Memorandum

U.S. Department
of Transportation

**Federal Highway
Administration**

6300 Georgetown Pike
McLean, Virginia 22101

Subject: **ACTION**: LTPP Directive I-170 Amendment #1
Information Management System

Date: March 17, 2015

From: Jane Jiang
Long Term Pavement Performance Team

Reply to
Attn of: HRDI-30

To: Mr. Gabe Cimini, PM - LTPP North Atlantic Regional Contract
Mr. Gabe Cimini, PM - LTPP North Central Regional Contract
Mr. James Sassin, PM - LTPP Southern Regional Contract
Mr. Kevin Senn, PM - LTPP Western Regional Contract

Attached is Long Term Pavement Performance (LTPP) Program Directive I -170, AIMS Data Storage Format Standards. This directive supersedes directive I-170 partially. Please ensure that all personnel involved with the process are aware of this new directive.

Should you have any questions concerning this directive, please do not hesitate to contact me on (202) 493-3149 or jane.jiang@fhwa.dot.gov.

Attachment

LONG TERM PAVEMENT PERFORMANCE PROGRAM DIRECTIVE

For the Technical Direction of the LTPP Program

Program Area:	Information Management System	Directive Number:	I-170 Amendment #1
Date:	March 17, 2015	Supersedes:	I-170 partially
Subject:	AIMS Data Storage Format Standards		

Directive I-170 dated October 13, 2014 is amended replacing the tables that show directory structures and the section on file naming for profiler outputs.

The tables removed are: Table 1. LTPP AIMS directory data storage structure, Table 2. Expanded LTPP AIMS directory data storage structure for regionally loaded data, and Table 3. Expanded LTPP AIMS directory data storage structure for centrally loaded data. The replacement tables are by Table 1. LTPP AIMS directory data storage structure – field operations, Table 2. LTPP AIMS directory data storage structure - other RSC operations and Table 3. LTPP AIMS directory data storage structure – centrally loaded which follow.

The section on naming for profiling operations beginning "Profile (PRF)—Longitudinal and Weigh-In-Motion (WIM) Sites" (page 12) and ending immediately prior to Resilient Modulus Material Tests (page) 14 is replaced with the material beginning on page 5.

Table 1. LTPP AIMS directory data storage structure – field operations.

Primary Directory	2nd Tier	3rd Tier	4th Tier	5th Tier	6th Tier
DEF	STATE_CODE	STATE_CODE+SHRP_ID	SURVEY_DATE		
DEFCAL	DEFL_UNIT_ID	YEAR	REF		
DEFCAL	DEFL_UNIT_ID	YEAR	REL		
DIS	ADS	STATE_CODE	STATE_CODE+SHRP_ID	SURVEY_DATE	
DIS	MDS	STATE_CODE	STATE_CODE+SHRP_ID	SURVEY_DATE	
DIS	TPF	STATE_CODE	STATE_CODE+SHRP_ID	SURVEY_DATE	
DSV	STATE_CODE	STATE_CODE+SHRP_ID	DIS	VIDEO_DATE	
DSV	STATE_CODE	STATE_CODE+SHRP_ID	GEN	VIDEO_DATE	
DSV	STATE_CODE	STATE_CODE+SHRP_ID	PROF	VIDEO_DATE	
HSS	FRD	STATE_CODE	YEAR		
HSS	LPF	STATE_CODE	STATE_CODE+SHRP_ID	SURVEY_DATE	
HSS	LPF	STATE_CODE	STATE_CODE+SHRP_ID	SURVEY_DATE	ERD
HSS	LPF	STATE_CODE	STATE_CODE+SHRP_ID	SURVEY_DATE	*Set#*
HSS	LPF	STATE_CODE	STATE_CODE+SHRP_ID	SURVEY_DATE	PHOTO
HSS	WSP	STATE_CODE	STATE_CODE+*EELW*	SURVEY_DATE	
HSS	WSP	STATE_CODE	STATE_CODE+*EELW*	SURVEY_DATE	ERD
HSS	WSP	STATE_CODE	STATE_CODE+SHRP_ID	SURVEY_DATE	PHOTO
PRF	LPF	STATE_CODE	STATE_CODE+SHRP_ID	SURVEY_DATE	
PRF	LPF	STATE_CODE	STATE_CODE+SHRP_ID	SURVEY_DATE	ERD
PRF	LPF	STATE_CODE	STATE_CODE+SHRP_ID	SURVEY_DATE	*Set#*
PRF	LPF	STATE_CODE	STATE_CODE+SHRP_ID	SURVEY_DATE	PHOTO
PRF	WSP	STATE_CODE	STATE_CODE+*EELW*	SURVEY_DATE	ERD
PRF	WSP	STATE_CODE	STATE_CODE+*EELW*	SURVEY_DATE	
PRF	WSP	STATE_CODE	STATE_CODE+*EELW*	SURVEY_DATE	ERD
PRF	WSP	STATE_CODE	STATE_CODE+SHRP_ID	SURVEY_DATE	PHOTO

Note: *Set#* : {SET1, SET2, SET3, etc.} and *EELW*: {EE - Experiment Number, L - Lane (O) outer or (I) inner, W - Wheelpath (L) left, (R) right, (C) center}

Table 2. LTPP AIMS directory data storage structure - other RSC operations.

Primary Directory	2nd Tier	3rd Tier	4th Tier	5th Tier	6th Tier	7th Tier	8th Tier
AWS	STATE_CODE	AWS_ID					
DRN	STATE_CODE	STATE_CODE+SHRP_ID					
FRIC	STATE_CODE	STATE_CODE+SHRP_ID					
INV	STATE_CODE	STATE_CODE+SHRP_ID					
MAT	SAMP	STATE_CODE	STATE_CODE+SHRP_ID				
MAT	TST	STATE_CODE	STATE_CODE+SHRP_ID				
MNT	STATE_CODE	STATE_CODE+SHRP_ID					
RHB	STATE_CODE	STATE_CODE+SHRP_ID					
SMP	STATE_CODE	STATE_CODE+SHRP_ID	SURVEY_DATE				
SPS	STATE_CODE	STATE_CODE+SHRP_ID					
TRF[1]	LTAS	STATE_CODE	STATE_CODE+SHRP_ID	YEAR	AVC		
TRF[1]	LTAS	STATE_CODE	STATE_CODE+SHRP_ID	YEAR	WIM		
TRF	LTAS	STATE_CODE	STATE_CODE+SHRP_ID	YEAR	VOL		
TRF	LTQC	STATE_CODE	STATE_CODE+SHRP_ID	LEV4	DATA	YEAR	AVC4
TRF	LTQC	STATE_CODE	STATE_CODE+SHRP_ID	LEV4	DATA	YEAR	DATA
TRF	LTQC	STATE_CODE	STATE_CODE+SHRP_ID	LEV4	DATA	YEAR	VOL3
TRF	LTQC	STATE_CODE	STATE_CODE+SHRP_ID	LEV4	DATA	YEAR	WIM7
TRF	MON	STATE_CODE	STATE_CODE+SHRP_ID	LEV4	YEAR		
TRF	SHEET	STATE_CODE	STATE_CODE+SHRP_ID				

[1] Loaded from processing software

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Table 3. LTPP AIMS directory data storage structure – centrally loaded.

Primary Directory	2nd Tier	3rd Tier	4th Tier	5th Tier	6th Tier	7th Tier	8th Tier	9th Tier
DDV	STATE_CODE	STATE_CODE+ SHRP_ID	VIDEO_DATE					
DLR	Ohio_DOT_Data							
DLR	RAW_TRACES	STATE_CODE	STATE_CODE+ SHRP_ID	Trace_Number				
GPR	STATE_CODE+ SPS_ID							
MAT	TST	P07	STATE_CODE	STATE_CODE+ SHRP_ID	*Layer_No*			
MAT	TST	P46	STATE_CODE	STATE_CODE+ SHRP_ID	*Layer_No*			
TRF	PVR	STATE_CODE	STATE_CODE+ SHRP_ID	YEAR	BINARY			
TRF	PVR	STATE_CODE	STATE_CODE+ SHRP_ID	YEAR	ASCII	iANALYZE5_1		
TRF	PVR	STATE_CODE	STATE_CODE+ SHRP_ID	YEAR	ASCII	iANALYZE5_2Beta		
TRF	PVR	STATE_CODE	STATE_CODE+ SHRP_ID	YEAR	ASCII	iANALYZE5_3	LTPP_CLASS_ SCHEME_2006	LTPP_Lane
TRF	PVR	STATE_CODE	STATE_CODE+ SHRP_ID	YEAR	ASCII	iANALYZE5_3	LTPP_CLASS_ SCHEME_2006	NON_LTPP_Lane
TRF	PVR	STATE_CODE	STATE_CODE+ SHRP_ID	YEAR	ASCII	iANALYZE5_3	LTPP_CLASS_ SCHEME_2013	LTPP_Lane
TRF	PVR	STATE_CODE	STATE_CODE+ SHRP_ID	YEAR	ASCII	iANALYZE5_3	LTPP_CLASS_ SCHEME_2013	NON_LTPP_Lane

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Profile (PRF)—Longitudinal and Weigh-In-Motion (WIM) Sites
The PRF folders are used for profile data collected prior to April 19, 2013, the implementation data for the Ames Inertial Profilers. Separate folders shall be used for each profile subcategory; longitudinal profile (LPF) and WIM site profile (WSP). Where applicable, data files created during the archival process using the ProQual software are placed in the corresponding directories in accordance with Directive 49 or its successors. Specific directions and subdirectory structures for each subcategory follow.

Longitudinal Profile (LPF)

Longitudinal profile that has been collected with both high-speed road profilers and Dipstick shall be stored in the central AIMS file archive. LPF data includes texture measurements from high speed profilers. File names for data from road profilers are assigned in accordance with applicable directives at the time the data was collected.

The following directory structure and subfolders are used for data files from high-speed profilers where the data storage directory does not have to be split due to repeat files names produced by the ProQual software for multiple measurement data sets created on the same day.

PRF\LPF\STATE_CODE\STATE_CODE+SHRP_ID\SURVEY_DATE (YYYYMMDD)

An example data storage directory is PRF\LPF\01\012106\19921222.

The following directory structure and subfolders are used for data files from high-speed profilers where the data storage directory have to be split due to repeat files names produced by the ProQual software for multiple sets of measurement data created on the same day. In this situation, an additional folder is being added to the directory structure using the name SET. A set is a group of multiple profile measurements collected on a measurement day where all of the required data files produced from ProQual can logically be stored in the same file folder.

PRF\LPF\STATE_CODE\STATE_CODE+SHRP_ID\SURVEY_DATE (YYYYMMDD)\SET#

An example data storage directory is PRF\LPF\04\040210\20131225\SET1.

Where SET#, starts at SET1 and is incremented by one for each set of profile measurements performed on the same day. For example, if in response to LTPP directive P-46, 3 sets of profile measurements are performed at different times on the same day then the resulting data would be stored as follows:

- SET1 – first data set collected on the test day.
- SET2 – second data set collected on the test day.
- SET3 – third data set collected on the test day.

When possible, RSCs shall convert raw profiles to the *.ERD format and place these files in the ERD directory subfolder. This structure is used for *.ERD files regardless of if the other profile data files need to be split into sets.

PRF\LPF\STATE_CODE\STATE_CODE+SHRP_ID\SURVEY_DATE (YYYYMMDD)\ERD

An example data storage structure is PRF\LPF\01\012106\19921222\ERD.

Photos collected as part of profiling will be retained with the data collected on the survey date in a separate subfolder.

PRF\LPF\STATE_CODE\STATE_CODE+SHRP_ID\SURVEY_DATE (YYYYMMDD)\PHOTO

File names for photographs collected as part of a profiling visit use the following file naming convention:

PRF+STATE_CODE+SHRP_ID+SURVEY_DATE(YYYYMMDD)+##.JPG

Where ## is the photograph sequence number on the survey day starting at 01.

The following directory structure and file name convention is used for longitudinal profile measurements with a Dipstick scanned from the paper data collection forms:

PRF\LPF\STATE_CODE\STATE_CODE+SHRP_ID\SURVEY_DATE (YYYYMMDD)*File_name*

Where *File_name* is PRF+STATE_CODE+SHRP_ID+"_"+SURVEY_DATE (YYYYMMDD).pdf

An example data directory storage structure and file name format for longitudinal Dipstick measurements performed on section 10_1450 on 03/08/2000 is:

PRF\LPF\10\101450\20030308\PRF101450_20000308.pdf

WIM Site Profile (WSP)

For the WIM site profile (WSP) subcategory, the following directory structures and subfolders shall be used for raw data and data in ERD format

PRF\WSP\STATE_CODE*SSEELW*\SURVEY_DATE (YYYYMMDD)*filename.ext* is used for raw profile data files produced by the field measurement device and named in accordance with the LTPP file naming convention in force at the time of data collection.

PRF\WSP\STATE_CODE*SSEELW*\SURVEY_DATE (YYYYMMDD)\ERD*filename.*ERD is used for longitudinal profile data converted to ERD format.

Where:

SS = State code

EE = Experiment number

L = Lane designation, "O" is outer and "I" is inner

W = Wheel path, "L," "R," and "C" for left, right, and center, respectively.

An example data storage structure is PRF\WSP\36\3608OL\20020913\ERD.

This folder should contain the electronic data files produced by the field measurement device, other associated electronic data files, and ERD files if they were previously created. The files shall be named in accordance with LTPP file naming conventions at the time of their creation.

Photos collected as part of profiling will be retained with the data collected on the survey date in a separate subfolder.

PRF\WSP\STATE_CODE\STATE_CODE+SHRP_ID\SURVEY_DATE (YYYYMMDD)\PHOTO

File names for photographs collected as part of a profiling visit are with the following file naming convention:

PRF+STATE_CODE+SHRP_ID+SURVEY_DATE(YYYYMMDD)+##.JPG

Where:

SHRP_ID = project ID or a specific section SHRP_ID as long as the same SHRP_ID is used for all visits with any type of profiler.

= the photograph sequence number on the survey day starting at 01.

Profile (HSS)—Longitudinal and Weigh-In-Motion (WIM) Sites
The HSS folders are used for profile data collected by the Ames Inertial Profilers beginning April 19, 2013. Separate folders shall be used for each profile subcategory; longitudinal profile (LPF) and WIM site profile (WSP). Where applicable, data files created during the archival process using the ProQual software are placed in the corresponding directories in accordance with Directive P 49 or its successors. Specific directions and subdirectory structures for each subcategory follow.

Longitudinal Profile (LPF)

Longitudinal profile that has been collected with both high-speed road profilers and Dipstick shall be stored in the central AIMS file archive. LPF data includes texture measurements from high speed profilers. File names for data from road profilers are assigned in accordance with applicable directives at the time the data was collected.

The following directory structure and subfolders are used to archive raw data files and equivalent XML files from runs collected by high-speed survey units for individual sections. In addition to section data, pre & post data is included as well as transitional area data for multi-section data collection runs.

HSS\LPF\STATE_CODE\STATE_CODE+SHRP_ID\SURVEY_DATE (YYYYMMDD)

An example data storage directory is HSS\LPF\24\240503\20140912.

The following directory structure and subfolders are used for data files from high-speed profilers where the data storage directory have to be split due to repeat files names produced by the ProQual software for multiple sets of measurement data created on the same day. In this situation, an additional folder is being added to the directory structure using the name SET. A set is a group of multiple profile measurements collected on a measurement day where all of the required data files produced from ProQual can logically be stored in the same file folder.

HSS\LPF\STATE_CODE\STATE_CODE+SHRP_ID\SURVEY_DATE (YYYYMMDD)\SET#

An example data storage directory is HSS\LPF\48\480001\20151216\SET1.

Where SET#, starts at SET1 and is incremented by one for each set of profile measurements performed on the same day. For example, if in response to LTPP directive P-46, 3 sets of profile measurements are performed at different times on the same day then the resulting data would be stored as follows:

- SET1 – first data set collected on the test day.
- SET2 – second data set collected on the test day.
- SET3 – third data set collected on the test day.

When possible, RSCs shall convert raw profiles to the *.ERD format and place these files in the ERD directory subfolder. This structure is used for *.ERD files regardless of if the other profile data files need to be split into sets.

HSS\LPF\STATE_CODE\STATE_CODE+SHRP_ID\SURVEY_DATE (YYYYMMDD)\ERD

An example data storage structure is PRF\LPF\01\012106\20140513\ERD.

For raw data files and equivalent XML files the following directory structure will be used:

HSS\FRD\STATE_CODE\YEAR

An example data storage directory structure is HSS\FRD\35\2015.

Photos collected as part of profiling will be retained with the data collected on the survey date in a separate subfolder.

HSS\LPF\STATE_CODE\STATE_CODE+SHRP_ID\SURVEY_DATE (YYYYMMDD)\PHOTO

File names for photographs collected as part of a profiling visit use the following file naming convention:

HSSAASHRPBrYYYYMMDDNNNN.jpg

Where:

HSS – High-Speed survey. The first three characters of the filename will always be HSS.

AA = Numeric State Code.

SHRP = SHRP_ID for Site.

B = G for a GPS section. After sequential visit identifier Z has been reached at a GPS section change G to H

= S for a SPS section. After sequential visit identifier Z has been reached at a SPS section change S to T.

r – Sequential Visit Identifier Associated with the Profiler Visit. After visit identifier Z has been reached restart with visit identifier A.

YYYYMMDD – Profile date (Year/Month/Date).

NNNN – Number of image in sequence starting with 1 for the first image.

The following directory structure and file name convention is used for longitudinal profile measurements with a Dipstick scanned from the paper data collection forms:

HSS\LPF\STATE_CODE\STATE_CODE+SHRP_ID\SURVEY_DATE (YYYYMMDD)*File_name*

Where *File_name* is PRF+STATE_CODE+SHRP_ID+"_"+SURVEY_DATE (YYYYMMDD).pdf

An example data directory storage structure and file name format for longitudinal Dipstick measurements performed on section 42_0606 on 03/08/2014 is:

HSS\LPF\10\420606\20140308\PRF420606_20140308.pdf

WIM Site Profile (WSP)

For the WIM site profile (WSP) subcategory, the following directory structures and subfolders shall be used for raw data and data in ERD format

HSS\WSP\STATE_CODE*SSEELW*\SURVEY_DATE (YYYYMMDD)*filename.ext* is used for raw profile data files produced by the field measurement device and named in accordance with the LTPP file naming convention in force at the time of data collection.

HSS\WSP\STATE_CODE*SSEELW*\SURVEY_DATE (YYYYMMDD)\ERD*filename.*ERD is used for longitudinal profile data converted to ERD format.

Where:

SS = State code

EE = Experiment number

L = Lane designation, "O" is outer and "I" is inner

W = Wheel path, "L," "R," and "C" for left, right, and center, respectively.

An example data storage structure is HSS\WSP\36\3608OL\20130913\ERD.

This folder should contain the electronic data files produced by the field measurement device, other associated electronic data files, and ERD files if they were previously created. The files shall be named in accordance with LTPP file naming conventions at the time of their creation.

Photos collected as part of profiling will be retained with the data collected on the survey date in a separate subfolder.

HSS\WSP\STATE_CODE\STATE_CODE+SHRP_ID\SURVEY_DATE (YYYYMMDD)\PHOTO

File names for photographs collected as part of a profiling visit are with the following file naming convention:

HSSAASHRPBrYYYYMMDDNNNN.jpg

HSS – High-Speed survey. The first three characters of the filename will always be HSS.
AA – Numeric State Code.
SHRP – SHRP_ID for Site.
B –W for a WIM section. After sequential visit identifier Z has been reached at a WIM section change W to X.
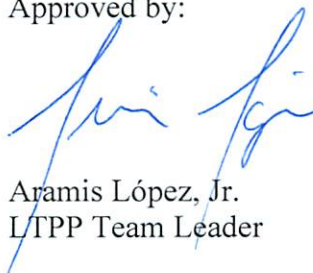r – Sequential Visit Identifier Associated with the Profiler Visit. After visit identifier Z has been reached restart with visit identifier A.
YYYYMMDD – Profile date (Year/Month/Date).
NNNN – Number of image in sequence starting with 1 for the first image.

Prepared by: TSSC

Approved by:

Aramis López, Jr.
LTPP Team Leader

3/20/15