

**Request for Research Funding for FY 2022-2023**

**SPR Subpart B Project: SMO-23-05**

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|---|--|--|--|
| <b>Requesting Office</b>  | State Materials Office   | <b>Priority</b>  | 5 of 10 (projects may not have the same ranking – no ties) |
| <b>Proposed Title</b>   | Evaluation of Type XI Retroreflective Sign Sheeting Materials by Accelerated Laboratory Weathering   |  |  |
| <b>Justification</b>  | Florida Department of Transportation (FDOT) requires the use of Type XI retroreflective sheeting materials for most of the highway signs. These materials are required to meet ASTM D4956 and FDOT Specification 994 requirements after 36 months of outdoor exposure to assess their potential long-term performance. The goal is to assess how sunlight, temperature fluctuations, humidity fluctuations, rain, and other atmospheric factors will affect the product and predict if the product will meet FDOT standards over its expected life. This research seeks to validate laboratory weathering testing protocol recommended after literature review completed for <i>BE717 Accelerated Weathering of Traffic Control Materials by Laboratory Testing</i> . The accelerated testing protocol will reduce testing time from 36 months to 6 months. Approved Product office currently offers conditional approval, if needed, because of the lengthy process of outdoor weathering. If an accelerated weathering laboratory method is validated, the test results will provide more confidence to APL office to approve sign sheeting materials in shorter time. |  |  |
| <b>Impact</b>   | If recommended protocol is validated, the Department may be able to accept new products submitted for Approved Product List in less than a year. This will benefit both the Department and Industry. The Department may use this data to better assess quality of materials.   |  |  |
| <b>Affected Offices</b>   | Program Management (Approved Product and Specification Offices) and the State Materials Office will be intimately involved in the research and its implementation.   |  |  |
| <b>Existing Work</b>  | <p>Laboratory-accelerated versus outdoor weathering for retroreflectivity sheeting specifications, Transportation Research Record, Issue 1657, 1999, p. 63-70.</p> <p>Life expectancy of retroreflective sheeting for road signs in various conditions of natural and artificial weathering, Publication of: Australian Road Research Board, Volume 15, Issue 5, 1990, p. 137-154</p> <p>Accelerated Weathering of Traffic Control Materials by Laboratory Testing, BE717</p>  |  |  |
| <b>Keywords Used In Existing Work Search (Cannot leave blank)</b> | Accelerated Laboratory Weathering Sign Sheeting  |  |  |
| <b>Related Contracts (Give contract numbers)</b>                  | BE717  |  |  |
| <b>Funding Request</b>  | 150,000  | <b>Anticipated Duration</b>  | 18 months  |
| <b>Project Manager</b>  | Awilda Merced  | <b>Contracting Method</b>  | RFP  |
| <b>Equipment</b>  | Estimated equipment cost (or N/A)  | N/A  |  |
| <b>Urgency</b>  | Score 1-5 1= highest, most immediate need  | 2- This project will provide the Department a faster weathering protocol to approved sign sheeting materials).   |  |
| <b>Implementability</b>   | Score 1-5 1=greatest likelihood of and proximity to implementing results   | 2- If <b>BE717</b> protocols are validated, FDOT will have better chance to convince the industry to include the accelerated laboratory weathering testing as approval requirement in sign sheeting material specifications. |  |

**Project Benefits (Succinct, complete explanation)**

**Results from this project will help to determine if recommended accelerated laboratory weathering testing protocol can be used in lieu of current outdoor weathering protocol. The accelerated laboratory weathering would reduce testing time to 6 months (16%) of current testing time (36 months).**

| <b>Project Benefits<br/>(Select all that apply and explain)</b> | <b>Quantifiable Benefits<br/>(units, dollars, etc...if applicable)</b> | <b>Methodology or Data Sources Used to Determine Quantifiable Benefits. If not applicable, please give justification of project benefits</b>                             |
|---|--|--|
| <input type="checkbox"/> Materials Enhancement                  |  |  |
| <input type="checkbox"/> Materials Savings                      |  |  |
| <input type="checkbox"/> Time Savings                           | Reduce testing from 36 months to 6 months.                             | The accelerated laboratory weathering would reduce testing time to 6 months (16%) of current testing time (36 months). Sign Sheeting materials would be approved faster. |
| <input type="checkbox"/> Lives Saved/Injuries Prevented         |  |  |
| <input type="checkbox"/> Other (Explain)                        |  |  |

\*Comments should explain and support urgency, financial benefit, and implementability scores