



TRAINING GUIDE

# Advanced Crystal 1



# Using Crystal Reports with Lucy

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## *Advanced Examples - 1*

The fifth of a seven-part series, this workbook is designed for Crystal Reports® users with some experience, who wish to explore the power of adding graphics to their reports.

Graphs help you visualize data. They show patterns and trends at-a-glance. In addition, they add impact to your ideas.

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# Developing a Graphical Report

Crystal Reports allows you to add graphs in the Header and Footer sections of a report. In the following step-by-step example, we'll create a report showing the Sewer Work Orders grouped by categories. We'll add a bar graph showing number of Work Orders for each Sewer category and a pie chart to show percentage of Work Orders for each category.

1. Export MS\_WOHide.rpt and name the new report MS\_WOCatGraph.rpt.
2. Open MS\_WOCatGraph.rpt.
3. Change the Title to "Sewer Work Orders by Category Report."
4. Next, we will limit the work orders to those for Sewer assets.
  - o Open Select Expert, click New.
  - o Highlight WO\_INV\_ID and click OK.
  - o Select is between from the drop down box and type in 2 and 6 (2:Structure, 3:Pump Station, 4:Pump, 5:Service Lateral, 6:Pipe). Then, click OK.
    - These numbers come from the WKCATINV table. Discussed further in Advanced Crystal 2.
  - o The *Select Expert* formula now looks like this:  
{WKORDER.WO\_INV\_ID} in 2 to 6

## Preview

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### **Sewer Work Orders by Category Report**

Double click the category code to view the individual work orders.

<u>Category</u>	<u>Count</u>
21100 Sewer Manhole	3
21200 Sewer Pipe	5
21300 Sewer Service	1

5. We will now add a graph to the Report Footer.

## Notes:

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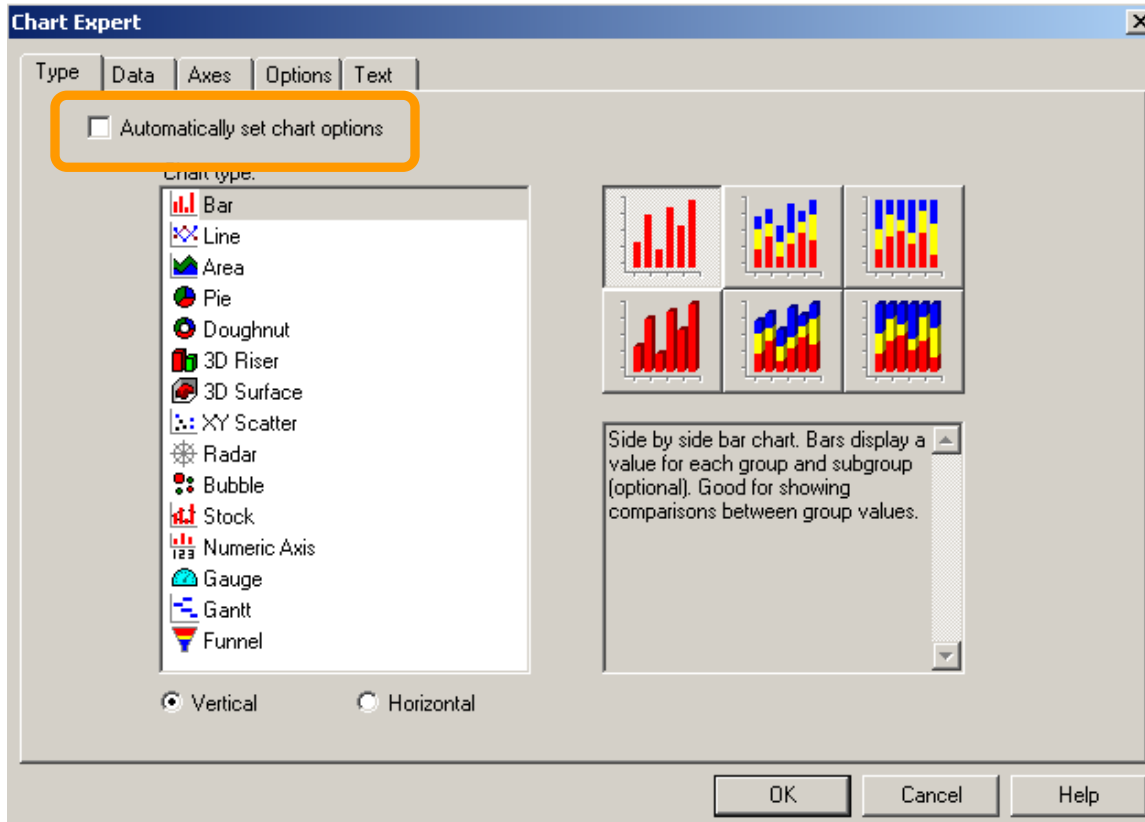
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## Crystal 10

- Click *Insert Chart* . Once the *Chart Expert* dialog is open, there are many options available for creating the chart.
- The *Automatically set chart options* checkbox needs to be blank in order to view the *Axes* and *Options* tabs.



## Crystal XI

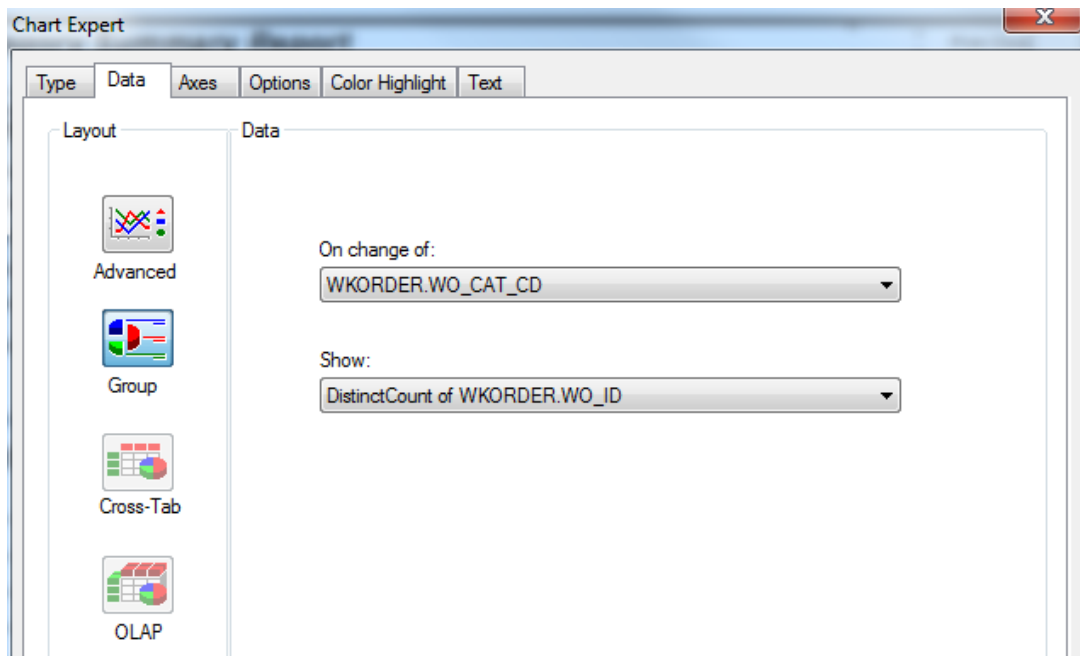
- Click *Insert Chart* .
- Place the "box" where the graph is to be located in the **Report Footer**.
- The *Chart Expert* may automatically open where you will proceed with the *Data* tab.

OR

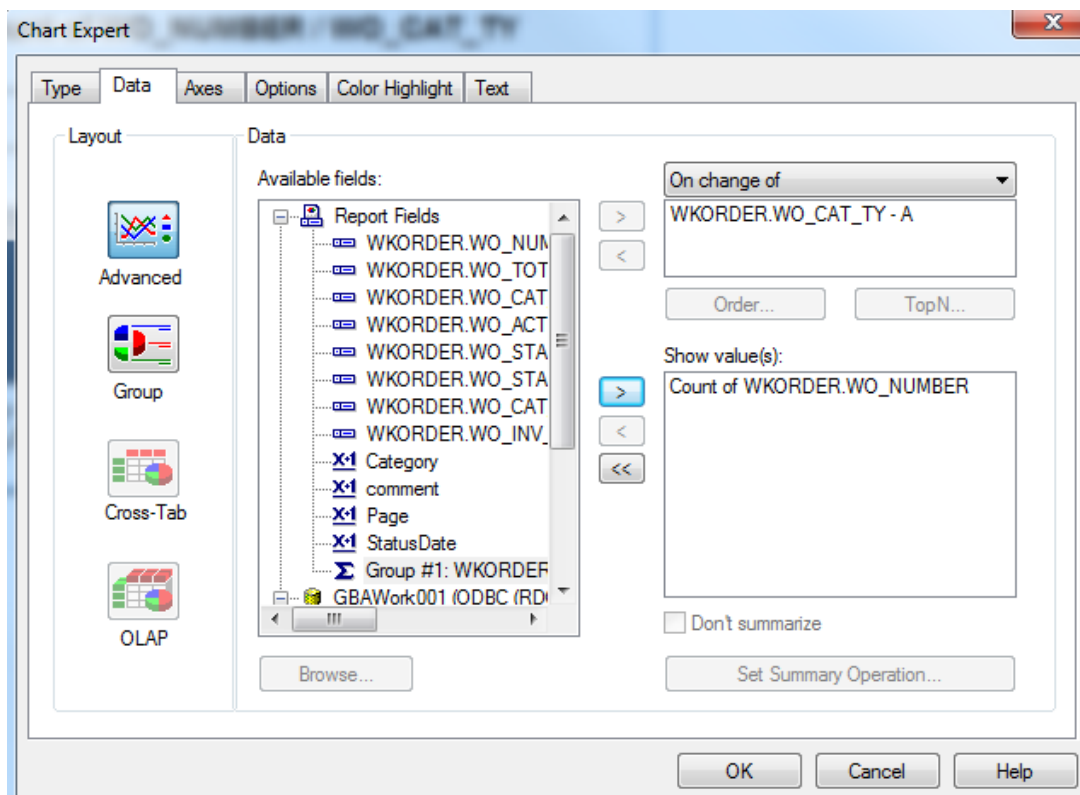
- Crystal may guess what data and type of graph you wish to use and drop the graph in. If the graph shows up then you will need to right click in the graph box and select *Chart Expert* to make any revisions.

## Chart Expert, Data tab

If Crystal has guessed on your data, the following should appear:

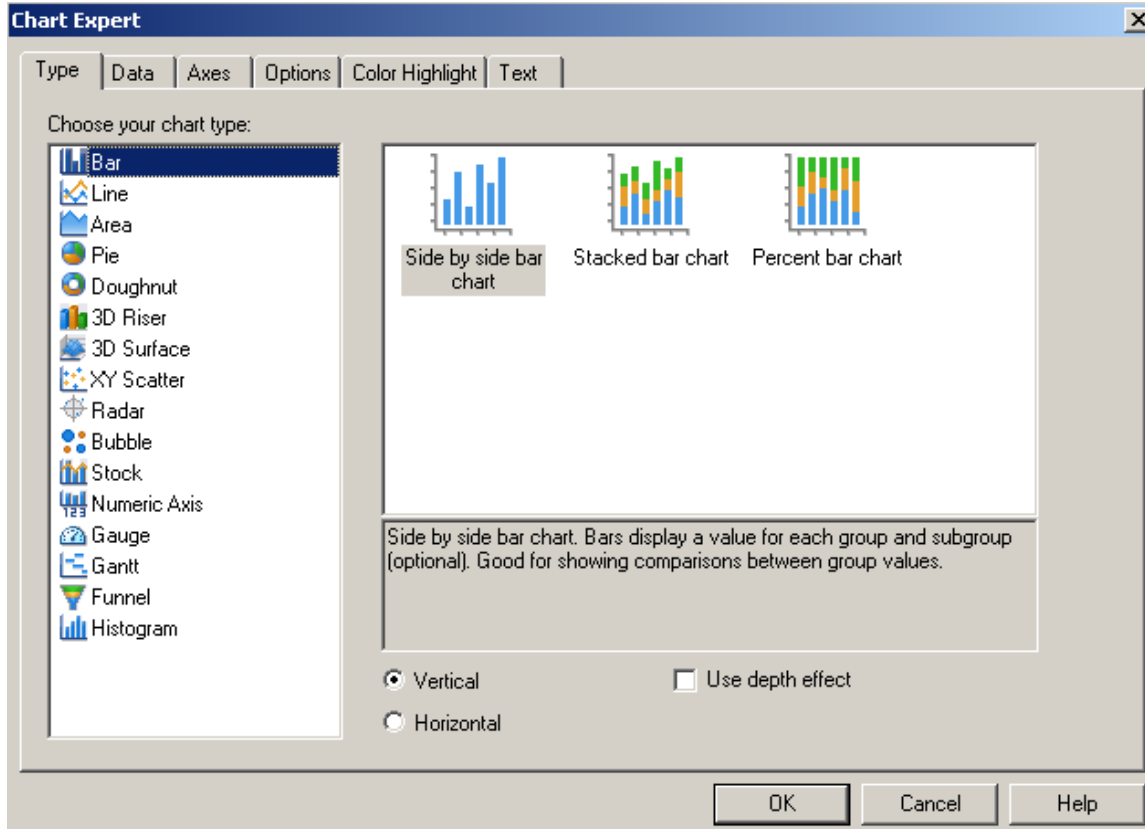


If this is correct, then you should look at the options within the other tabs to modify as needed. If this isn't correct, then click on Advanced and set up the data as follows:



## Chart Expert, Type Tab

Highlight the "Side by side bar chart" option.



Notes:

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### Chart Expert, Axes tab

The screenshot shows the 'Chart Expert' dialog box with the 'Axes' tab selected. The dialog has a title bar 'Chart Expert' and four tabs: 'Type', 'Data', 'Axes', 'Options', and 'Text'. The 'Axes' tab contains three sections:

- Show gridlines:** A table with columns 'Major' and 'Minor'.

	Major	Minor
Group axis:	<input type="checkbox"/>	<input type="checkbox"/>
Data axis:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
- Data values:** A table with columns 'Auto scale', 'Auto range', 'Min', 'Max', and 'Number format'.

	Auto scale	Auto range	Min	Max	Number format
Data axis:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	0.00	0.00	1
- Number of divisions:** A table with columns 'Data axis', 'Automatic', 'Manual', and a text box.

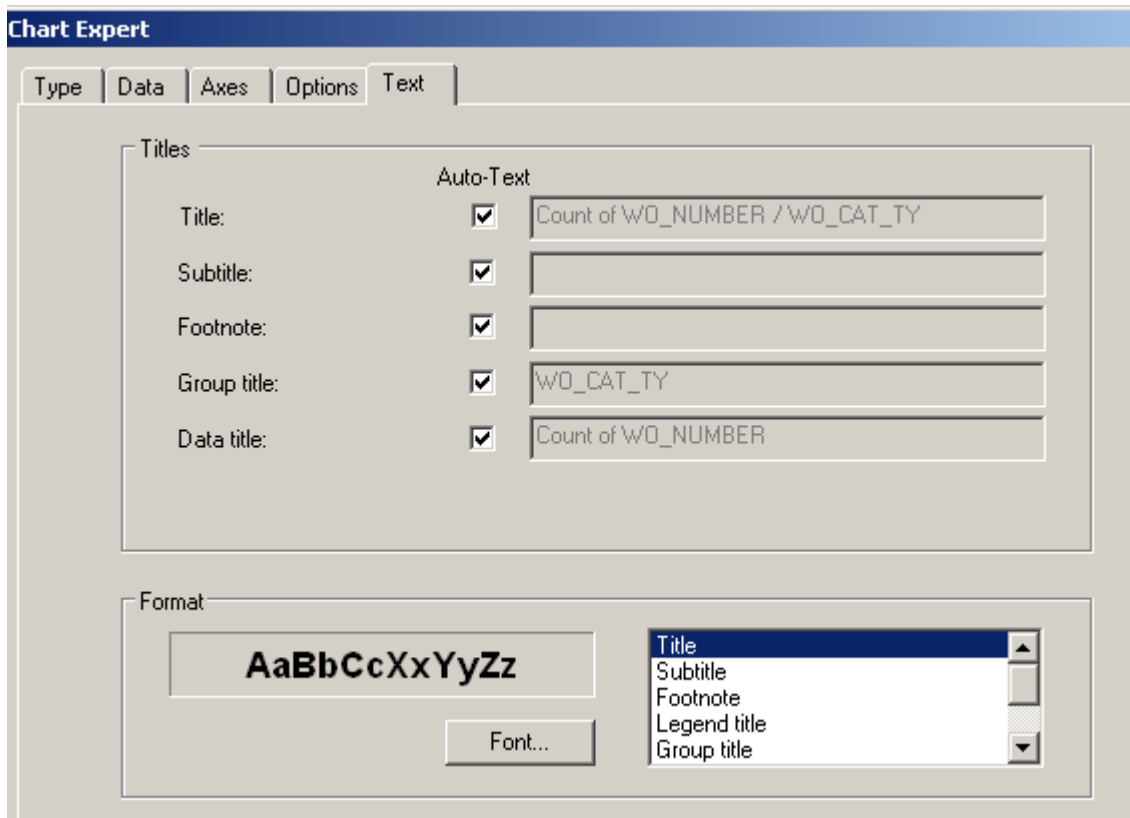
	Automatic	Manual	
Data axis:	<input checked="" type="radio"/>	<input type="radio"/>	1

### Chart Expert, Options tab

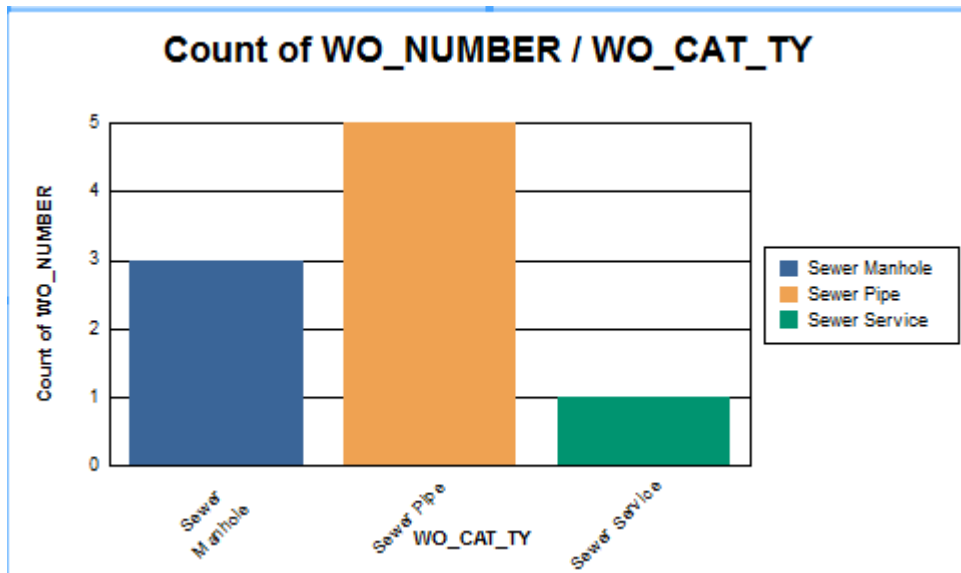
The screenshot shows the 'Chart Expert' dialog box with the 'Options' tab selected. The dialog has a title bar 'Chart Expert' and four tabs: 'Type', 'Data', 'Axes', 'Options', and 'Text'. The 'Options' tab contains three sections:

- Chart color:** Radio buttons for 'Color' (selected) and 'Black and white', with a 'Format' button.
- Data points:** Checkboxes for 'Show label' and 'Show value', and a 'Number format' dropdown menu set to '1'.
- Customize settings:** Checkboxes for 'Transparent background', 'Marker size' dropdown set to 'Medium', 'Marker shape' dropdown set to 'Rectangle', and 'Bar size' dropdown set to 'Large'.
- Legend:** Checkboxes for 'Show legend' (checked) and 'Placement' dropdown set to 'Right'.

Chart Expert, Text tab



This is the way the graph will look with the current titles:

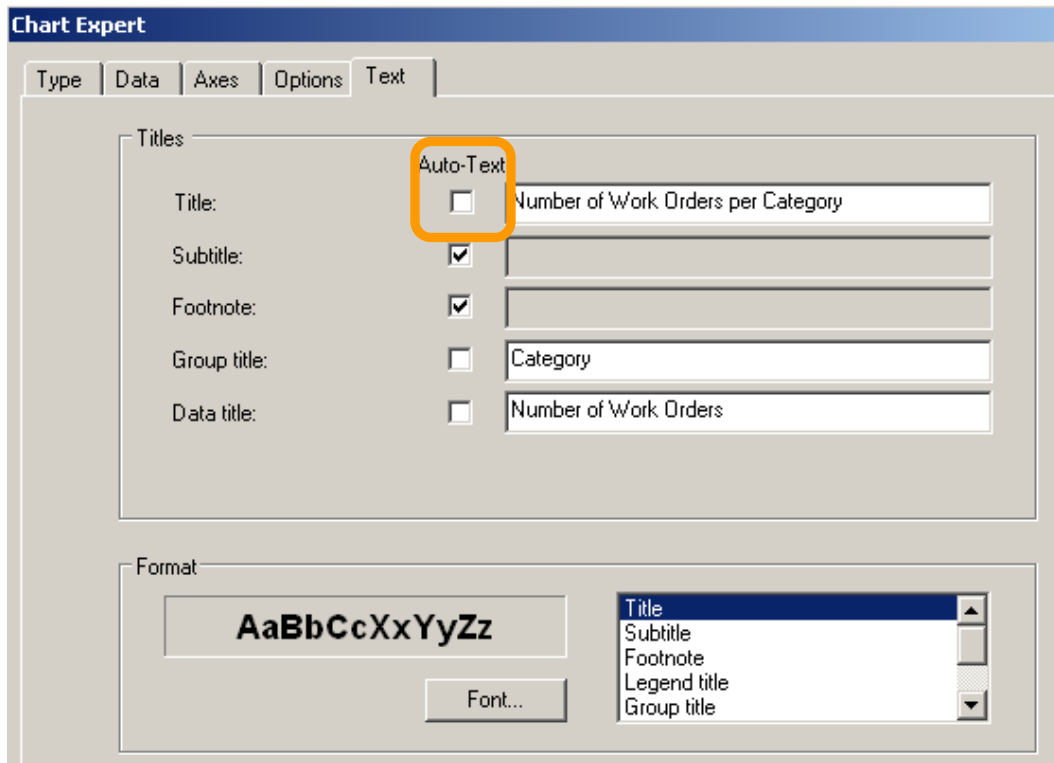


- To modify the report, right click on the graph and select *Chart Expert*.

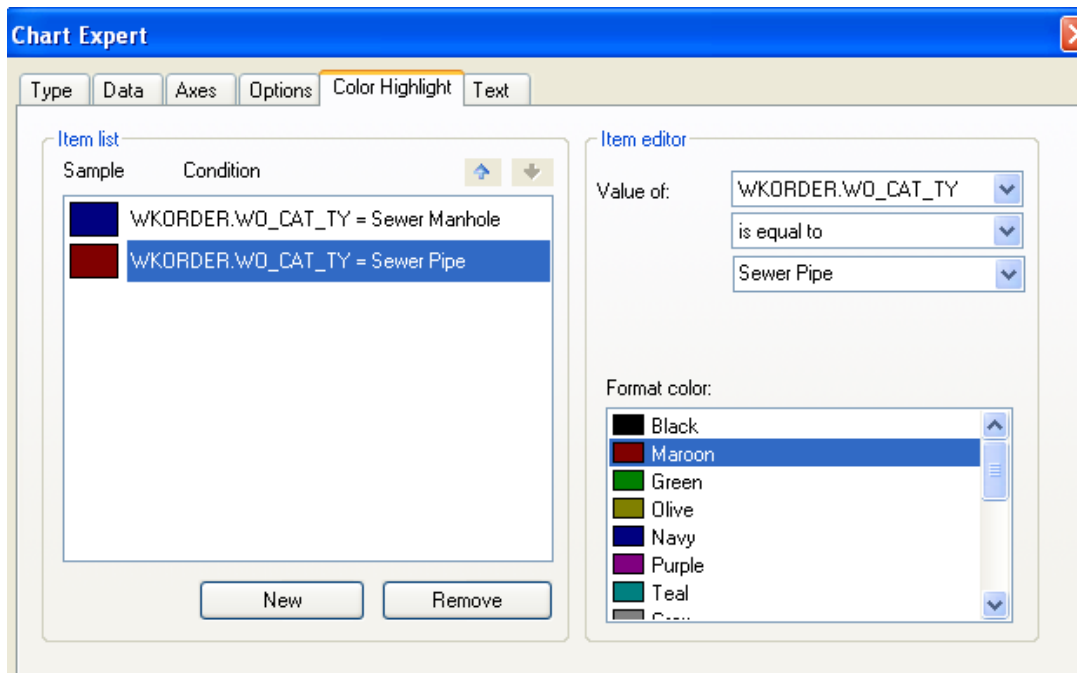
Change the names in the Text tab to clarify the graph titles.



Uncheck the Auto-Text boxes to allow modification of the text in the associated field.



Crystal XI has an additional tab: Color Highlight.



- When you are finished making your modifications, click *OK*.



## Preview

### Sewer Work Orders by Category Report

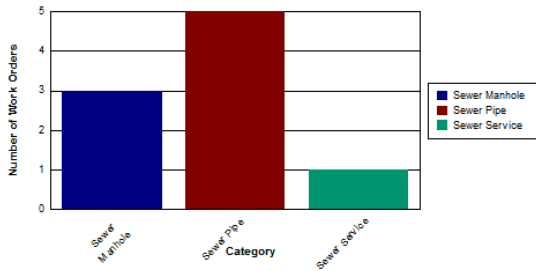
8/27/2012

11:24 AM

Double click the category code to view the individual work orders.

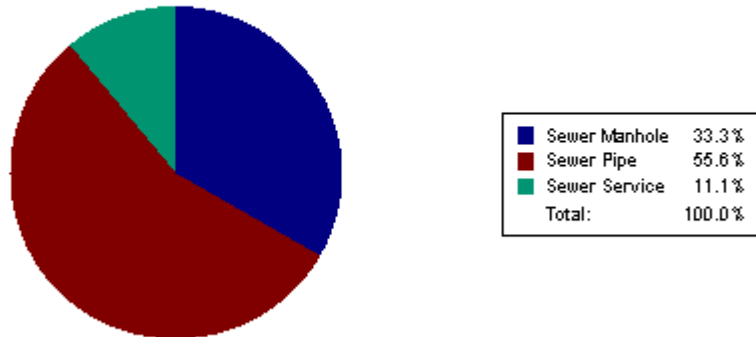
Category	Count
21100 Sewer Manhole	3
21200 Sewer Pipe	5
21300 Sewer Service	1
	<b>\$938.51</b>

Number of Work Orders per Category



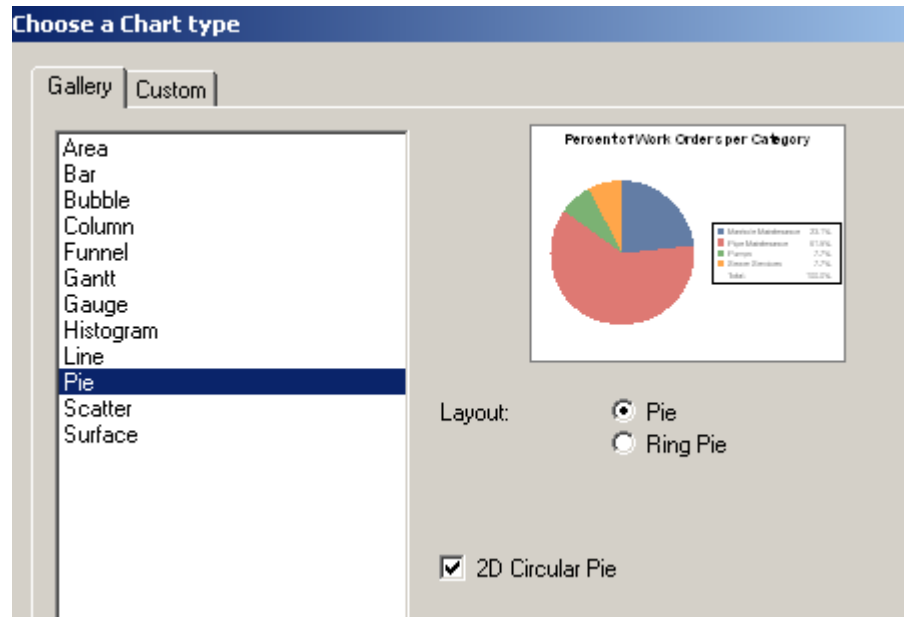
- In the Chart Expert, Type tab, you can select the Chart Type. These include Bar, Pie, Line, Gauge, etc. If the Pie option had been chosen instead of the Bar Graph pictured above, the graph we created would look like this:

Percent of Work Orders per Category

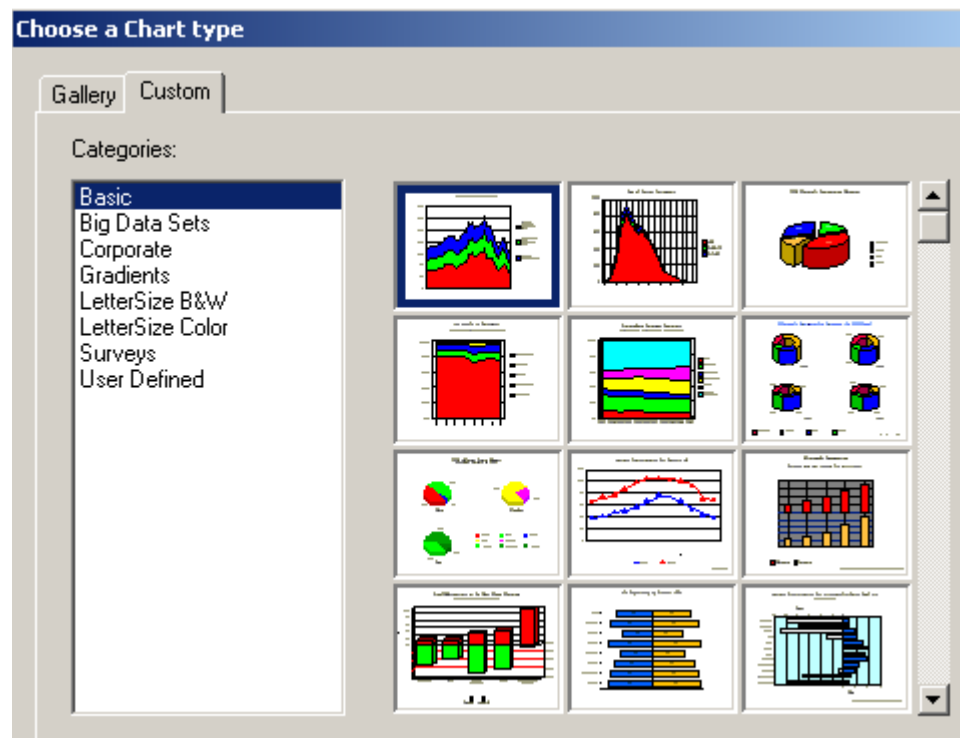


- Right click on the chart for further options. Examples of these options are displayed on the following pages. Options vary depending on the type of graph you are working with:

(Crystal 10) Chart Type, Gallery tab



(Crystal 10) Chart Type, Custom tab



(Crystal 10) Chart Options, General tab

**Chart Options**

General | Layout | Data Labels | Numbers | Dual Y Options | Look | Display Status

Overlap: 25

Gap Width: 19

Riser Shape: Rectangle

Use Depth

Depth: 100

Direction: 45

(Crystal 10) Chart Options, Layout tab

**Chart Options**

General | Layout | Data Labels | Numbers | Dual Y Options | Look | Display Status

Type:

- Clustered
- Stacked
- Percent
- True 3D Column

Dual Axes

Split Dual Axes

Notes: \_\_\_\_\_

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*Crystal 10) Chart Options, Data Labels tab*

**Chart Options**

General | Layout | **Data Labels** | Numbers | Dual Y Options | Look | Display Status

**Number of Work Orders per Category**

Category	Number of Work Orders
Manhole Maintenance	4
Pipe Maintenance	7
Pumps	1
Sewer Services	1

Show Data Labels

Labels Location: Center

Label Format: Label

*(Crystal 10) Chart Options, Look tab*

**Chart Options**

General | Layout | Data Labels | Numbers | Dual Y Options | **Look** | Display Status

**Number of Work Orders per Category**

Category	Number of Work Orders
Manhole Maintenance	4
Pipe Maintenance	7
Pumps	1
Sewer Services	1

Color Mode: Color by Groups

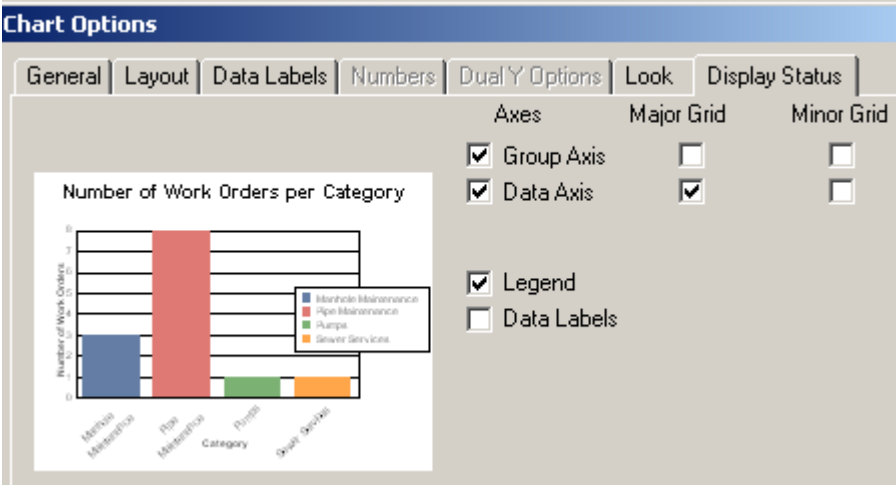
Show Legend

Markers and Text: Markers to Left of Text

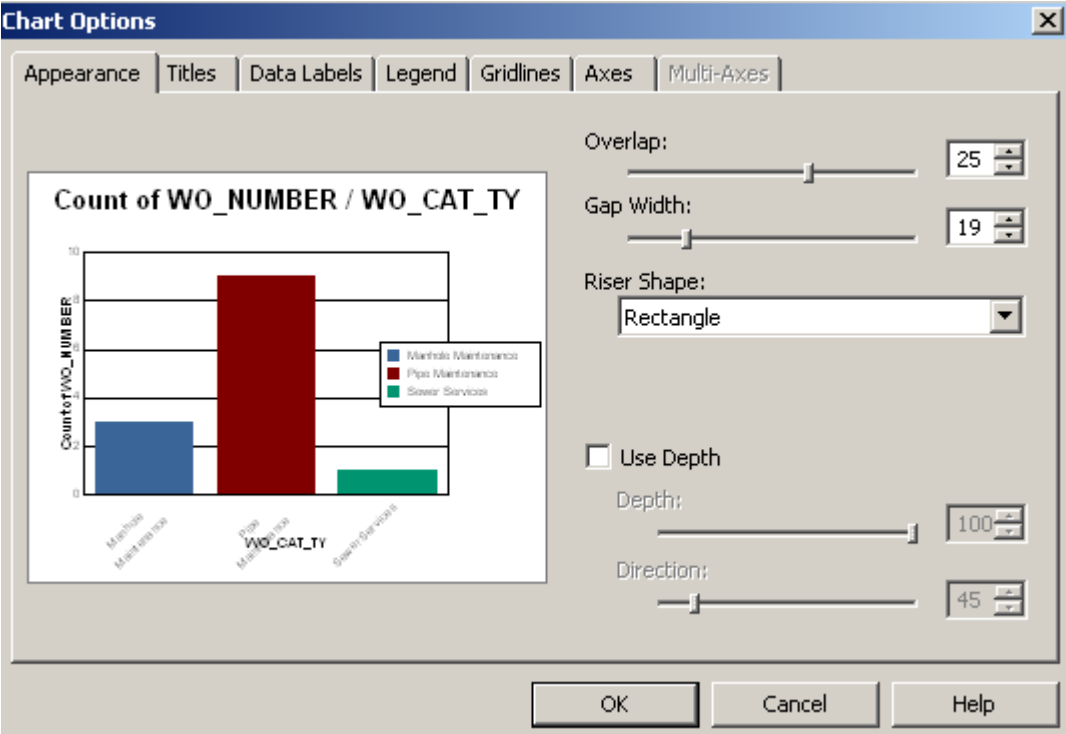
Layout: Legend on Right Side

Box Style: Single Line Frame

(Crystal 10) Chart Options, Display Status tab



(Crystal XI) Chart Options, Appearance tab



(Crystal XI) Chart Options, Titles tab

**Chart Options**

Appearance | **Titles** | Data Labels | Legend | Gridlines | Axes | Multi-Axes

**Count of WO\_NUMBER / WO\_CAT\_TY**

WO_CAT_TY	Count of WO_NUMBER
Manhole Maintenance	3
Pipe Maintenance	9
Sewer Service	1

Title:

Subtitle:

Footnote:

Group Title:

Data Title:

(Crystal XI) Chart Options, Data Labels tab

**Chart Options**

Appearance | Titles | **Data Labels** | Legend | Gridlines | Axes | Multi-Axes

**Count of WO\_NUMBER / WO\_CAT\_TY**

WO_CAT_TY	Count of WO_NUMBER
Manhole Maintenance	3
Pipe Maintenance	9
Sewer Service	1

Show Data Labels

Labels Location:

Label Format:



(Crystal XI) Chart Options, Legend tab

**Chart Options**

Appearance | Titles | Data Labels | Legend | Gridlines | Axes | Multi-Axes

**Count of WO\_NUMBER / WO\_CAT\_TY**

WO_CAT_TY	Count
Manhole Maintenance	3
Pipe Maintenance	9
Sewer Services	1

Show Legend

Layout: Legend on Right Side

Markers and Text: Markers to Left of Text

Box Style: Single Line Frame

Color Mode: Color by Groups

Swap Series/Groups

(Crystal XI) Chart Option, Gridlines tab

**Chart Options**

Appearance | Titles | Data Labels | Legend | Gridlines | Axes | Multi-Axes

**Count of WO\_NUMBER / WO\_CAT\_TY**

WO_CAT_TY	Count
Manhole Maintenance	3
Pipe Maintenance	9
Sewer Services	1

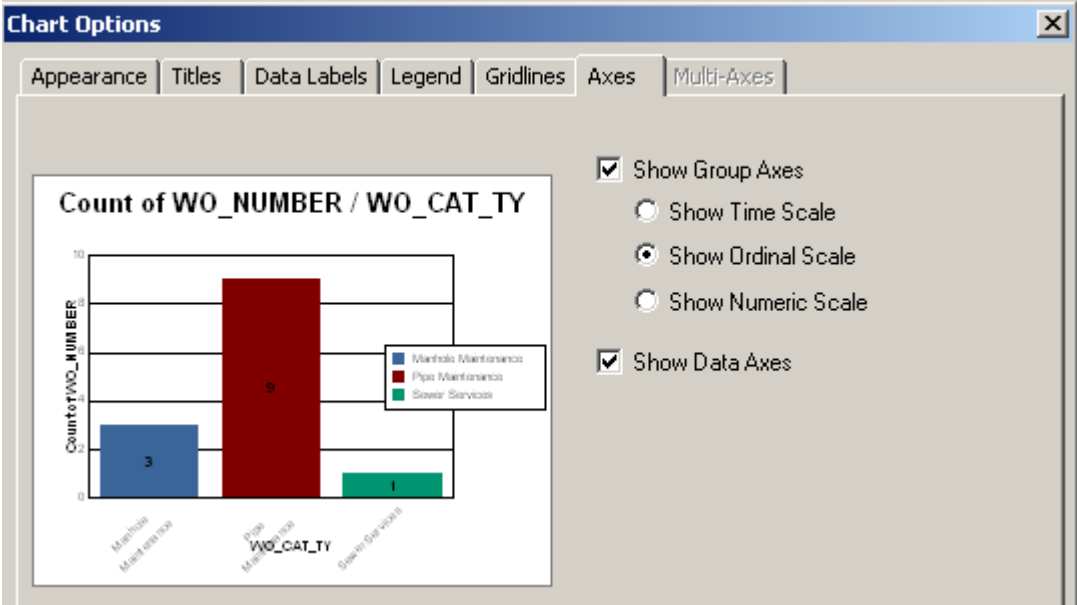
Group Axis:

- Major Gridlines
- Minor Gridlines

Data Axis:

- Major Gridlines
- Minor Gridlines

(Crystal XI) Chart Options, Axes tab



- You can play with the options until you achieve the look that best portrays your information.

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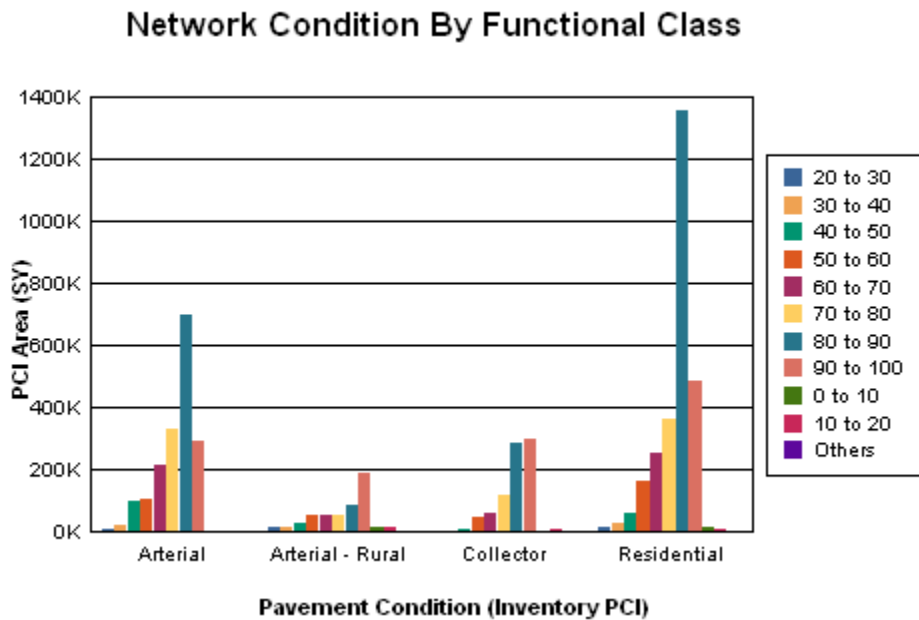
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## Cross - Tabs

**Cross-Tab**  is a row and column object that can be helpful in creating a type of spreadsheet. It is also useful in creating and modifying graphs.

It was necessary to use a **Cross-Tab** object to fix some graphs that were originally created using just the Crystal Chart option.

One graph looked like this:



As you can clearly see, the chart legend poses the most obvious issue. The placement of the bars is an additional concern. The "0 to 10", "10 to 20", and "Others" bars are placed after the "90 to 100" bar instead of before the "20 to 30" bar.

"This behavior occurs because Crystal Reports takes the first grouping in the data set and creates a sorted view of this data before creating the graph. When this first grouping does not contain all the possible items to be shown in the legend, Crystal Reports will sort the selection and add any new items to the end of the legend list."

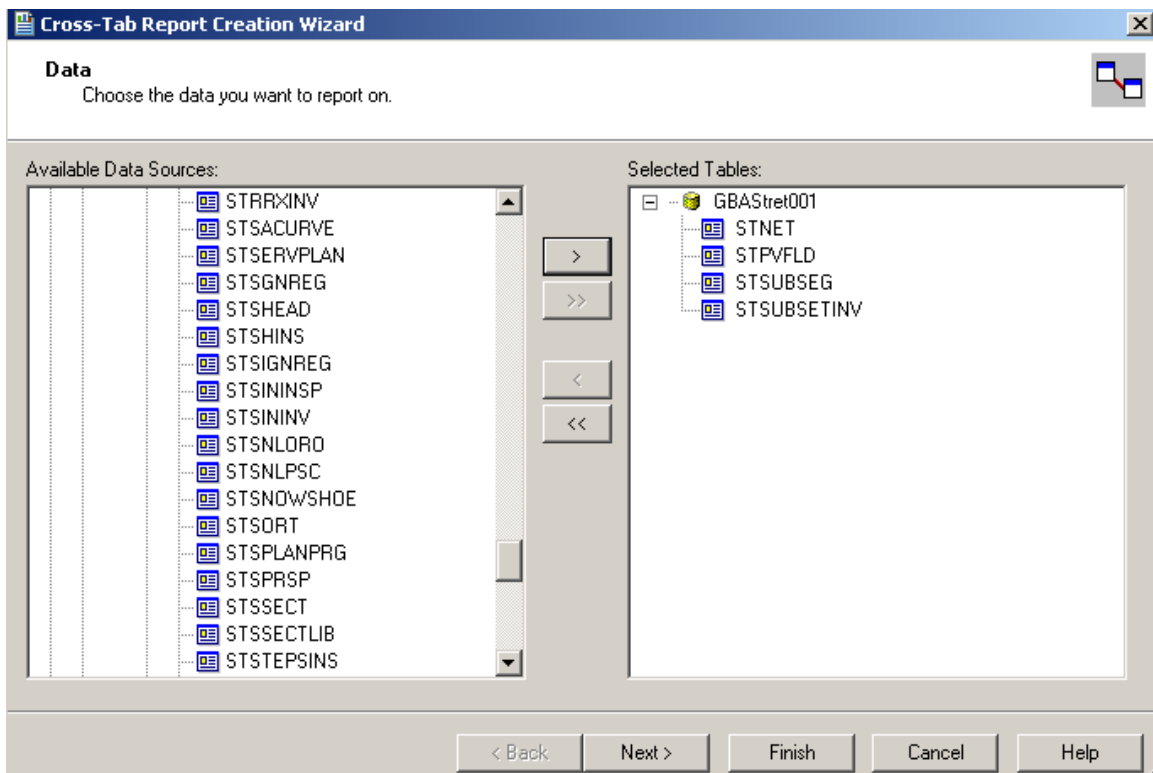
<http://technicalsupport.businessobjects.com>

The **Arterial** grouping did not have bars for "0 to 10", "10 to 20" or "Others". Thus, the legend was created without these ranges. As additional groupings were added, the legend picked up the missing PCI values.

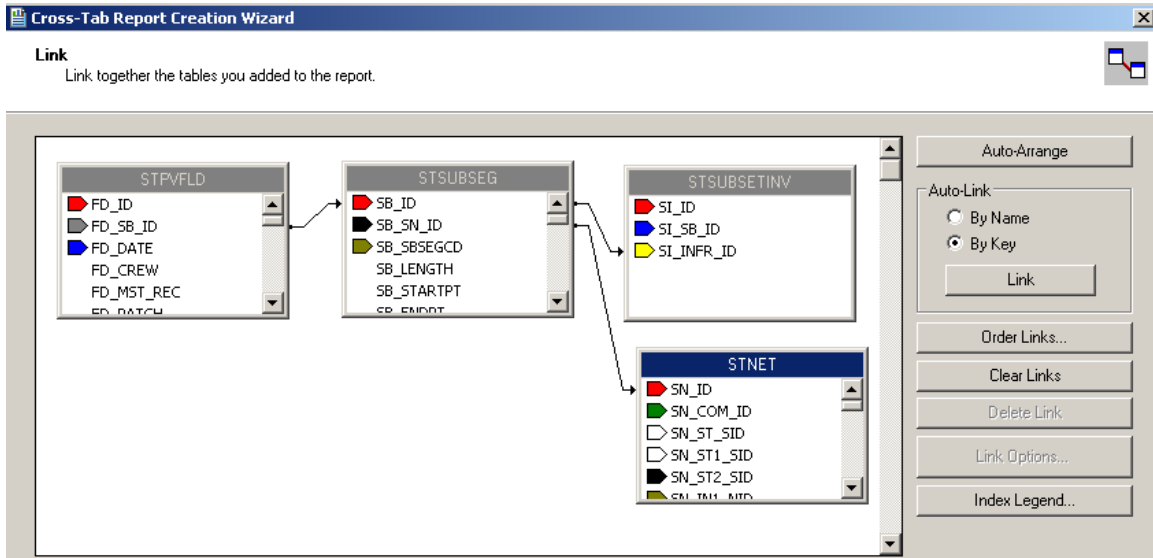
A **Cross-Tab** object was used to correct these issues.

We will create a Cross-Tab report for Street Pavement Conditions to be run in the Pavement Manager>>Field Inspections module. This module has fields utilizing several tables so it would be worthwhile to check **Field Definitions** to make sure we bring in all of the pertinent tables. We will be using the **Inventory PCI** (STPVFLD\_FD\_PCI), **Total Area** (STSUBSEG\_SB\_TAREA), and **Street Classification** (STNET\_SN\_CLAS\_TY) fields.

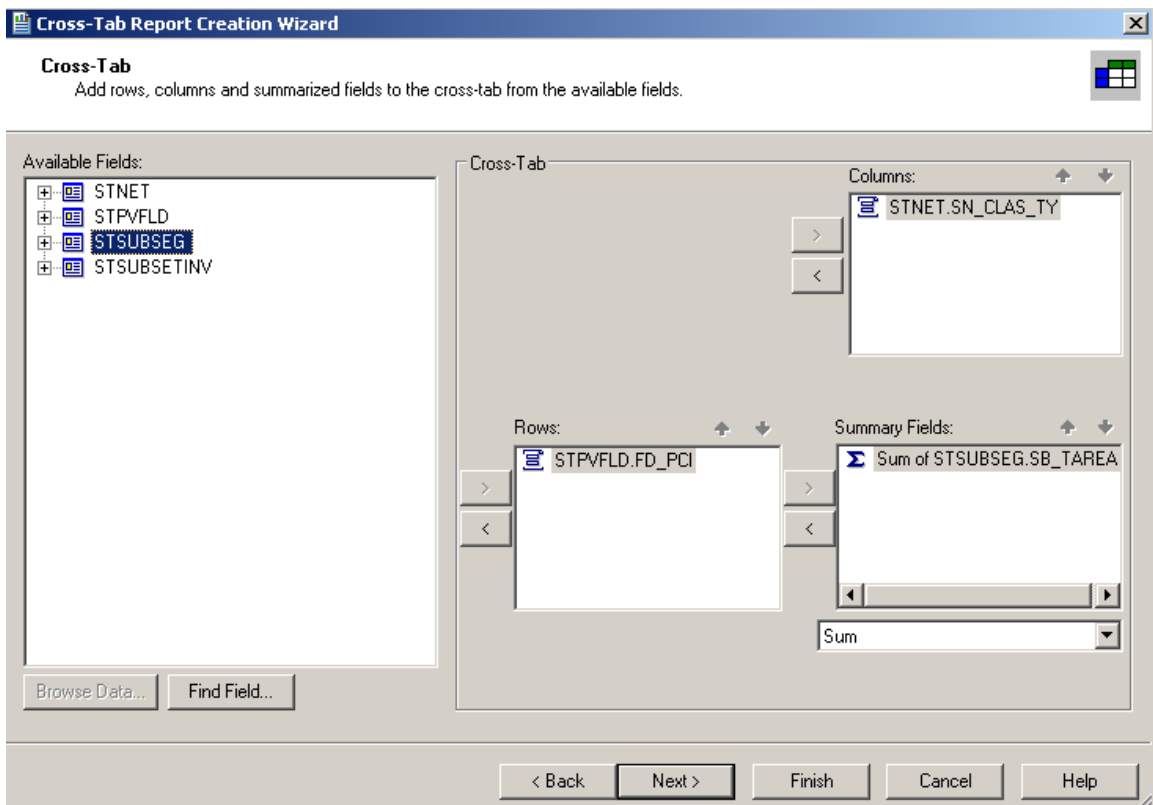
1. Open Crystal Reports and select New Reports >> Cross-Tab Report Wizard.
2. Open Create New Connection >> ODBC (RDO).
3. Within Data Source Selection select GBASStret001 >> Next >> Finish.
4. Click Next and move the necessary tables from Available Data Sources to Selected Tables.



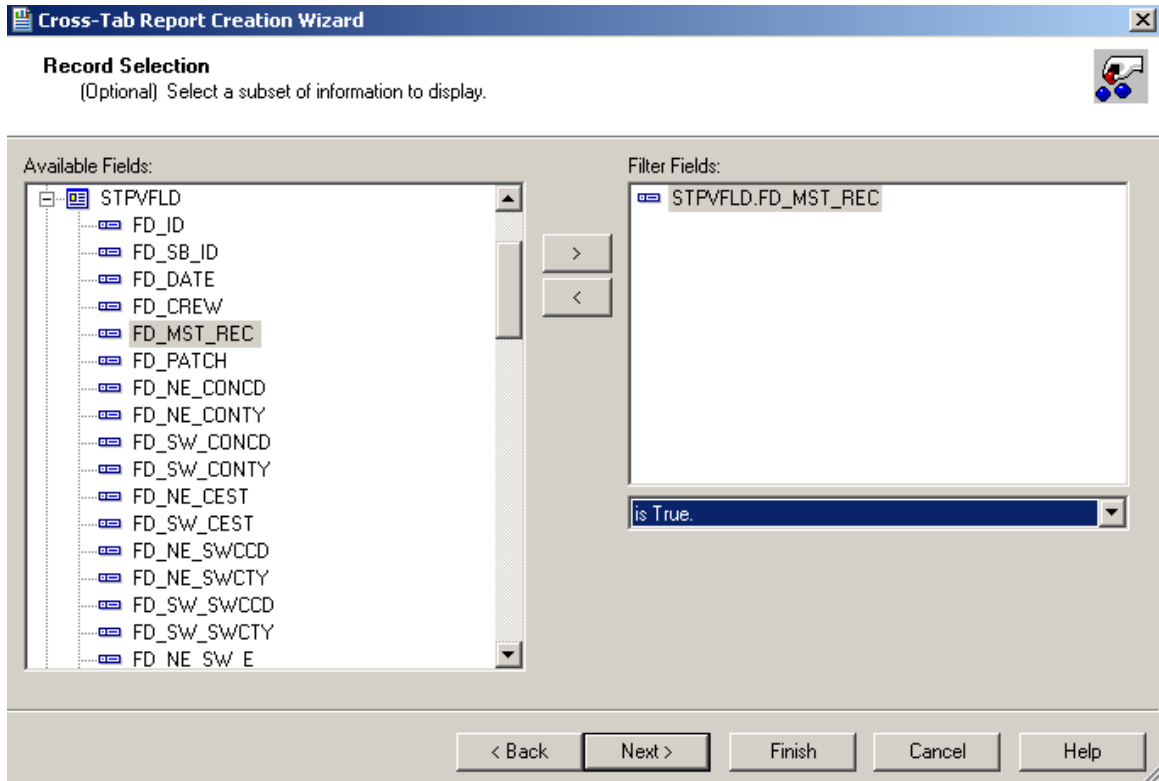
5. Click **Next** and link as follows. Remember to “Left Outer Join” between tables.



6. Click **Next**. Set up the column, rows, and summarized field as follows:



- At this time, we will skip the charting option.
- Click **Next**. We would like to filter for the most recent records.



- Click **Next** and then click **Finish**. A report has been created.

**Notes:** \_\_\_\_\_

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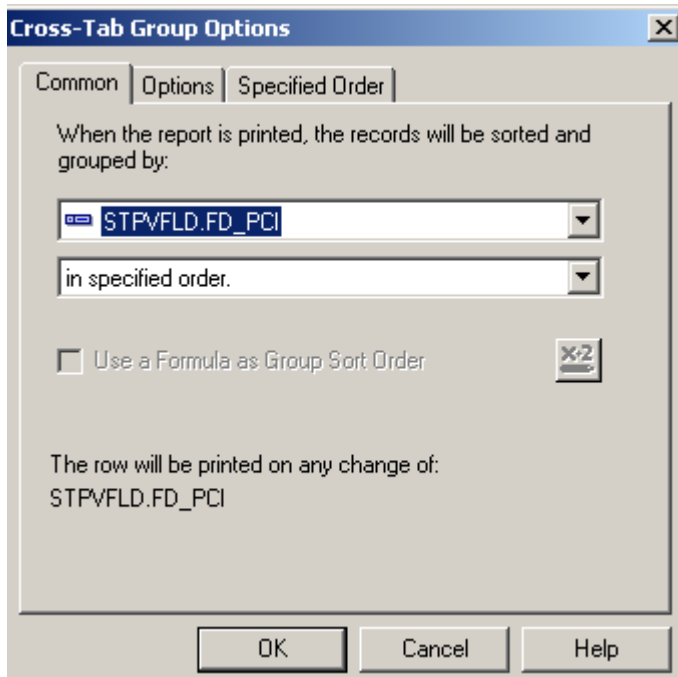
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This is the Cross-Tab object that has been created.

	Arterial	Arterial	Collect	Reside	Total
	0	0	0		
8	0	13840	0	0	13840
10	0	0	0	11810	11810
14	0	13966	0	0	13966
15	0	0	2152	0	2152
15	0	0	3695	0	3695

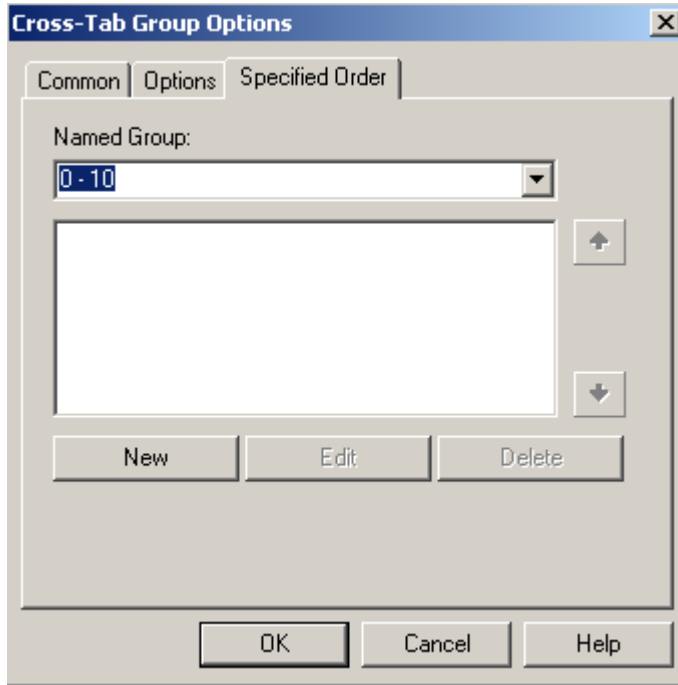
It shows every PCI value. We would like to group the PCI values to make the data more manageable.

1. Right click in the empty top-left corner of the table and select **Cross-Tab Expert...**
2. Click on the **STPVFLD.FD\_PCI** field in the **Rows** box to highlight it.
3. Click on **Group Options...** This will open the various grouping options that we used previously.
4. Using the drop down box below the field name, select "in specified order".

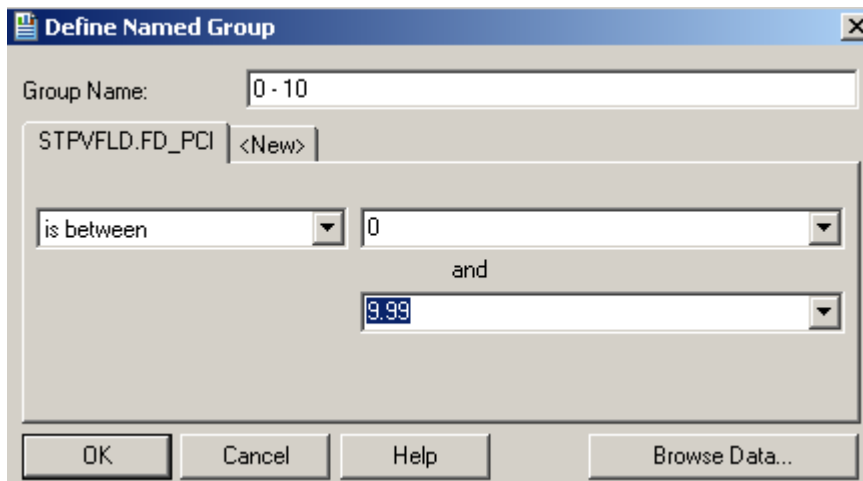


5. This should take you to the **Specified Order** tab. If that tab does not open, click on the tab name.
6. Enter the first group name.

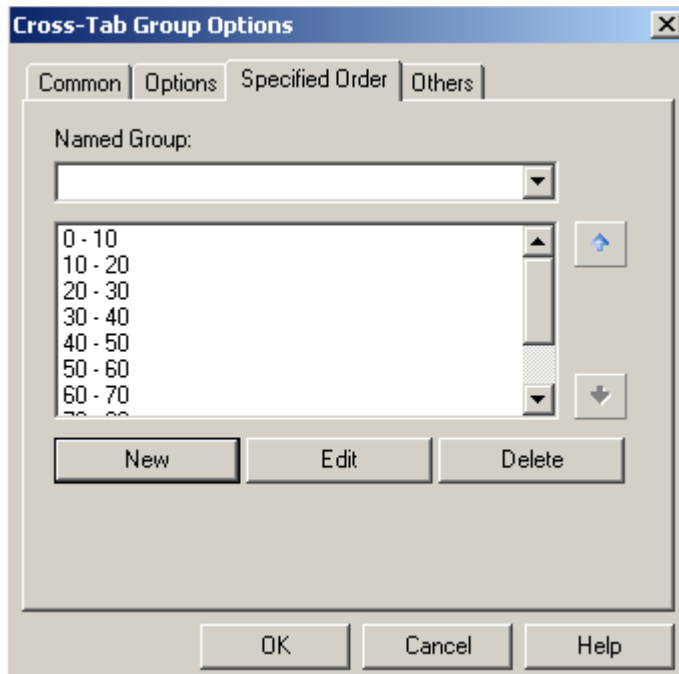
- Here, we've entered "0 – 10".



7. Click **New**. (Or, you can click **New** and enter the group name in the **Define Named Group** box.)
8. Select "is between" from the drop down box. Two boxes appear allowing you to set the upper and lower limits of the group. Enter the appropriate values.
9. Click **OK** and continue the process until all of the ranges have been entered.







10. Click OK and then click OK again to close the Cross-Tab Expert.

The report now looks like this:


	Arterial	Arterial	Collect	Reside	Total
0 - 10	0	13840	0	0	13840
10 - 20	0	13966	5847	17570	37383
20 - 30	8921	13164	0	8522	30607
30 - 40	21016	15034	3627	31961	71639
40 - 50	97662	24637	10991	62586	#####
50 - 60	#####	54789	45150	#####	#####
60 - 70	#####	54392	58259	#####	#####
70 - 80	#####	53392	#####	#####	#####
80 - 90	#####	84961	#####	#####	#####
90 - 100	#####	#####	#####	#####	#####
Others	0	0	0		
Total	#####	#####	#####	#####	#####

To see all of the number fields, the cell size will need to be increased.

1. Click on one of the blocked out fields (#####). This will activate the sizing handles.
2. Click and drag the sizing handle to increase the width of the cell. All of the cells for this field will increase in size.

	Arterial	Arterial -	Collector	Residenti	Total
0 - 10	0	13840	0	0	13840
10 - 20	0	13966	5847	17570	37383
20 - 30	8921	13164	0	8522	30607
30 - 40	21016	15034	3627	31961	71639
40 - 50	97662	24637	10991	62586	195876
50 - 60	106168	54789	45150	165433	371540
60 - 70	217784	54392	58259	251528	581963
70 - 80	328873	53392	116909	361008	860182
80 - 90	698267	84961	283996	1355414	2422638
90 - 100	292926	186245	298119	488666	1265956
Others	0	0	0		
Total	1771616	514420	822899	2742688	5851623

We will now create a graph using the information from the Cross Tab object.

1. Click on the report *Design* tab and increase the size of the *Report Footer* section.
2. Click on Insert Chart  or click on Insert and then Chart.
3. Click the chart box frame in the *Report Footer* section.
4. The Chart Expert dialogue opens.
5. In the Data tab select Cross-Tab.

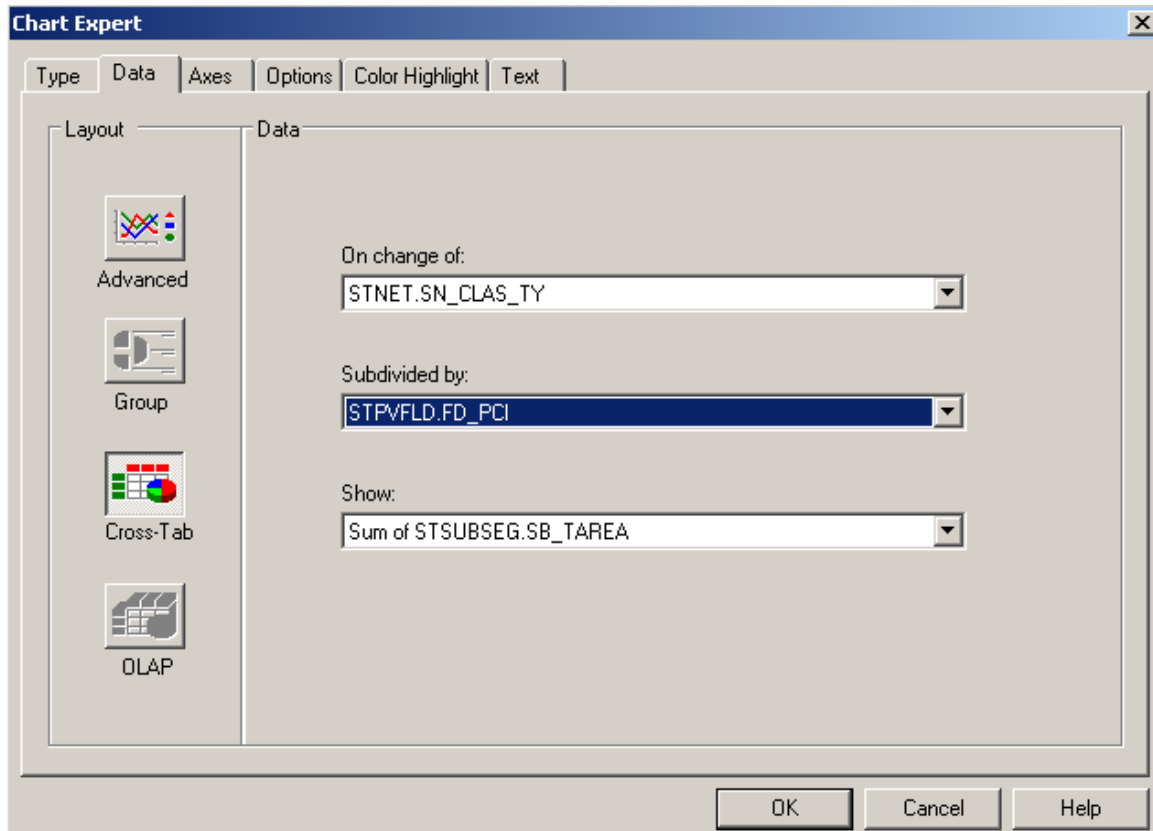
Notes: \_\_\_\_\_

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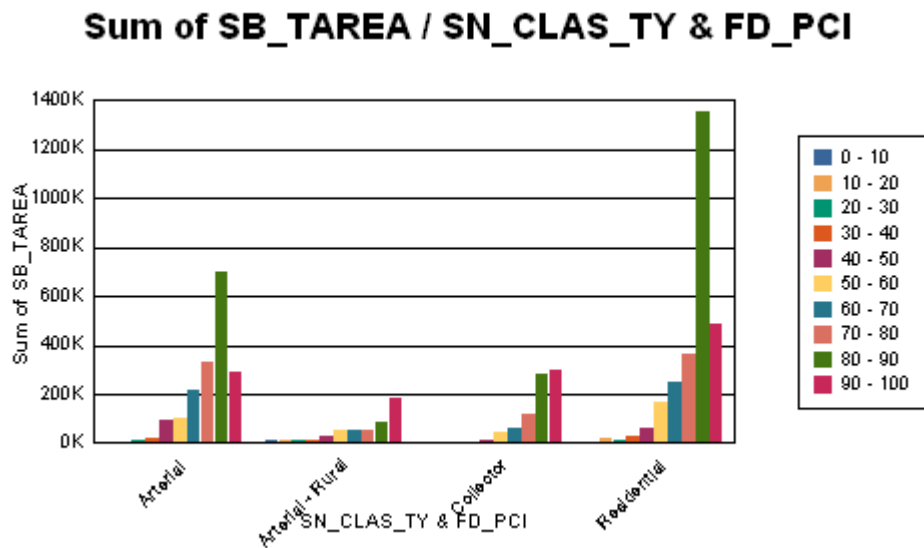
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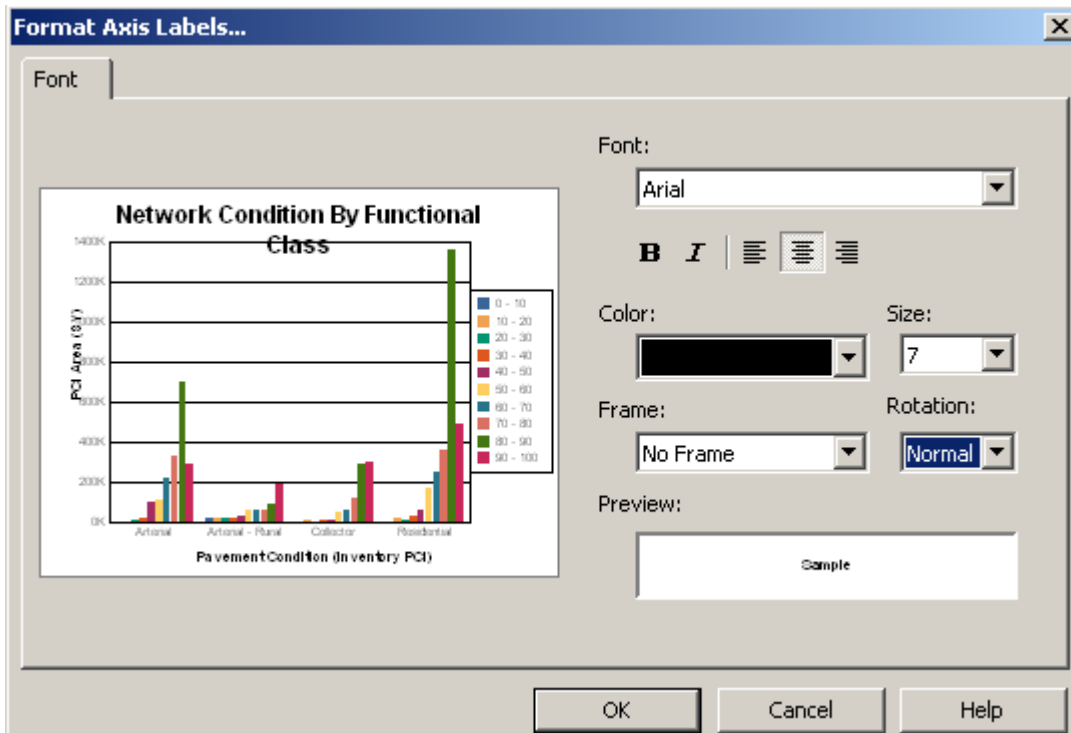
6. Use the drop down arrows to choose the appropriate fields and formulas.



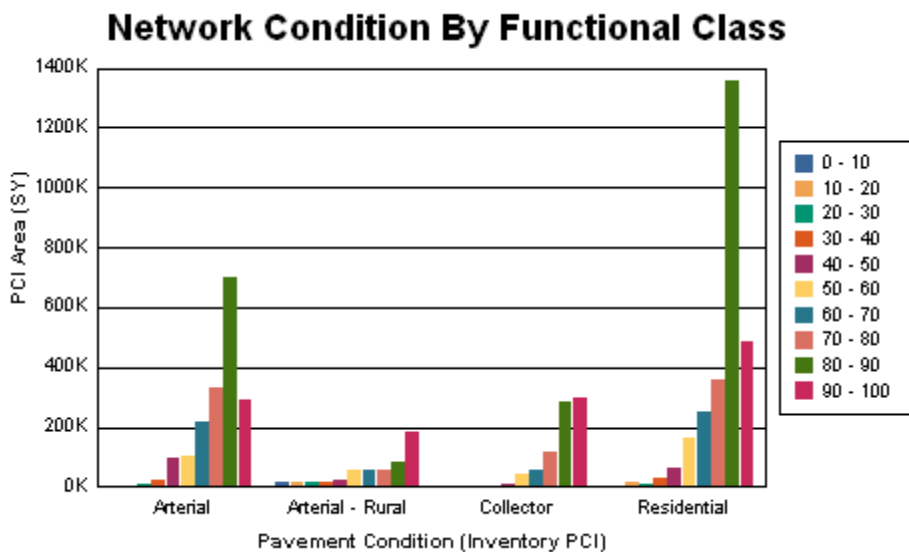
7. Click OK. The chart now looks like this:



- The Chart Expert can be used to modify the titles (Text tab).
- If you would like the x-axis titles to be read horizontally, click on one of the titles. Then, right click and select **Format Axis Label**. Change the rotation to **Normal**.



- Click **OK**. The changes will be applied to the chart.

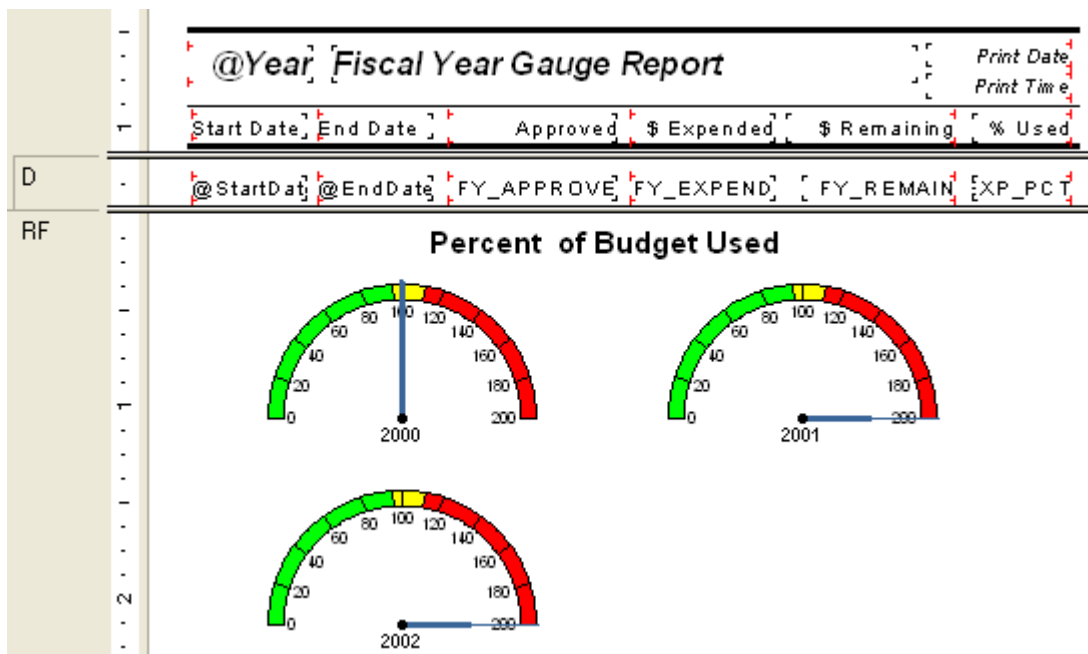


- The Cross-Tab object can be left at the top of the report or it can be suppressed, leaving the graph on its own.

**Note:** "Because cross-tabs are calculated during the first report pass (While Reading Records), you cannot use second-pass formulas in cross-tabs. You can use only formulas that calculate during the first pass. However, you can base a chart or a map on a cross-tab, because cross-tabs are processed before charts and maps." **The Complete Reference Crystal Reports 10, Peck, 2004**

## Gauge Report

Gauge reports give a unique perspective on data. An expenditure report can show where you are with your spending for the year. You can set the values and colors of your bands. At a glance the pointer will show you where you are now and if you need to worry about the next few months of spending or not.



**Notes:** \_\_\_\_\_

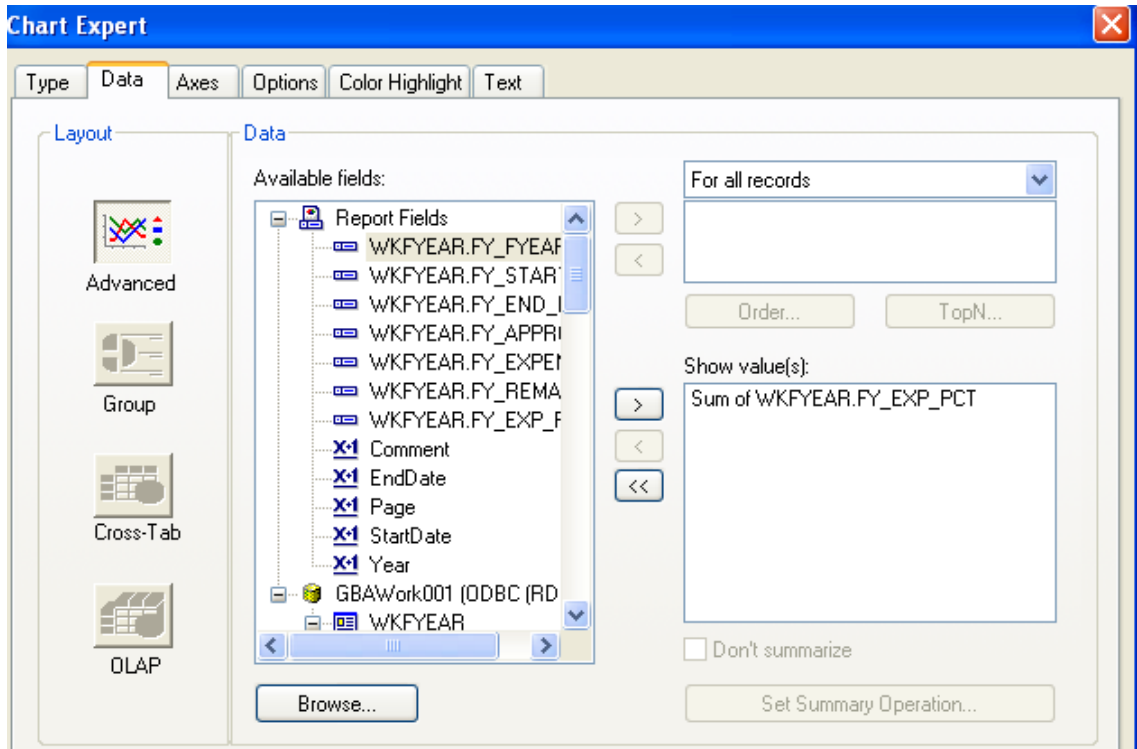
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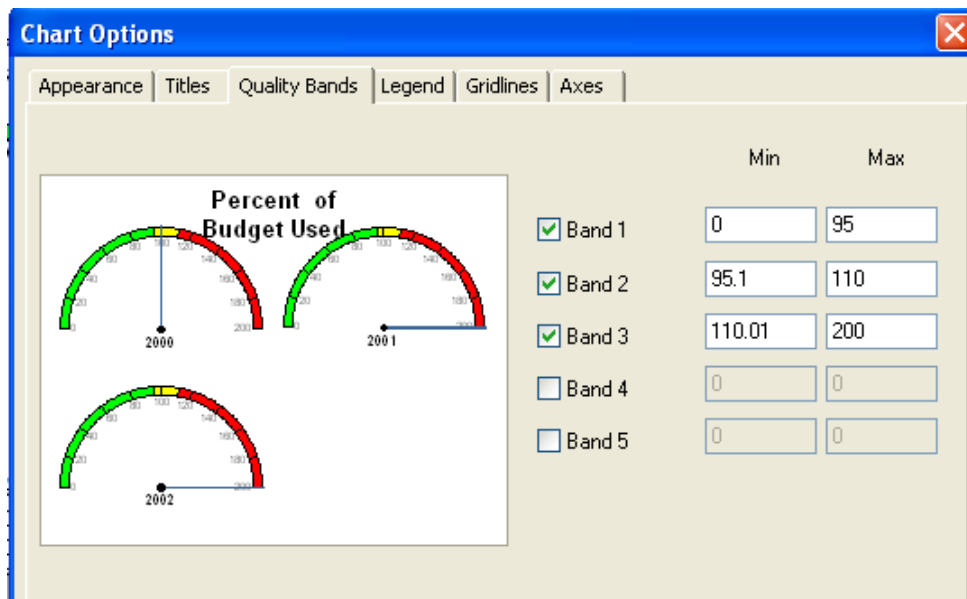
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To get the colors in the gauge. Right click on the gauge chart box. Select "Chart Options".

Click on "Quality Bands". You can set up to 5 "bands" or ranges of values.



Then for each band to have an individual color, you have to left click each individual band to highlight, then right click and select "Format selected items". Choose the Foreground Color.