Central Florida Regional Planning Model
Version 6.0.1
Draft SubArea Application

Prepared for the
Florida Department of Transportation

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List of Acronyms

CFRPM	Central Florida Regional Planning Model
FDOT	Florida Department of Transportation
GUI	Graphical User Interface
MPO	Metropolitan Planning Organization
SERPM	South East Florida Regional Planning Model
TAZ	Transportation analysis zone
TPO	Transportation Planning Organization

1. SUBAREA APPLICATION

The FDOT District 5 requested a Sub Area application be incorporated into the CFRPM v6.0.1 to allow users to reduce model run times. A review of models in the state found that the SERPM v6.5.4 already had a good sub area application in it therefore it was used the basis for this new application.

The following sections describe how the SubArea application was created in the CFRPM and how to use it.

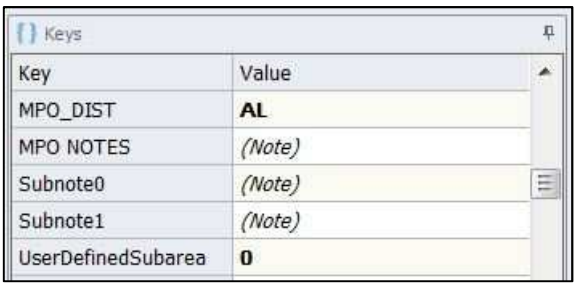
1. Catalog Keys

There are 3 new keys required for the SubArea application which include 2 note keys and 1 "check box" key. 2 other keys are used in the application that already exist and were documented in the *Graphical User Interface & MPO Reporting Tech Memo*. The existing keys are shown as the first 2 keys below. The 5 keys used in the SubArea application are described and shown in Table 1-1 and are found in the model as shown in Figure 1-1.

Table 1-1: SubArea Application Catalog Key Definitions

Key	Definition
MPO_DIST	Key used to designate how the user wishes the districting to be run. Setup as a drop down list to avoid errant entries in the GUI.
MPO NOTES	Note key used to define the districting options for selection in the MPO_DIST key in the GUI.
Subnote0	New Note key used as a heading for the User-Defined Subarea/Windowed Network section of the GUI.
Subnote1	New Note key used to define the steps the user must take to execute their own Subarea for selection.
UserDefinedSubarea	New key used to select the users Defined Windowed Subarea step in the GUI.

Figure 1-1: SubArea Application Keys



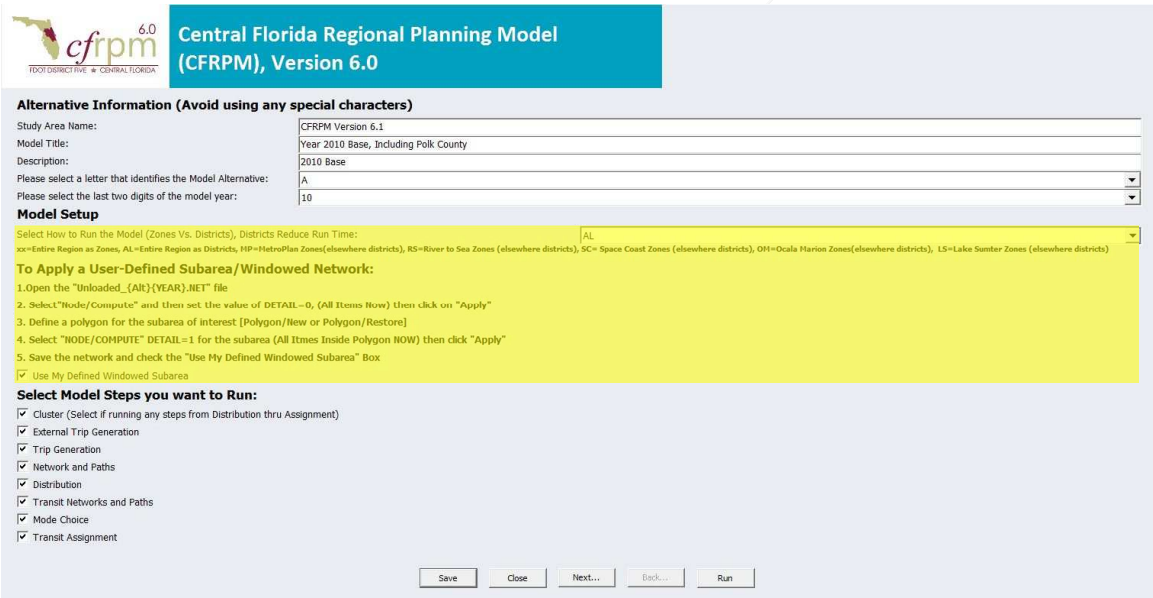
2. Design and Use of the SubArea Application in the Updated GUI

In order to implement the new SubArea application, the design of the GUI needed to be updated. This section discusses those updates and explains how to use the new application.

1. Design of the Updated GUI

The implementation of the 5 keys of the SubArea application immediately follow the "MODEL SETUP" note on Page 1 of the GUI and are shown in Figure 1-2.

Figure 1-2: SubArea Application GUI Page 1



2. Use of the SubArea Application

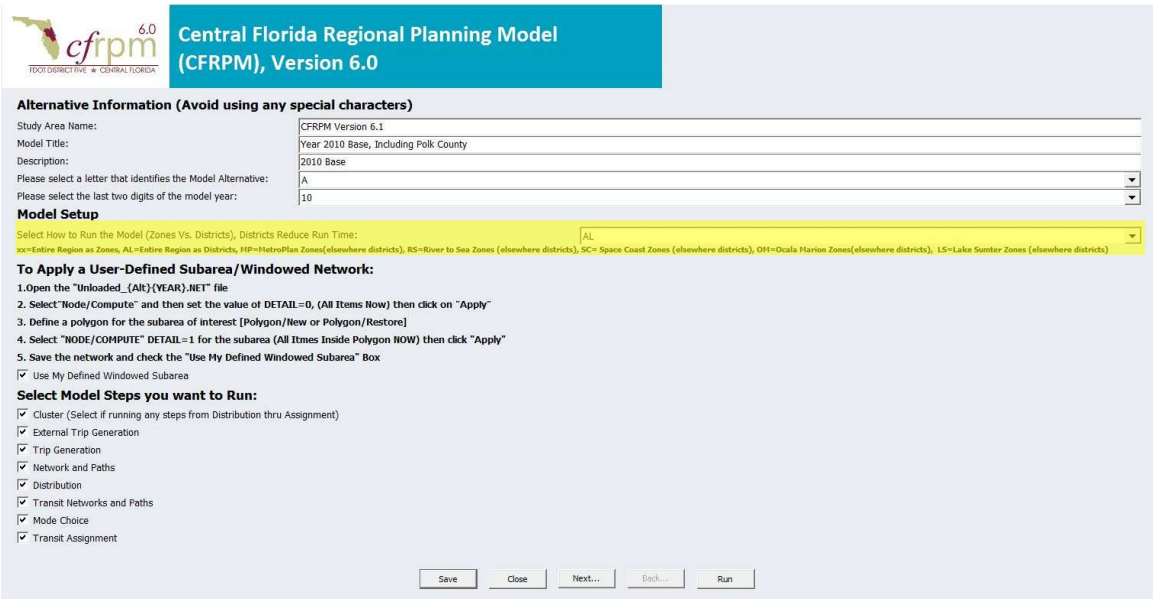
The SubArea section of the GUI allows the user to select how the districting is implemented during the model run

The model can be run 4 different ways and is accomplished through a drop down list for the first 3 options and through a polygon procedure for the last.

1. The user can select a specific MPO/TPO area. Once selected, the MPO/TPO area is run as TAZs with the rest of the model run as districts.
2. The user can select the entire region as TAZ. Once selected, the whole model area is run as TAZs.
3. The user can select the entire region as districts. Once selected, the whole model area is run as districts.
4. The user can define their own SubArea. Once selected, the model is run with the selected SubArea as TAZs with the rest of the model run as districts.

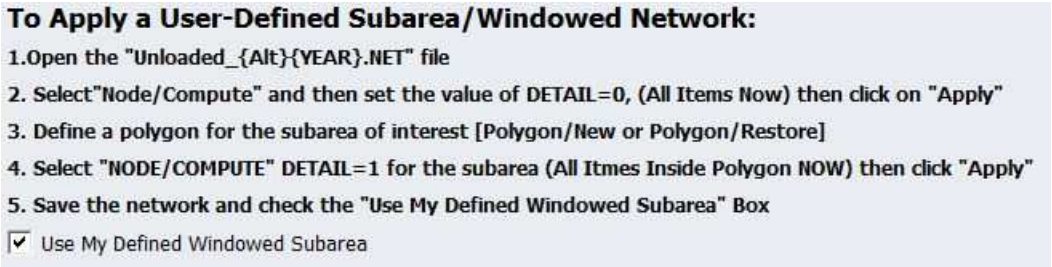
To run the model by MPO, the entire region as DISTRICTS or TAZs the user simply selects that option from the drop down menu. As an example, Figure 1-3 below shows the selection of "AL" to run the entire model as Districts.

Figure 1-3: Select District/Zone Option



To run the model with a user Defined Windowed SubArea the user follows the instructions located under the heading "To Apply a User-Defined Subarea/Windowed Network". Figure 1-4 shows these steps.

Figure 1-4: User Defined Subarea Steps



Figures 1-5 through 1-7 show steps 1-4.

Figure 1-5: User Defined Subarea Step 1

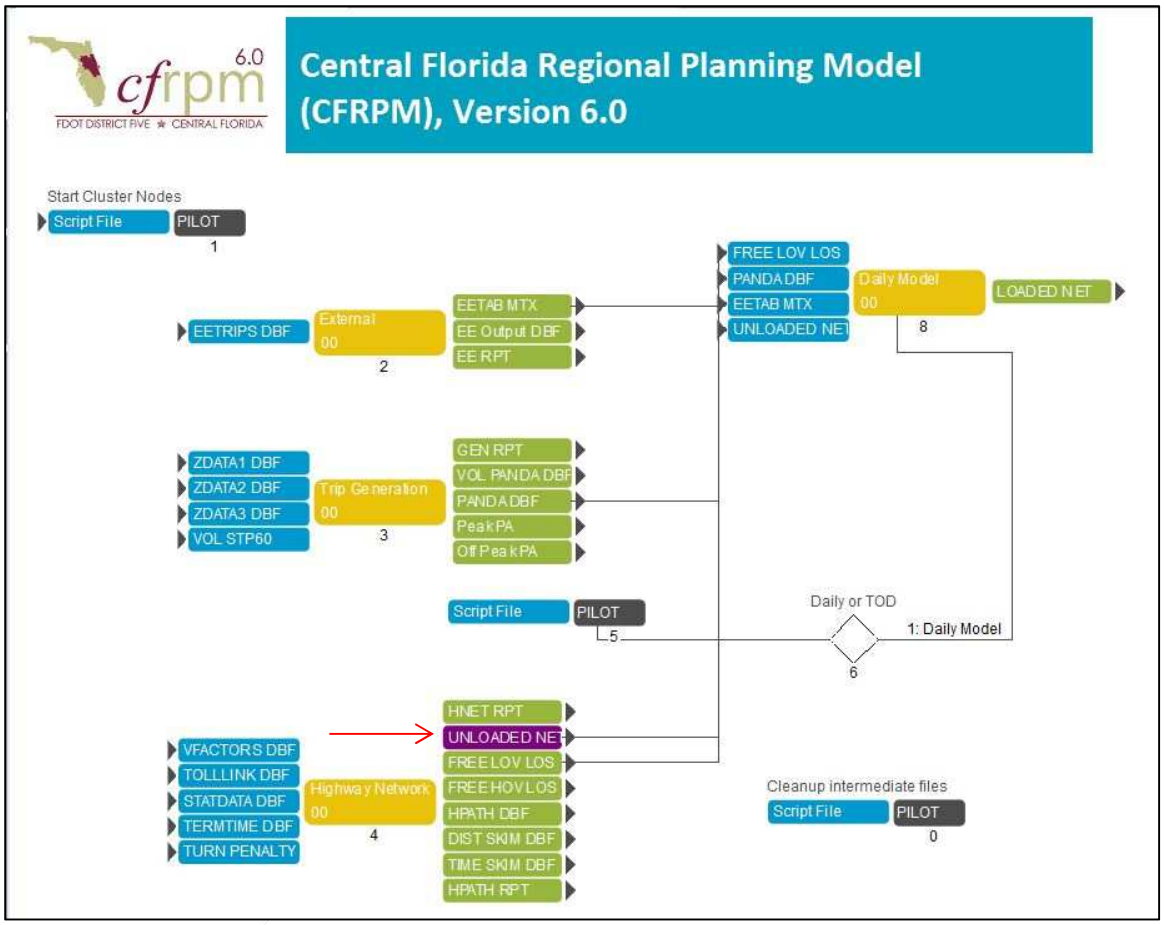


Figure 1-6: User Defined Subarea Step 2

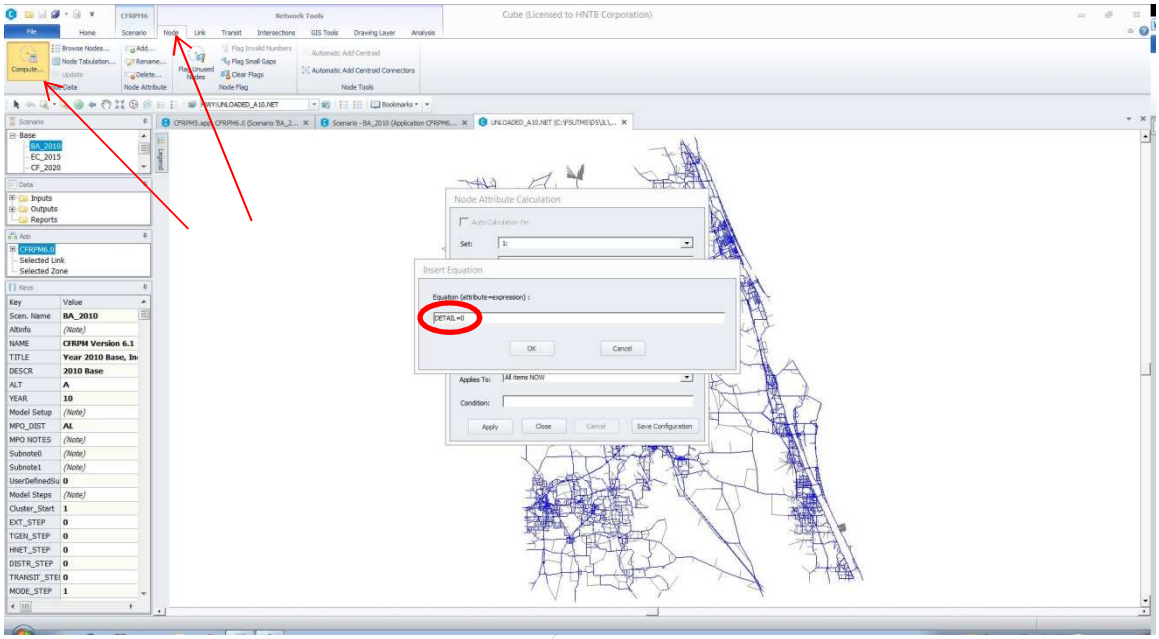


Figure 1-7: User Defined Subarea Step 3

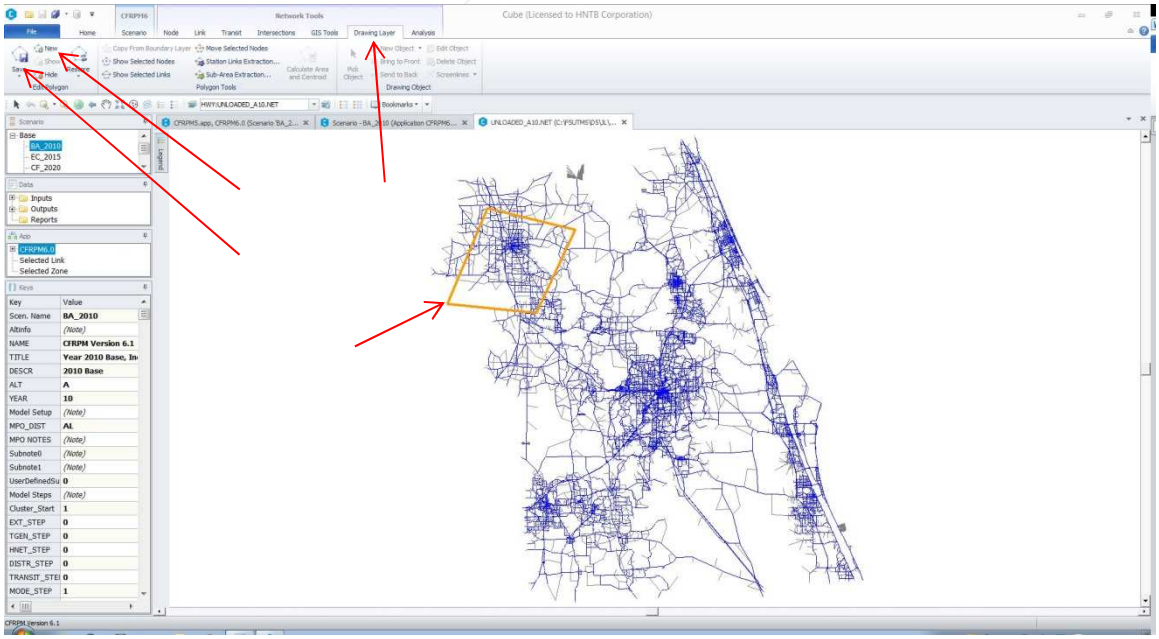
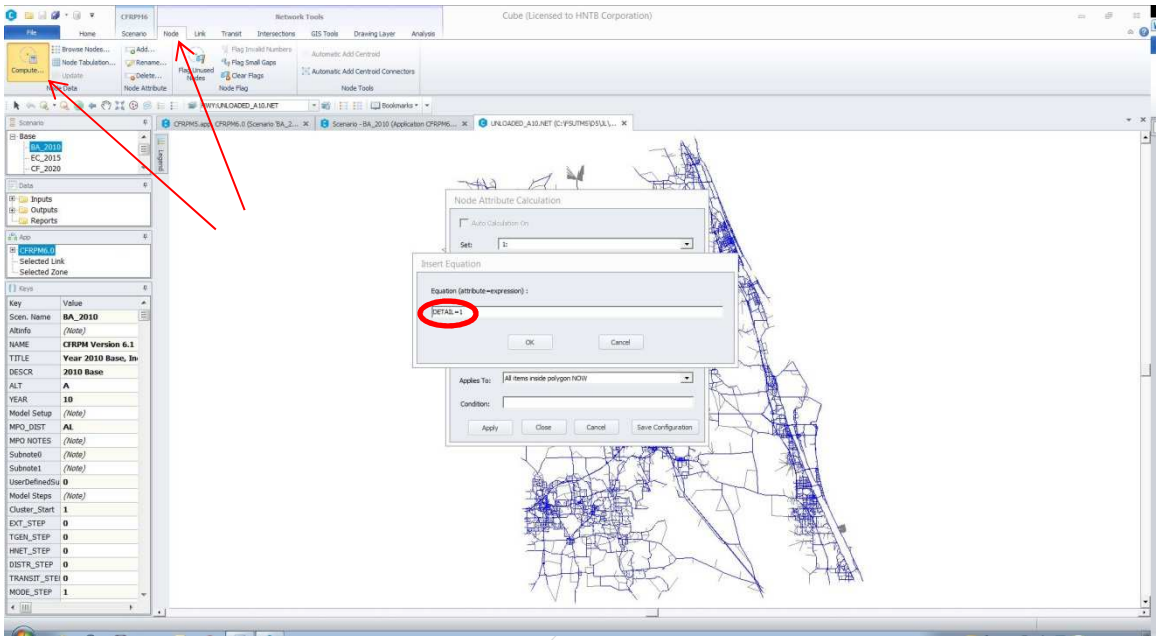


Figure 1-8: User Defined Subarea Step 4

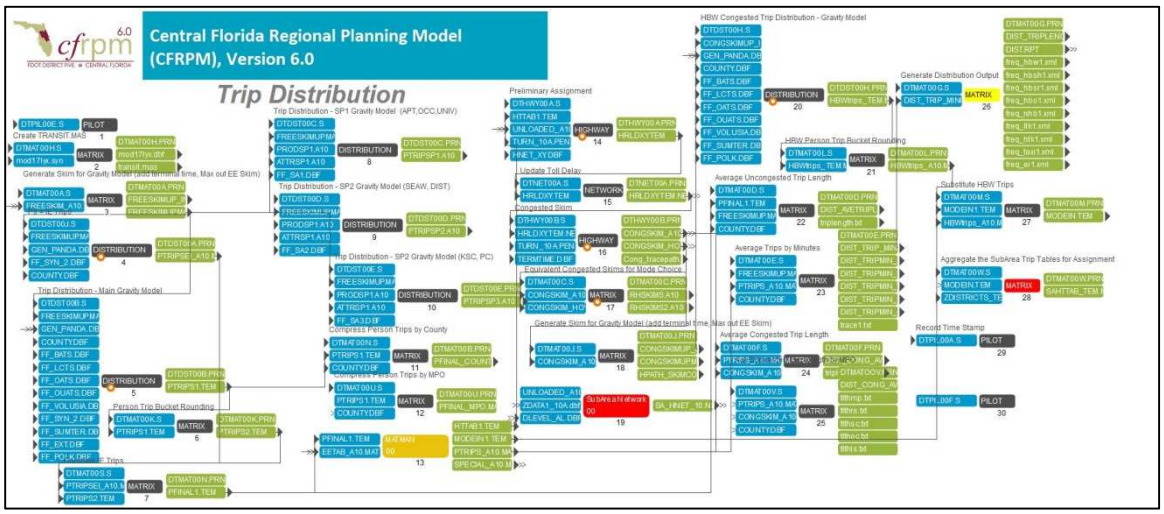


The final step is the select the “check box” for “Use My Defined Windowed Subarea” on the GUI.

3. Application & Script Modifications

In order to accommodate the use of the SubArea application in the model, modifications were made to the DISTRIBUTION and MODE CHOICE applications.

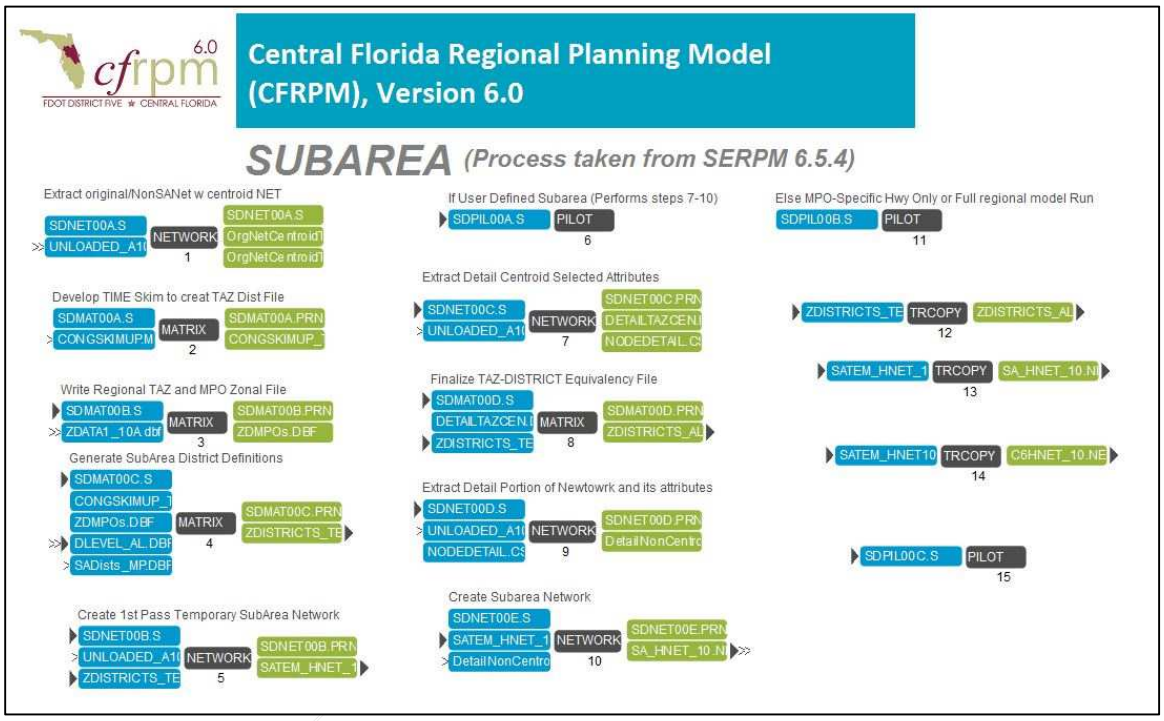
Figure 1-9: DISTRIBUTION Application



The RED boxes show the modified steps.

The SubArea application was inserted as step 19 in DISTRIBUTION. This application is where the networks are configured based on the user's selection for SubArea windowing. See Figure 1-10 below. All scripts are contained in Appendix A.

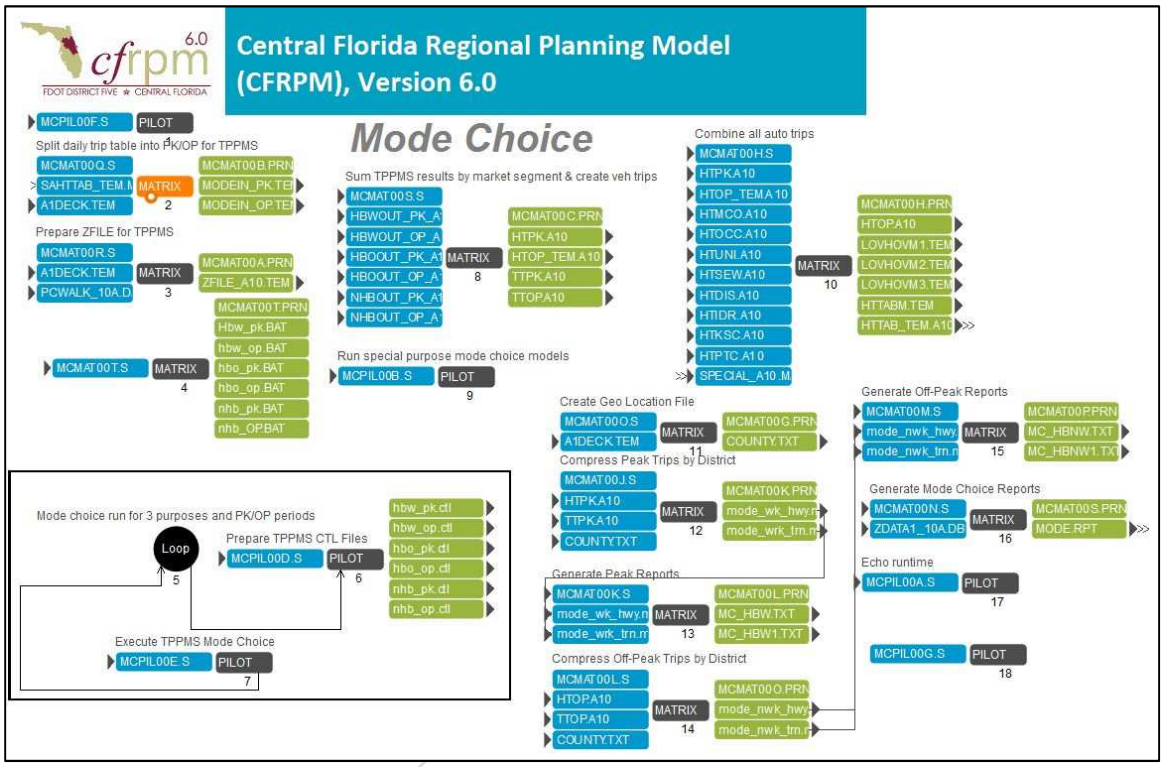
Figure 1-10: SubArea Application



Step 28 of the DISTRIBUTION application was also added to create the SubArea trip tables for assignment. See Figure 1-9.

The final modification in is the Mode Choice Application. Step 2 was modified to sue the output trip table from the SubArea application named "SAHTTAB_TEM.MAT". See Figure 1-11 for the Mode Choice application. The modified Script is located in Appendix A.

Figure 1-11: Mode Choice Application



A. SubArea Application Scripts

```
1  ; Do not change filenames or add or remove FILEI/FILEO statements using an
   editor. Use Cube/Application Manager.
2  ;SDNET00A.S
3  RUN PGM=NETWORK PRNFILE="{CATALOG_DIR}\Cube\SDNET00A.S" MSG='Extract
   original/NonSANet w centroid NET'
4  FILEI LINKI[2] = "{SCENARIO_DIR}\Output\UNLOADED_{ATL}{YEAR}.NET"
5  FILEO NETO = "{SCENARIO_DIR}\Output\Temp\OrgNetCentroidTime.NET"
6  FILEO LINKO = "{SCENARIO_DIR}\Output\Temp\OrgNetCentroidTime.TEM",
7     include=a,b,TimeOrg
8
9  PROCESS  PHASE=LINKMERGE
10   if ((a >5406)& (b >5406)) delete
11   TimeOrg=Time
12 ENDPROCESS
13 ENDRUN
14
```

```
1  ; Do not change filenames or add or remove FILEI/FILEO statements using an
   editor. Use Cube/Application Manager.
2  ;SDMAT00A.S
3  RUN PGM=MATRIX PRNFILE="{CATALOG_DIR}\Cube\SDMAT00A.PRN" MSG='Develop TIME Skim
   to creat TAZ Dist File'
4  FILEI MATI[1] = "{SCENARIO_DIR}\Output\Temp\CONGSKIMUP.MAT"
5  FILEO MATO[1] = "{SCENARIO_DIR}\Output\Temp\CONGSKIMUP_TEM.MAT",
6  mo=1,NAME=TIME
7
8  PAR ZONEMSG=100
9  MW[1]=mi.1.1*1      ; TIME With Terminal Time (in Minutes) - Step Not really
   needed as TT is already in Minutes. Done for consistency with SERPM
10 MW[1][I]=1000000    ; QUICKER (WW)
11
12 ENDRUN
13
```

```
; Do not change filenames or add or remove FILEI/FILEO statements using an editor. Use Cube/Application Manager.
;SDMAT00B.S
RUN PGM=MATRIX PRNFILE="{CATALOG_DIR}\Cube\SDMAT00B.PRN" MSG='Write Regional TAZ and MPO Zonal File'
FILEI ZDATI[1] = "{SCENARIO_DIR}\Input\ZDATA1_{YEAR}{ALT}.dbf"
FILEO RECO[1] = "{SCENARIO_DIR}\Output\ZDMPOs.DBF",
form=10.0, FIELDS=N,MPO
PAR ZONES={ZONES}
PAR ZONEMSG=100


;Get Zonal TAZ Info as Node Record...
N=ZI.1.TAZ_REG
MPO=ZI.1.MPO

_ztemp=_ztemp+1

;Set Data for Indian River  and Polk Internal and Dummy Zones

if(z>=4601 & z<={ZONESI})
   N=z

    MPO=0

endif

;Set Data for MetroPlan Orladndo Internal and Dummy Zones
if(z>=1 & z<=1400)
  N=z

    MPO=1

endif

;Set Data for Volusia Internal and Dummy Zones

if(z>=1801 & z<=2900)
  N=z

    MPO=2

endif

;Set Data for Flagler Internal and Dummy Zones

if(z>=4401 & z<=4600)
  N=z

    MPO=2
ENDIF

;Set Data for Space Coast Internal and Dummy Zones

if(z>=2901 & z<=3700)
   N=z

    MPO=3

endif

;Set Data for Ocala Marion Internal and Dummy Zones
```

```
61
62   if(z>=3701 & z<=4200)
63     N=z
64
65       MPO=4
66
67   endif
68
69   ;Set Data for Lake Internal and Dummy Zones
70
71   if(z>=1401 & z<=1800)
72      N=z
73
74       MPO=5
75
76   endif
77
78
79   ;Set Data for Sumter Internal and Dummy Zones
80
81   if(z>=4201 & z<=4400)
82      N=z
83
84       MPO=5
85
86   ENDIF
87
88   WRITE RECO=1
89
90   ;External Zones
91   if(z={ZONESI})
92     loop jj={ZONESI}+1,{ZONES}
93       N=jj
94
95       if (N>=5351 & N<=5357)          ;Indian River Polk Externals
96        MPO=0
97       ENDIF
98
99        if (N>=5361 & N<=5377)          ;Polk Externals
100        MPO=0
101       ENDIF
102
103       if (N>=5358 & N<=5360)          ;MetroPlan Orlando Externals
104         MPO=1
105      endif
106
107      if (N>=5401 & N<=5406)          ;River to Sea Externals
108        MPO=2
109      endif
110
111      if (N>=5384 & N<=5400)          ;Ocala Marion Externals
112         MPO=4
113      endif
114
115      if (N>=5378 & N<=5383)          ;Lake Sumter Externals
116        MPO=5
117      endif
118
119
120      WRITE RECO=1
121
122    endloop
```

```
123    ENDIF
124    ENDRUN
125
```

```
; Do not change filenames or add or remove FILEI/FILEO statements using an editor. Use Cube/Application Manager.
;SDMAT00C.S
RUN PGM=MATRIX PRNFILE="{CATALOG_DIR}\Cube\SDMAT00C.PRN" MSG='Generate SubArea District Definitions'

FILEI ZDATI[1] = "{SCENARIO_DIR}\Output\ZDMPOs.DBF",
    z=N
FILEI LOOKUPI[1] = "{SCENARIO_DIR}\Input\DLEVEL_{MPO_DIST}.DBF"
FILEI LOOKUPI[2] = "{SCENARIO_DIR}\Input\SADists_MP.DBF"
FILEO RECO[1] = "{SCENARIO_DIR}\Output\Temp\ZDISTRICTS_TEM_{MPO_DIST}.DBF",
    Fields= TAZ,DTAZ,NEAR,SADIST,MPO
FILEI MATI[1] = "{SCENARIO_DIR}\Output\Temp\CONGSKIMUP_TEM.MAT"

LOOKUP LOOKUPI=2,  ; One record per District
       NAME=DCENTROID,
         LOOKUP[1]=CENTERTAZ, RESULT=SADIST,
         LOOKUP[2]=CENTERTAZ, RESULT=CENTERTAZ,
         LOOKUP[3]=CENTERTAZ, RESULT=MPOCODE,
         LOOKUP[4]=CENTERTAZ, RESULT=SADST_TW,
       FAIL=0,0,0

LOOKUP LOOKUPI=1,  ; One record per MPO
       NAME=LEVEL,
         LOOKUP[1]=MPO, RESULT=DLEVEL, ; 1=District Level, 0=TAZ Level
       FAIL=0,0,0

Parameters ZONES={ZONES}
PAR ZONEMSG=100


near=1000
TAZ=i
MPO=zi.1.MPO
mylevel=LEVEL(1,MPO)
IF(i>{ZONESI}) MPO=99
  jloop
   place=DCENTROID(2,j)
   thisdist=DCENTROID(1,j)
   if(place<>0)
      if(i=place)
        near=0
        DTAZ=j
        SADIST=thisdist
      else
        ctime=mi.1.time[j]
        if(ctime < near)
           near=ctime
           DTAZ=j
           SADIST=thisdist
        endif
      endif
   endif
  endjloop
if(mylevel=0) DTAZ=i ; At the TAZ level
if(near<1000 & MPO>=0) WRITE RECO=1 ;added = in MPO>0 for Polk and Indian River  zones 4601-5350

ENDRUN

```

```
1   ; Do not change filenames or add or remove FILEI/FILEO statements using an
    editor. Use Cube/Application Manager.
2   ;SDNET00B.S
3   RUN PGM=NETWORK PRNFILE="{CATALOG_DIR}\Cube\SDNET00B.PRN" MSG='Create 1st Pass
    Temporary SubArea Network'
4   FILEI LINKI[2] = "{SCENARIO_DIR}\Output\UNLOADED_{ALT}{YEAR}.NET"
5   FILEI LOOKUPI[1] = "{SCENARIO_DIR}\Output\Temp\ZDISTRICTS_TEM_{MPO_DIST}.DBF"
6   FILEO NETO = "{SCENARIO_DIR}\Output\SATEM_HNET_{YEAR}.NET"
7
8   array gone=99000
9
10  PROCESS  PHASE=NODEMERGE
11    LOOKUP LOOKUPI=1,
12         NAME=SADIST,
13           LOOKUP[1]=TAZ, RESULT=DTAZ,
14         FAIL[3]=0
15    if(N<={ZONES}) _NN=_NN+1
16    if(N<={ZONES}) SA_Centroid=1
17    IF((N<>SADIST(1,N)) & (N<={ZONESI}))
18
19    ;| (NODETYPE=3,4))   ; for SERPM Only
20       gone[N]=1
21      _dd=_dd+1
22    delete
23    endif
24  ENDPROCESS
25
26  PROCESS  PHASE=LINKMERGE
27    _AD=gone[a]
28    _BD=gone[b]
29    if(_AD>0 | _BD>0)
30      print list= A(5.0),B(5.0),' deleted'
31      delete
32    endif
33  ENDPROCESS
34
35  PROCESS  PHASE=SUMMARY
36    _LL=_NN-_dd
37    print list=' ******* Deleted ',_dd(4.0),' nodes out of a total of ',_NN(4.0),
    ' leaving ',_LL(4.0),' active centroids'
38  ENDPROCESS
39
40
41
42
43  ENDRUN
44
```

```
1  ; Do not change filenames or add or remove FILEI/FILEO statements using an
   editor. Use Cube/Application Manager.
2  ;SDPIL00A.S
3  if ({UserDefinedSubarea}=1) ; User defined Subarea
4
5
```

```
1   ; Do not change filenames or add or remove FILEI/FILEO statements using an
    editor. Use Cube/Application Manager.
2   ;SDNET00C.S
3   RUN PGM=NETWORK PRNFILE="{CATALOG_DIR}\Cube\SDNET00C.PRN" MSG='Extract Detail
    Centroid Selected Attributes'
4   FILEO PRINTO[1] = "{SCENARIO_DIR}\Output\NODEDETAIL.CSV"
5   FILEO NODEO = "{SCENARIO_DIR}\Output\Temp\DETAILTAZCEN.DBF",
6      INCLUDE=TAZ,DTAZ,NEAR,SADIST,MPO,DETAIL
7   FILEI LINKI[1] = "{SCENARIO_DIR}\Output\UNLOADED_{ALT}{YEAR}.NET"
8
9   PROCESS  PHASE=NODEMERGE
10  ; ---------------------------------------------------------------
11  ; NEXT STEP IS TO CAPTURE THE DETAIL ATTRIBUTE ON THE NODES TO
12  ; SAVE THE USER NEEDING TO COMPUTE IT FOR LINKS TOO
13    PRINT CSV=T, LIST=N(6.0),DETAIL(2.0), PRINTO=1
14  ; ---------------------------------------------------------------
15    IF (DETAIL=1 & N <={ZONES})
16      TAZ=NI.1.N
17      DTAZ=NI.1.N
18      NEAR=0
19      SADIST=5000+TAZ
20      MPO=NI.1.MPO
21    ELSE
22      DELETE
23    ENDIF
24  ENDPROCESS
25
26  ENDRUN
27
```

```
; Do not change filenames or add or remove FILEI/FILEO statements using an
editor. Use Cube/Application Manager.
;SDMAT00D.S
RUN PGM=MATRIX PRNFILE="{CATALOG_DIR}\Cube\SDMAT00D.PRN" MSG='Finalize
TAZ-DISTRICT Equivalency File'

FILEI ZDATI[2] = "{SCENARIO_DIR}\Output\Temp\ZDISTRICTS_TEM_{MPO_DIST}.DBF",
  Z=TAZ
FILEI ZDATI[1] = "{SCENARIO_DIR}\Output\Temp\DETAILTAZCEN.DBF",
  z=taz
FILEO RECO[1] = "{SCENARIO_DIR}\Output\ZDISTRICTS_{MPO_DIST}.DBF",
   FIELDS=TAZ,DTAZ,NEAR,SADIST,MPO,DETAIL

PAR ZONES={ZONES}
PAR ZONEMSG=100

;xxxxxx
TAZ=ZI.2.TAZ
DETAIL=ZI.1.DETAIL

IF (DETAIL=1)
  DTAZ=ZI.1.DTAZ
  NEAR=ZI.1.NEAR
  SADIST=ZI.1.SADIST
  COUNTY=ZI.1.MPO
  DETAIL=ZI.1.DETAIL
 Else
  DTAZ=ZI.2.DTAZ
  NEAR=ZI.2.NEAR
  SADIST=ZI.2.SADIST
  COUNTY=ZI.2.MPO
  DETAIL=0
ENDIF

WRITE RECO=1
ENDRUN

```

```
1  ; Do not change filenames or add or remove FILEI/FILEO statements using an
   editor. Use Cube/Application Manager.
2  ;SDNET00D.S
3  RUN PGM=NETWORK PRNFILE="{CATALOG_DIR}\Cube\SDNET00D.PRN" MSG='Extract Detail
   Portion of Newtowrk and its attributes'
4  FILEI LOOKUPI[1] = "{SCENARIO_DIR}\Output\NODEDETAIL.CSV"
5  FILEO NETO = "{SCENARIO_DIR}\Output\Temp\DetailNonCentroid.NET"
6  FILEI LINKI[1] = "{SCENARIO_DIR}\Output\UNLOADED_{ALT}{YEAR}.NET"
7  PROCESS  PHASE=NODEMERGE
8    IF (DETAIL=1 & N <={ZONES})SA_Centroid=1
9  ENDPROCESS
10
11 PROCESS  PHASE=LINKMERGE
12   LOOKUP NAME=NODEDETAIL, LOOKUP[1]=1, RESULT=2,
13          FAIL[1]=0, FAIL[2]=0, FAIL[3]=0,
14          LOOKUPI=1
15   _ADETAIL=NODEDETAIL(1,A.N)
16   _BDETAIL=NODEDETAIL(1,B.N)
17   ; IF EITHER THE ANODE OR BNODE IS A KEEPER THEN KEEP
18   _KEEP=MAX(_ADETAIL,_BDETAIL)
19   IF (_KEEP=0) DELETE
20
21 ;  IF (DETAILNET=0) delete
22 ENDPROCESS
23
24 ENDRUN
25
```

```
1   ; Do not change filenames or add or remove FILEI/FILEO statements using an
    editor. Use Cube/Application Manager.
2   ;SDNET00E.S
3   RUN PGM=NETWORK PRNFILE="{CATALOG_DIR}\Cube\SDNET00E.PRN" MSG='Create Subarea
    Network'
4   FILEI LINKI[3] = "{SCENARIO_DIR}\Output\Temp\DetailNonCentroid.NET"
5
6   FILEI LINKI[1] = "{SCENARIO_DIR}\Output\SATEM_HNET_{YEAR}.NET"
7   FILEO NETO = "{SCENARIO_DIR}\Output\SA_HNET_{YEAR}.NET"
8
9   merge MAX=SA_Centroid
10
11  PROCESS  PHASE=LINKMERGE
12
13  ENDPROCESS
14
15  ENDRUN
16
```

```
1   ; Do not change filenames or add or remove FILEI/FILEO statements using an
    editor. Use Cube/Application Manager.
2   ;SDPIL00B.S
3
4   else
5
```

```
1   ; Do not change filenames or add or remove FILEI/FILEO statements using an
    editor. Use Cube/Application Manager.
2   ;SDPIL00C.S
3
4   ;*if exist {SCENARIO_DIR}\Output\TEMP\ZDISTRICTS_TEM_XX.DBF copy
    {SCENARIO_DIR}\Output\TEMP\ZDISTRICTS_TEM_XX.DBF
    {SCENARIO_DIR}\Output\ZDISTRICTS_XX.DBF
5   ;*if exist {SCENARIO_DIR}\Output\SATEM_HNET_{Year}.NET copy
    {SCENARIO_DIR}\Output\SATEM_HNET_{Year}.NET
    {SCENARIO_DIR}\Output\SA_HNET_{Year}.NET
6   ;*if exist {SCENARIO_DIR}\Output\SATEM_HNET_{Year}.NET copy
    {SCENARIO_DIR}\Output\SATEM_HNET_{Year}.NET
    {SCENARIO_DIR}\Output\S6HNET_{Year}.NET
7   ENDIF
8
9
10
```

```
1  ; Do not change filenames or add or remove FILEI/FILEO statements using an
   editor. Use Cube/Application Manager.
2  ;DTMAT00W.S
3  RUN PGM=MATRIX PRNFILE="{CATALOG_DIR}\Cube\DTMAT00W.PRN" MSG='Aggregate the
   SubArea Trip Tables for Assignment'
4  FILEI ZDATI[1] = "{SCENARIO_DIR}\Output\Temp\ZDISTRICTS_TEM_{MPO_DIST}.DBF"
5  FILEI MATI[2] = "{SCENARIO_DIR}\Output\MODEIN.TEM"
6  ;DISTRIBUTEINTRASTEP PROCESSID='CFRPMdist',
   PROCESSLIST=2-%NUMBER_OF_PROCESSORS%,MinGroupSize=20,SavePrn=F
7  ;DISTRIBUTEINTRASTEP ProcessID='CFRPMdist',ProcessList=1-4
8  FILEO MATO[1] = "{SCENARIO_DIR}\Output\Temp\SAHTTAB_TEM.MAT",
9   MO=1-4, NAME=M1,M2,M3,M4 DEC=2*S
10
11
12 PAR ZONEMSG=100
13
14 FILLMW MW[1]=MI.2.1,2,3,4
15
16 RENUMBER ZONEO=ZI.1.DTAZ MISSINGZI=W MISSINGZO=W ZONES={ZONES}
17
18
19 ENDRUN
20
```

```
; Do not change filenames or add or remove FILEI/FILEO statements using an
editor. Use Cube/Application Manager.
;MCMAT00Q.S
RUN PGM=MATRIX PRNFILE="{CATALOG_DIR}\CUBE\MCMAT00B.PRN" MSG='Split daily trip
table into PK/OP for TPPMS'
FILEI MATI[2] = "{SCENARIO_DIR}\Output\Temp\SAHTTAB_TEM.MAT"

DistributeINTRASTEP ProcessID="CFRPMdist", ProcessList=1-%NUMBER_OF_PROCESSORS%
;DistributeINTRASTEP ProcessID="CFRPMdist", ProcessList=1-4

FILEI LOOKUPI[1] = "{SCENARIO_DIR}\output\A1DECK.TEM"
FILEO MATO[2] = "{SCENARIO_DIR}\OUTPUT\MODEIN_OP.TEM",
MO=4-10, name=HBW0,HBW1,HBW2,HBO0,HBO1,HBO2,NHB, Format=tranplan
FILEO MATO[1] = "{SCENARIO_DIR}\OUTPUT\MODEIN_PK.TEM",
MO=4-10, name=HBW0,HBW1,HBW2,HBO0,HBO1,HBO2,NHB,format=tranplan
zonemsg=100

LOOKUP NAME=A1DECK,LOOKUP[1]=1,RESULT=5, ;HBW0
                   LOOKUP[2]=1,RESULT=6, ;HBW1
                   LOOKUP[3]=1,RESULT=7, ;HBW2
                   LOOKUP[4]=1,RESULT=8, ;NWK0
                   LOOKUP[5]=1,RESULT=9, ;NWK1
                   LOOKUP[6]=1,RESULT=10, ;NWK2
                   FAIL=0,0,0,
                   LOOKUPI=1

FILLMW MW[1]=MI.2.1,2,3

MW[4]=MW[1]*A1DECK(1,I)*0.5*0.01
MW[5]=MW[1]*A1DECK(2,I)*0.5*0.01
MW[6]=MW[1]*(100-A1DECK(1,I)-A1DECK(2,I))*0.5*0.01
MW[7]=MW[2]*A1DECK(4,I)*0.5*0.01
MW[8]=MW[2]*A1DECK(5,I)*0.5*0.01
MW[9]=MW[2]*(100-A1DECK(4,I)-A1DECK(5,I))*0.5*0.01
MW[10]=MW[3]*0.5

ENDRUN

```