The Pavement Resource Program (PRP) is an independent, university-based research lab and service provider for federal and state agencies, local municipalities, and industry. Together, they work tirelessly to maintain and improve the quality and durability of the region’s roads and highways.

PRP conducts wide-ranging pavement research; tests materials for transportation agencies and commercial producers; develops materials and methods to improve and maintain roadway infrastructure; and educates working professionals and young people who will lead the field in the future. PRP is part of Rutgers’ Center for Advanced Infrastructure and Transportation, a U.S. Department of Transportation-designated University Transportation Center.
Rutgers Asphalt Pavement Laboratory

PRP conducts wide-ranging pavement research; develops and tests materials for transportation agencies and commercial producers; conducts pavement evaluation, design, and management to improve and maintain roadway infrastructure; and educates working professionals and young people who will lead the field in the future.

RAPL's capabilities include: materials, structural, and performance testing; pavement design and evaluation for conventional, modified, recycled, and specialty asphalts; advanced materials development; specifications assessment and formulation; and materials modeling.

RAPL focuses on practical solutions and implementation encompassing materials, pavement design, advanced materials development, pavement design practices, technology transfer, and training.

The lab is well equipped to perform all routine mixture design and quality control tests for aggregates, asphalt binder, and asphalt mixtures, as well as advanced- and research-grade test methods.

RAPL also performs significant forensic investigations to help customers determine cause of asphalt failure or underperformance.

Lab staff includes six full-time engineers with certification from the Society of Asphalt Technologists of New Jersey (NJSAT) and NorthEast Transportation Technician Certification Program (NETTCP).

For a full list of RAPL testing capabilities, equipment, and material and design services, contact PRP.

CASE STUDY

Project: Evaluation of Plant-Produced High-Percentage RAP Mixtures in the Northeast Customer: FHWA Transportation Pooled Fund

PRP evaluated the use and performance of recycled asphalt pavement (RAP) containing high percentages of recycled materials, especially concentrating on plant-produced asphalt mixtures. This multi-faceted study showed significant performance differences can occur simply due to typical plant production variations and silo-storage times.

In addition, using “softer” asphalt binder did not always result in better performance, since effective asphalt content of these mixtures is critical. Performance-related specifications (PRS) and increased asphalt content—either by increasing in the void in mineral aggregate (VMA) in the mixture or reducing the amount of RAP binder in the total asphalt content—were found to be the best method to improve fatigue cracking resistance and durability of high-RAP asphalt mixtures.

CASE STUDY

Project: Newark and JFK International Airports Asphalt Mixture and Binder Fatigue/Durability Performance and Their Correlation to Field Observations Customer: Port Authority of New York & New Jersey

Newark International Airport and JFK International Airport were experiencing premature fatigue cracking on their runways. Sample field cores were taken from runways that were different ages and exhibiting different levels of cracking. Asphalt mixture and binder tests were conducted on the recovered cores and their performance was indexed. The study provided recommendations regarding asphalt mixture and binder performance tests to help mitigate fatigue cracking on asphalt airfield pavements in the future.
Pavement Evaluation, Design, and Management Capabilities

The pavement experts at PRP provide a range of evaluation and assessment services to help better manage roadways. This may take the form of network-level pavement condition evaluation using a traffic-speed deflectometer or project-level pavement condition evaluation and overlay design.

Monitoring and understanding the condition of a road network is the first step in good pavement management. PRP has done manual condition-data surveys on more than 600 miles of New Jersey municipal roads since 2010 and has extensive experience with automated data collection using systems such as Pathway and Pavometrics. PRP also supports agencies by developing and implementing data quality control procedures to ensure accurate data reporting.

Our professionals are well versed in mechanistic-empirical (ME) pavement design and characterizing material properties for ME. For example, PRP helped New Jersey DOT implement AASHTO standards for ME throughout the state.

CASE STUDY
Project: HMA Pay Adjustment for Quality Assurance
Customer: New Jersey Department of Transportation

This project developed comprehensive and effective multi-characteristic acceptance specification for asphalt pavement construction.

Particular efforts developed a performance-related pay adjustment methodology for in-place air void and longitudinal joint density of asphalt pavement.

The team employed life-cycle cost analysis to develop a performance-related pay adjustment methodology for in-place air void and longitudinal joint density of asphalt pavement.

The project resulted in improved specifications that can be implemented by NJDOT to ensure quality control in pavement construction.

Another important component of efficient pavement management is life-cycle cost analysis. Performance also is key.

PRP has calibrated performance transfer functions to ensure pavement design is accurate and appropriate for its environment. The group has done advanced modeling of tire-pavement interaction and pavement structure responses, and conducted environmental assessments of different designs, rehabilitation alternatives, and prevention techniques for common issues—such as reflective cracking—so agencies can make the right choice for their roads.

Generating models using data reported by multiple agencies is the best way to predict how roads perform over time. PRP and many partners are collaborating to formulate custom distress metrics based on issues that are of particular concern in New Jersey. The goal is to map performance metrics, proposed workplans, and other road features, and combine them to produce a robust geographic information system and better performance models. The New Jersey Transportation Asset Management Plan uses these models to query network health in correlation with different levels of funding, which can be a strong case for increasing investment in our roads.
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Partial customer list

**Agencies**

Federal Aviation Administration

Federal Highway Administration

Federal Highway Administration–New Jersey Division

Florida Department of Transportation

New Jersey Department of Transportation

New Jersey Turnpike Authority

New York State Department of Transportation

Pennsylvania Department of Transportation

Port Authority of New York & New Jersey

U.S. Army Corps of Engineers

U.S. Bureau of Reclamation

**Industry**

Advanced Infrastructure and Design (AID)

Deighton Associates

Maher Terminals, LLC

Michael Baker International LLC

New Jersey Asphalt Pavement Association (NJAPA) and their member companies

Stantec

For a full list of customers from federal, state, and local agencies and private industry, contact PRP.

Funding and support

Agencies that have funded PRP projects include USDOT, the Federal Highway Administration, Federal Aviation Administration, Port Authority of New York & New Jersey, and several state departments of transportation including Florida, New Jersey, and Pennsylvania, among others.