

Webmenus Proof of Concept Research Project



KnowledgeBase
Consulting Group

Introduction



Kevin B. Fern
President
KnowledgeBase Consulting Group



Company History



- Formed in 1998
- Arizona based company
- Focused on DOT and Utility industry clients:
 - LDOTD - Louisiana
 - NMDOT – New Mexico
 - ADOT - Arizona
 - UDOT - Utah
 - KDOT - Kansas
 - Palo Verde Nuclear Generating Station



Company Offerings



- Experience:
 - Analysis = Feasibility studies, ROI, Assessments
 - Development = programming, CADD standards, etc.
 - Implementation = ProjectWise, AutoCAD and MicroStation deployment, custom applications
 - Documentation = Training manuals, CADD Standards manuals, Workflow documentation
 - Training = ProjectWise, MicroStation, AutoCAD
 - Support = on-site & remote support, deployment coaching



Company Products



➤ Training Material:

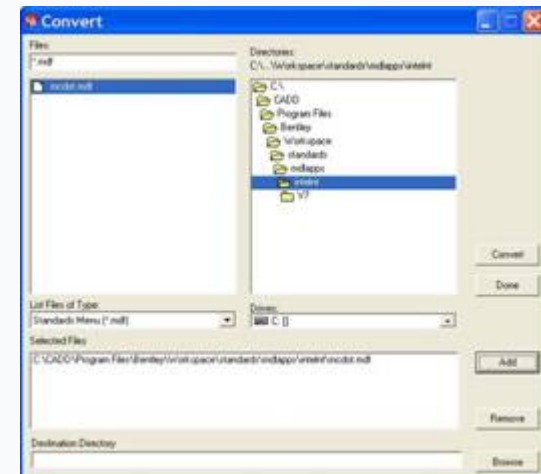
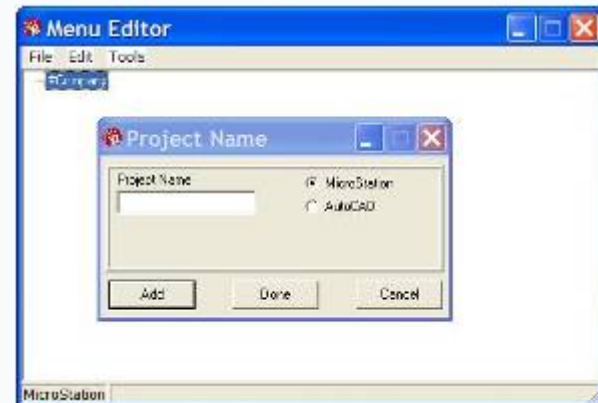
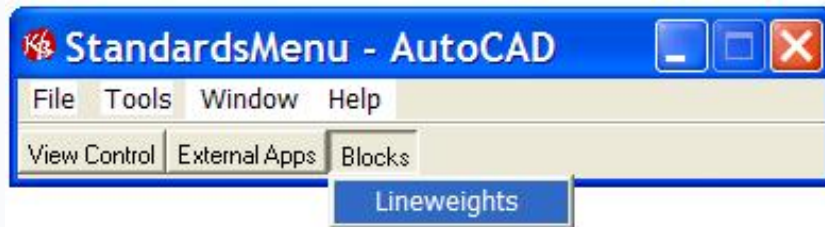
- ProjectWise XM User
- ProjectWise XM Administrator
- ProjectWise v8i User
- ProjectWise v8i Administrator
- Microstation XM Update



Company Products



- Software Solutions:
 - StandardsMenu 1.0
 - MicroStation or AutoCAD



Presentation Focus



CADD Menus

Research Department – Research Project



Introduction to CADD Menu



Getting Started



Who is familiar with what a CADD Menu is?



Getting Started



Who has ever used MicroStation or AutoCAD?



Getting Started



Who has ever Managed CADD Menus?



What is a CADD Menu?



A menubar or menu system used to invoke or force commands within the CADD system

CADD system = MicroStation or AutoCAD



Bar Menu History



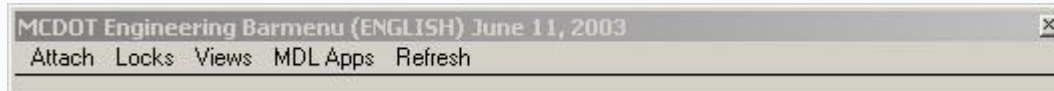
Bill Steinbock (Bentley) developed a barmenu application to easily populate a menu with user specific fields driven from an ASCII text



Bar Menu Makeup



- MDL = MicroStation Development Language
 - barmenu.ma



Bar Menu Makeup



- Compiled code files = **barmenu.mc** including other code file

```
barmenu.mc - Notepad
File Edit Format View Help
-----*/
Private void exitApplication
(
Boolean silently /* => Unload this application silently */
)
{
cmdMenuBar = ndDialog_menuBarGetWindow ();
if (cmdMenuBar)
{
nbarMenuP = ndDialog_menuBarFindMenu (cmdMenuBar, NULL,
PULLDOWNMENUID_DEVSP);
ndDialog_menuBarDeleteMenu (nbarMenuP, cmdMenuBar,
RTYPE_PULLDOWNMENU, PULLDOWNMENUID_DEVSP);
}

/*
Queue a command to unload the application with/without displaying
a notification message.
-----*/
ndDialog_cmdMenuBarQueue (FALSE,
(silently) ? CMD_MDL_SILENTUNLOAD :
CMD_MDL_UNLOAD,
ndSystem_getCurrTaskID (), TRUE);

/* start the default command */
ndState_startDefaultCommand ();
}

-----*/
name openresources
```



Bar Menu Makeup



- Ascii Text file **DOT.mdf** containing pulldown menu definitions

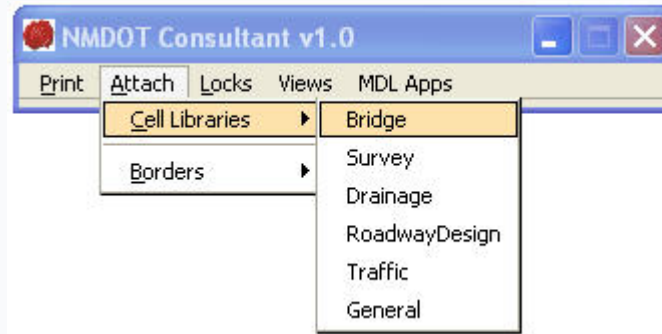
```
mcidot.mdf Notepad
File Edit Format View Help
-----
:
: MCDOT ENGINEERING MENU BAR - METRIC (mcidot.mdf)
:
:-----
: #MCDOT Engineering Bar menu (METRIC) September 18, 2001
: (mcidot.mdf)
:
: --- now build pull down menus ---
Attach
{
  Cell Libraries
  {
    Design_MC, "dialog
cell\maintenance;rc-p:\engineering\fcg\cadd_support\microstation\cell_11b\de
sign_mc"
    Row_MC, "dialog
cell\maintenance;rc-p:\engineering\fcg\cadd_support\microstation\cell_11b\ro
w_mc"
    Sign_MC, "dialog
cell\maintenance;rc-p:\engineering\fcg\cadd_support\microstation\cell_11b\si
gn_mc"
    Signal_MC, "dialog
cell\maintenance;rc-p:\engineering\fcg\cadd_support\microstation\cell_11b\si
gnal_mc"
    Struct_MC, "dialog
cell\maintenance;rc-p:\engineering\fcg\cadd_support\microstation\cell_11b\st
ruc_mc"
    Traffic_MC, "dialog
cell\maintenance;rc-p:\engineering\fcg\cadd_support\microstation\cell_11b\tr
affic_mc"
    summ_mc, "dialog
cell\maintenance;rc-p:\engineering\fcg\cadd_support\microstation\cell_11b\su
```



Sample DOT Menus



New Mexico – MCDOT – Mississippi DOT



The Use of CADD Menus in DOT's



- To simplify CADD standards compliance
 - ByLevel/Layer control
 - Cell Library loading
 - Custom program loading
 - Etc.



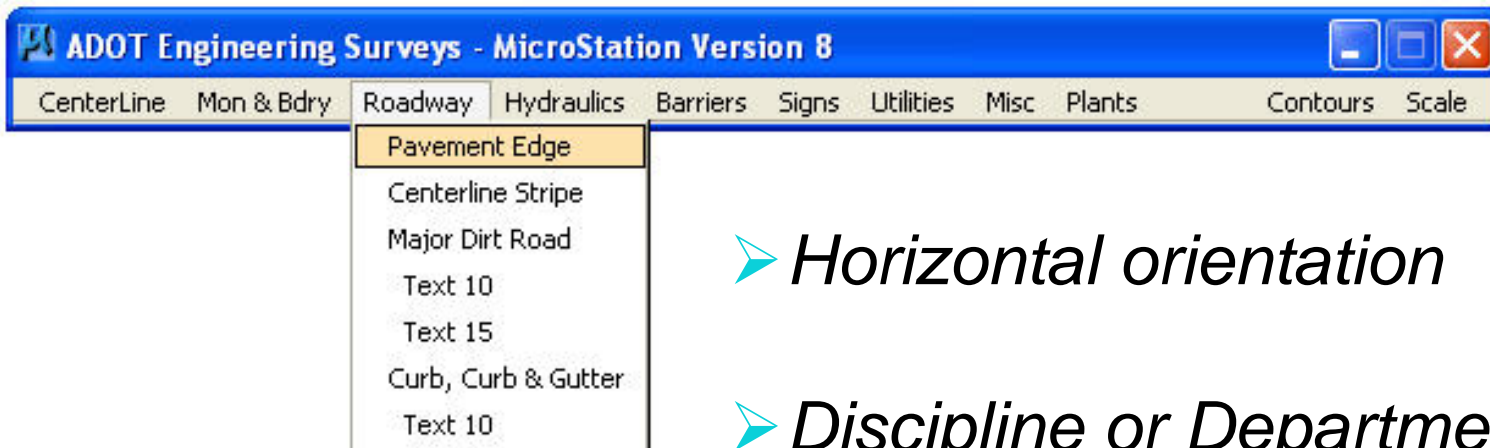
The Use of CADD Menus in DOT's



- To disseminate agency CADD standards to consultants
- To enable custom automated programs necessary for DOT standardization
- Simplify and standardize agency menu's
 - Familiarity with agency menu



Typical CADD Menu makeup



- *Horizontal orientation*
- *Discipline or Departmentally segregated*
- *Pulldown menus*
- *Text Description*



CADD Menu technology



- Bentley Menus = MDL, MVBA
- AutoCAD = LISP
- Client application driven
 - *MDL or LISP menus are typically run locally or within an organizations LAN*
- *Compiling source code is required*



Research Project



Why Research?



- *Evaluate and Test first*
- *Determine if it can or cannot be done?*
- *Compare options first*
 - *OTS = Off the Shelf solutions*
 - *Custom solution developed externally*
 - *Custom solution developed internally*
- *Build consensus within staff and management*
- *Utilize Federal technology transfer funding*



Research Makes Sense



- *Current climate of State funding shortfalls*
- *Typical Research agency funding surpasses \$1,000,000 of federal research \$\$\$*
- *State contribution matching (10% in some cases)*
- *Use it or lose it*
- *Research projects make way for Technology Transfers (purchasing of software or development)*



Who can utilize Research?



- *Contact your research department*
- *Typically Department heads or Bureau Chiefs must sponsor*
- *Board approval*
- *RFP process*
- *Sole Source*
- *Educational research selection (LSU, etc.)*



Research Problem Statement



“DOT is adversely challenged with effectively supporting and maintaining internally and externally distributed CADD Standard Menu’s”



Why the Challenge?



Reasons:

- *Multiple copies of menus (too numerous to determine)*
- *Proprietary code structure, MDL, MVBA, Macros (No in-house experienced MDL, MVBA programmers)*
- *Multiple installed CADD versions requiring version compiled menu's (MicroStation v7, 8.5 2004, XM, and v8i)*



Project Purpose



“To create a single (1) proof of concept CADD menu that is Web-based”



Project Objective



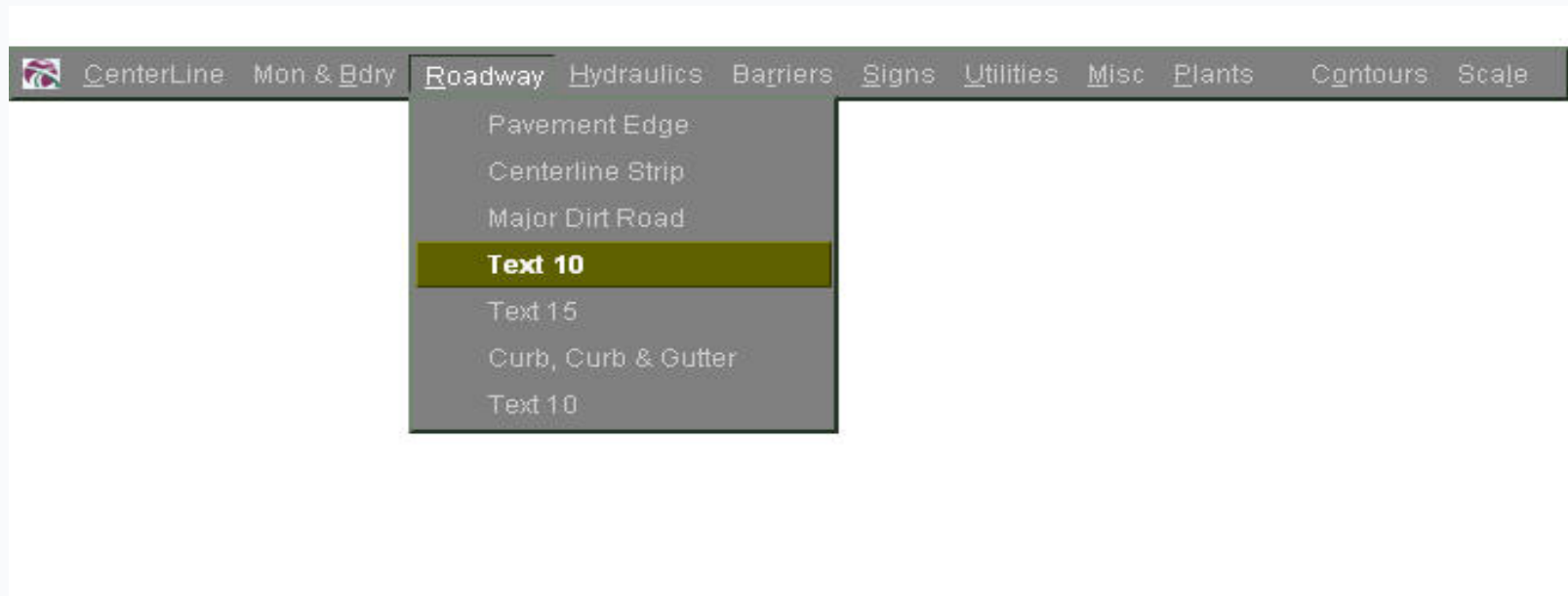
- *Utilize industry standard code structures*
- *Must be DOT maintainable*
- *Must be cost effective to implement and maintain*



What is a CADD Webmenu?



“An internet web-based menu system used to distribute CADD standard commands”



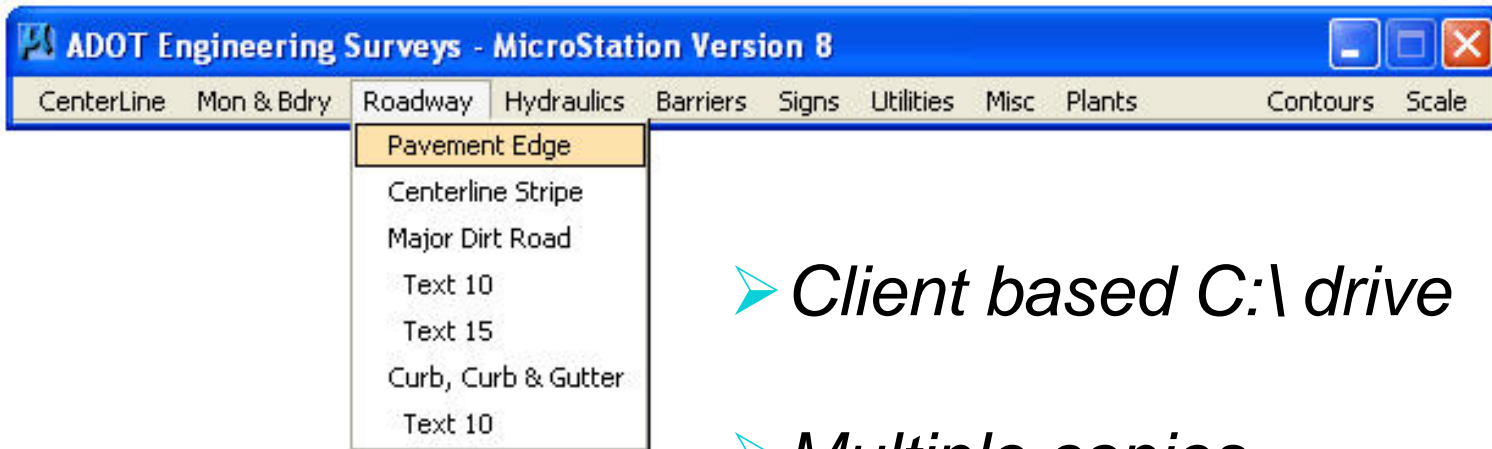
Functional Specifications



- Menu to look and function similar to the current CADD menu
- All updates to the menu will be in one location in order to reduce Administrative overhead



Current Menu



- *Client based C:\ drive*
- *Multiple copies*
- *Proprietary code structure*
- *CADD version specific*



Proof of Concept CADD Webmenu



File Locations/Functionality



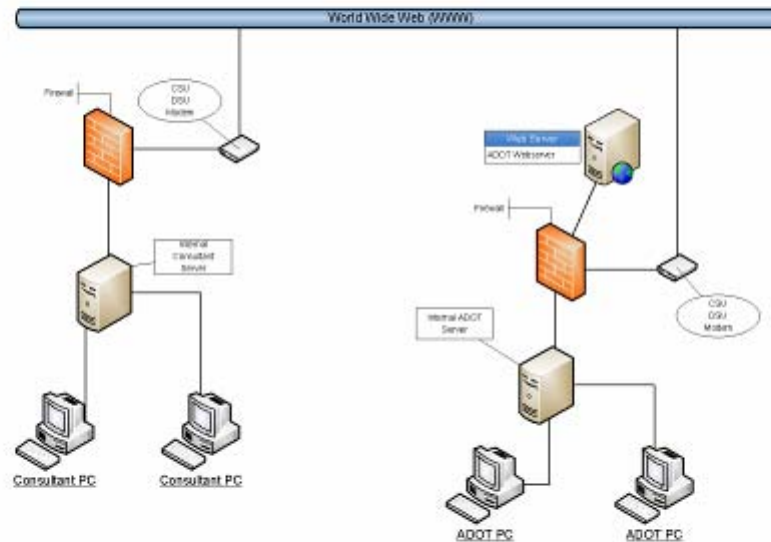
- CADD Standards files store on the DOT Webserver
 - Cell libraries
 - Font resource files
 - Custom Linestyles
- Files are downloaded (back end) at request via menu item
- Configurations are set “on the fly” when necessary



Network Architecture



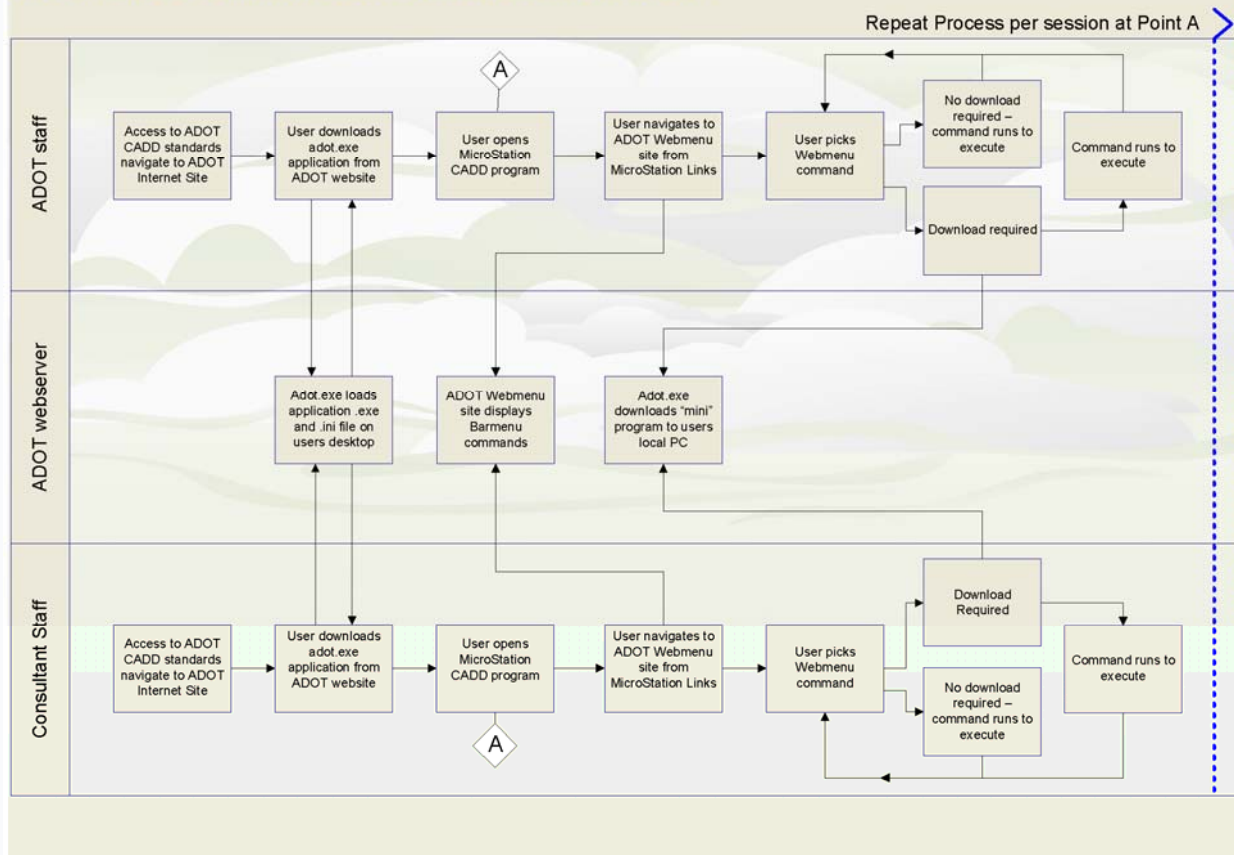
ADOT Webmenus system architecture chart



Process Chart



ADOT CADD Webmenus Process Workflow Chart



Functional Process



1. Download and extract install.exe
2. open MicroStation CADD engine
3. Select to Load the DOT menu item or parsed keyin
4. Select command from the Webmenu
5. Commands Execute in CADD engine seamlessly



File Structures



- Java Script
- HTML
- Standard web components .css (cascading style sheets)
- .ico (icon image files)



Final Reports



Feasibility Test of CADD Web Menus: SPR-683

Final Report

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September 2009

Prepared for:

Arizona Department of Transportation
206 South 17th Avenue
Phoenix, Arizona 85007

Study

Project goals:

The study consisted of two primary phases, which included the actual CADD proof of concept testing and the supporting project documentation. The proof of concept phase consisted of preparing, and testing of the menus to look and function similar to the existing ADOT menus. The documentation phase consisted of developing research material necessary to findings such as a process chart demonstrating how the CADD Webmenu. A migration plan intended for how the Webmenu system would be was also developed. Research council notes necessary for documenting the summary of the project. Develop a final report capturing all project , followed by a Research Council presentation.

Each:
Programming Code
Developing Application
Developing Research Material

End testing:

One of this project was to research and prepare programming code capable of meeting two primary objectives. The first was that it needed to look and function like the current ADOT CADD menus and the second was to enable the CADD menus to be in one single location.

Research and testing resulted in the decision to utilize JavaScript and base HTML programming languages for this project. Various examples of Java based menus existed in the industry and made it the most logically supported and equivalent to the current ADOT CADD menus.

The project consisted of coding menus that looked and responded similar if not exactly to the current menu system with command options equal to the ADOT CADD menu system. Testing consisted of transferring developed code to an external web server and testing the interactive results of the web based menus within the CADD application. The most challenging task was determining the functional process and naming menu programs (macros and MDL applications) from the web based CADD program. This challenge was overcome with the creation of an external utilized "behind the scenes" FTP for direct file transfer.



Research Results



- Proved existing technology capable of enabling a Web-based Menu system
- Proved Menus can “look and feel” like current DOT Menus
- Proved Menus are easy to maintain
- Proved Menus can be located in 1 single location for ALL users
- Proved Menus can run “mini” programs as needed



Questions

