U.S. Department of Transportation
Federal Highway Administration

Pavement Performance Division
Long-Term Pavement Performance Program

Specific Pavement Studies
Nomination Forms
Experiment SPS-10
Warm Mix Asphalt Study

Federal Highway Administration
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PREFACE

Guidelines for participation, project selection requirement, and nomination procedures of test sites included in the Specific Pavement Studies-10 (SPS-10) experiment Warm Mix Asphalt (WMA) Study are presented in this document. These guidelines should be followed by the FHWA-LTPP Regional Support Contractor (RSC) when working with the State and Provincial Highway Agencies (SHAs) in selecting candidate SPS-10 project locations. The FHWA-LTPP RSC office must coordinate with the participating SHA and FHWA in populating the experimental matrix with SPS-10 projects that meet the criteria set forth in this document.

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INTRODUCTION

This document provides guidelines and information for nominating candidate projects for the Specific Pavement Studies experiment-10 (SPS-10) Warm Mix Asphalt (WMA) Study, and outlines participation requirements. Detailed project nomination forms and instructions are included in this document. Details of the experimental design and study factors are described in the LTPP SPS-10 Experimental Design and Research Plan.

PARTICIPATION REQUIREMENTS

Highway agencies considering participating in the SPS-10 experiment must be willing to perform the following activities:

1. Construct the test sections described in the experimental design document referenced above. These include a test section using conventional HMA designed according to the agency's current mix design, and two test sections, each using different WMA technologies. All test sections on a project must be constructed during the same construction season. The treatments within the length of the test sections must be applied across all lanes in the direction of travel.

2. Provide traffic information. For an SPS-10 section, a continuously operating permanent device for classification and weight data is preferred. This level of data collection is desired for two reasons: (1) to provide the accurate traffic loading measurements required to develop mechanistic and mechanistic/empirical design models and (2) to provide the base data necessary to understand the intricacies of the interactions among pavement, traffic load, and environment.

   While data collection is preferred on the site continuously over the year, sites without continuous WIM equipment will still be considered. The minimum recommended data collection effort for each site is two weeks of continuous classification data, four times per year (a total of eight weeks of classification data per year). It is the agency's responsibility to ensure representative data is collected that accounts for seasonal variation, weekday/weekend differences, and inconsistent truck loading patterns throughout the year. Complete details on traffic data collection can be found in Attachment 1.

   When nominating a project location, consideration should be given to the location of existing WIM equipment. Sites where existing WIM equipment can be used to capture the traffic loading would allow for traffic data to be captured without the installation of additional equipment.

3. Perform and/or provide for drilling, coring and sampling of in-place pavement materials used in the test sections. Costs for this work are to be borne by the participating agency. LTPP Regional Support Contractor (RSC) staff will be

on site to perform sample logging and sample shipment. Testing of samples will be performed by FHWA or its contractors.

4. Prepare plans, specifications, quantities, and all other documents necessary as part of the agency's contracting procedure. The agency must also provide construction control, inspection and management in accordance with their standard quality control and assurance procedures. RSC staff will be on-site during construction to perform documentation required by LTPP.

5. Provide periodic traffic control for on-site data collection activities such as drilling and materials sampling, distress surveys, deflection testing, and other monitoring activities.

6. Coordinate maintenance activities on the test sections to prevent application of premature treatments which alter the characteristics of the test sections and limit their use in the study.

7. Notify FHWA LTPP RSC prior to the application of overlays or other such treatments when any of the test section reach an unsafe condition or become a candidate for rehabilitation. As much lead time as possible is needed to allow recording of the terminal condition of the test sections.

8. Provide and maintain signing and marking of test sites.

If highway agency personnel would like to discuss the details of these participation requirements, they should contact the LTPP RSC for their region.

PROJECT SELECTION CRITERIA

The following criteria will be considered in evaluating candidate projects for inclusion in this experiment:

1. The construction project must be of sufficient length to accommodate all of the experimental test sections. The experimental design requires a minimum of 800 feet per section, with a core monitoring section of 500 feet that will be used for future non-destructive performance monitoring. A 50-foot buffer on each side of the monitoring area will be included to separate the destructive sampling area from the monitoring area. The destructive sampling area will consist of 100 feet on each side built at the same time and to the same specifications to allow material sampling without disturbing the 500-foot monitored area and will consist of the outside (i.e., truck) lane only. Transition zones are required between test sections, and shall be a minimum of 800 feet long. The project will require at least three different mixes (one HMA and two WMA) to be produced at the same plant, and each mix may only be placed on the test section after the plant has reached steady-state operation. This may require longer transitions between the sections, or some other use/disposal of mix produced before the plant achieves steady-state

operation and to establish rolling patterns/compactive effort requirements. The minimum project length is 4,000 feet, but may be longer if more than the minimum number of sections is built and/or if the transition zones are longer than the minimum length. The same compaction equipment shall be used on all three test sections.

2. Other than the mix properties of the surface layer, all other properties of the test sections should be as similar as possible. If the construction project is a resurfacing project, variation in the pre-construction condition, pavement layer thicknesses and subgrade properties should be minimal. Areas with unusual distress types should be avoided.

3. Traffic flow over all the test sections on a project should be uniform. All sections should carry the same traffic stream. Intersections, rest stops, on-off ramps, weaving areas, quarry entrances, etc., should be avoided on and between test sections on a project.

4. Test sections should be located on portions of the project which are relatively straight and have a uniform vertical grade. Horizontal curves greater than 3° and vertical grades greater than 4% should be avoided.

5. It is highly desirable that the portion of the project that includes the proposed test sections be opened to traffic at the same time.

6. Ideally, all test sections should be located on shallow fills. The entire length of each test section, however, should be located completely on either a cut or a fill. Cut-fill transitions and side hill fills should be avoided.

7. Culverts, pipes and other substructures beneath the pavement should be avoided within the limits of each test section. It is recommended that subsurface structures, if required, be located in the transition zones between test sections.

8. Pavements which are either excessively under or over designed for existing site conditions should be avoided. As a general guide, the design life should be between 10 and 20 years, as determined using the agency's standard design procedure. The accepted range of overlay thicknesses is 2 to 4 inches.

9. Any open graded friction courses or surface treatments (i.e., chip seals, slurry seals) should be removed via milling prior to the SPS-10 overlay being placed.

10. Pre-overlay repairs may be performed in accordance with the SHA standard practice. The repairs should be consistent throughout the project so as not to add variability between test sections.

11. Tack coats shall be used between lifts and between original surface and overlay.

12. Road sections with added lanes, added shoulders, or that have been widened are not desirable for the SPS-10 experiment.

13. Existing pavements with retro-fitted edge drains are not desirable.

14. The project must not have curb and gutter within 6 feet from the outside edge of the pavement adjacent to the test lane.

15. The test sections should be placed in the outside test lane and must be 12 feet wide with a consistent and uniform thickness.

16. The type, extent, and severity of distress should be relatively uniform over the project. Test sections must be located to avoid areas of unusual distress occurrences on the project. It is desired that the type of distress and performance of the pavement is typical for the SHA. Unique performance and deterioration should be avoided to the extent possible.

These criteria and considerations will help identify projects in which the relative performance of the test sections is due to the differences in the AC mix of the surface layer, and the influence of other factors such as changes in the existing pavement structure, subgrade, traffic patterns, and drainage characteristics is minimized.

Section homogeneity is important to the success of the experiment. For resurfacing projects this includes the subgrade, existing pavement structure and existing condition. Construction history records, while valuable, often do not fully reflect the variability of in-service pavements. It is requested that the agency evaluate the homogeneity of potential projects prior to nominating them, and include the evaluation results with their submission. Tools to evaluate homogeneity include distress surveys, Falling-Weight Deflectometer (FWD) testing, and ground-penetrating radar (GPR) testing.

It is recognized that projects containing all of the desirable characteristics are not always readily available. Each candidate site will be evaluated individually to determine the extent of compliance with the desired criteria and usefulness to the experiment. Deviation from the desired project characteristics may be necessary in order to obtain sufficient projects for the experiment. For example, projects will be considered where it is not possible to locate all of the test sections completely in either cuts or fills. In this case it may be necessary to locate some test sections in cuts and others in fills. Also, on a project in rolling terrain with limited distance between intersections, it may be necessary to locate a test section over a shallow cut-fill transition (less than 3 meters difference). Generally, engineering judgment will be used to evaluate the impact of such non-uniformities on test section performance.

The criteria and considerations presented in this document will be used to evaluate and rank candidate projects in cases where more than the required number of projects is available. They can also be used as a guide by an agency to indentify candidate projects in their jurisdiction that are most suitable for nomination.

Special consideration will be given to projects that include test sites that are located near existing SPS or GPS experiments.

NOMINATION PROCEDURE

Agencies desiring to participate in the SPS-10 experiment should review candidate projects and evaluate them against the criteria and considerations presented in this document. A minimum of two test sites are being sought in each cell marked with a "2" to complete the experimental design shown in Table 1. Under certain conditions, additional projects might be included into one or more of the experimental design cells.

Table 1. SPS-10 Experimental Matrix

			Wet				Dry				Moisture
			Freeze		No Freeze		Freeze		No Freeze		Temperature
WMA Technology			High	Low	High	Low	High	Low	High	Low	Traffic
Core Test Sections on Project											
HMA (Control)	WMA (Foaming Process)	WMA (Chemical Additive)	2	2	2	2	2	2	2	2	

Project acceptance will be performed sequentially over time. Decisions on acceptance will be made by the "Latest Date for Approval Notification from FHWA" to be furnished by the nominating agency on the nomination forms contained in this document. Nominating agencies should set this date as late as possible to allow for review of other projects nominated for the same cell and selection of the best suited sites for this experiment. Agencies should coordinate their nomination of projects through the FHWA-LTPP RSC.

CANDIDATE PROJECT NOMINATION FORMS

The following are instructions for completion of the SPS-10 candidate project nomination and instruction forms contained in Appendix A. Each Form is referenced according to a sheet letter designation.

APPENDIX A

SPS-10
Nomination Forms and Instructions

Sheet A. General Project Information

This sheet includes information on project location, significant dates, a general project description, and design traffic.

State/Province. State or province in which the project is located.

SHRP ID. This four-digit SHRP ID will be assigned by FHWA if the project is selected for inclusion in the SPS-10 experiment, and will be used as a project reference number.

PROJECT LOCATION

This portion of the form provides information on the location of the candidate project. In this document, a project refers to the overall construction project. Test sections refer to 152.4 m (500 ft) portions of the project in which the experimental pavement structures are constructed and monitored over time.

Route Number. This is the number assigned to the route on which the project is located. The common number used on maps and highway signs should be provided to avoid confusion.

Route Signing. Check the appropriate designation for the route on which the project is located. If the route is other than an Interstate, U.S., State or county, please write in the appropriate designation in the space provided with a short explanation. For example a Farm to Market signed route should be entered as "FM - Farm to Market". This designation should refer to how the route is signed and indicated on general highway maps.

Project Location. Enter the start and end mileposts or milepoints of the portion of the project which is considered suitable for construction of the test sections. The milepost or milepoint refer to reference locations signed or marked along the route in the field. If the route is signed with kilometer posts, enter the appropriate post numbers, scratch out milepost and write kilometer post on the form. The start and end station location are not required but are requested for use in locating the portion of the project proposed for the experimental sections on the plans.

Location Description. This is a written description of the location of the start of the project referenced to a permanent landmark such as signed highway intersections, signed or labeled bridges, underpasses, overpasses, rest areas and railroad crossings. The objective is to provide a reference for field crews to easily locate the section in the field. Distances from a landmark located prior to the section, in the direction of travel and a landmark located past the start of the section should be specified. For example, "The start of the project is 2.2 km north of overpass 20-45-43; the intersection with I-71 is located 3.3 km north of the start of the project" (assuming the direction of travel in northbound).

GPS Coordinates. This is the Global Positioning System coordinates of the location of the start of the project. The latitude and longitude as determined from the global positioning system measurement, in degrees, minutes and seconds to the nearest tenth of a second (0.1").

Direction of Travel. Check the box that describes the direction of travel of the lane proposed for the LTPP experiment. The direction of travel should be as the route is signed. For example, if the lane is on I-71, only northbound or southbound should be chosen, even if route trends mostly east-west within the project limits.

Facility Type. Check the box divided if there is a median, curb, or other permanent barrier between the directions of traffic.

Number of Lanes. For an undivided road, enter the total number of lanes in both directions. For a divided road, enter the number of lanes in the project direction.

County. This is the county or county-level governmental jurisdiction unit in which the project is located. If the project is located in more than one county, indicate the county first encountered in the direction of travel.

Highway Agency District Number. Enter the number that identifies the highway agency's district, division or region in which the project is located.

Distance to nearest Weather Station. Enter the distance in miles to the nearest fully operational and permanent weather station. The weather stations operated by NOAA and the National Weather Service are preferred.

SIGNIFICANT DATES

Latest Date of Approval Notification from FHWA. This is the latest date that FWHA can notify the agency of acceptance of a project into the experiment. This date represents the latest date than an agency can start preparation of construction specifications and contractual documents in order to have the test sections constructed. This should be a realistic "drop dead date" that provides FHWA with the longest time possible to evaluate and coordinate other candidate projects so that the best spread and most suitable projects are included into the experiment.

Contract Letting Date. This is the actual date the contract is scheduled for letting.

Estimated Construction Start Date. This is the date on which construction on the portion of the project containing the test sections is expected to begin. This date is important for scheduling pre-construction activities, such as section marking, deflection tests, etc.

Estimated Date Test Sections Opened to Traffic. Indicate the expected date on which the test sections will be opened to traffic.

Estimated Construction Completion Date. This is the scheduled date for completion of construction of the project on which the LTPP test sections are located. In some instances, the estimated dates for opening the test sections to traffic and for completion of construction will be the same.

TRAFFIC

AADT (in project lane). This is the estimate of the annual average daily traffic (AADT), all vehicles in the project lane only.

Percent Heavy Trucks and Combinations. This is the ratio of trucks and heavy combinations to total vehicles (AADT) expressed to the nearest tenth of a percent. This excludes all pickups, panels, and other two axle, four tire trucks. This is for the traffic in the project lane only.

Annual 18-kip ESALs (in project lane). Provide the design average application rate of heavy truck loadings, in 18-Kip equivalent single axle load applications, in the study lane of the proposed project. This should be the design number of ESAL applications divided by the duration of the design period.

Design Life (years). Enter the length of the design life, in years, used for estimating the traffic used in the pavement design of the project.

TRAFFIC EQUIPMENT

Permanent WIM installed that can be applied to test sections? (Y or N). Indicate if an existing permanent WIM is installed within close proximity to the proposed location. The WIM needs to be in the same direction of travel and have the same traffic loadings/patterns as the site location.

WIM Location. Provide the milepost and direction of travel of the installed WIM.

WIM Type/Manufacturer. Provide information on the type of WIM equipment installed.

Last Calibration Date of WIM. Provide the date of the last known calibration of the WIM equipment.

Does Agency agree to provide a minimum of 2 weeks of classification data, 4 times per year (total 8 weeks)? If a permanent, full time WIM is not currently available for the proposed location, please indicate if the Agency is willing to collect temporary (2 weeks) of classification data 4 times per year.

Sheet B. Pavement Design Information, Resurfacing

The purpose of this sheet is to provide information on the agency's typical pavement resurfacing design for the project site. This should represent the pavement structure for the project as a whole, without special consideration of the test sections (i.e., what the agency would be constructing if the project is not included in the SPS-10 experiment).

State/Province. State or province in which the project is located.

SHRP ID. This four-digit SHRP ID will be assigned by FHWA if the project is selected for inclusion in the SPS-10 experiment, and will be used as a project reference number.

Design Method. If this project was designed using MEPDG (AASHTOWare Pavement ME Design) or the AASHTO 1993 design procedure, check the appropriate box. Otherwise, describe the design method in the space provided.

Design Life. The design life of the pavement structure in years.

Existing Pavement Condition. This is the condition of the existing pavement. If available, please provide the Pavement Condition Index (PCI) as determined using ASTM D6433. If another methodology was used, please describe it in the space provided for "Other". If no objective description of the pavement condition is available, please describe as good, fair or poor.

Predominant Distress Type. This is the most significant distress on the section, and the distress of most importance in determining the need for resurfacing and the design of the resurfacing. For example, if the section exhibits both alligator cracking and weathering, alligator cracking should be entered here.

Date Existing Surface Opened to Traffic: This is the date the existing surface layer was placed. Only consider structural layers, and ignore fog seals and surface treatments.

DESIGN LAYER STRUCTURE

Layer No. This layer number convention starts with the naturally occurring subgrade as layer 1 and progresses to the pavement surface as the highest numbered layer. Each unique material above the subgrade is assigned a layer number and corresponding material type code. Fabrics, surface treatments and other thin layers should be included.

Layer Description. Describe the layer in general terms. Examples include "Select fill", "Aggregate Base", and "Hot-Mix". Please use generally-understood terms and avoid agency-specific descriptions.

Material Type Class Code. The two digit codes identifying the type of material in each layer of the pavement structure are shown in Tables 1 through 4 of Attachment 2. The intent is a general identification of materials for classification and project selection purposes.

Thickness (in). This is the thickness of the existing layer, in inches. Provide the full thickness of the layer as it exists pre-construction, even for layers that will be reduced in thickness or removed entirely during construction.

Required Overlay Thickness (in). This is the thickness of the required overlay to meet the design life, as determined using the pavement design methodology used. Please do not round up the thicknesses. The intent is to obtain the actual thickness of pavement materials required to meet the design life to the precision provided by the pavement design method used.

Design Overlay Thickness (in). This is the thickness of overlay material that the agency intends to specify in construction documents. Typically this will be the required thickness rounded up to reflect actual construction practices.

Depth of Milling/Grinding (in). This is the depth (if any) of milling/grinding of the existing pavement surface.

Estimated Base Repair Quantity (%). This is the percentage of area of the project that will require base repairs or other excavation below the post-milling surface.

Other Pre-Construction Repairs: Describe any other pre-overlay repairs that the agency intends to perform other than milling/grinding and base repair.

Sheet C. Mix Information

The purpose of this sheet is to provide information on the AC mixes that the agency intends to use as part of the experiment. Mixes used on portions of the project outside the section boundaries are not relevant to this form.

State/Province. State or province in which the project is located.

SHRP ID. This four-digit SHRP ID will be assigned by FHWA if the project is selected for inclusion in the SPS-10 experiment, and will be used as a project reference number.

GENERAL MIX DESIGN INFORMATION
The information required for this section will be the same for the HMA mix and the two core section WMA mixes.

Nominal Maximum Aggregate Size, mm. The nominal maximum aggregate size of the mixes, in mm.

RAP Content %. This is the quantity of recycled asphalt pavement to be used in the mix, expressed in terms of binder replacement as percent by total binder in the mix.

Rubber Content %. This is the quantity of rubber to be used in the mixes, expressed as percent by total binder in the mix.

Total Binder Content %. This is the total quantity of binder, including virgin binder, binder from RAP, and rubber, expressed as percent by total weight of mix.

Mix Design Method. This is the mix design method that the agency intends to use. If SuperPave, check the box provided. Otherwise, check "Other" and enter the mix design method in the space provided.

HMA CONTROL SECTION
The information in this section applies to the HMA control section only.

Binder Grade. The binder grade to be used on the HMA control section. If this is a PG grade, check the box provided. Otherwise, check "Other" and enter the name of the grading system.

WMA SECTIONS
The information in these sections applies to the 2 core WMA sections only.

WMA Technology. Check the appropriate box for the WMA technology to be used on the section.

Additive Type. Describe the specific type of additive to be used. Use trade names as appropriate. Leave this blank if a foaming process is to be used.

Additive Dosage Rate. Enter the dosage rate of the additive, including the basis of measurement, as in "% by weight of mix" or "% by weight of binder". Leave this blank if a foaming process is to be used.

SUPPLEMENTAL SECTIONS
If the agency intends to build supplemental sections, enter the relevant information in places provided.

WMA Technology. Check the appropriate box for the WMA technology to be used on the section.

Additive Type. Describe the specific type of additive to be used. Use trade names as appropriate. Leave this blank if a foaming process is to be used.

Additive Dosage Rate. Enter the dosage rate of the additive, including the basis of measurement, as in "% by weight of mix" or "% by weight of binder". Leave this blank if a foaming process is to be used.

Other Variations. If variations from the information specified in Sheets A, B, or C are intended for this section, describe them here. Examples include variation in RAP content, variation in binder content or grade, or variation in overlay thickness.

Sheet D. Test Section Layout

This sheet includes detail on the layout of the LTPP experimental test sections.

Total Number of Test Sections: This is the total number of test sections planned for the project, including the three core sections and any supplemental sections.

Number of Test Sections on Cut and Fill: The as-built plan and profile sheets for the candidate project should be reviewed to determine the nature of the suitable locations for the test sections. It is preferred that all test sections be located either entirely in a fill or a cut. Potential test sections should be 800 feet long to enable sampling of the subgrade and the pavement materials without disturbing the 500 feet long monitored sections. If all test sections can be located completely in a cut or fill, place a check mark on the appropriate line. If it is not possible to locate all test sections entirely on fills or cuts and it is necessary to locate some test sections on cuts and some on fills within the project, indicate the number of potential locations on cuts and the number of potential locations on fills.

Maximum Transition Between Test Sections. Indicate the maximum transition (in feet) between consecutive test sections possible in order to locate all of the test sections within the project limits.

Vertical Grade. Enter the average vertical grade slope, in percent, for the portion of the project on which the test sections are located. Downgrades, in the direction of travel, should be indicated as a negative value. If the test sections are located on varying slopes, provide information under comments on deviations from desired site selection criteria on the range in differences between the vertical slope of the test section sites.

Horizontal Curvature. Check the box if the test sections are located on a tangent section or indicate the horizontal degree of curvature at the test site. Provide a brief description under deviation from desired site selection criteria if some sections are located on tangents and others on horizontal curves. Provide information on any differences in cross slope of test sections due to superelevations on horizontal curves.

Comments on Deviations from Site Location Criteria. Provide brief comments describing significant deviations from the desired site location criteria presented in this document. Include in these comments items such as:

Unusual traffic patterns
Intersections between test sections
Substructures beneath test sections
Test section locations at cut-fill transitions

Sheet A. SPS-10 Candidate Project Nomination and Information

STATE/PROVINCE _____
SHRP ID _____ (to be assigned by FHWA if project is selected)

General Project Information

Project Location

Route Number _____
Route Signing [ ] Interstate [ ] U.S. [ ] State [ ] County
Other _____
Project Location Start Milepost _____ End Milepost _____
Begin Station _____ End Station _____
Location Description _____

_____
GPS Coordinates Latitude ° ' . " Longitude ° ' . "
Direction of Travel [ ] North Bound [ ] South Bound [ ] West Bound [ ] East Bound
Facility Type [ ] Divided [ ] Undivided
Number of Lanes (total # in both directions if undivided) _____
County _____
Highway Agency District Number _____
Distance to nearest Weather Station (miles) _____

Project Type

[ ] New Construction [ ] Flexible Resurfacing [ ] Rigid Resurfacing

Significant Dates

Latest Date of Approval Notification from FHWA _____
Contract Letting date _____
Estimated Construction Start Date _____
Estimated Date Sections Opened to Traffic _____
Estimated Construction Completion Date _____

Traffic

AADT (in project lane) _____
Percent Heavy Trucks and Combinations _____
Annual 18-kip ESALs (in project lane) _____
Design Life (years) _____

Traffic Equipment

Permanent WIM installed that can be applied to test sections? (Y or N) _____
WIM Location: Milepost: _____ Direction of Travel: _____
WIM Type/Manufacturer: _____
Last Calibration Date of WIM: _____
Does Agency agree to provide a minimum of 2 weeks of classification data, 4 times per year (total 8 weeks)? (Y or N) _____

STATE/PROVINCE _____
SHRP ID _____ (to be assigned by FHWA if project is selected)

Pavement Design Information
Resurfacing

Design Method [ ] MEPDG [ ] AASHTO 93
Other: _____

Design Life (years) _____

Existing Pavement Condition _____

Condition Assessment Method [ ] PCI (ASTM D6433)
Other: _____

Predominant Distress Type: _____

Date Existing Surface Opened to Traffic: _____

Existing Layer Structure

Layer No.[1]	Layer Description	Material Code[2]	Thickness (in)
1	**Subgrade**		[3]
2			
3			
4			
5			
6			
7			
8			
9			

Notes:
1. Layer 1 is the naturally occurring subgrade soil. The pavement surface will have the largest assigned layer number
2. Refer to Tables A-1 through A-4 for material class codes
3. If the depth to a rigid layer (such as bedrock) is known, enter it here. Otherwise leave blank.

Required Overlay Thickness (in) _____
Design Overlay Thickness (in) _____
Depth of Milling/Grinding (in) _____
Estimated Base Repair Quantity (%) _____
Other Pre-Construction Repairs _____
_____
_____

STATE/PROVINCE _____
SHRP ID _____ (to be assigned by FHWA if project is selected)

Mix Information

General Mix Design Information

Nominal Maximum Aggregate Size, mm _____
RAP Content, % _____
Rubber Content, % _____
Total Binder Content, % _____
Mix Design Method [ ] Superpave Other [ ]: _____

HMA Control Section

Binder Grade _____
Binder Grade Basis [ ] PG
[ ] Other: _____

WMA Section 1

WMA Technology [ ] Foaming Process [ ] Chemical Additive
Additive Type _____
Additive Dosage Rate _____

WMA Section 2

WMA Technology [ ] Foaming Process [ ] Chemical Additive
Additive Type _____
Additive Dosage Rate _____

[ ] Supplemental Section 1

WMA Technology [ ] Foaming Process [ ] Foaming Additive [ ] Chemical Additive [ ] Organic Additive
Additive Type _____
Additive Dosage Rate _____
Other Mix Variation _____

STATE/PROVINCE _____
SHRP ID _____ (to be assigned by FHWA if project is selected)

[ ] Supplemental Section 2

WMA Technology	[ ] Foaming Process	[ ] Foaming Additive	[ ] Chemical Additive	[ ] Organic Additive
Additive Type				
Additive Dosage Rate				
Other Mix Variation				

[ ] Supplemental Section 3

WMA Technology	[ ] Foaming Process	[ ] Foaming Additive	[ ] Chemical Additive	[ ] Organic Additive
Additive Type				
Additive Dosage Rate				
Other Mix Variation				

[ ] Supplemental Section 4

WMA Technology	[ ] Foaming Process	[ ] Foaming Additive	[ ] Chemical Additive	[ ] Organic Additive
Additive Type				
Additive Dosage Rate				
Other Mix Variation				

[ ] Supplemental Section 5

WMA Technology	[ ] Foaming Process	[ ] Foaming Additive	[ ] Chemical Additive	[ ] Organic Additive
Additive Type				
Additive Dosage Rate				
Other Mix Variation				

[ ] Supplemental Section 6

WMA Technology	[ ] Foaming Process	[ ] Foaming Additive	[ ] Chemical Additive	[ ] Organic Additive
Additive Type				
Additive Dosage Rate				
Other Mix Variation				

Note: If more than 6 supplemental sections are built the section numbers will change from “2 to 6” to “7 to11” and continuing the process to cover each supplemental section

Sheet D. SPS-10 Candidate Project Nomination and Information

STATE/PROVINCE _____
SHRP ID _____ (to be assigned by FHWA if project is selected)

Test Section Layout

Total Number of Test Sections _____
Number of Test Sections Entirely on: Cut _____ Fill _____
Maximum Transition Between Consecutive Test Sections, feet _____
Average Vertical Grade, % (+ upgrade, - downgrade) _____
Horizontal Curvature, degrees _____ [ ] Tangent

Comments on Deviations from Desired Site Location Criteria _____

LONG-TERM PAVEMENT PERFORMANCE (LTPP)
SPS-10: Warm-Mix Asphalt Experiment
Nomination Guidelines Attachment 1
Traffic Data Collection Guidelines

Overview

Quality traffic data is critical in assessing the vehicle loading on pavements. To quantify traffic loading, LTPP uses vehicle volume by classification data to determine the number of heavy and light vehicles using a roadway, as well as the variability in those volumes during different time periods (time of day, day of week, and time of year). Individual vehicle weight data is summarized to determine the distribution of axle weights by class of vehicle. When combined, these datasets provide the necessary information to directly measure or estimate vehicle loads at test sites.

Equipment Location

Traffic data must be collected at or near the warm-mix asphalt (WMA) test site, in the same direction of travel and in the LTPP lane. If the equipment is not located at the site, it should be located in close proximity to the WMA test site either upstream or downstream. The intent is to measure the same vehicles that cross over the test site, so the traffic data collection equipment must be placed away from interchanges and off ramps or on ramps between the equipment location and the SPS-10 project.

Equipment Type

The individual highway agency will determine the type of sensor to use to collect the traffic data at each test site. The TRB LTPP Expert Task Group on Traffic Data Collection and Analysis (Traffic ETG) strongly recommends using permanently mounted sensors whenever possible, even when only short duration counts are being taken. The LTPP SPS Traffic Data Collection Pooled-Fund Study has demonstrated that correctly installed and maintained permanent equipment yields more reliable results, particularly for weigh-in-motion (WIM) data[1]. Permanent equipment also reduces the cost of repeated equipment setup, allows longer data collection efforts, requires less staff time per data collection session, and reduces the exposure of data collection personnel to hazardous situations (e.g., the need to provide traffic control during portable sensor placement or the placement of data collection sensors in the roadway without traffic control).

Equipment Calibration

The highway agency should have a well-documented calibration plan that is consistently followed to ensure the quality of the data being collected is a true representation of the traffic traveling over the test site. As long as a documented calibration plan is followed, data from both portable and permanent equipment will be accepted.

[1]Field Operations Guide for SPS WIM Sites (Version 1 – April 2012, or latest version thereof)

In addition to calibrating the equipment, the highway agency should also monitor the equipment output to determine if or when an additional calibration is needed. If the equipment fails or experiences calibration drift, the agency should plan to repair the equipment within one month. Data should not be submitted for times during which the equipment is not properly calibrated.

Forms and procedures for completing the required LTPP Traffic Sheet 16, Data Collection Equipment Calibration, are detailed in the LTPP Traffic Data Collection and Processing Guide, Version 1.3 or latest version thereof.

Traffic Data Types and Collection Frequency

The monitored traffic data submitted to LTPP must consist of the following: volume counts, volume counts by vehicle class, truck weights, and ancillary information that supports the data.

Continuous data collection for classification and weight data from permanent WIM equipment is preferred at the WMA test site for two very important reasons. First, it will provide accurate traffic loading measurements that are required to develop mechanistic and mechanistic/ empirical design models. Second, it will provide the base data necessary to better understand the intricacies of the interactions among pavement, traffic load, and environment. However, if the highway agency is unable to collect continuous classification and weight data, potential project locations nominated to the SPS-10 experiment will be considered based on the amount and type of traffic data available. At a minimum , two weeks of continuous classification data four times per year (a total of eight weeks of classification data) should be collected. The highway agency is responsible for making sure representative data is collected that accounts for seasonal variation, weekday/weekend differences, and inconsistent truck loading patterns that may occur throughout the year.

Traffic Data Submittal

Traffic data collected at the WMA test site must be reported and submitted to LTPP in the format defined in the latest version of the *FHWA Traffic Monitoring Guide (TMG)*. All monitored data and ancillary information may be submitted electronically to LTPP. It is preferred the data be submitted by the agency on a monthly basis, however, the data will be accepted if submitted quarterly as well.

The agency must identify each file using the file naming convention in place for current LTPP data. An example is shown below. (Details in the "Traffic Data Collection Guide – March 12, 2001 – pages 40-42, or the latest version thereof).

C530200.C1N or W530200.C1N

Where:

- The first character represents whether the file contains weight (W) or classification (C) data.
- The second and third characters represent the State/Province code (53).
- Characters 4 through 7 represent the site identification number (0200).
- The first character of the extension represents the month of count (C = January).
- The second character of the extension represents the day of count (1=first day of the month).
- The third character of the extension represents the year of count (N=2013).

This file name will allow LTPP to enter the data, store and retrieve the data, and provide a data tracking mechanism.

The highway agency should keep the submitted data for at least 10 years, and in no circumstances should traffic data be discarded by an agency before LTPP confirms that the data were successfully loaded.

Sheet 10: Traffic Volume and Load Estimate Update – No Site Count

If a WMA test site does not have weight data, then the agency must submit an LTPP Traffic Sheet 10. A Sheet 10 records the AADT and ESAL estimates for test sections during the monitoring period when either no other site-specific or site-related traffic volume classification count and weight data were collected, or classification data but no weight data were collected. For the WMA test site, submitting one Sheet 10 per year is sufficient.

Forms and procedures for Sheet 10, Traffic Volume and Load Estimate Update – No Site Count are detailed in the LTPP Traffic Data Collection and Processing Guide, Version 1.3 or latest version thereof.

LONG-TERM PAVEMENT PERFORMANCE (LTPP)
SPS-10: Warm-Mix Asphalt Experiment
Nomination Guidelines Attachment 2
Material Type Classification Code Tables

Table 1. Pavement surface material type classification codes.

MATERIAL TYPE	CODE
Hot Mixed, Hot Laid, Asphalt Concrete, Dense graded	01
Hot Mixed, Hot Laid, Asphalt Concrete, Open Graded (Porous Friction Course)	02
Sand Asphalt	03
Jointed Plain Portland Cement Concrete	04
Jointed Reinforced Portland Cement Concrete…	05
Continuously Reinforced Portland Cement Concrete	06
Prestressed Portland Cement Concrete	07
Fiber Reinforced Portland Cement Concrete	08
Plant Mix, Cold Laid, Emulsified Asphalt Material	09
Plant Mix, Cold Laid, Cutback Asphalt Material	10
Single Surface Treatment	11
Double Surface Treatment…	12
Hot Recycled, Central Plant Mix, Asphalt Concrete	13
Central Plant Mix, Cold Laid, Recycled Asphalt Concrete…	14
Mixed-in-place, Cold Laid, Recycled Asphalt Concrete	15
Heater Scarification/Recompaction, Recycled Asphalt Concrete	16
Jointed Plain Recycled Portland Cement Concrete	17
Jointed Reinforced Recycled Portland Cement Concrete	18
Other	19

LONG-TERM PAVEMENT PERFORMANCE (LTPP)
SPS-10: Warm-Mix Asphalt Experiment
Nomination Guidelines Attachment 2
Material Type Classification Code Tables

Table 2. Base and subbase material type classification codes.

MATERIAL TYPE	CODE
No Base (Pavement Directly on Subgrade)	21
Uncrushed Gravel	22
Crushed Stone, Gravel or Slag	23
Sand	24
Soil-Aggregate Mixture, Predominately Fine-Grained Soil	25
Soil-Aggregate Mixture, Predominately Coarse-Grained Soil	26
Soil Cement	27
BITUMINOUS BOUND BASE OR BUBBASE MATERIALS	
Dense Graded, Hot Laid, Central Plant Mix	28
Dense Graded, Cold Laid, Central Plant Mix	29
Dense Graded, Cold Laid Mixed-in-place	30
Open Graded, Hot Laid, Central Plant Mix	31
Open Graded, Cold Laid, Central Plant Mix	32
Open Graded, Cold Laid, Mixed-in-place	33
Recycled Asphalt Concrete, Plant Mix, Hot Laid	34
Recycled Asphalt Concrete, Plant Mix, Cold Laid	35
Recycled Asphalt Concrete, Mixed-in-place	36
Sand Asphalt	46
Cement Aggregate Mixture	37
Lean Concrete (< 3 sacks/cy)	38
Recycled Portland Cement Concrete	39
Sand-Shell Mixture	40
Limerock, Caliche (Soft Carbonate Rock)	41
Lime-Treated Subgrade Soil	42
Cement Treated Subgrade Soil	43
Pozzolanic-Aggregate Mixture	44

LONG-TERM PAVEMENT PERFORMANCE (LTPP)
SPS-10: Warm-Mix Asphalt Experiment
Nomination Guidelines Attachment 2
Material Type Classification Code Tables

Table 3. Subgrade soil Description codes.

MATERIAL TYPE	CODE
FINE-GRAINED SUBGRADE SOILS	
Clay (Liquid Limit > 50)	51
Sandy Clay	52
Silty Clay	53
Silt	54
Sandy Silt	55
Clayey Silt	56
COARSE-GRAINED SOILS	
Sand	57
Poorly Graded Sand	58
Silty Sand	59
Clayey Sand	60
Gravel	61
Poorly Graded Gravel	62
Clayey Gravel	63
Shale	64
Rock	65

LONG-TERM PAVEMENT PERFORMANCE (LTPP)
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Nomination Guidelines Attachment 2
Material Type Classification Code Tables

Table 4. Material type classification codes for thin seals and interlayers.

MATERIAL TYPE	CODE
Chip Seal Coat	71
Slurry Seal Coat	72
Fog Seal Coat	73
Woven Geotextile	74
Nonwoven Geotextile	75
Stress Absorbing Membrane Interlayer	77
Dense Grades Asphalt Concrete Interlayer	78
Aggregate Interlayer	79
Open Graded Asphalt Concrete Interlayer	80
Chip Seal with Modified Binder (Excluding Absorbing Membrane)	81
Sand Seal	82
Asphalt Rubber Seal Coat (Stress Absorbing Membrane)	83
Sand Asphalt	84
Other	85