ADOT
Intermodal Transportation

MEMORANDUM

TO: Traffic Engineering CADD Users

FROM: Maysa Hanna P.E., State Traffic Engineer HH

DATE: 5/5/2014

RE: Traffic Design CADD Standards

As a larger effort to update our current Traffic Engineering Standards, the Traffic Group has updated its CADD Standards. To help you become better acquainted with these new CADD Standards, we have outlined some fundamental points, as seen below, and have available sample CADD drawings illustrating their use. We have updated the Traffic Engineering CADD Standards based on the current ADOT English CADD Standards and ADOT Roadway "Drafting Guides for use in Office and Field (2010)". While developing these Standards, attention was given to the need for consistency among each of the ADOT design groups, however, some variation exists and is attributable to the type of drawings Traffic Design produces. Please review and become familiar with these new CADD standards as you incorporate them into your designs. It is expected that all new Traffic Engineering projects and current Traffic Engineering projects less than 30% shall incorporate these new standards from the date of this memorandum.

In addition to the sample CADD drawings, we have outlined a few additional details as indicated below:

BORDERS AND TITLE BLOCKS

The border plan sheet cells are located in the Traffic_V8i.cel library. ADOT staff, may find the cell library in the following folder; **V:\Traffic\Dev_V8i\celllibs\.** Consultants and others not connected to the ADOT network may find the cell library files on the web at:

http://www.azdot.gov/business/engineering-and-construction/traffic/cadd-standards

The file name of the Traffic Design border sheet is **TRAFD**. As with all cells, when placing the border sheet, the Active Scale (AS) will determine the size of the cell (and thus, the scale of the drawing). If the active scale is set to 1, the border cell will be placed at a scale of 1" = 100', or at full size, 100 scale. For a 40 scale (full size) drawing, the border cell is placed with an active scale of 0.4 (AS=0.4). NOTE: even though we work with half size (11"x17") drawings, Traffic standards are based on full size (22"x34") drawings.

TEXT HEIGHT AND PLOTTING SCALE

The text heights (TX) noted on the Drafting Guides are based on a full size drawing scale of 1" = 100'. Text height for proposed text will equal 0.175 multiplied by the scale of the full size sheet. Text height for text describing existing elements or conditions shall be 0.15 multiplied by the sheet scale. If we place the cell TRAFD at 0.2 scale (AS=0.2), we will have a 20 scale drawing. The correct text height for proposed text for a 20 scale drawing is 0.175 x 20 = 3.5, and 0.15 x 20 = 3.0 for "existing" text.

Note: ALL base files (sometimes called "master files" or "reference files") shall be drawn at 1:1, (1'=1').

Example:
For a 50 scale drawing, place the TRAFD cell at a scale of 0.5 (AS=0.5). The text for this 50 scale drawing will be placed at 0.175 x 50 = 8.75. The weights, levels, colors and fonts all remain as indicated on the Guide Sheets. This will give the proper text heights and weights when the drawings are submitted at full size, 22" x 34".

PLAN SHEET CALL OUTS & GENERAL NOTES

Plan sheet call outs should generally be above the leader line, except when delineating between proposed (TX=0.175) and existing (TX=0.15) conditions. Refer to the Guide Sheets for more information.

Plan sheet call outs will generally **not** include punctuation. Call outs shall use what MicroStation refers to as Title Case, the first character of each word is capitalized. Exceptions to this are words defined as definite articles ("the"), indefinite articles ("a", and, "an") and coordinating conjunctions ("and", "but", "if", "or", "for", "yet", "so", and "nor") these generally are not capitalized.

A collection of general notes may be found on this web site in word format. Plan sheet general notes should be written using correct grammar, punctuation, and capitalization. Use of abbreviations should be avoided in the general notes.

See ADOT Roadway's "Drafting Guides for use in Office and Field (2010)" for a list of approved abbreviations.

PAVEMENT MARKINGS

Dimensions placed between lane line pavement markings (lane widths) may be placed at the smaller TX = 0.15 (as opposed to 0.175) when drawing at larger scales. This will prevent the text from interfering with the pavement markings.

Generally, Pavement Marking plan sheets (with or without signing) should be drawn with a full size, 22" x 34" scale of 1" = 40' (AS=0.4, TX = 0.175 x 40 = 7.0).

As indicated on the attached sample drawings, double yellow lines should be drawn with a weight of 3 (WT=3). If, due to the scale of the drawing, the lines bleed together, a lesser weight may be used. All other line weights shall follow the attached samples.

Pavement marking line weights will typically be drawn at a weight that is one half the width of the actual line in inches. A 12" wide stop bar would be drawn with a weight of 6 (WT=6). A 6" wide lane line would be drawn with a weight of 3 (WT=3), etc.

LINE STYLES

When placing elements with line styles in a base or master file, the Active Linestylescale shall be 1. By doing this, the line styles will display correctly at larger or smaller scales. Typically, the Active Linestylescale is equal to the Active Scale for a plan sheet. If you are working on a 40 scale drawing, both the Active Scale (AS) and the Active Linestylescale would be 0.40. The new ADOT Traffic MicroStation Menu will assist you in choosing the correct Active Linestylescale for your drawing. MicroStation provides a way to override the Active Linestylescale when using reference files. When attaching a Pavement Marking base sheet to a plan sheet, use the toggle provided on the reference attachment dialog box and use the reference's Active Linestylescale. This will ensure that the pavement marking line styles are displayed correctly.

ADOT Traffic Engineering has modified and added new line styles. Gore20_e has been renamed to Gore40_e, and a new Gore20_e has been created. A new line style DY (Double Yellow) has been added. In some cases, the symbols in the line styles Typ220_e, Typ240_e, Typ280_e, Cone20_e, Cone40_e, Cone80_e, VP20_e, VP40_e, and VP80_e are too small. The original line styles are still available, and new line styles that have larger symbols have been created. Typ220T2, Typ240T2, Typ280T2, Cone20T2, Cone40T2, Cone80T2, VP20T2, VP40T2, and VP80T2. The symbols in the new line styles are 2 times larger than in the original line style.

TRAFFIC ENGINEERING CELL LIBRARIES

ADOT Traffic Engineering has also updated it's cell libraries. New sign libraries have been created and reflect the changes in the MOAS and ADOT Traffic Standards (see below). The new sign cells have been created so that they will all be proportional when placed at the same Active Sacle. Traffic_V8.cel has been updated and renamed to Traffic_V8i. Portions of the original cell library have been moved out and placed into new libraries, Accident.cel & Pave_Patt.cel. Tred_V8.cel is no longer used. TSL_V8i includes updated cells for signal and lighting applications.

All cells and patterns placed in a drawing will already have the correct weight, level and color for their intended purpose. There is no need to change the symbology of a cell.

Example:
The pavement legend "ONLY" is placed in a drawing, - the cells weight, level and

color should be correct as is. No symbology changes are needed.

Direction of travel arrows shall NOT be filled in on the drawing (the cell was created with no fill and should be correct as is). All pavement marking arrows (the arrows that will be placed on the roadway) shall be filled in. Again, the cell was created with a fill and should be correct as is.

The following are the ONLY approved CADD cell libraries for Traffic Design. These libraries should contain most of the cells required to complete a pavement marking, signing and traffic control plan.

V:\Standards\English\ADOT.cel.....ADOT.cel (and other ADOT cell libraries).

V:\Traffic\Dev_V8i\Celllibs\traffic_V8i.cel.....Cells used in the preparation of Pavement Marking, Signing and Traffic Control plans.

V:\Traffic\Dev_V8i\Celllibs\Sign_2014-X.....Libraries containing signs from the Manual of Approved signs.

V:\Traffic\Dev_V8i\Celllibs\tsl_V8i.cel…….Cells used in preparation of Signal and Lighting plans.

All of the above cells may also be found on ADOT Traffic Engineering's web page; **http://www.azdot.gov/business/engineering-and-construction/traffic/cadd-standards**

Items not shown on the attached Guide Sheets shall be placed as outlined in ADOT Roadway's "CADD Standards and ADOT Drafting Guides for use in Office and Field (2010)". In any case, attention should be given to level (see ADOT Level Structure), color, and weight. Color will always be the same as the level (CO = LV) except when drafting pavement markings.

NOTE: It is very important that CADD users use only those cell libraries and line styles found in the directories indicated. If you notice any problems, have questions or suggestions please bring them to the attention of the Traffic Group's MicroStation Application Administrator.

Don Shreeve
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TRAFFIC ENGINEERING CADD FILE NAMING

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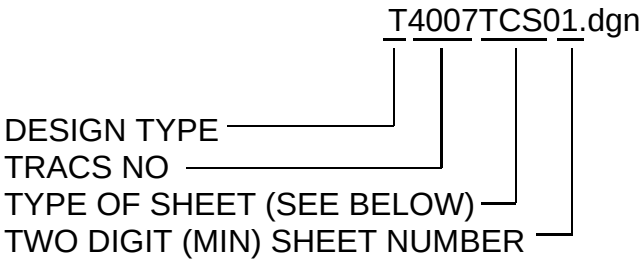
TRAFFIC DESIGN - ELECTRICAL DESIGN
CAD FILE NAMING

DESIGN TYPE
T Traffic Design
E Electrical Design



TYPE OF SHEET

TRAFFIC DESIGN

TCS Traffic Control Sheet(s)
TCD Traffic Control Detail Sheet(s)
TCN Traffic Control Note Sheet(s)
TCQ Traffic Control Quantity sheet(s)
MOT Maintenance of Traffic Sheet(s)
PMS Pavement Marking Sheet(s)
PMD Pavement Marking Detail Sheet(s)
PMN Pavement Marking Notes Sheet(s)
SDS Sign Detail Sheet(s)
SLS Sign Locations Sheet(s)
SSS Sign Summary Sheet(s)
SFS Sign Formats Sheet(s)
SNS Signing Notes Sheet(s)
XRS Crossroad Sheet(s)

Example: T4007SDS15.dgn

ELECTRICAL DESIGN

SIG Signal Sheet(s)
STS Signal/Electrical General Notes
SGN Signal General Notes
LIT Lighting Sheet(s)
ELD Electric Detail Sheet(s)
UGR Underground Conduit sheet(s)
INT Interconnect Sheet(s)
FMS Freeway Management Sheet(s)
LRP Loop Replacement Sheet(s)
SLT Sign Lighting Sheet(s)

REFERENCE FILE NAMES

Base files (reference files) shall conform to the above structure with the following exception: An "X" shall be placed at the beginning of the file name.

TRAFFIC DESIGN

PMB Pavement Marking Base
SSB Sign Summary Base
SFB Sign Format Base
TCB Traffic Control Base
SNB Signing Base
BDR Border File

ELECTRICAL DESIGN

CSB Conduit Schedule Base
SSB Pole Schedule Base

Example: XT4007TCB.dgn (Add two digit Sheet number if needed)