



U.S. Department  
Of Transportation

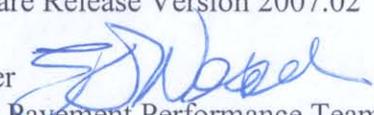
Federal Highway  
Administration

# Memorandum

6300 Georgetown Pike  
McLean, Virginia 22101

Subject: **ACTION:** LTPP Directive I-132  
IMS Software Release Version 2007.02

Date: February 22, 2007

From: Eric Weaver   
Long Term Pavement Performance Team

Reply to  
Attn of: HRDI-13

To: Dr. Frank Meyer, PM - LTPP North Atlantic Regional Contract  
Dr. Frank Meyer, PM - LTPP North Central Regional Contract  
Mr. Mark Gardner, PM - LTPP Southern Regional Contract  
Mr. Kevin Senn, PM - LTPP Western Regional Contract

Attached is the Long Term Pavement Performance (LTPP) Program Directive I-132. This directive authorizes implementation of the IMS software upgrade from version 2006.09 to 2007.02. Upgrade instructions are provided in attachment 1. Please notify the FHWA and TSSC when the upgrade has been installed. Please ensure that all personnel involved with the IMS are aware of this new directive.

Should you have any questions or would like to discuss this directive, please do not hesitate to contact me at 202-493-3153.

Attachments (3)

FHWA:HRDI-13:EWeaver:mdeeney:493-3153:2/16/07

File: c:/mdeeney/directive/ims/I-132dir.doc

cc:

Gonzalo Rada  
Directive Binder  
LTPP Team  
Official file  
Chron



## LONG TERM PAVEMENT PERFORMANCE PROGRAM DIRECTIVE



*For the Technical Direction of the LTPP Program*

**Program Area:** IMS

**Directive Number:** I-132

**Date:** February 22, 2007

**Supersedes:** I-131

**Subject:** IMS Software Release Version 2007.02

This directive authorizes implementation of the IMS software upgrade from version 2006.09 to 2007.02. Upgrade instructions are provided in attachment 1. Please notify the FHWA and TSSC when the upgrade has been installed.

Software change notice 98, contained in the attached file, SCN\_98.pdf, lists all of the changes made to the IMS software since the last software release. This notice shall be filed in the Operator's Log.

This software update constitutes a formal release of QC changes and data updates that were identified during the processing of Data Release 21. Changes include corrections to the new QC checks in the manual and automated distress modules, two modifications to the new CN assign procedure, and updates to the materials test QC and transverse profile QC.

In addition, a resolution to the problem of multiple codetypes associated with fields INV\_ADMIX, INV\_ADMIXTURE and INV\_AGGR\_COMP.AGGR\_COMP\_TYPE has been implemented. A new code list was generated to include all valid codes and the datatype of the coded field was changed to a character field. Due to these changes, inventory forms 8, 9, 12, and 20 will no longer be available for data entry or data updates. Data entry personnel will not see these forms in the menu and typing the associated sheet number in another INV form will cause a message at the bottom of the screen indicating that the referenced form does not exist.

The Software Change Notice (attachment 2) lists these and other miscellaneous changes.

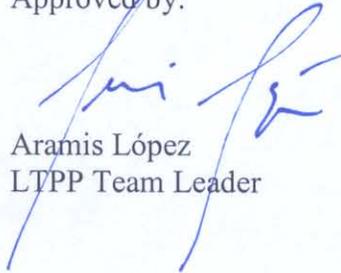
Version 2007.02 of the IMS software will be distributed via e-mail to each region. The files included in the password protected zip file are:

- VR2007\_02.ZIP – A zip file with the batch file (VR2007\_02.BAT) and scripts needed to make miscellaneous updates to the database and to run other related administrative commands. Refer to the table included in attachment 1 for an alphabetic list and descriptions of the scripts called by this batch file.

- LTPP.ZIP - A zip file with all files to go in the LTPP area (and subdirectories) on the server.
- OracleVersions.ZIP – A zip file with listings of all Oracle files and versions loaded on the server at the central site. These are included for reference only.

Prepared by: TSSC

Approved by:



Aramis López  
LTPP Team Leader

# Attachment 1

## Instructions to Apply VR 2007.02 Release

1. Create the subdirectory RELEASES\VR2007\_02 (the directory RELEASES should already exist).
2. Copy and unzip the VR2007\_02.zip file into the subdirectory created in step 1.
3. Shutdown ORACLE in normal mode and backup Server.
4. Bring ORACLE up.
5. From a DOS prompt in the RELEASES\VR2007\_02 directory, type

```
VR2007_02 dbusername/dbpassword@instance
```

to begin the software update. This batch file will export several tables that are updated by the release scripts. **The export file, VR2007\_02AlteredTables.dmp, could approach 500 MB,** so you may want to compress this file and/or write it off to CD if you have issues with disk space. If the export is successful, the batch file will run the scripts listed alphabetically in table 1, below.

6. The scripts make some table changes and data updates. **Check carefully that all scripts completed successfully by reviewing the \*.lis files (refer to list, below).** Ignore errors about dropping non-existent objects.
7. Copy the LTPP.ZIP file into the LTPP subdirectory. Right-click on the filename and choose "Extract to Here" to unzip the file into the LTPP subdirectory. Answer "Yes to all" to overwrite existing files. Delete the LTPP.ZIP file.
8. The OracleVersions.zip file is included for reference only. Extract these files into the OracleVersions directory. It will create an OracleVersions\VR200702 subdirectory.

Table 1. Scripts run from the VR2007\_02.bat file

Script and Output Filenames (.sql & .lis)	Description
ALL_AWS_SOLAR_FIX	Update AWS_HOURLY_DATA.TOTAL_HR_SOLAR from null to 0 on days where there are at least 2 hours of solar data.
fix_history_stored	Update MON_DEFL_DROP_DATA.HISTORY_STORED to 'N' or 'Y' where it is currently 0 or 1.
HPMS_SAMPLE_NO	Update INV_ID.HPMS_SAMPLE_NO and SPS_ID.HPMS_SECTION_SD.
ResetRecordStatus_0702	Reset record_status for records in CRCP tables that fail the revised level E check. Reset all records in MON_T_PROF_PROFILE and MON_T_PROF_MASTER to D.
SPR3721SetPvmtWidth	Set MON_T_PROF_MASTER.PVMT_WIDTH to the most common maximum x value in MON_T_PROF_PROFILE.
SPR3726_UpdateCommentCode	Update CODES.DETAIL for CODETYPE L05B_COMMENT_CODES and CODE ='Z' (other).
SPR3728LabCodes	Added CODES for Arizona DOT Central Laboratory.
SPR3737MultipleCodeFixes	Combined inventory codetypes to reduce confusion where multiple codetypes existed for a single field. See new codetypes INV_ADMIX_TYPE and INV_AGGR_COMP.
SPR3737_RemoveINVForms	Remove access to INV forms 8, 9, 12, 20 due to datatype changes on INV_ADMIX.INV_ADMIXTURE and INV_AGGR_COMP.AGGR_COMP_TYPE.
UpdateNullRollerDesc	Update INV_PMA_ROLLER.ROLLER_CODE_DESC field where it was null.

## Attachment 2

# Software Change Notice 98

REG #	SAIC #	Program Name	Referred To	Date Rec	Date Comp
<b>Administrative</b>					
4-3728	3728	Lab Code		1/4/2007	1/24/2007
<b>Description</b>			<b>Resolution</b>		
Add new lab code for Arizona DOT Central Laboratory in Phoenix, AZ.			Added code.		
M-3726	3726	Codes Table		12/5/2006	12/18/2006
<b>Description</b>			<b>Resolution</b>		
The code LO5B_COMMENT_CODES, change the definition for a code of Z to: Other (Enter description in COMMENT_NOTE field).			Code description changed, as requested.		
There is no column 8 in the TST_LO5B table. There is on the paper data form for this table.					
<b>Climatic</b>					
S-3558	3558	CLM_QC		11/18/2004	10/11/2006
<b>Description</b>			<b>Resolution</b>		
Change the length of the ROWID in the clm QC program to something greater than or equal to 28. Since memory is no longer an issue, I would choose 64. That seems safe since the logical ROWID is based on the keys and does not have a fixed length. The longest length in this table is 28.			Superseded by SPR3575 which moves these checks to CLMVWSQC.		

REG #	SAIC #	Program Name	Referred To	Date Rec	Date Comp
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CN Assign
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3-3711      3711      CN Assign Procedure

10/2/2006      10/3/2006

**Description**

I think there is a small problem with the new CN assignment procedure that was implemented through the last version of the RIMS upgrade (VR 06.08). The new procedure uses the Date Measurement Began from the SPS 6 Layer Thickness table to assign the CN nos to this table. The SPS 6 Layer Thickness table contains the summarized rod and level data taken prior to the overlay and after the overlay. The date measurements began is inconsequential in this case as the date complete should determine the actual construction no. (the date began is inconsequential as long as there was no intermediate construction event that modified that the elevation of the original surface layer).  
I have attached the actual data sheet that contains entries that go into this table for your reference. The new CN assignment procedure has reset the const. no. for 825 records in our region to an incorrect CN due to the above mentioned problem. I have also attached the CN.lis output that shows the change in CN no.

**Resolution**

Changed CN\_DRIVING\_COLUMN() in CNUilities.sql to always return 'DATE\_COMPLETE' for SPS6\_LAYER\_THICKNESS and SPS7\_LAYER\_THICKNESS.

With the upload looming just around the corner, we have 2 options of fixing this problem.

1. Updating the SPS 6 Layer Thickness Table with the correct CN no by means of a script just prior to the upload after all other QC has been taken care of.
2. Wait for SAIC to fix the CN assignment procedure.

Please let us know how you would like to handle this.

M-3725      3725      CNUilities.sql

12/14/2006      12/14/2006

**Description**

Update CN Assign utility for TST\_ISD\_MOIST so that it will use the TST\_HOLE\_LOG table to set CN.

**Resolution**

CNUilities.sql updated.

REG #	SAIC #	Program Name	Referred To	Date Rec	Date Comp
<b>Data</b>					
S-3739	3739	Misc Data Updates		1/4/2007	1/5/2007
<b>Description</b>			<b>Resolution</b>		
Run scripts developed during Data Release 21 on central database and in the regions. The ones to be sent to the regions are as follows: ALL_AWS_SOLAR_FIX, fix_history_stored, HPMS_SAMPLE_NO, UpdateNullRollerDesc.			1. All scripts run centrally by 1/10/07. 2. Send necessary scripts to regions with 2007.02 software release.		
<b>Database Administration</b>					
S-3738	3738	SECT_MNT.BAT		1/2/2007	1/2/2007
<b>Description</b>			<b>Resolution</b>		
Remove the profile constraint disable call since the constraint must be enabled for the CASCADE DELETE to MON_PROFILE_DATA to work.			Removed disable and enable constraint statements from this batch file.		
<b>Inventory</b>					
M-3737	3737	CODES, CODETYPES		1/19/2007	2/13/2007
<b>Description</b>			<b>Resolution</b>		
As was brought up during out post upload review of Release 21, there are a few INV tables that have fields containing multiple codes. Given our resources, we have determined that the best course of action is to simply combine the multiple codes into a single code, and change the entries as necessary. See specs, attached. Include necessary changes to INV_QC.			SPR3737MultipleCodeFixes.sql created to remove old and create new codes, make schema changes to the coded fields, and update the coded data. Changed INV_QC to allow for datatype changes and coded value changes. Also created SPR3737_RemoveINVForms to remove inventory forms INV_08, 09, 12, 20 from the INV forms menu.		

REG #	SAIC #	Program Name	Referred To	Date Rec	Date Comp
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**Manual Distress**

2-93      3712      DISQC

10/4/2006      10/4/2006

**Description**

New level C QC checks for values missing in MON\_DIS\_JPCC\_REV that came with IMS latest upgrade version VR 2006\_09 are incorrectly failing records that should not fail.

The QC is looking in the PATCH\_FLEX\_A\_M field and if a value exists it is expecting a value to be in the PATCH\_FLEX\_NO\_M field but the QC is looking in the PATCH\_FLEX\_NO\_H not the PATCH\_FLEX\_NO\_M field. When it doesn't find a value it reports it as an error and leaves the record\_status at level B.

Please modify the QC so that it looks in the correct field. Also modify the output file so that the correct field is listed as well. Time is of the essence as we have an impending upload on October 31, 2006

**Resolution**

Changed PATCH\_FLEX\_NO\_H to PATCH\_FLEX\_NO\_M in column 20 of the level C output.

2-94      3713      DISQC

10/4/2006      10/4/2006

**Description**

New level C QC checks for values missing in MON\_DIS\_CRCP\_REV that came with latest IMS upgrade, version VR 2006\_09, are incorrectly failing records that should not fail.

The QC is looking in the LONG\_JT\_SEAL\_NO field and if a value greater than zero exists, it is expecting a value larger than zero to be in the LONG\_JT\_SEAL\_DAM\_L field. The LONG\_JT\_SEAL\_NO field shows the number of Longitudinal joints sealed and does not require a value larger than zero to be present in the LONG\_JT\_SEAL\_DAM field (a newly sealed joint will have no damage thus a zero value).

The records failing in the attached output all have a zero value for the LONG\_JT\_SEAL\_DAM\_L field as no damage was reported.

Please modify the QC so that it allows a zero value for the LONG\_JT\_SEAL\_DAM\_L field when a value greater than zero exists in the LONG\_JT\_SEAL\_NO field. Time is of the essence as we have an impending

**Resolution**

Changed the LONG\_JT\_SEAL\_DAM\_L to LONG\_JT\_SEAL\_NO comparison to be one sided. LONG\_JT\_SEAL\_DAM\_L is not required just because there are sealed joints.

REG #	SAIC #	Program Name	Referred To	Date Rec	Date Comp
upload on October 31, 2006.					
3-896	3719	DISQC, level C	MACTEC	10/18/2006	2/13/2007
<b>Description</b>			<b>Resolution</b>		
<p>The level C distress QC on the table MON_DIS_JPCC_REV requires an entry for the fields "spalling_I" and "pumping_I" if an entry is found for the field "spalling_no" or "pumping_no". The initial distress data collection forms (prior to May 1992) did not have a field to record the lengths. As such, the data collected prior to May 1992 will not have these required data elements. The QC should be changed to exclude this check on surveys prior to May 1992.</p>			<p>Modified QC to only run level C checks on indicated fields after 6/1/1992. These fields appeared on data sheet 4 after this date. Fpair routine added to code to print fields when bypassed by the QC checks.</p>		
M-3710	3710	Distress QC		9/27/2006	10/11/2006
<b>Description</b>			<b>Resolution</b>		
<p>I can't believe I didn't notice this before, but the new checks on FAULT_SECT are no good. The checks that were in place are good.</p> <p>Fortunately for us, this is a central computed parameter table, which means that we can safely send this QC out to the regions, despite the bad checks.</p> <p>So, sometime before I do the computed parameters for the next upload, we have to make sure and remove the new checks so we don't get all these bad failures.</p>			<p>Did a difference between version 1.13 which is the latest code and version 1.10 in PVCS to see the changes for SPR 3608. Restored mondisjpcfaultsect() to pre-SPR3608 functionality.</p>		
M-3715	3715	DISQC and DISPAD42		10/11/2006	11/17/2006
<b>Description</b>			<b>Resolution</b>		
<p>Modify DISQC as described in attached email:  In particular - remove the checks between TRANS_CRACK_NO_H, M, and L and TOTAL_NO for both MON_DIS_CRCP_REV and MON_DIS_PADIAS42_CRCP.</p> <p>Also, modify the Level E QC for both MON_DIS_CRCP_REV and MON_DIS_PADIAS42_CRCP as follows:</p>			<p>Removed checks from DISQC (MonDisCrcpRevC) and DISPAD42 (MonDisPadias42CrcpC). Altered checks as described in DISQC (MonDisCrcpRevE) and (MonDisPadias42CrcpE).</p>		

REG #	SAIC #	Program Name	Referred To	Date Rec	Date Comp
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The summation of low (L), moderate (M), and high (H) severity levels of TRANS\_CRACK\_NO\_i cannot exceed the TRANS\_CRACK\_TOTAL\_NO

0.0 <= (TRANS\_CRACK\_NO\_L+ TRANS\_CRACK\_NO\_M+ TRANS\_CRACK\_NO\_H) <= TRANS\_CRACK\_TOTAL\_NO

should be modified as follows:

The summation of low (L), moderate (M), and high (H) severity levels of TRANS\_CRACK\_NO\_i must equal TRANS\_CRACK\_TOTAL\_NO

0.0 <= (TRANS\_CRACK\_NO\_L+ TRANS\_CRACK\_NO\_M+ TRANS\_CRACK\_NO\_H) = TRANS\_CRACK\_TOTAL\_NO

<b>Materials Testing</b>
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3-895      3714      MatActLoad.bat

**Description**

The Material Action Loader allows loading of test results that have a match on State\_Code, SHRP\_ID and FS in the TST\_SAMPLE\_BASIC\_INFO view. No other key fields (LOC\_NO, SAMPLE\_NO etc) are included in the match process. As a result of this, test data with incorrect FS numbers can get uploaded as long as there is a matching FS (corresponding to a previous sampling effort) in the TST\_SAMPLE\_BASIC\_INFO view. The Materials Action Loader should be modified to include all primary key fields in the matching operation.

MACTEC

10/6/2006

10/6/2006

**Resolution**

This type of error will be identified by existing QC checks and can be adequately resolved by the QC process. The MatActLoad program does not require additional constraints.

4-3727      3727      UnboundSpecGrav, Level E

**Description**

Received application error while running UnboundSpecGrav, level E, QC.

**Resolution**

Recompiled entire application and new executable works fine.

1/2/2007

1/3/2007

M-3722      3722      TST\_E QC

**Description**

We need to modify the TST\_E QC so that it does NOT check for a matching SAMPLE\_NO between TST\_AC05 and TST\_SAMPLE\_BASIC\_INFO. The

**Resolution**

Removed level E checks between TST\_AC05 and TST\_SAMPLE\_BASIC\_INFO since all SAMPLE\_Nos are not represented. TST\_E.pc modified and distributed to

11/21/2006

12/14/2006

REG #	SAIC #	Program Name	Referred To	Date Rec	Date Comp
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date check is still valid. We just need to remove the SAMPLE\_NO check. We would like to have this change in place before the data release processing is complete. We will most likely run the modified QC centrally and take care of data issues centrally. We will distribute to the regions at the next release.

regions.

**PG Binder**

4-504      3720      PGBinder QC

MACTEC

10/19/2006

2/7/2007

**Description**

PG Binder QC lists Error E-101 for TST\_LINK\_SAMPLE table (Error description- STATE\_CODE, SHRP\_ID, LAYER\_NO, FIELD\_SET, SAMPLE\_NO could not be found in TST\_SAMPLE\_LOG, TST\_SAMPLE\_LOG\_LAB, TST\_SAMPLE\_LOG\_SPS\_3\_4, TST\_ASPHALT\_CEMENT or TST\_UNCOMP\_BITUMINOUS). These are combined samples and the TST\_SAMPLE\_COMBINE table is populated for the above samples with the SDS 23. Attached files are extracts from TST\_SAMPLE\_COMBINE and TST\_LINK\_SAMPLE tables.

**Resolution**

Removed TST\_LINK\_SAMPLE-E-101 check from level E QC. Check E-104 replaced this check. (TstLinkSampleLevelE.pc) Also found and fixed latent bug in TstAe07MasterLevelE.pc in CheckE108And109.

**QC Manual**

P-3236      3236      IMS QC Manual

1/16/2003

9/27/2006

**Description**

The tables IMS\_CLASS\_CONVERSION\_DATA and MASTER do not exist in the IMS. Need to remove from the QC manual and IMS QC for traffic tables. The indicated TRF tables need to be removed from the QC manual. QC for TRF\_MONITOR\_AXLE\_DISTRIB should be replaced with the current QC for the revised table. TRF\_MONITOR\_LTPP\_LN added.

**Resolution**

Modified QC Manual as directed on 3/17/2003. Traffic chapter rebuilt from QC program code and code for TRF\_MONITOR\_\* was put back in. This SPR is on hold until we are ready to completely remove the following tables: TRF\_MONITOR\_VEHICLE\_DISTRIB, TRF\_MONITOR\_AXLE\_SUMMARY, TRF\_MONITOR\_AXLE\_DISTRIB\_OLD.

Superseded by I-118, Removal of obsolete tables from the IMS. Closed per BKO on 9/27/06.

REG #	SAIC #	Program Name	Referred To	Date Rec	Date Comp
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<b>Transverse Profile</b>
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<b>M-3718</b>	<b>3718</b>	<b>TPROF QC</b>		<b>11/14/2006</b>	<b>11/17/2006</b>
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**Description**

MON\_T\_PROF\_PROFILE-E-5 checks that the greatest non-null X measurement (distance across the lane) in each MON\_T\_PROF\_PROFILE record is no more than the pavement width in the MASTER table plus 5. Change this check to require the MON\_T\_PROF\_PROFILE.X# (greatest non-null X) to be equal to MON\_T\_PROF\_MASTER.pvmt\_width.

**Resolution**

Changed MON\_T\_PROF\_PROFILE-E-5 check to check that the greatest non-null X measurement is equal to MON\_T\_PROF\_MASTER.pvmt\_width. Also corrected errors in checks MON\_T\_PROF\_PROFILE-E-3 and E-4.

<b>M-3721</b>	<b>3721</b>	<b>Tprof Loader, QC, Data</b>		<b>11/21/2006</b>	<b>12/4/2006</b>
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**Description**

1. Create a script: There are 100+ data sets with more than one maximum transverse measurement in the data table. The script should determine the most common maximum transverse measurement among the data records and set MON\_T\_PROF\_MASTER.PVMT\_WIDTH to that measurement.
2. Update the TProf QC: Modify the check that you just changed to allow a +/- 16 in comparison of maximum measurement and MASTER.PVMT\_WIDTH.
3. Update the TProf Loader: The loader should now look at the maximum transverse measurement in each data record (!) and determine from that which should be put in the MASTER.PVMT\_WIDTH field. The most common max measurement should go into the MASTER.PVMT\_WIDTH field.

**Resolution**

Created SPR3721SetPvmtWidth.sql to set the pavement width based on the most common width. Modified TPROF QC to allow +/- 16 mm variance in the pavement widths. Deferred modification of the TPROF Loader to SPR3723.

These should be done in this order, with the loader being least important. It can be fixed after the data release.