



STRATEGIC RECYCLING PROGRAM FACT SHEET

Date: FY 2020

Project:
Hot-in Place (HIP)
Recycling of Asphalt
Pavement

Site Locations:
PennDOT District 10-0
Armstrong and Indiana
Counties

PennDOT District 11-0
Allegheny County

Date of Project:
2016-2017

Recycled Material:
Recycled asphalt
pavement (RAP)

Partnerships:
The Pennsylvania
Department of
Environmental
Protection provided
funding and assistance
for this project.

Did you Know?
HIP uses up to 35 % less
energy than conventional
paving methods and uses
up to 50 % less asphalt
cement than
conventional equivalent
methods.
By using less energy and
emitting fewer
greenhouse gases than
other pavement
methods.

Introduction

There are limited material resources to repair the many miles of pavement in Pennsylvania. Hot-In-Place (HIP) Asphalt Recycling is an on-site, in place pavement rehabilitation method. This system consists of heating, scarifying, adding a rejuvenating agent, mixing, placing, and compacting the recycled bituminous pavement. The benefits of using HIP include; using the existing asphalt pavement rejuvenated to remove surface distresses, less pollution, and less fuels consumed transporting materials. Fewer resources are used than under normal asphalt recycling, which includes milling the surface, transporting the millings to a plant to be heated and rejuvenated, and then back to the site for placement.



Scarified Asphalt Surface during construction of the Allegheny County Project Site

Summary of Projects



Construction of Armstrong County Project Site

PROJECT 1: Allegheny County

The project consisted of a 2-lane highway 3.75 mile long section of SR 1019 located between Segment/Offset 0100/0000 to Segment/Offset 0170/0864. The AADT varies from 670 vehicles with 9% trucks to 2,890 vehicles with 4% trucks. The roadway width is approximately 20' over the length of the project with four foot shoulders on both sides. The project was completed across the entire mainline and shoulder (out to out). After the HIP process is completed, a sealcoat surface treatment was applied by Allegheny County Department Forces.

During construction this project experienced flushing issues and challenges with pavement markings. However, the oil content of the mixture was adjusted and the flushing issue was controlled. This project did fix some areas of major rutting.

During the 2019 field evaluation, the project was performing fairly with areas of bleeding and some pot-holes observed.

Overview of Projects

A total of three HIP paving projects were performed in the Commonwealth; specifically, two in District 10-0 (Armstrong and Indiana Counties) and one in District 11-0 (Allegheny County). Each Project location was carefully chosen based on use and average annual daily traffic (AADT).

PROJECT 2: Indiana County

The project consisted of a 2-lane highway 8 mile long Section of SR 0085 located between Segment/Offset 0020/0000 to Segment/Offset 0160/2241. The AADT varies from 2,204 vehicles with 19% trucks to 3,683 vehicles with 9% trucks. The roadway width is approximately 22' over the length of the project. After the HIP process was completed, a two layer microsurfacing treatment was applied.

With the exception of minor issues with shoulder break-off, there were no reported quality control or placement issues encountered during project execution. The maintenance crew shored the areas where extreme shoulder break-off occurred.

During the 2019 field evaluation, the pavement appeared to be performing well with a minimal amount of distress from the original pavement was observed.

PROJECT 3: Armstrong County

The project consisted of a 2-lane highway section of SR 0056 between Segment/Offset 0150/0000 to Segment/Offset 0210/0000. The AADT is approximately 6968 vehicles with 4% trucks. The roadway width is approximately 22' over the length of the project. After the HIP process was completed, a surface treatment was applied consisting of either micro-surfacing or thin asphalt overlay.

There were no reported quality control or placement issues encountered during project execution.

During the 2019 field evaluation, the project was performing poorly with reflective cracking observed at the joints which is attributed to the concrete slabs.



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Project Updates

During project development, the Work Plan proposed formal evaluations of each project location for a period of three years; therefore, a final evaluation is expected to occur during the 2020 Fiscal Year. To date, based on the performance of these projects, the PennDOT New Products Evaluation and Research Department is considering making improvements to a draft specification for the HIP Asphalt Recycling Process. Specifically, the Evaluation group is considering revising the guidelines on acceptable pavement conditions for future projects.

After a final Specification for the HIP process is approved and published, this Fact Sheet will be updated to reflect those changes.

Project Pictures During Construction:



Post-construction view of the Indiana County Project Site



View of HIP Process at the Allegheny County Project Site

2018 Project Site Inspection Pictures:



View during the one year evaluation of the Indiana County Project Site



Surface bleeding observed during the one year evaluation of the Allegheny County Project Site

Project Contacts:

The [New Products Evaluation and Research Department](#) can provide project specific research details.

For Additional Information:

Go to the Strategic Recycling Program page on the PennDOT website at: <https://www.penndot.gov/ProjectAndPrograms/RoadDesignEnvironment/Environment/PollutionPrevention/Pages/default.aspx>. or send a request to PennDOTSRP@pa.gov.