truck mounted IR
- Truck mounted LiDAR

Project level
- IE scanning
- Ground coupled GPR
- SASW