

# Building Dashboard with Base SAS® - Institutional Research Experience

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## ABSTRACT

Institutions of higher education are increasingly depending on data to make evidence based policy decisions. Top level administrators want to see summarized data as key metrics and dashboards are a good way to present such data in a visually appealing way. This paper presents the process of building a six-panel dashboard that the office of Institutional Research and Effectiveness of Western Oregon University built with Base SAS® that brings together student enrollment, retention, graduation and degrees awarded. Other charts in the dashboard show revenue and expenditure by source and type and faculty and staff by rank and class. All of the six charts have several levels of drill down capability.

## INTRODUCTION

Use of data and level of analysis varies by need. While top level administrators like the president, provost or the board of trustees like to start with some key metrics to look at the broad picture about the health of their institution, they would also like to have the capacity to drill down and slice and dice the data if needed. There are, of course, various software which can build visually appealing dashboards but cost involved in acquiring such software is always a concern for smaller institutions which have to watch and account for every penny spent on non-instructional activities. The office of Institutional Research and Effectiveness at Western Oregon University explored the use of Base SAS® software to build a dashboard with drilldown capacity since Base SAS® was already being used by the office and therefore involved no extra cost. This paper presents result of that effort which proved to quite successful in delivering the key figures that the institutions Board of Trustees wanted to see to assess performance by the institution and trend over the years.

## COHORT, RETENTION AND GRADUATION EXAMPLE

Primary among metrics used to evaluate performance of a four year college is student success which is defined by retention and 4- and 6-year graduation rates of first-time full-time cohorts. Other metrics frequently used by the institutions are degrees granted by levels, tuition and cost of education, number of faculty and staff, expenses by category and revenue by source. Since investment in education is a long term commitment as metrics do not change dramatically from year to year, it's important to have trend data available for these metrics also. So, Western Oregon University's dashboard consists of a six panel dashboard that can be drilled down to several layers below depending on the need.

Student data typically will look like the following table once we get the cohorts identified and determine their retention and graduation status. Typically other student attributes needed to show retention and graduation status by gender or residency status do not reside in data tables but to build an interactive dashboard it's necessary to merge tables by bringing attributes together.

	Year	Pidm	Retention	Grad_4_Year	Grad_6_Year	Gender	Resident	Pell	URM
1	2007	402333	1	0	0	2	1	0	0
2	2007	399680	0	0	0	1	1	0	0
3	2007	402558	1	0	1	2	1	1	0
4	2007	400410	1	0	0	2	1	0	0
5	2007	398517	1	1	1	2	1	0	0
6	2008	423553	1	0	0	2	1	1	1
7	2008	404134	1	0	0	2	1	1	0
8	2008	417965	0	0	0	1	1	0	0
9	2008	423527	1	0	0	2	1	1	0
10	2008	405147	0	0	0	1	1	0	1
11	2009	425786	1	1	1	2	0	0	0
12	2009	427412	1	0	0	2	1	1	1
13	2009	428920	1	0	0	2	1	1	1
14	2009	428202	1	0	0	1	1	1	0
15	2009	427407	1	0	0	1	1	1	1
16	2010	434539	1	0	0	2	1	1	0
17	2010	434517	1	1	1	2	0	0	0
18	2010	434550	1	0	0	2	1	1	1
19	2010	434609	0	0	0	2	1	1	0
20	2010	434618	0	0	1	2	1	0	0

Figure 1. Student Data

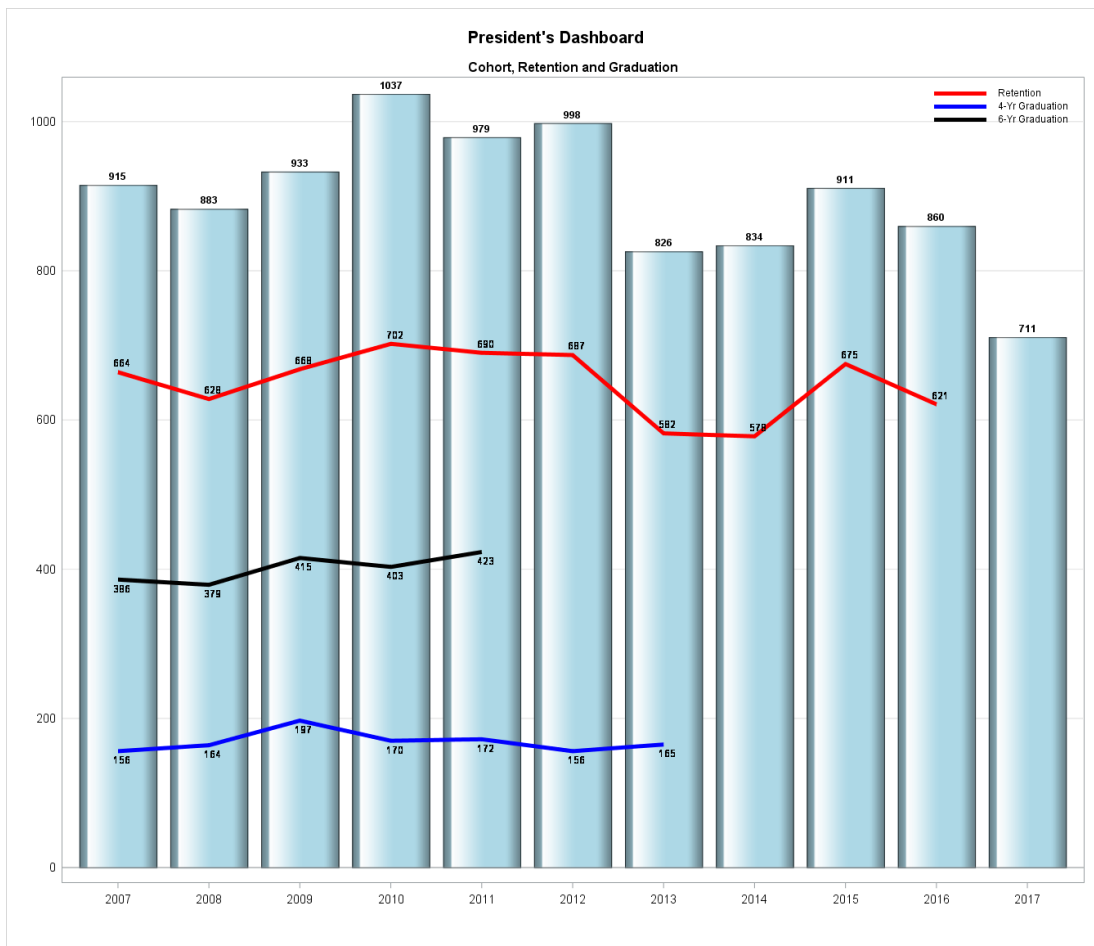


Figure 2. Cohort, Retention and Graduation

```

1  *TEMPLATE;
2  proc template;
3      define statgraph Dashboard_Template;
4          begingraph;
5              entrytitle "President's Dashboard";
6              layout gridded / columns= 1;
7              layout lattice / rows=1 columns=1
8                  rowgutter=0px columngutter=10px;
9
10     *DEFINE CELL;
11     cell;
12         cellheader;
13             entry "Cohort, Retention and Graduation" / BORDER = FALSE
14                 TEXTATTRS=(size = 10 pt WEIGHT=bold color = black) PAD=1;
15         endcellheader;
16
17     layout overlay / cycleattrs=false opaque = true xaxisopts=(label=' ')
18         yaxisopts=(griddisplay=on label="" linearopts=(viewmin=-0.05));
19         barchart x=year y=Freshman / barlabel=true dataskin=gloss
20             datatransparency=0.001
21             barlabelattrs = (size = 7 pt WEIGHT=bold color = black)
22             name='bar1' fillattrs=(color=lightblue);
23         seriesplot x=year y=Reten / datalabel=reten
24             lineattrs=graphData5(thickness=4 pattern=solid color=red)
25             datalabelattrs = (size = 7 pt color = black )
26             DATALABELPOSITION = top name='line1';
27         seriesplot x=year y=grad_4 / datalabel=grad_4
28             lineattrs=graphData5(thickness=4 pattern=solid color=blue)
29             datalabelattrs = (size = 7 pt color = black)
30             DATALABELPOSITION = bottom name='line2';
31         seriesplot x=year y=grad_6 / datalabel=grad_6
32             lineattrs=graphData5(thickness=4 pattern=solid color=black)
33             datalabelattrs = (size = 7 pt color = black)
34             DATALABELPOSITION = bottom name='line3';
35         discretelegend 'line1' 'line2' 'line3' / location=inside
36             valign=top halign=right VALUEATTRS = (size = 7) border = false;
37         endlayout;
38     endcell;
39     endlayout;
40     endlayout;
41     endgraph;
42 end;
43 run;

```

But we also want to see drilldowns of cohort totals, retention and graduation by Pell recipients, Under Represented Minority (URM) students, gender and residency status. This is done first by changing Line 7 above to:

7 `layout lattice / rows=2 columns=3` and defining six cells instead of one and creating link to six cell drilldown by providing a link to it from the top chart:

```

19     barchart x=year y=Freshman / barlabel=true dataskin=gloss
20         datatransparency=0.001
21         barlabelattrs = (size = 7 pt WEIGHT=bold color = black)

```

```

22     name='bar1' fillattrs=(color=lightblue) url=URLOriginLink_1;
23 seriesplot x=year y=Reten / datalabel=reten
24     lineattrs=graphData5(thickness=4 pattern=solid color=red)
25     datalabelattrs = (size = 7 pt color = black)
26     DATALABELPOSITION = top name='line1' url=URLOriginLink_1;
27 seriesplot x=year y=grad_4 / datalabel=grad_4
28     lineattrs=graphData5(thickness=4 pattern=solid color=blue)
29     datalabelattrs = (size = 7 pt color = black)
30     DATALABELPOSITION = bottom name='line2' url=URLOriginLink_1;
31 seriesplot x=year y=grad_6 / datalabel=grad_6
32     lineattrs=graphData5(thickness=4 pattern=solid color=black)
33     datalabelattrs = (size = 7 pt color = black)
34     DATALABELPOSITION = bottom name='line3' url=URLOriginLink_1;

```

Now this hyperlink have to be assigned in the data set:

```

data dashboard;
  set students;
  .
  .
  .

  URLOriginLink_1 = cats("1_Freshman_Retention_Graduation.htm");
run;

```

The six cell drilldown chart have to be named '1\_Freshman\_Retention\_Graduation.htm' (see Appendix 1 for full set of codes).

With these changes, clicking on the top chart will take us to the following chart:

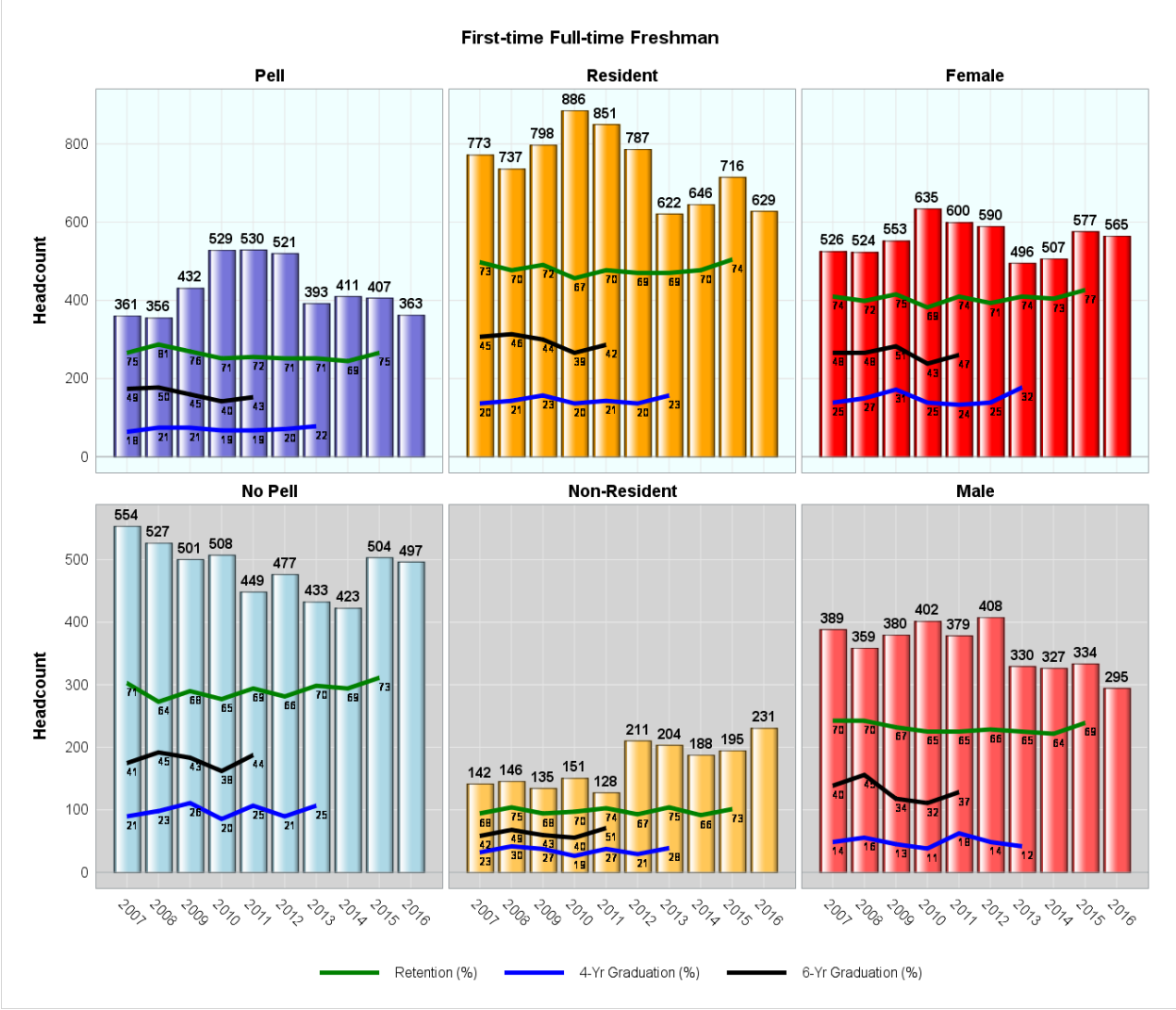


Figure 3. Cohort, Retention and Graduation Drilldown

**THE DASHBOARD**

The Board of Trustees, president and other top administrators of Western Oregon University want to know performance of the institution by looking at some key performance metrics at a glance. Besides cohort total, retention and graduation, degrees granted, affordability of the institution, expense, revenue and faculty and staff numbers are the broad indices they want to have at their fingertips. So, the face to dashboard appears like the following that meets their needs:

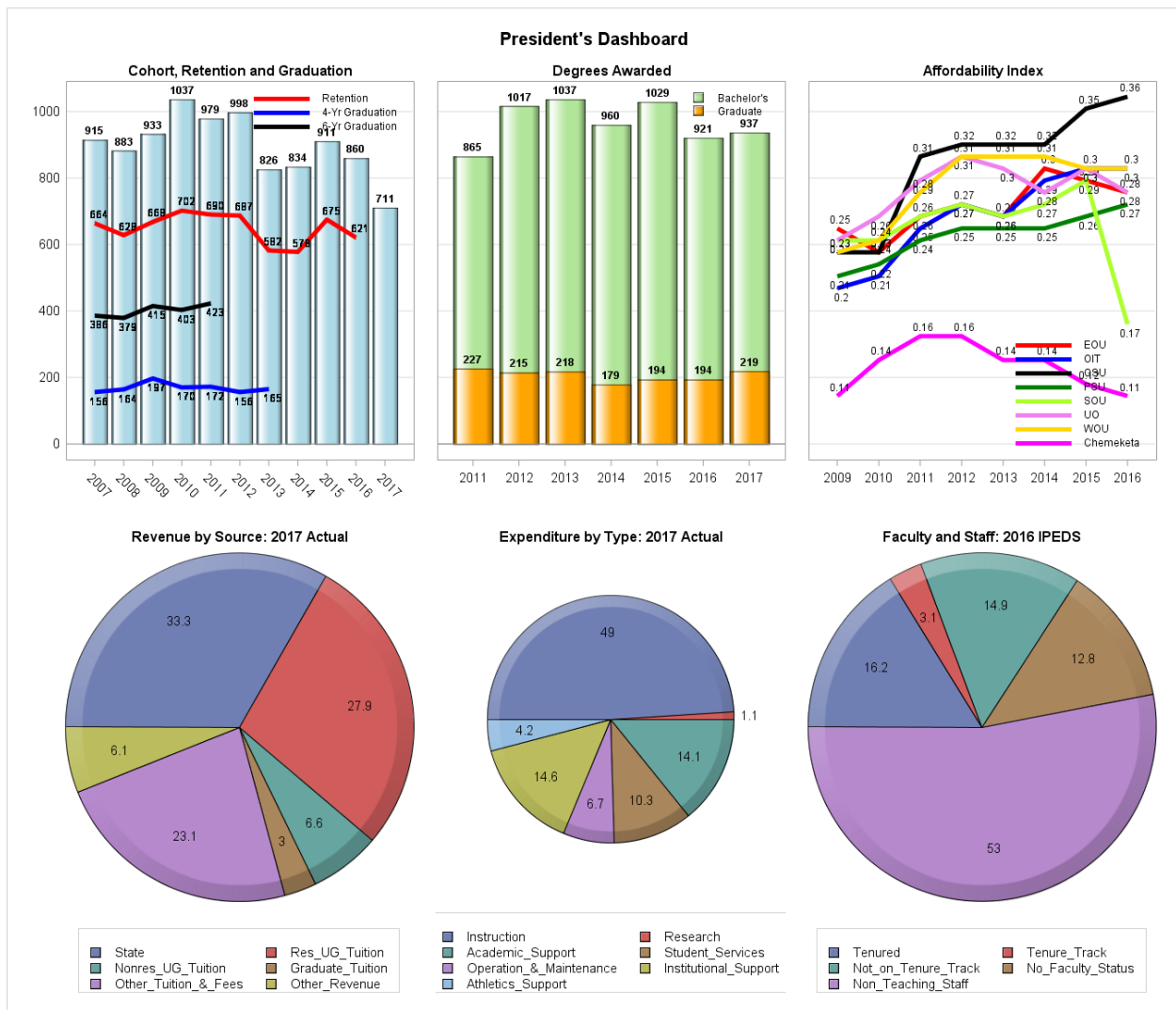


Figure 4. Dashboard

## LINKS, LEGENDS AND LEGEND LOCATIONS

Notice in Output 2. Second Set of Codes that all the URL links are the same, i.e., url=URLOriginLink\_1, which means all of these links point to the same chart in the next drilldown level. However, depending on needs we can create links to different charts for the next level by changing the URL links.

For multiple cell panels, it may be necessary to avoid repeating legends to save space if charts happen to have common legends. This can be done by inserting the following code after Line 8 in Output 1:

```
rowdatarange=union columndatarange=union
```

and by using syntax for sidebar as follows:

```
sidebar / align=bottom SPACEFILL = _ON_ ;
```

```
discretelegend 'line1' 'line2' 'line3' / ORDER = ROWMAJOR
```

```
across=3 border=off pad=(top=2px);
```

```
endsidebar;
```

Figure 3 above is an example of this.

When charts need individual legends, it's possible to put those inside the chart to save space, or outside if preferred. It's also possible to move the legends around to avoid putting them directly over the bars, for example. The following codes are provide an example:

```
discretelegend "Total" "URM" "Men" "Women"/ title=""
location=inside halign=right valign=top;
endlayout;
```

(See appendix 2 for full set of codes).

Figure 5 below is provides an example.

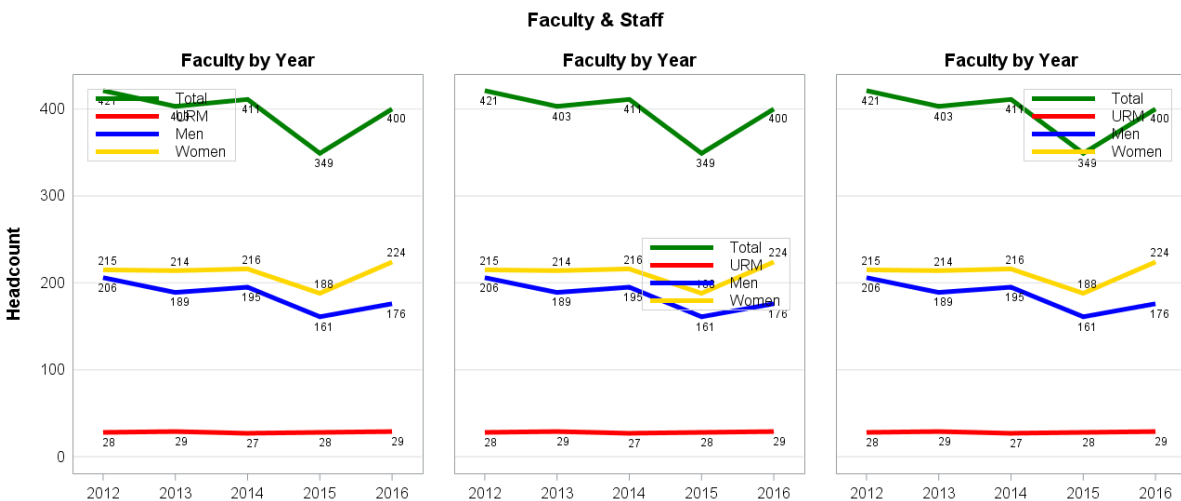


Figure 5. Legend Locations

## CONCLUSION

Base SAS® is a great alternative to expensive software to build visually appealing dashboards. These dashboards can have many layers of drilldown capacity and present data in different formats. SAS® graph template provides many options to make these dashboards colorful and attractive.

## REFERENCES

Lafler, Kirk Paul; Joshua M. Horstman and Roger D. Muller (2016), "Building a Better Dashboard Using SAS® Base Software," Proceedings of the 2016 Pharmaceutical SAS Users Group (PharmaSUG) Conference, The Trinodium Group, USA.

## ACKNOWLEDGMENTS

The author gratefully acknowledges the help from Kirk Paul Lafler and Joshua M. Horstman in learning this exciting method of building a dashboard.

## RECOMMENDED READING

- *Base SAS® Procedures Guide*
- *SAS® 9.4 Graph Template Language: Reference, Fifth Edition*

## CONTACT INFORMATION

Your comments and questions are valued and encouraged. Contact the author at:

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## APPENDIX 1

```
PROC TEMPLATE;
  define statgraph Retention_Drilldown_Template;
  begingraph / designwidth=495px designheight=370px;
  entrytitle "First-time Full-time Freshman";
    layout gridded / columns= 1;
      layout lattice / rows=2 columns=3
        rowdatarange=union columndatarange=union
        rowgutter=2px columngutter=2px;

*DEFINE ROW;
*Pell;
  cell;
    cellheader;
      entry "Pell" /BORDER = FALSE TEXTATTRS=(size = 10 pt WEIGHT=bold
        color = black);
    endcellheader;

    layout overlay / cycleattrs=false opaque = true xaxisopts=(label="")
    yaxisopts=(griddisplay=on label=' ' linearopts=(viewmin=-0.05))
    wallcolor = azure walldisplay = all
    y2axisopts=(DISPLAY=none linearopts=(viewmin=0 viewmax=250));
    barchart x=year y=Pell_Fresh / barlabel=true
      barlabelattrs = (size = 9 pt WEIGHT=bold color = black)
      dataskin=gloss datatransparency=0.001 name='bar1'
      fillattrs=(color=vlib);
    seriesplot x=yeary=pell_reten_pct /datalabel=pell_reten_pct
      lineattrs=GraphData1(thickness=4 pattern=solid color=green)
      DATALABELPOSITION = bottom legendlabel="Retention (%)"
      name='line1' yaxis=y2;
    seriesplot x=yeary=pell_grad_4_pct / datalabel=pell_grad_4_pct
      lineattrs=GraphData1 (thickness=4 pattern=solid color=blue)
      DATALABELPOSITION = bottom legendlabel="4-Yr Graduation (%)"
      name='line2' yaxis=y2;
    seriesplot x=yeary=pell_grad_6_pct / datalabel=pell_grad_6_pct
      lineattrs=GraphData1 (thickness=4 pattern=solid color=black)
      DATALABELPOSITION = bottom legendlabel="6-Yr Graduation (%)"
      name='line3' yaxis=y2;
    endlayout;
  endcell;

*Resident;
  cell;
    cellheader;
      entry "Resident" / BORDER = FALSE TEXTATTRS=(size = 10 pt
        WEIGHT=bold color = black) PAD=1;
    endcellheader;

    layout overlay / cycleattrs=false opaque = true
    yaxisopts=(griddisplay=on label=' ' linearopts=(viewmin=-0.05))
    wallcolor = azure walldisplay = all
    y2axisopts=(DISPLAY=none linearopts=(viewmin=0 viewmax=130));
    barchart x=year y=Resident_Fresh / barlabel=true
```

```

    barlabelattrs = (size = 9 pt WEIGHT=bold color = black)
    dataskin=gloss datatransparency=0.001 name='bar2'
    fillattrs=(color=orange);
seriesplot x=yeary=resident_reten_pct / datalabel=resident_reten_pct
lineattrs=GraphData1 (thickness=4 pattern=solid
color=green)DATALABELPOSITION = bottom yaxis=y2;
seriesplot x=yeary=resident_grad_4_pct / datalabel=resident_grad_4_pct
lineattrs=GraphData1 (thickness=4 pattern=solid
color=blue)DATALABELPOSITION = bottom yaxis=y2;
seriesplot x=yeary=resident_grad_6_pct / datalabel=resident_grad_6_pct
lineattrs=GraphData1 (thickness=4 pattern=solid color=black)
DATALABELPOSITION = bottom yaxis=y2;
endlayout;
endcell;

```

```
*Female;
```

```

cell;
cellheader;
    entry "Female" / BORDER = FALSE TEXTATTRS=(size = 10 pt
WEIGHT=bold color = black) PAD=1;
endcellheader;

layout overlay / cycleattrs=false opaque = true
yaxisopts=(griddisplay=on label='' linearopts=(viewmin=-0.05))
wallcolor = azure walldisplay = all
y2axisopts=(DISPLAY=none linearopts=(viewmin=0 viewmax=160));
barchart x=year y=Female_Fresh / barlabel=true
    barlabelattrs = (size = 9 pt WEIGHT=bold color = black)
    dataskin=gloss datatransparency=0.001 name='bar3'
    fillattrs=(color=V000FFFF);
seriesplot x=yeary=female_reten_pct / datalabel=female_reten_pct
lineattrs=GraphData1 (thickness=4 pattern=solid color=green)
DATALABELPOSITION = bottom yaxis=y2;
seriesplot x=yeary=female_grad_4_pct / datalabel=female_grad_4_pct
lineattrs=GraphData1 (thickness=4 pattern=solid
color=blue)DATALABELPOSITION = bottom yaxis=y2;
seriesplot x=yeary=female_grad_6_pct / datalabel=female_grad_6_pct
lineattrs=GraphData1 (thickness=4 pattern=solid color=black)
DATALABELPOSITION = bottom yaxis=y2;
endlayout;
endcell;

```

```
*DEFINE ROW 2;
```

```
*No Pell;
```

```

cell;
cellheader;
    entry "No Pell" / BORDER = FALSE TEXTATTRS=(size = 10 pt
WEIGHT=bold color = black) PAD=1;
endcellheader;

layout overlay / cycleattrs=false opaque = true
yaxisopts=(griddisplay=on label='' linearopts=(viewmin=-0.05))
wallcolor = lightgray walldisplay = all
y2axisopts=(DISPLAY=none linearopts=(viewmin=0 viewmax=130));
barchart x=year y=no_Pell_Fresh / barlabel=true

```

```

    barlabelattrs = (size = 9 pt WEIGHT=bold color = black)
    dataskin=gloss datatransparency=0.001 name='bar1'
    fillattrs=(color=lightblue);
seriesplot x=yeary=no_pell_reten_pct / datalabel=no_pell_reten_pct
lineattrs=GraphData1 (thickness=4 pattern=solid color=green)
DATALABELPOSITION = bottom yaxis=y2;
seriesplot x=yeary=no_pell_grad_4_pct / datalabel=no_pell_grad_4_pct
lineattrs=GraphData1 (thickness=4 pattern=solid color=blue)
DATALABELPOSITION = bottom yaxis=y2;
seriesplot x=yeary=no_pell_grad_6_pct / datalabel=no_pell_grad_6_pct
lineattrs=GraphData1 (thickness=4 pattern=solid color=black)
DATALABELPOSITION = bottom yaxis=y2;
endlayout;
endcell;

```

```
*Non-Resident;
```

```

cell;
cellheader;
    entry "Non-Resident" / BORDER = FALSE TEXTATTRS=(size = 10 pt
    WEIGHT=bold color = black) PAD=1;
endcellheader;

layout overlay / cycleattrs=false opaque = true
yaxisopts=(griddisplay=on label='' linearopts=(viewmin=-0.05))
wallcolor = lightgray walldisplay = all
y2axisopts=(DISPLAY=none linearopts=(viewmin=0 viewmax=400));
barchart x=year y=Non_Resident_Fresh /
    barlabel=true barlabelattrs = (size = 9 pt WEIGHT=bold color =
    black) dataskin=gloss datatransparency=0.001 name='bar2'
    fillattrs=(color=lightorange);
seriesplot x=yeary=Non_resident_reten_pct /
    datalabel=Non_resident_reten_pct lineattrs=GraphData1
    (thickness=4 pattern=solid color=green) DATALABELPOSITION =
    bottom yaxis=y2;
seriesplot x=yeary=Non_resident_grad_4_pct /
    datalabel=Non_resident_grad_4_pctlineattrs=GraphData1
    (thickness=4 pattern=solid color=blue) DATALABELPOSITION = bottom
    yaxis=y2;
seriesplot x=yeary=Non_resident_grad_6_pct /
    datalabel=Non_resident_grad_6_pctlineattrs=GraphData1
    (thickness=4 pattern=solid color=black)DATALABELPOSITION = bottom
    yaxis=y2;
endlayout;
endcell;

```

```
*Male;
```

```

cell;
cellheader;
    entry "Male" / BORDER = FALSE TEXTATTRS=(size = 10 pt WEIGHT=bold
    color = black) PAD=1;
endcellheader;
layout overlay / cycleattrs=false opaque = true
yaxisopts=(griddisplay=on label='' linearopts=(viewmin=-0.05))
wallcolor = lightgray walldisplay = all

```

```

y2axisopts=(DISPLAY=none linearopts=(viewmin=0 viewmax=160));
barchart x=year y=Male_Fresh / barlabel=true
    barlabelattrs = (size = 9 pt WEIGHT=bold color = black)
    dataskin=gloss datatransparency=0.001 name='bar3'
    fillattrs=(color=lightred);
seriesplot x=year y=Male_reten_pct /
    datalabel=Male_reten_pct lineattrs=GraphData1 (thickness=4
    pattern=solid color=green) DATALABELPOSITION = bottom yaxis=y2;
seriesplot x=year y=Male_grad_4_pct / datalabel=Male_grad_4_pct
    lineattrs=GraphData1 (thickness=4 pattern=solid color=blue)
    DATALABELPOSITION = bottom yaxis=y2;
seriesplot x=year y=Male_grad_6_pct / datalabel=Male_grad_6_pct
    lineattrs=GraphData1 (thickness=4 pattern=solid color=black)
    DATALABELPOSITION = bottom yaxis=y2;
    endlayout;
endcell;

sidebar / align=bottom SPACEFILL = _ON_;
    discretelegend 'line1' 'line2' 'line3' / ORDER = ROWMAJOR across=3
    border=off pad=(top=2px);
endsidebar;

rowaxes;
    rowaxis / griddisplay=on display=(label tickvalues)
    label="Headcount" labelattrs=(weight=bold);
    rowaxis / griddisplay=on display=(label tickvalues)
    label="Headcount" labelattrs=(weight=bold);
endrowaxes;

columnaxes;
    columnaxis / griddisplay=on display=(line tickvalues)
    labelattrs=(weight=bold)
    timeopts=(tickvalueformat=monname1.);
    columnaxis / griddisplay=on display=(line tickvalues)
    labelattrs=(weight=bold)
    timeopts=(tickvalueformat=monname1.);

columnaxis / griddisplay=on display=(line tickvalues)
    labelattrs=(weight=bold)
    timeopts=(tickvalueformat=monname1.);
endcolumnaxes;

    endlayout;
    endlayout;
    endgraph;

end;
run;
quit;

PROC TEMPLATE;
    define style styles.mystyle;
    parent=styles.default;
    style GraphData1 from GraphData1 /
    contrastcolor=green linestyle=3;
    style GraphFonts from GraphFonts

```

```

"Fonts used in graph styles" /
'GraphTitleFont' = ("", "10pt,bold)
'GraphFootnoteFont' = ("", "8pt)
'GraphLabelFont' = ("", "8pt)
'GraphValueFont' = ("", "7pt)
'GraphDataFont' = ("", "7pt);

STYLE HEADER /
BACKGROUND= white
FOREGROUND = red
FONT_FACE= "arial"
FONT_WEIGHT= bold;
end;
run;

ods html body="1_Freshman_Retention_Graduation.htm"
path="&outputloc." (url=none);
ods graphics / reset
imagemap=on
width=14in
height=12in
TIPMAX=9200
ANTIALIASMAX=9200
imagename="1_Freshman_Retention_Graduation_Image";
title;

PROC SGRENDER data=cars_4
template=Retention_Drilldown_Template;
run;
quit;
title;
ods html close;

```

## APPENDIX 2

```

PROC TEMPLATE;
define statgraph Workforce_Drilldown_Template;
begingraph / designwidth=495px designheight=370px;
entrytitle "Faculty & Staff";
layout gridded / columns= 1;
layout lattice / rows=2 columns=3
rowdatarange=union
rowgutter=0px columngutter=10px;

*Faculty by Year;
*left chart;
cell;
cellheader;
entry "Faculty by Year" / BORDER = FALSE TEXTATTRS=(size = 10 pt
WEIGHT=bold color = black) PAD=1;
endcellheader;

layout overlay / cycleattrs=false xaxisopts=(label=" ")

```

```

yaxisopts=(griddisplay=on label='Rank' linearopts=(viewmin= 0.0));
seriesplot x=yeary=faculty_total /datalabel=faculty_total
    lineattrs=GraphData(thickness=4 pattern=solid color=green)
    DATALABELPOSITION = bottom legendlabel="Total" name='line1'
    url=URLWF2Link;
seriesplot x=yeary=faculty_total_urm /datalabel=faculty_total_urm
    lineattrs=GraphData(thickness=4 pattern=solid color=red)
    DATALABELPOSITION = bottom legendlabel="URM" name='line2'
    url=URLWF2Link;
seriesplot x=yeary=faculty_men /datalabel=faculty_men
    lineattrs=GraphData(thickness=4 pattern=solid color=blue)
    DATALABELPOSITION = bottom legendlabel="Men" name='line3'
    url=URLWF2Link;
seriesplot x=yeary=faculty_women / datalabel=faculty_women
    lineattrs=GraphData(thickness=4 pattern=solid color=gold)
    DATALABELPOSITION = top legendlabel="Women" name='line4'
    url=URLWF2Link;
discretelegend 'line1' 'line2' 'line3' 'line4' / title=""
    location=inside halign=left valign=top;
endlayout;
endcell;

*middle chart;
cell;
cellheader;
    entry "Faculty by Year" / BORDER = FALSE TEXTATTRS=(size = 10 pt
        WEIGHT=bold color = black) PAD=1;
endcellheader;

layout overlay / cycleattrs=false xaxisopts=(label=" ")
yaxisopts=(griddisplay=on label='Rank' linearopts=(viewmin= 0.0));
seriesplot x=yeary=faculty_total /datalabel=faculty_total
    lineattrs=GraphData(thickness=4 pattern=solid color=green)
    DATALABELPOSITION = bottom legendlabel="Total" name='line1'
    url=URLWF2Link;
seriesplot x=yeary=faculty_total_urm /datalabel=faculty_total_urm
    lineattrs=GraphData(thickness=4 pattern=solid color=red)
    DATALABELPOSITION = bottom legendlabel="URM" name='line2'
    url=URLWF2Link;
seriesplot x=yeary=faculty_men /datalabel=faculty_men
    lineattrs=GraphData(thickness=4 pattern=solid color=blue)
    DATALABELPOSITION = bottom legendlabel="Men" name='line3'
    url=URLWF2Link;
seriesplot x=yeary=faculty_women / datalabel=faculty_women
    lineattrs=GraphData(thickness=4 pattern=solid color=gold)
    DATALABELPOSITION = top legendlabel="Women" name='line4'
    url=URLWF2Link;
discretelegend 'line1' 'line2' 'line3' 'line4' / title=""
    location=inside halign=right valign=center;
endlayout;
endcell;

*right chart;
cell;
cellheader;
    entry "Faculty by Year" / BORDER = FALSE TEXTATTRS=(size = 10 pt
        WEIGHT=bold color = black) PAD=1;

```

```

endcellheader;

layout overlay / cycleattrs=false xaxisopts=(label=" ")
yaxisopts=(griddisplay=on label='Rank' linearopts=(viewmin= 0.0));
seriesplot x=yeary=faculty_total /datalabel=faculty_total
    lineattrs=GraphData1(thickness=4 pattern=solid color=green)
    DATALABELPOSITION = bottom legendlabel="Total" name='line1'
    url=URLWF2Link;
seriesplot x=yeary=faculty_total_urm /datalabel=faculty_total_urm
    lineattrs=GraphData1(thickness=4 pattern=solid color=red)
    DATALABELPOSITION = bottom legendlabel="URM" name='line2'
    url=URLWF2Link;
seriesplot x=yeary=faculty_men /datalabel=faculty_men
    lineattrs=GraphData1(thickness=4 pattern=solid color=blue)
    DATALABELPOSITION = bottom legendlabel="Men" name='line3'
    url=URLWF2Link;
seriesplot x=yeary=faculty_women / datalabel=faculty_women
    lineattrs=GraphData1 (thickness=4 pattern=solid color=gold)
    DATALABELPOSITION = top legendlabel="Women" name='line4'
    url=URLWF2Link;
discretelegend 'line1' 'line2' 'line3' 'line4'/ title=""
    location=inside halight=right valign=top;
endlayout;
endcell;

rowaxes;
rowaxis / griddisplay=on display=(label tickvalues)
label="Headcount"labelattrs=(weight=bold);
rowaxis / griddisplay=on display=(label tickvalues)
label="Headcount" labelattrs=(weight=bold);
endrowaxes;

columnaxes;
columnaxis / griddisplay=on display=(tickvalues);
columnaxis / griddisplay=on display=(tickvalues);
columnaxis / griddisplay=on display=(tickvalues);
endcolumnaxes;

endlayout;
endlayout;
endgraph;
end;
run;
quit;

```