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**2021 Initial Idea Development**

*2021-2022 NRRA Research and MnROAD Construction Development*

*(Updated Form – March 23, 2021)*

*Initial Proposal is for NRRA Executive Team to Approve for further development (keep to two pages)*

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| **Research Title:** | Predicting and Preventing Panel Buckling in Concrete Pavements |
| **NRRA Team(s):** | Rigid |
| **Type of Effort:** | Synthesis |
| **Developed By:** | Tim Andersen- MnDOT, Peter Taylor- ISU CPTech, Sheue Lee -Terracon, Tom Burnham-MnDOT |
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| **Phone:** |  |

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| **Research Funding Estimate:** | $50,000 |
| **Research Years Expected:** | 9 to 12 months |
| **Beneficial Partnerships:** | PM Team |

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| **Number of Test Sections:** | N/A |
| **Instrumentation Effort:** | N/A |
| **MnROAD Monitoring:** | N/A |

**Research Objectives:**

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| To develop a synthesis focused on understanding concrete panel buckling as it relates to:   * Current extent of issue in NRRA states. * Documented or suspected causes of buckling. * Prediction of conditions conducive to panel buckling. * Actual or potential mitigation measures.   This synthesis would also be tasked with recommending potential test sections that might be constructed on the MnROAD LVR to address any unresolved issues/concerns discovered during the development of the synthesis. |

**Pavement Test Cells Needed:**

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| None in this first phase. Some ideas were discussed with regards to potential test sections constructed on the MnROAD LVR that would allow further identification and quantification of the mechanisms involved in creating conditions conducive to panel buckling. |

**NRRA Sustainability/Resiliency and or Intelligent Construction:**

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| Concrete pavements are only sustainable if they perform well long term. In additional to preserving the asset, the safety aspect of preventing panel buckling is of utmost importance. |

**Cross-cutting Opportunities:**

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| There is an active research project: “Evaluation of Concrete Pavement Buckling in Wisconsin” that could provide valuable information to this synthesis. There is interest by the NRRA PM team in identifying best practices for the repair of buckled slabs. |

**Implementation Plan:**

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| Findings from this synthesis could be used by agencies to be proactive in identifying potential areas conducive to panel buckling, as well suitable and effective preventive measures. They may also be influential in changing concrete pavement design features or construction practices. Implementation would be dissemination of the information in the form of a tech brief and final report posted on the NRRA Team webpage(s), as well as presentations at NRRA and other pavement related conferences. |