AIM Innovation Showcase Application

# Sponsor

**Nominations must be submitted by an AASHTO member DOT willing to help promote the innovation.** If selected, the sponsoring DOT will be asked to present the innovation at the Innovation Showcase during the AASHTO Spring Meeting.

1. Sponsoring DOT (State): Florida

2. Name and Title: Dan Hurtado

Organization: FDOT

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State: FL

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# Innovation Description (30 points)

The term “innovation” may include processes, products, techniques, procedures, and practices.

3. Name of the innovation:

Field permeameter

4. Please describe the innovation.

Developed a testing device and analysis program to measure the hydraulic conductivity of in-situ porous/open-graded asphalt friction courses.

5. What is the existing baseline practice that the innovation intends to replace/improve?

This device replaced a less accurate device and analysis program.

6. What problems associated with the baseline practice does the innovation propose to solve?

The equations used to calculate the permeability values with previous devices did not account for the variation in flow rate with dropping head pressure and also changed the shape of the base from square to circular to better solve for the flow rate through the pavement.

7. Briefly describe the history of its development.

The earliest version of the field permeameter was a standpipe with a base that technicians stood on (to seat to the pavement) and the flow time was measured. Subsequently, hydraulic equations were developed similar to the lab permeability device, for calculating the coefficient of permeability and standardized weights were developed to better seat the device during testing.

8. What resources—such as technical specifications, training materials, and user guides—have you developed to assist with the deployment effort? If appropriate, please attach or provide weblinks to reports, videos, photographs, diagrams, or other images illustrating the appearance or functionality of the innovation below (if electronic, please provide a separate file). Please list your attachments or weblinks here.

Please see the linked report titled “Study of the field hydraulic conductivity of thin open-graded friction courses” in the Journal of Construction and Building Materials. <https://www.sciencedirect.com/science/article/abs/pii/S0950061821019966>

# State of Development (10 points)

Innovations must be successfully deployed in at least one State DOT. The AIM selection process will favor innovations that have advanced beyond the research stage, at least to the pilot deployment stage, and preferably into routine use.

9. How ready is this innovation for implementation in an operational environment? Please select from the following options. Please describe.

Innovation is fully functional and yet to be piloted.

Innovation has been piloted successfully in an operational environment.

Innovation has been deployed multiple times in an operational environment.

Innovation is ready for full-scale implementation.

FDOT has used this device on multiple projects and the National Center for Asphalt Technology has also utilized the device on research projects.

10. What additional development is necessary to enable implementation of the innovation for routine use?

A test method needs to be written, which would include detailed drawings of the device. In addition, for project implementation, ruggedness and precision studies should be conducted.

11. Do you have knowledge of other organizations using, currently developing, or showing interest in this innovation?  Yes  No

If so, please list organization names and contacts.

|  |  |  |  |
| --- | --- | --- | --- |
| **Organization** | **Name** | **Phone** | **Email** |
| National Center for Asphalt Technology | Randy West | 334-844-6244 | westran@auburn.edu |
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# Potential Payoff (30 points)

Payoff is defined as the combination of broad applicability and significant benefit or advantage over baseline practice.

12. Identify the top three benefits your DOT has realized from using this innovation. Describe the type and scale of benefits of using this innovation over baseline practice. Provide additional information, if available, using quantitative metrics, to describe the benefits.

|  |  |
| --- | --- |
| **Benefit Types** | **Please describe:** |
| Improved Asset Performance | Permits the evaluation of construction variability and its impact on permeability for porous friction courses. |
| Improved Safety | Ensuring porous friction courses have adequate permeability enhances public safety by reducing the risk of hydroplaning and increasing visibility by reducing road spray. |
| Other (please describe) | The device can also be used to develop new types of porous friction course mixtures and compare them to the current mixtures in use. |

Provide any additional details below:

Click or tap here to enter text.

# Deployability (30 points)

The AIM selection process will favor innovations that can be adopted with a reasonable amount of effort and cost, commensurate with the payoff potential.

13. What challenges and/or lessons learned should other organizations be aware of before adopting this innovation?

There is not a current supplier of the device. FDOT’s device was fabricated in-house by a staff machinist. The device can easily be fabricated by any commercial machine shop, but it is not currently available for purchase at typical asphalt equipment supply companies.

14. Please provide details of cost, effort, and length of time expended to deploy the innovation in your organization.

**Cost**: The equipment is rather simple in design and materials, and costs should not exceed $1,000.

**Level of Effort**: Fabrication effort and time are rather minimal once the materials are acquired. The Excel software analysis program is already developed and ready for distribution. A method/device for supplying water in a field setting is necessary.

**Time**: Less than two days for equipment fabrication by an experienced machinist.

15. To what extent might implementation of this innovation require the involvement of third parties, including vendors, contractors, and consultants? If so, please describe. List the type of expertise required for implementation.

It would be beneficial if an asphalt supply company would fabricate and sell the device.