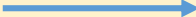


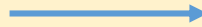


Caltrans District 11 Work Items Master List

1 Peak Hour Volumes Tool Development ...for ICTM ...for ABM	 	Wei / Hanwen <ul style="list-style-type: none">- CS teach GISDK, Scripts, Post-processing tool development, etc.- peak hour tool development for the ICTM- peak hour tool development for the SANDAG ABM
2 EmFAC Input Data Preparation - Automation Scripts ...for ICTM (Regional and MSAT); and SANDAG ABM (Regional and MSAT)		<ul style="list-style-type: none">- EmFAC data preparation / script development for generating outputs from the SANDAG ABM and ICTM, to be used as formatted inputs into the EMFAC and Cal-EMFAC for green house gas (GHG) and mobile air source toxin (MSAT) analyses- Portability for scripts – D11 priority is to make sure what CS provides would respond to our specific D11 needs. It would be great in the end product helps other Caltrans districts.
3 ABM Training Refined and comprehensive flow-chart; specifically "how to run the SANDAG ABM" and "how to run the ICTM". Model installation assistance and assistance with performing the runs Assistance with extracting results for examination and analysis		Sarah <ul style="list-style-type: none">- Run each model successfully step by step- Learn as much as possible to successfully run each model and troubleshoot.- Edit networks- Edit TAZ and associated land use
4 Network Editing/Tolling/Select Link & Zone Analysis		Wei / Sarah <ul style="list-style-type: none">- Select zone / Select link analysis- Adjusting model tolling schemes / toll rates
5 Post-Processing of Traffic Forecasts Checking and Adjusting volumes based on the existing traffic counts ADT only and peak hour factor		Farah / Ali / Sai / Carlana <ul style="list-style-type: none">- How to pull data from various models- How to explain the way model behave in certain corridor. For example, ADT discrepancies on adjacent segments- Develop a broad understanding of how each model works
6 SED Updating & TAZ Splitting		Wei / Sarah / Hanwen <ul style="list-style-type: none">- SED updating, particularly for ICTM; TAZ splitting for ICTM

7 Develop Other GUI and Tools

(to generate commonly asked data/information - maps, VMT, VHT, VHD numbers for region and subarea, etc)



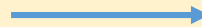
Hanwen / Wei / Sarah
For SANDAG ABM

- GUI interface
- AQ analysis (develop methodology, macro, script)
- Peak Hour Volume (develop methodology) based on Peak Period

For Imperial County ICTM

- AQ analysis (develop methodology, macro, script)
- SED checking; align SCAG SED forecasts with on-the-ground reality – Does the existing network look like what's on the ground? Is the future network in agreement with circulation elements of the local general plans?
- ICTM TAZ re-sizing – Splitting TAZs in a reasonable & logical manner.
- ICTM air quality/greenhouse gas analysis capability – AQ analyses (development of Macro/methodology to address data needs for GHG reports from an EmFAC-2014 run, and MSAT report from a CT-EmFAC run. The efforts should be tied back to SCAG regional model somehow.
- Adjusting volumes based on existing traffic counts – Providing technical assistance for troubleshooting unreasonable future forecast volumes (too high or too low), and assist staff to adjust volumes. For example, existing counts on SR-86 look higher than future forecasts.

8 Task Order Documentation | Budget



Ali / Maurice

- CS to provide D11 with (1) daily work plan, prior to arrival.
- CS to provide documentation (per spreadsheet) of tasks, activities, accomplishments, challenges, work arounds, solutions, etc... see the "Daily Work Plan and Progress Report spreadsheet.



Ali / Maurice

Budget: Revise cost estimate matrix after each invoice submitted and reimbursed to keep track of balance and progress

How to Set Up and Run the SANDAG ABM

TO: Caltrans D11

FROM: Chao Wang and Ramesh Thammiraju of Cambridge Systematics Inc.

DATE: May 10, 2016

RE: How to set up and run the SANDAG ABM (**DRAFT**)

This technical memorandum describes the steps to set up and run the San Diego Association of Governments Activity Based Model (SANDAG ABM). There are three major steps:

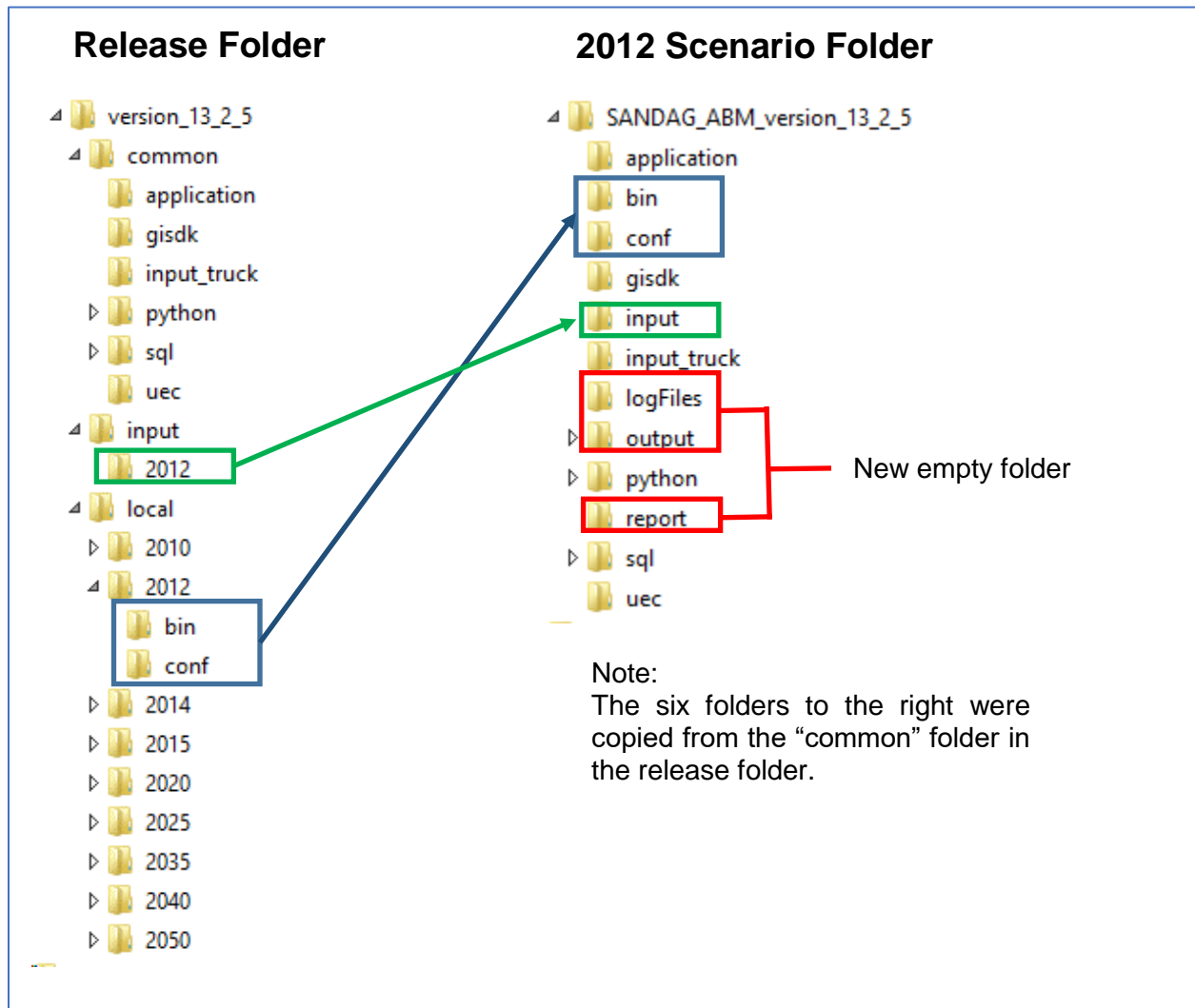
- 1) Create a scenario folder (based on the SANDAG ABM release folder)
- 2) Set up the model run environment
- 3) Run the SANDAG ABM in TransCAD

Each of the steps above are described in detail below.

1. Create a scenario folder

The SANDAG ABM was delivered as a release folder named 'version_13_2_5'. The release folder is not a model folder and cannot be used for a model run directly. Instead, a scenario folder should be created by user from this release folder. To create a scenario folder, user must run a batch file named "create_scenario.cmd" which is located in the release folder. This cmd file will copy the needed folders & files from the release folder and organize them in the scenario folder as shown in **Figure 1**. This cmd file also uses the path of the scenario folder to update the paths in GISDK scripts automatically (user does not need to modify the paths in GISDK scripts manually).

Figure 1: Release Folder and Scenario Folder Structure



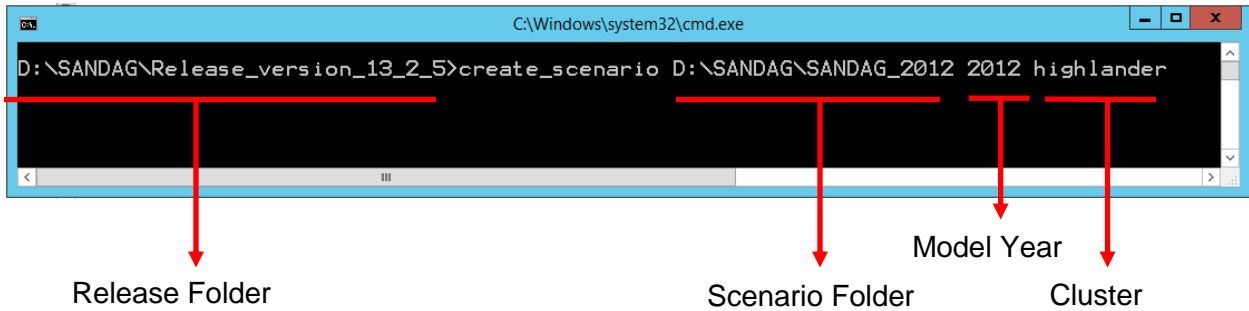
The **steps** to create the scenario folder are:

- 1) Open Windows Explorer, navigate to the release folder, such as D:\SANDAG\Release_version_13_2_5.
- 2) Hold the SHIFT key; move mouse over to the release folder.
- 3) Right click mouse and select 'Open command window here'. A DOS command window will pop up.
- 4) In the DOS window, type the following command.

create_scenario <scenario_folder> <year> <cluster> <network_inputs_folder>

- a. It takes 4 arguments **separated by space**.
- b. <scenario_folder>: the scenario folder
- c. <year>: model year
- d. <cluster>: cluster name. It has to be “**highlander**” or “**scarlett**” if only one computer is used to run SANDAG ABM.
- e. <network_inputs_folder>: a folder with user defined network input files to be copied over to the scenario folder. If this parameter is left blank, the model uses the network input files in the release folder (such as “\input\2012”).

An example is shown below.



2. Set up the model run environment

To run SANDAG ABM, the model run environment has to be configured correctly. The model run environment should be configured in “\bin\CTRampEnv.bat” in the scenario folder by specifying the following information:

- Directory of the 32-bit Java
- Directory of the 64-bit Java
- Directory of the 64-bit TransCAD

The **steps** to set up the model run environment are:

- 1) If the 32-bit or the 64-bit Java has not been installed, go to the following link to download and install them. Usually, the latest version of Java SE (Standard Edition) JRE (Java Runtime Environment) for Windows is sufficient to run SANDAG ABM.

<http://www.oracle.com/technetwork/java/javase/downloads/jre8-downloads-2133155.html> (Accessed on May 08, 2016)

Java SE Runtime Environment 8u91		
You must accept the Oracle Binary Code License Agreement for Java SE to download this software.		
Thank you for accepting the Oracle Binary Code License Agreement for Java SE; you may now download this software.		
Product / File Description	File Size	Download
Linux x86	49.07 MB	jre-8u91-linux-i586.rpm
Linux x86	70.56 MB	jre-8u91-linux-i586.tar.gz
Linux x64	46.95 MB	jre-8u91-linux-x64.rpm
Linux x64	68.48 MB	jre-8u91-linux-x64.tar.gz
Mac OS X	64.27 MB	jre-8u91-macosx-x64.dmg
Mac OS X	55.97 MB	jre-8u91-macosx-x64.tar.gz
Solaris SPARC 64-bit	51.97 MB	jre-8u91-solaris-sparcv9.tar.gz
Solaris x64	49.83 MB	jre-8u91-solaris-x64.tar.gz
Windows x86 Online	0.7 MB	jre-8u91-windows-i586-iftw.exe
Windows x86 Offline	48.52 MB	jre-8u91-windows-i586.exe
Windows x86	59.36 MB	jre-8u91-windows-i586.tar.gz
Windows x64	54.99 MB	jre-8u91-windows-x64.exe
Windows x64	62.7 MB	jre-8u91-windows-x64.tar.gz

32-bit Java

64-bit Java

- 2) Install the 64-bit TransCAD if it has not been installed. The TransCAD version SANDAG is using is 6.0r2 Build 9065. Any later version of TransCAD should work, but model results could be different due to the changes in TransCAD.
- 3) In a text editor, such as Notepad++, open “\bin\CTRampEnv.bat” in the scenario folder created in Section 1.
- 4) Go to the bottom of the file; lines 59 through 63 show directories for Java and TransCAD. The below screenshot shows these lines before they were modified.

```
59 rem set location of java
60 set JAVA_64_PATH=C:\\Progra~1\\Java\\jre7
61 set JAVA_32_PATH=C:\\Progra~2\\Java\\jre7
62 set JAVA_HOME_32=%JAVA_32_PATH%
63 set TRANSCAD_PATH=C:\\Progra~1\\TRANSC~1.0
```

- 5) Update the directory for the 64-bit Java.

- The Java directory is the directory in which “\bin\Java.exe” can be found. The 64-bit Java is usually installed in “C:\Program Files” instead of “C:\Program Files (x86)”.
- Double backslashes should be used in the directory.
- DOS 8.3 format should be used, which has at most eight characters for folder or file names, and three characters for file extension. The following command can be used to convert a directory to a short 8.3 DOS format.

```
cmd /c for %A in ("<Directory>") do @echo %~sA
```

An example is shown below

```
D:\>cmd /c for %A in ("C:\Program Files\Java\jre1.8.0_65") do @echo %~sA
C:\PROGRA~1\Java\JRE18~1.0_6
```

In this example, the directory is “C:\Program Files\Java\jre1.8.0_65” and its DOS 8.3 format is “C:\PORGRA~1\Java\JRE18~1.0_6”, which should be used as the directory in “\bin\CTRampEnv.bat”, as shown below.

```
60 set JAVA_64_PATH=C:\\PROGRA~1\\Java\\JRE18~1.0_6
```

6) Update the directory for the 32-bit Java

- The Java directory is the directory in which “\bin\Java.exe” can be found. The 32-bit Java is usually installed in “C:\Program Files (x86)” instead of “C:\Program Files”.
- Double backslashes should be used in the directory.
- DOS 8.3 format should be used.

7) Update the directory for the 64-bit TransCAD

- The TransCAD directory is the directory in which “tcw.exe” can be found. The 64-bit Java is usually installed in “C:\Program Files” instead of “C:\Program Files (x86)”.
- Double backslashes should be used in the directory.

- DOS 8.3 format should be used.

8) Close “bin\CTRampEnv.bat”.

An example “bin\CTRampEnv.bat” after setting up the model run environment is shown below.

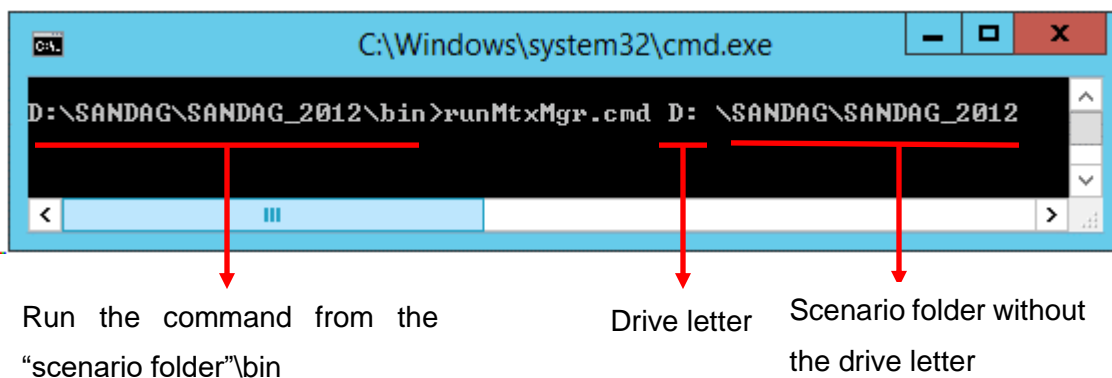
```
59 rem set location of java
60 set JAVA_64_PATH=C:\\PROGRA~1\\Java\\JRE18~1.0_6
61 set JAVA_32_PATH=C:\\PROGRA~2\\Java\\JRE18~1.0_6
62 set JAVA_HOME_32=%JAVA_32_PATH%
63 set TRANSCAD_PATH=C:\\PROGRA~1\\TRANSC~2.0B9
```

To verify if the model run environment has been set up correctly, use the following command to check whether the matrix manager can be started successfully.

runMtxMgr.cmd <drive letter:> <scenario_folder>

- In Windows Explorer, navigate to the scenario folder. Right click on the “bin” folder while holding the SHIFT key, and select ‘Open command window here’. A DOS command window will pop up. Type the above command in the DOS window.
- It takes 2 arguments **separated by space**.
- <drive letter:>: the drive such as C: and D:.
- <scenario_folder>: the scenario folder without the drive letter.

An example is shown below.



The model run environment has been set up correctly if the following window pops up after running the “runMtxMgr.cmd”.



```
C:\PROGRA~1\Java\JRE18~1.0_6\bin\java.exe
pis-1.0.b2.jar;\SANDAG\SANDAG_2012\application\xmlbeans-2.3.0.jar;\SANDAG\SANDAG_2012\application\xmlParserAPIs-2.6.2.jar;\SANDAG\SANDAG_2012\application\xom-1.0b3.jar;\SANDAG\SANDAG_2012\application\xsdlib-20030807.jar
[COMMAND] -Xms1500m
[COMMAND] -Xmx1500m
[COMMAND] com.pb.common.matrix.RemoteMatrixDataServer
[COMMAND] -hostname
[COMMAND] localhost
[COMMAND] -port
[COMMAND] 1190
[STDOUT] 08-May-2016 20:17:14:631, ERROR, RemoteMatrixDataServer started on: localhost:1190
[STDERR] java version "1.8.0_65"
[STDERR] Java(TM) SE Runtime Environment (build 1.8.0_65-b17)
[STDERR] Java HotSpot(TM) 64-Bit Server VM (build 25.65-b01, mixed mode)
[STDERR]
08-May-2016 20:17:19:256, INFO, creating RmiMatrixWriter for: //localhost:1190/com.pb.common.matrix.RemoteMatrixDataServer, count=0, main
08-May-2016 20:17:19:272, INFO, RmiMatrixWriter.testRemote() returning: RemoteMatrixDataServer test2: created RmiMatrixWriter for: //localhost:1190/com.pb.common.matrix.RemoteMatrixDataServer, count=0, main
08-May-2016 20:17:19:272, INFO, matrix data server 32 bit process started.
server starting on amd64 operating system.
SANDAG Matrix Server version 2.2 started on: 127.0.0.1:1191
```

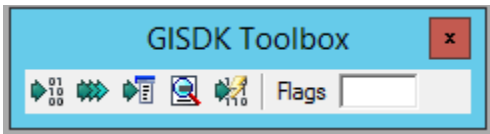
3. Run the SANDAG ABM in TransCAD

After the model run environment has been set up successfully, the entire SANDAG ABM model stream can be started in TransCAD by following these six **steps**:

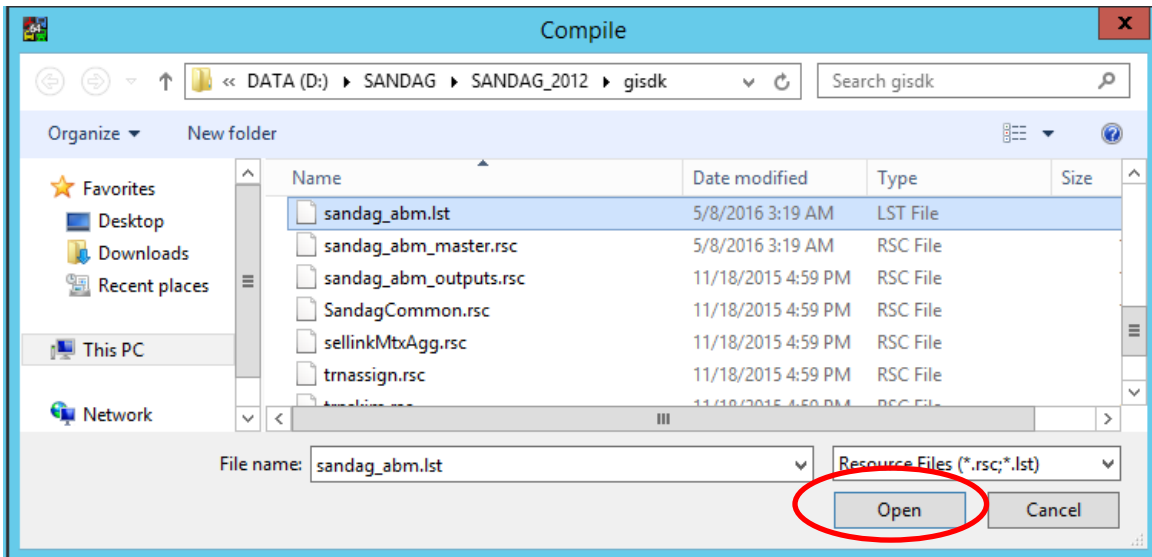
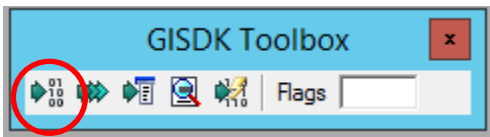
- 1) Make sure the file “tucson_VDF_rev.vdf” is placed in the TransCAD directory. For example, “C:\Program Files\TransCAD 6.0 b9250_net”. This is a file that defines the volume delay function used in the SANDAG ABM. If this vdf file is not included in the release folder, please contact SANDAG. The release folder CS received did not include this file and our very first run crashed at the warm up traffic assignment stage.
- 2) Make sure the matrix files “trip_EA.mtx”, “trip_AM.mtx”, “trip_MD.mtx”, “trip_PM.mtx”, and “trip_EV.mtx” are placed in the “input” folder of the scenario folder. For example, “D:\SANDAG\SANDAG_2012\input”. They are the warm up trip tables, and they are different for different model years. If they are not included in the release folder, please contact SANDAG. These are not included in the release folder for the base year that we

received. Make sure request SANDAG if these matrices are not included in the release folder.

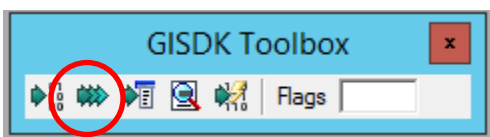
- 3) Open TransCAD. The “GISDK Toolbox” should appear in the TransCAD window. If not, go to *Tools* → *GIS Developer’s Kit* to open the “GISDK Toolbox”.



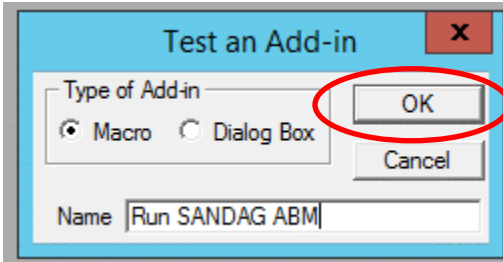
- 4) Click the “Compile” button on the “GISDK Toolbox” to open the “Compile” window, navigate to the scenario folder → *gisdk*, select “sandag_abm.lst”, and click the “Open” button to compile the GISDK script. If the GISDK script is compiled successfully, no prompt message will be shown.



- 5) Click the “Test” button on the “GISDK Toolbox” to open the “Test an Add-in” window.



- 6) In the “Test an Add-in” window, select “Macro” and type “Run SANDAG ABM”. Click the “OK” button to start the entire SANDAG ABM model run.



Note: TransCAD portion of the SANDAG ABM does not have a separate user interface (UI) – it is a macro called from the TransCAD default add-in UI.