



THE STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION



CHRISTOPHER D. CLEMENT, SR.
COMMISSIONER

JEFF BRILLHART, P.E.
ASSISTANT COMMISSIONER

Bureau of Materials & Research
October 24, 2013

Her Excellency, Governor Margaret Wood Hassan
and the Honorable Council
State House
Concord, New Hampshire 03301

REQUESTED ACTION

- 1. Authorize the Department of Transportation to amend a Cooperative Project Agreement (CPA) with the UNH Sponsored Programs Administration (Vendor #177867) Durham, NH for research related to the performance of high-percentage mixtures of recycled asphalt pavement (RAP) sections in NH by extending the completion date from December 31, 2013 to September 30, 2014, effective upon Governor and Council approval. The original CPA was approved by Governor and Council on July 14th, 2010, Item #92. Time extension only, no new funding.
2. Authorize the Department of Transportation to amend a Cooperative Project Agreement (CPA) with the UNH Sponsored Programs Administration (Vendor #177867) Durham, NH for research related to the evaluation of plant-produced, high-percentage recycled asphalt pavement (RAP) mixtures in the Northeast by extending the completion date from December 31, 2013 to December 31, 2014, effective upon Governor and Council approval. In addition, reduce total project funding by \$50,000 from \$781,706 to \$731,706 and modify the scope of remaining work. The original CPA was approved by Governor and Council on August 11, 2010, Item #65, with a funding allocation of \$225,000/year for FYs 2011, 2012 and 2013, and \$106,706 for FY 2014.

FY 2014 funding is reduced as follows (100% Federal):

Table with 4 columns: Line Item, FY 2014 (Orig.), Reduction, FY 2014 (Amended). Row 1: 04-96-96-962015-3036 State Planning and Research Funds, \$106,706, (\$50,000), \$56,706. Row 2: 046-500463 - Engin. Consultants Non-Benefit

EXPLANATION

The research conducted under the above agreements is investigating the performance of pavements containing high percentages of recycled asphalt pavement (RAP) and developing guidelines to optimize the use of RAP in New Hampshire. The requested amendments are due to circumstances beyond either party's control, as summarized below.

1. The performance of high-RAP sections in NH - testing of RAP mixtures scheduled to be completed in 2013 was delayed because of electronic and mechanical issues with two pieces of equipment used for the work. In addition, recently-developed procedures from the Federal Highway Administration (FHWA) that allow the researchers to conduct full dynamic modulus and fatigue testing of field cores (not possible with the original setup) required changes to the test geometry, along with associated training and experience, which delayed completion of the project.

2. The evaluation of plant-produced, high-percentage RAP mixtures in the Northeast – this is a pooled-fund project led by NHDOT (\$91,706 contribution) with financial participation from six other state DOTs (\$90,000 each) and the FHWA. The original project budget assumed an FHWA contribution of \$150,000. Uncertainty in actual, available funding from FHWA resulting in postponement of some work scheduled for 2012. In 2013, FHWA verified that only \$100,000 is available for the work. The proposed amendment includes a modified scope of work developed by the researchers, in consultation with the pooled-fund technical advisory committee overseeing the project, to optimize the use of remaining funds in light of the \$50,000 budget reduction.

The amended agreements have been approved by the Attorney General as to form and execution. Copies of the fully executed amended Agreement are on file at the Secretary of State's Office and the Department of Administrative Services, and subsequent to Governor and Council approval will be on file at the Department of Transportation.

It is respectfully requested that authority be given to amend the Agreements as outlined above.

Sincerely,

A handwritten signature in black ink, appearing to read "C. D. Clement, Sr.", written in a cursive style.

Christopher D. Clement, Sr.
Commissioner

Attachments

**AMENDMENT #1 to
COOPERATIVE PROJECT AGREEMENT**

between the
STATE OF NEW HAMPSHIRE, **Department of Transportation**
and the
University of New Hampshire of the UNIVERSITY SYSTEM OF NEW HAMPSHIRE

The Cooperative Project Agreement, approved by the State of New Hampshire Governor and Executive Council on 7/14/10, item # 92, for the Project titled "**Performance of High-RAP Pavement Sections in NH,**" Campus Project Director, **Dr. Jo Sias Daniel**, is and all subsequent properly approved amendments are hereby modified by mutual consent of both parties for the reason(s) described below:

Purpose of Amendment (Choose all applicable items):

- Extend the Project Agreement and Project Period end date, at no additional cost to the State.
- Provide additional funding from the State for expansion of the Scope of Work under the Cooperative Project Agreement.
- Other:

Therefore, the Cooperative Project Agreement is and/or its subsequent properly approved amendments are amended as follows (Complete only the applicable items):

- Article A. is revised to replace the State Department name of _____ with _____ and/or USNH campus from _____ to _____.
- Article B. is revised to replace the Project End Date of **12/31/13** with the revised Project End Date of **9/30/14**, and Exhibit A, article B is revised to replace the Project Period of **G&C approval – December 31, 2013** with **G&C approval – September 30, 2014**.
- Article C. is amended to add Exhibit A by including the proposal titled, " _____," dated _____.
- Article D. is amended to change the State Project Administrator to _____ and/or the Campus Project Administrator to _____.
- Article E. is amended to change the State Project Director to _____ and/or the Campus Project Director to _____.
- Article F. is amended to increase funds in the amount of \$ _____ and will read:
Total State funds in the amount of \$ _____ have been allotted and are available for payment of allowable costs incurred under this Project Agreement. State will not reimburse Campus for costs exceeding the amount specified in this paragraph.
- Article F. is amended to change the cost share requirement and will read:
Campus will cost-share _____ % of total costs during the amended term of this Project Agreement.
- Article F. is amended to change the source of Federal funds paid to Campus and will read:
Federal funds paid to Campus under this Project Agreement as amended are from Grant/Contract/Cooperative Agreement No. _____ from _____ under CFDA# _____. Federal regulations required to be passed through to Campus as part of this Project Agreement, and in accordance with the Master Agreement for Cooperative Projects between the State of New Hampshire and the University System of New Hampshire dated November 13, 2002, are attached

to this document as **revised** Exhibit B, the content of which is incorporated herein as a part of this Project Agreement.

- Article G. is exercised to amend Article(s) _____ of the Master Agreement for Cooperative Projects between the State of New Hampshire and the University System of New Hampshire dated November 13, 2002, as follows:

Article _____ is amended in its entirety to read as follows:

Article _____ is amended in its entirety to read as follows:

- Article H. is amended such that:

- State has chosen **not to take** possession of equipment purchased under this Project Agreement.
- State has chosen **to take** possession of equipment purchased under this Project Agreement and will issue instructions for the disposition of such equipment within 90 days of the Project Agreement's end-date. Any expenses incurred by Campus in carrying out State's requested disposition will be fully reimbursed by State.

- Exhibit A is amended as attached.

- Exhibit B is amended as attached.

All other terms and conditions of the Cooperative Project Agreement remain unchanged.

This Amendment, all previous Amendments, the Cooperative Project Agreement, and the Master Agreement constitute the entire agreement between State and Campus regarding the Cooperative Project Agreement, and supersede and replace any previously existing arrangements, oral and written; further changes herein must be made by written amendment and executed for the parties by their authorized officials.

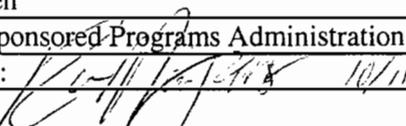
This Amendment and all obligations of the parties hereunder shall become effective on the date the Governor and Executive Council of the State of New Hampshire or other authorized officials approve this Amendment to the Cooperative Project Agreement.

IN WITNESS WHEREOF, the following parties agree to this **Amendment #1** to the Cooperative Project Agreement.

**By An Authorized Official of:
University of New Hampshire**

Name: Karen Jensen

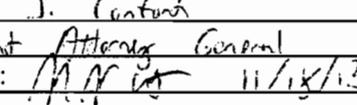
Title: Manager, Sponsored Programs Administration

Signature and Date:  10/11/13

**By An Authorized Official of: the New
Hampshire Office of the Attorney General**

Name: John J. Conforti

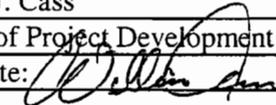
Title: Assistant Attorney General

Signature and Date:  11/15/13

**By An Authorized Official of:
Department of Transportation**

Name: William J. Cass

Title: Director of Project Development

Signature and Date:  10/24/13

**By An Authorized Official of: the New
Hampshire Governor & Executive Council**

Name: _____

Title: _____

Signature and Date: _____

Note: This CPA did not require G&C approval because it was executed under prior G&C authorization for on-call research services (6/22/11 Item #360)



GEORGE N. CAMPBELL, JR.
COMMISSIONER

THE STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION
Bureau of Materials & Research



JEFF BRILLHART, P.E.
ASSISTANT COMMISSIONER

62C 7-14-10 Item # 92

RECEIVED May 28, 2010

JUN 11 2010

His Excellency, Governor John H. Lynch
and the Honorable Council
State House
Concord, New Hampshire 03301

Requested Action

Authorize the Department of Transportation to execute a sole-source Cooperative Project Agreement with the UNH Office of Sponsored Research, (VC#177867), Durham, NH, in the total amount of \$186,516 for transportation research services related to pavement construction and maintenance, from Governor and Council approval through December 31, 2013. 100% Federal Funds.

Funding is available as follows for Fiscal Year 2011. Funding for Fiscal Years 2012, 2013, and 2014 is contingent upon the availability and continued appropriation of funds.

	<u>FY 2011</u>	<u>FY 2012</u>	<u>FY 2013</u>	<u>FY 2014</u>
04-96-96-962015-3036	\$85,956	\$50,325	\$36,572	\$13,663
State Planning and Research Funds				
046-500464 - General Consultants Non-Benefit				

EXPLANATION

The requested action is in furtherance of a long-standing cooperative relationship of transportation research between the Department of Transportation and the University of New Hampshire. This relationship has been mutually beneficial, culminating in savings to the State while enhancing work force development and maintaining New Hampshire's position on the leading edge of new technology. Research studies conducted by UNH for the Department have led to numerous innovations in the highway and bridge industry, including such successes as high performance concrete, improved pavements, alternative reinforcing for bridge decks, increased use of recycled materials, and rapid construction techniques.

Research services are required to investigate the performance of pavements containing high amounts of recycled asphalt pavement (RAP) and to develop guidelines to optimize the use of RAP in NH. This project was identified as a high priority by the Department and developed through collaborative discussions with the UNH Civil Engineering Department.

Statewide-SPR 15680B Performance of High RAP Pavements in NH

The use of RAP in hot mix asphalt is routine in New Hampshire. However, the amount of RAP has typically been limited to the 15-20% range due to a lack of experience with, and understanding of, mixtures containing higher amounts of RAP. Due to dwindling sources of raw materials, the increasing price of liquid asphalt, and the recognition of the need to practice sustainable techniques in roadway construction, NHDOT and local contractors are interested in pursuing the use of higher percentages of RAP in state projects. Additional research and study of high RAP mixtures in NH is necessary to establish the best practices and procedures that will produce high RAP mixtures with equal or better performance than the mixtures currently used in the state.

A milling and resurfacing project is underway on I-93 between Exits 30 and 32 in Woodstock and Lincoln. This section of highway was built with a high RAP (35% RAP) pavement section in the late 1980's and is

one of the only sections of roadway in the nation of its age with such a high RAP content. The northbound lanes have been milled this spring. These millings will be incorporated as RAP in the pavement mixes for resurfacing the southbound lanes in 2011. The existing high RAP section has been in place for over 20 years and has performed well. A forensic evaluation of this pavement and a comparable pavement containing virgin materials that includes evaluation of the existing pavement conditions and characterization of the mixture properties will provide valuable insight into material properties of high RAP mixtures that perform well in NH.

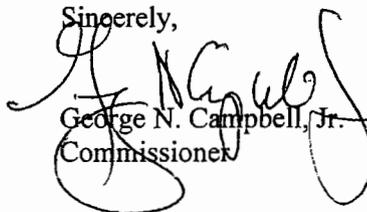
UNH will be responsible for conducting the forensic evaluation of the existing pavement and for testing of a series of 6 trial mixes that will be placed using varying contents of RAP on this project. The work will involve conducting a series of material characterization tests on existing and test pavement samples; analyzing the results to determine material property differences and performance evaluations, and preparation of the associated reports.

Through this forensic evaluation and evaluation of the series of trial mixes at varying RAP contents, this project will provide guidance on the use of high RAP mixtures to the NHDOT. Through the optimum use of RAP on New Hampshire projects, the Department expects to save significant money on pavement construction and maintenance.

The Department's Federal-aid research program includes a blend of in-house and contracted research. For some contracted studies, particularly where private industry or out-of-state organizations can best provide the necessary expertise and resources to perform the work, it is appropriate to utilize the Department's *Consultant Selection and Service Agreement Procedures* to identify and select an appropriate organization to perform the research. In other cases however, the specialized nature of the research does not lend itself to that process and it is in the Department's and the State's best interest to assign work directly to the University of New Hampshire. The study included in this requested action meets this description and will address an immediate Department need; is unique to New Hampshire's environment, materials, and conditions thereby requiring substantial local experience; and is directly aligned with a particular area of University expertise. In addition, the Principal Investigator has extensive experience in recycled asphalt pavements and is a nationally recognized expert in this field.

The use of Cooperative Project Agreements, including allowable costs, is outlined in the *Master Agreement for Cooperative Projects between the State of New Hampshire and the University System of New Hampshire*, approved by the Governor and Council on November 13, 2002. The Agreements have been approved by the Attorney General as to form and execution. The Department has verified that the necessary funds are available for FY 2011. Copies of the fully executed Agreements are on file at the Secretary of State's Office and the Department of Administrative Services, and subsequent to Governor and Council approval will be on file at the Department of Transportation.

It is respectfully requested that authority be given to enter into a Cooperative Project Agreement for the transportation research service as outlined above.

Sincerely,

George N. Campbell, Jr.
Commissioner

AMENDMENT #1 to
COOPERATIVE PROJECT AGREEMENT

between the
STATE OF NEW HAMPSHIRE, **Department of Transportation**
and the

University of New Hampshire of the UNIVERSITY SYSTEM OF NEW HAMPSHIRE

RECEIVED
05/22/13
Director of Transportation
10/22/13

The Cooperative Project Agreement, approved by the State of New Hampshire Governor and Executive Council on 8/11/10, item # 65, for the Project titled "Evaluation of Plant-Produced High-Percentage RAP Mixtures in the Northeast," Campus Project Director, Dr. Jo Sias Daniel, is and all subsequent properly approved amendments are hereby modified by mutual consent of both parties for the reason(s) described below:

Purpose of Amendment (Choose all applicable items):

- Extend the Project Agreement and Project Period end date, at no additional cost to the State.
- Provide additional funding from the State for expansion of the Scope of Work under the Cooperative Project Agreement.
- Other: Decrease project funding, extend the Project End Date and modify the scope of work as outlined in attached Exhibit A.

Therefore, the Cooperative Project Agreement is and/or its subsequent properly approved amendments are amended as follows (Complete only the applicable items):

- Article A. is revised to replace the State Department name of _____ with _____ and/or USNH campus from _____ to _____.
- Article B. is revised to replace the Project End Date of **12/31/13** with the revised Project End Date of **12/31/14**, and Exhibit A, article B is revised to replace the Project Period of **Date of G&C approval – December 31, 2013** with **Date of G&C approval – December 31, 2014**.
- Article C. is amended to add Exhibit A by including the proposal titled, " _____ ," dated _____.
- Article D. is amended to change the State Project Administrator to _____ and/or the Campus Project Administrator to _____.
- Article E. is amended to change the State Project Director to _____ and/or the Campus Project Director to _____.
- Article F. is amended to decrease funds in the amount of **\$(50,000)** and will read:

Total State funds in the amount of **\$731,706** have been allotted and are available for payment of allowable costs incurred under this Project Agreement. State will not reimburse Campus for costs exceeding the amount specified in this paragraph.
- Article F. is amended to change the cost share requirement and will read:

Campus will cost-share _____ % of total costs during the amended term of this Project Agreement.
- Article F. is amended to change the source of Federal funds paid to Campus and will read:

Federal funds paid to Campus under this Project Agreement as amended are from Grant/Contract/Cooperative Agreement No. _____ from _____ under CFDA# _____. Federal regulations required to be passed through to Campus as part of this Project Agreement, and in

Campus Authorized Official KT
Date 10/22/13

accordance with the Master Agreement for Cooperative Projects between the State of New Hampshire and the University System of New Hampshire dated November 13, 2002, are attached to this document as **revised** Exhibit B, the content of which is incorporated herein as a part of this Project Agreement.

- Article G. is exercised to amend Article(s) _____ of the Master Agreement for Cooperative Projects between the State of New Hampshire and the University System of New Hampshire dated November 13, 2002, as follows:

Article _____ is amended in its entirety to read as follows:

Article _____ is amended in its entirety to read as follows:

- Article H. is amended such that:

- State has chosen **not to take** possession of equipment purchased under this Project Agreement.
- State has chosen **to take** possession of equipment purchased under this Project Agreement and will issue instructions for the disposition of such equipment within 90 days of the Project Agreement's end-date. Any expenses incurred by Campus in carrying out State's requested disposition will be fully reimbursed by State.

- Exhibit A is amended as attached.

- Exhibit B is amended as attached.

All other terms and conditions of the Cooperative Project Agreement remain unchanged.

This Amendment, all previous Amendments, the Cooperative Project Agreement, and the Master Agreement constitute the entire agreement between State and Campus regarding the Cooperative Project Agreement, and supersede and replace any previously existing arrangements, oral and written; further changes herein must be made by written amendment and executed for the parties by their authorized officials.

This Amendment and all obligations of the parties hereunder shall become effective on the date the Governor and Executive Council of the State of New Hampshire or other authorized officials approve this Amendment to the Cooperative Project Agreement.

IN WITNESS WHEREOF, the following parties agree to this **Amendment #1** to the Cooperative Project Agreement.

By An Authorized Official of:

University of New Hampshire

Name: Karen Jensen

Title: Manager, Sponsored Programs Administration

Signature and Date: [Signature] 10/15/13

By An Authorized Official of:

Department of Transportation

Name: William J. Cass

Title: Director of Project Development

Signature and Date: [Signature] 10/29/13

By An Authorized Official of: the New
Hampshire Office of the Attorney General

Name: Jan J. Conforti

Title: Assistant Attorney General

Signature and Date: [Signature] 10/15/13

By An Authorized Official of: the New
Hampshire Governor & Executive Council

Name: _____

Title: _____

Signature and Date: _____

EXHIBIT A

A. Project Title:

B. Project Period:

C. Objectives:

D. Scope of Work: Phase II testing has been fulfilled for mixes produced during 2011 construction season. Upon discussions between State and Campus, it is agreed that remaining testing shall be as described in Phase III scope below.

Northeast High RAP Pooled Fund – Phase III Testing Plan

The testing plan proposed for Phase III consists of a laboratory study of 8-10 mixtures to evaluate the impacts of asphalt binder grade and asphalt content on the mixture properties. The laboratory study is proposed to allow for better control of production variables (temperature, gradation, short term aging). NH Phase I mixtures were selected for comparison with plant produced mixtures tested previously. The conditions to be tested are shown in Table 1. The impact of a combination of changing binder grade and adding additional asphalt cement (conditions in parenthesis) will only be evaluated after examining the results of changing binder grade and increasing asphalt content independently.

Table 1. Laboratory Test Mixtures					
Mixture	Asphalt content	RAP Content (total weight)			
		0	20	40	
NH Pike Mixture from Phase I, 12.5 mm	optimum	PG 64-28	PG 64-28 PG58-28	PG 64-28 PG 58-28	
	+0.5%	-	PG 64-28	PG 64-28 (PG 58-28)	
	+1.0%	-	-	PG 64-28 (PG 58-28)	

		Optimum	+0.5%	+1.0%
% binder replacement	20% RAP	16.8	15.5	-
	40% RAP	33.7	31.0	28.7
RAP credit	20% RAP	100	47.9	-
	40% RAP	100	74.0	47.9

Laboratory Procedures

All specimens will be fabricated in the UNH laboratory for consistency and to minimize shipping costs. Laboratory procedures are summarized:

- Aggregate stockpiles will be dried and sieved into individual size components for batching of individual specimen sizes.
- Aggregates will be heated to mixing temperature for at least 4 hours prior to mixing. The mixing temperatures used in the plant production will be used for heating the aggregate (approx. 330 F).

- Asphalt cement will be heated to mixing temperature; it will be discarded after 3 hours at mixing temperature and will not be reheated once it has been heated to mixing temperature.
- RAP will be air dried on a flat sheet for 24 hours prior to mixing.
- RAP will be heated to 60C for 2 hours prior to being mixed with the virgin aggregate and asphalt.
- RAP, virgin aggregate, and asphalt will be mixed together for 2 minutes using a bucket mixer.
- Mixtures will be short-term oven aged for 2 hours at compaction temperature.
- Mixtures will be compacted to create specimens of appropriate geometry and air void content using a Superpave Gyratory Compactor.
- Specimens will be cored to appropriate diameter prior to being shipped.
- Testing labs will trim specimens to appropriate height.

Testing

Table 2. Binder Testing (Virgin & Extracted)			
Test/Test Parameter	Test Method/Reference	Title	Lab
Extraction and Recovery			Rutgers
Performance Grade	AASHTO R29 & AASHTO M320	Grading or Verifying the Performance Grade of an Asphalt Binder & Performance-Graded Asphalt Binder	Rutgers
Binder Modulus (G*) & Binder Master Curve			Rutgers
Critical Cracking Temperature	AASHTO R49-09	Determination of Low-Temperature Performance Grade (PG) of Asphalt Binders	Rutgers

Table 3. Mixture Testing			
Test/Test Parameter	Test Method/Reference	Title	Lab
Dynamic Modulus	AASHTO TP 62	Determining Dynamic Modulus of Hot Mix Asphalt Concrete Specimens	NCSU
Fatigue Test	Push-Pull Fatigue (S-VECD)	Proposed Standard Method of Test for Determining the Damage Characteristic Curve of Asphalt Concrete from Direct Tension Cyclic Fatigue Tests	NCSU
Permanent Deformation		Triaxial Stress Sweep	NCSU
Low Temperature Cracking		Thermal Stress Restrained Specimen Test (TSRST)	UMass

Material/Specimen Requirements

Lab	Specimens	Target air void of final test specimen
NCSU	<ul style="list-style-type: none"> • 3 - E* 100 mm diam x 150 mm tall • 4 - SVECD 100 mm diam x 130 mm tall • 8 - TSS 100 mm diam x 150 mm tall 	6%
UMass Dart	<ul style="list-style-type: none"> • 3 - TSRST 50 mm diam x 150 mm tall 	6 %
Rutgers	<ul style="list-style-type: none"> • Compacted specimens to produce at least 1000g of asphalt • RAP • Virgin binders 	n/a

E. Deliverables Schedule:

F. Budget and Invoicing Instructions:

Budget Items	State Funding	Cost Sharing	Total
1. Salaries & Wages	97,126	0	97,126
2. Employee Fringe Benefits	4,354	0	4,354
3. Travel	3,623	0	3,623
4. Supplies and Services	494,124	0	494,124
5. Equipment	52,977	0	52,977
6. Facilities & Admin Costs	79,502	0	79,502
Subtotals	731,706	0	731,706
Total Project Costs:			731,706



THE STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION
Bureau of Materials & Research



GEORGE N. CAMPBELL, JR.
COMMISSIONER

JEFF BRILLHART, P.E.
ASSISTANT COMMISSIONER

July 12, 2010

RECEIVED

JUL 20 2010

His Excellency, Governor John H. Lynch
and the Honorable Council
State House
Concord, New Hampshire 03301

Requested Action

Authorize the Department of Transportation to execute a sole-source Cooperative Project Agreement with the UNH Office of Sponsored Research, (VC#177867), Durham, NH, in the total amount* of \$781,706 for transportation research services related to plant-produced, high-percentage recycled asphalt pavement (RAP) mixtures, from Governor and Council approval through December 31, 2013. 100% Federal Funds.

Funding is available as follows for Fiscal Year 2011. Funding for Fiscal Years 2012, 2013, and 2014 is contingent upon the availability and continued appropriation of funds.

	<u>FY 2011</u>	<u>FY 2012</u>	<u>FY 2013</u>	<u>FY 2014</u>
04-96-96-962015-3036	\$225,000	\$225,000	\$225,000	\$106,706
State Planning and Research Funds				
046-500463 - Engin. Consultants Non-Benefit				

EXPLANATION

The requested action is in furtherance of a long-standing cooperative relationship of transportation research between the Department of Transportation and the University of New Hampshire. This relationship has been mutually beneficial, culminating in savings to the State while enhancing work force development and maintaining New Hampshire's position on the leading edge of new technology.

Research services are required to investigate the performance of plant-produced asphalt pavement mixtures containing high amounts of recycled asphalt pavement (RAP). This is a pooled-fund project whereby the Federal Highway Administration pays 100% of the project cost utilizing State Planning and Research (SPR) funds from a number of state DOTs in the northeast U.S.

Production of HMA mixtures with higher percentages of recycled asphalt pavement (RAP) is gaining increased attention as a way to save money and more efficiently utilize existing resources. Many state DOTs and contractors are very comfortable using RAP percentages of 10-15%. However, questions about low temperature performance and the need to soften binder grades limit the amount of HMA produced with greater than 15-20% RAP in many areas of the northeast US.

The Northeast Asphalt User/Producer Group (NEAUPG) is a non-profit association made up primarily of State DOTs and Industry, with the mission of improving the quality and performance of asphalt pavement applications in the region. The NEAUPG RAP Task Group has proposed a pooled-fund study to expand on work conducted last year during a joint NHDOT/UNH/Pike Industries study. This project will include the evaluation of higher-RAP mixtures produced by drum and batch plants in the region and will be conducted in two phases: Phase I will focus on evaluating the effects of binder grade and plant type on the properties of mixtures with various percentages of RAP. Phase II will be geared towards evaluating the amount of blending that occurs between the virgin and RAP binders and the impact of higher RAP percentages on material properties and performance. The testing will also evaluate moisture susceptibility of the mixtures containing RAP. The total cost of the two-phase study is \$781,706.

The New Hampshire DOT has agreed to serve as the Lead Agency for the pooled-fund study. In March 2010 the Department solicited the American Association of State Highway and Transportation Officials (AASHTO) member states to identify partners wanting to participate in this research. To date, commitments of support totaling \$450,000 (\$90,000 per state) have been received from the state Departments of Transportation of Maryland, New Jersey, New York, Pennsylvania, and Virginia. New Hampshire's share in the proposed research is also \$90,000 (\$30,000/yr for 3 years, 100% Federal funds). In addition, the Federal Highway Administration has committed \$150,000 of their own funding, and decisions are pending in several other states. In accordance with FHWA pooled-fund procedures, the NHDOT's federal-aid research apportionment will be increased by the amount contributed by participating agencies, enabling the Department to enter into an agreement with the University of New Hampshire for the total project amount using 100% Federal funds.

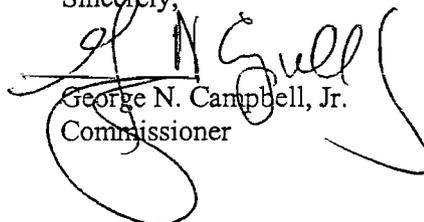
Sufficient funding exists to proceed with Phase I of the Agreement. The sources and quantity of mixtures tested in Phase II will be dependent on the total funding received, i.e. actual project costs will be limited to the total funds available. Contractors from participating states will provide plant-produced mix for testing, and will prepare specimens of each mix for the research. The contractors will also provide detailed data and information related to the production of each mixture. UNH will be responsible for coordinating the research, performing testing on lab specimens and field cores, data analysis, report preparation, and presentation of findings. UNH will contract with, oversee the work of, and incorporate the findings from three subcontractors as follows: UMass-Dartmouth and Rutgers University will be responsible for a portion of the binder testing, mixture testing, and data analysis, and they will assist in final report preparation. North Carolina State University will be responsible for refining the fatigue failure criteria for RAP mixtures.

The Department's Federal-aid research program includes a blend of in-house and contracted research. For some contracted studies, particularly where private industry or out-of-state organizations can best provide the necessary expertise and resources to perform the work, it is appropriate to utilize the Department's *Consultant Selection and Service Agreement Procedures* to identify and select an appropriate organization to perform the research. In other cases however, the specialized nature of the research does not lend itself to that process and it is in the Department's and the State's best interest to assign work directly to the University of New Hampshire. The study included in this requested action meets this description. The study involves a unique partnership with asphalt producers in the northeast and brings together some of the most experienced and talented professionals experienced with recycled asphalt pavements in the country. The Principal Investigator has extensive experience in recycled asphalt pavements and is a nationally recognized expert in this field.

The use of Cooperative Project Agreements, including allowable costs, is outlined in the *Master Agreement for Cooperative Projects between the State of New Hampshire and the University System of New Hampshire*, approved by the Governor and Council on November 13, 2002. The Department of Transportation considers the above-stated fee to be fair and reasonable for this work. The Agreements have been approved by the Attorney General as to form and execution. The Department has verified that the necessary funds are available for FY 2011. Copies of the fully executed Agreements are on file at the Secretary of State's Office and the Department of Administrative Services, and subsequent to Governor and Council approval will be on file at the Department of Transportation.

It is respectfully requested that authority be given to enter into a Cooperative Project Agreement for the transportation research service as outlined above.

Sincerely,



George N. Campbell, Jr.
Commissioner