

# 2019 UDOT RESEARCH PROBLEM STATEMENT

\*\*\* Problem statement deadline is Feb. 6, 2019. Submit statements to [UTRAC@utah.gov](mailto:UTRAC@utah.gov). \*\*\*

**Title:** Thresholds for intermediate temperature cracking using Flexibility Index

**No. (Office Use):** 19.01.05

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Select **ONE** Subject Area  Materials/Pavements  Maintenance  Traffic Mgmt/Safety  Structures/Geotech  
 Planning  Perf Mgmt/Data Analytics  Public Transportation  Other

## 1. Describe the problem to be addressed:

Seven different hot-mix asphalt samples were collected at the production plant and at laydown then tested to determine their flexibility index, FI, which relates to intermediate temperature cracking. The results varied from an FI of 3 to an FI of 20 and successfully identified mixtures with high RAP and/or low binder content. While it is known that asphalt mixtures with low FI values will have high propensity for cracking, an actual threshold value has not been determined in the state of Utah. Values between 5 and 10 have been suggested for other states (Illinois, Wisconsin, etc.). Since the seven mixtures tested were placed on actual roads, their early performance can be easily documented to determine what the appropriate limit should be for the state of Utah.

## 2. Write the project objective (25 words or less):

To determine the appropriate limit(s) for the Flexibility Index based on field performance.

## 3. Explain why this research is important:

(In response, consider addressing specific UDOT goals, applicability in Utah or other states, etc.)

UDOT is in the process of implementing the BBR for low temperature cracking and the Flexibility Index (either in the SCB or IDEAL configuration) for intermediate cracking. While limits have been established for the low temperature part, no values have been determined for intermediate temperatures. Thus, it is important to be able to document the early performance of pavement sections for which the material has already been tested.

## 4. List the major tasks:

1. Perform a literature review of the limits imposed by other states that have adopted the FI as a parameter
2. Perform a condition survey of the pavement sections for which the material was collected and tested, including weather and traffic (either through Mandli surveys or on-site visits)
3. Identify those sections with early cracking (1 or 2 years cycle) and relate their performance to the measured FI
4. Report results

## 5. List the expected deliverables (reports, manual, specification, design method, training, etc.):

1. A determination of the FI limit to prevent asphalt mixtures with potential for intermediate temperature cracking
2. A specification to reduce the risk of intermediate temperature cracking
3. A report

## 6. Describe how the research results will be implemented:

(In response, consider addressing UDOT leader support, process or standard improvement, etc.)

Once the low limit for FI has been established as a potential parameter to reduce the risk of placing mixture susceptible to intermediate temperature cracking (based on either SCB or IDEAL configuration) guidance will be issue to producers and a trial

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period (measure FI for information only) will be established. Based on the results, a performance related specification will be created

<b>7. Requested from UDOT: \$40,000</b>	<b>Other/Matching Funds: \$20,000</b>	<b>Total</b>
<b>Cost: \$60,000</b>		
<b>(or UTA for Public Transportation)</b>		

### 8. Outline the proposed schedule, including start and major event dates:

Fall 2019 – Literature Review  
Spring 2020 – Survey the condition of the pavements  
Summer 2020 – Establish a relation  
Fall 2020 – Report results.