



Getting Started with SAS[®] Cost and Profitability Management 8.1

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Getting Started with SAS® Cost and Profitability Management 8.1

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Chapter 1

Getting Started

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Import a Completed Model

This tutorial is intended to familiarize you with the basic modeling concepts that are used in SAS Cost and Profitability Management software. To complete the model-building process, perform this tutorial from beginning to end, exactly as it is presented.

Note: Depending on your display settings and the number of times that you perform a step or procedure, the information in the windows might differ slightly from the illustrations that are presented in this tutorial.

You can import an already completed model for the Parcel Express Tutorial by doing the following:

1. Select **File** ⇒ **Import** ⇒ **Model Data**.
2. Select **XML or ZIP File** as the type of data you want to import, and click **Next**.
3. Browse to the following file:
 <install directory>\SASHome\x86\SASCostandProfitabilityManagementClient
 \8.1\Samples\Models\Native\ParcelExpressTutorial.xml, and click **Next**.
4. Name the tutorial. You can name it anything you want. Click **Next**, review your choices, and then click **Finish**.

The tutorial model is imported. You must calculate the model to view calculated data.

If you are new to the discipline of Activity-Based Costing, you might benefit more from this tutorial by first learning about the concept. A number of books and articles present excellent overviews. Even without this background, you will learn some basic ABM concepts by completing this tutorial.

Even though you might know ABM, work through this tutorial to become familiar with SAS Cost and Profitability Management terminology, commands, and dialog boxes.

Terminology

This tutorial refers to both the discipline of activity-based management (ABM), and the SAS Cost and Profitability Management solution. References to the discipline appear in lowercase or by abbreviation. The SAS solution is always capitalized.

The discipline of ABM has a set of specialized terms. Some are used in this tutorial precisely because of their specialized meaning in the theory and practice of ABM. As these terms are introduced, this tutorial provides brief definitions. More complete definitions can be found in the CAMI Glossary of activity-based management..

Technical Support

If you encounter problems that you cannot solve by reading the online Help or this tutorial, try going to the SAS technical support site at <http://support.sas.com>.

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Overview

Cost and Profitability management is a discipline that enables companies to manage activities and processes as a means of improving organizational performance and the value that is received by the customer. By applying direct and indirect business costs to activities, the SAS Cost and Profitability Management solution enables managers to get a true understanding of the costs and profits that are associated with a product, customer, service, or business process. It supports ongoing profitability analysis, cost-management initiatives, shared-services management, planning and budgeting efforts, and capacity optimization.

Activity-based costing more accurately tracks costs than traditional methods. Two critical limitations of traditional cost accounting systems are:

- the inability to provide individual product, service, customer, or process costs with a reasonable level of accuracy

- the inability to provide useful feedback to management for the purpose of operational control

Often, managers of complex organizations make important decisions about pricing, product and customer mix, resource allocations, and budgeting that are based on inaccurate and inappropriate cost and profitability information.

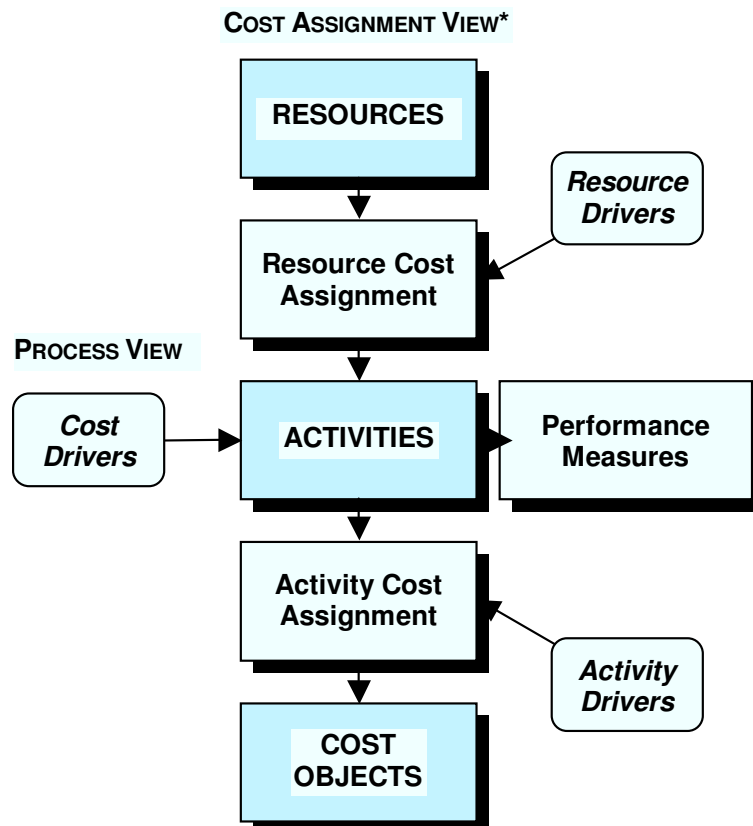
Using SAS Cost and Profitability Management, you build one or more models that apply direct and indirect organizational costs to specific activities and processes. As a result, managers are able to see actual cost assignments and their bottom-line impacts from an operational perspective. Managers get a true understanding of the cause-and-effect relationships that link resources and processes to outputs. Thus, business planners can easily forecast resource requirements, create budgets, and optimize capacity usage.

The ABC Model and CAM-I Methodology

Overview

ABC assumes that activities cause expenditure of resources, and that cost objects—the results of activities or products and services that are produced—create the demand for activities.

The Consortium of Advanced Management, International (CAMI) develops methods to define critical business issues and to model effective strategies and solutions that resolve cost and resource management issues. SAS Cost and Profitability Management uses the CAMI methodology for Cost and Profitability model development.



The Cost Assignment View

An ABM system enables you to identify the activities that are performed, associate resources (expenditures) with those activities, and flow the cost of activities to cost objects. Resource drivers (typically, general ledger entries such as payroll, utilities, or materials) drive expenditures for activities. Activity drivers (such as the number of parts or setups) drive activity consumption for cost objects. Types of cost objects are: products, services, markets, distribution channels, engineering projects, or customers.

The Process View

An ABM system enables you to expose the relationship between why work is done, and the results of that work. In ABM terms, cost drivers drive the reason for activities and the effort that is needed to engage in the activities. Performance measures drive the achieved results of activities the efficiency, the required completion time, and the quality of the activities that were performed.

SAS Cost and Profitability Management Models

The basic container for information in SAS Cost and Profitability Management software is the model. A meaningful model reflects the organization that it is modeling, and uses terms that are familiar to the people who work there. The structural elements of a model should be named after elements that are present in the organizational environment. For example, a company's general ledger account names, such as Wages and Depreciation, can be used to name and reference the resource accounts in the model; the hierarchy of processes in a company can be applied to the activity accounts in the model.

Periods and Scenarios

You define periods and scenarios independently of any model. Any period and scenario can be shared by all the models on a server.

A period is any number of days such as a year, month, week, and quarter. You can define a hierarchy of periods such as months within quarters within years.

A scenario is a label that you associate with a period so that you can distinguish the data for that period with that label from data for the same period with a different label. Two common labels are “Actual” and “Budget”. Using those labels (scenarios) allows you to distinguish actual costs and budgeted costs in a period. You can also define a hierarchy of scenarios such as Budget→WhatIf1, Budget→WhatIf2.

Period and Scenario Associations

A period and scenario association (also referred to as a period/scenario association, or just period/scenario) is an ordered pair consisting of one period and one scenario. You associate a period with a scenario when you specify the initial period and scenario for a model. Until you create additional period/scenario associations, all model data belongs to the initial period/scenario association.

Modules

A module contains a set of accounts. The set of modules forms an ordered set of sets of accounts. The set of modules is an ordered set because it determines the direction of cost flow in a model:

- An account in one module can flow costs to any other account (including itself) in the same module.
- An account in one module can flow costs to any other account in any module after its own module in the direction determined by the module order.

A traditional activity-based costing model consists of four basic modules, which reflect the CAM-I definitions:

Resource

contains the expenses (or costs), such as salaries, materials, and depreciation, for the organization that is being modeled.

Activity

contains activities. Activities have accounts with cost elements. Costs might be assigned to activities from resource accounts or from other activity accounts.

Cost Object

contains cost objects (products, services, channels, or customers). These cost objects are assigned costs from resources, activities, other cost objects, or any combination of the three.

External Unit

contains bill of costs that are external to the organization such as materials purchased from an external supplier. The External Unit module is optional but is useful for containing costs that originate outside the organization being modeled.

These modules constitute the main structure of a model. You will build each of these modules with the use of dimensions.

Dimensions

Overview

Dimensions are the top-level categories that lay out the types of accounts that exist in your model. Examples of dimensions are: region, channel, product, customer, resource, general ledger, materials, department, activity, etc. Each of these categories represents a single dimension. Common dimensions are products, time, geography, customers, promotions, and sales channels.

Types of Dimensions

There are two types of dimensions in a model: structural and attribute.

Structural dimensions are the building blocks of modules. For example, the typical structural dimensions of the resource module are region, organization, or general ledger; the activity module might be structured according to the region or organization dimension, along with an activity dimension.

Dimension attributes provide information that is useful, but not required, to uniquely identify the model structure. Using dimension attributes, you can classify or organize information in ways that will help you analyze model results. The SAS Cost and

Profitability Management OLAP tool makes no distinction between dimension attributes and structural dimensions.

Dimension Members

Dimension members form a tree structure under their respective dimension and further refine the types of accounts that exist in your model. Dimension hierarchies are a powerful modeling tool because they allow you to ask questions at a high level, and then expand a dimension to reveal more detail. For example, the tree structure under the region dimension might be:

- Americas
 - US
 - New York
 - Washington D.C.
 - Cary
 - Canada
 - Brazil
- Europe
 - Germany
 - England
 - France
- Asia
 - China
 - Korea
 - Japan

Accounts

An account is an intersection of dimension members—one dimension member from each dimension in a module—and is the bearer of costs in a model. For example, if a model contains the dimensions Region, Activity, and Product, one account might be the following:

London x Shipping x Hat

Where London is a dimension member of Region, Shipping is a dimension member of Activity, and Hat is a dimension member of Product.

Cost Elements

The cost in an account is the sum of its cost elements. There are two types of cost elements:

Entered Cost Element

An entered cost element is one that you create and to which you assign costs directly by giving it one or both of:

EnteredCost

A lump sum that you give to the cost element

EnteredUnitCost

If you specify EnteredUnitCost, then the cost for the cost element is determined by multiplying that unit cost times the number of units of the parent account that are assigned to destination accounts. In other words, the cost is determined by how many units are demanded by the destination accounts. For a fuller explanation, see [“Fixed and Variable Quantities” on page 102](#).

Note: All of the cost in a model originates with entered cost elements.

Received Cost Element

A received cost element is one that you create indirectly by creating an assignment from one account to another. The cost that the destination account receives from that source account is a received cost element.

Attributes

Attributes are things that you define to be true of accounts. Attributes are either:

Value attributes

A value attribute has a value that is true of an account. Value attributes can be of the following kind:

- Numeric
- Text
- Stage

Tag attributes

A tag attribute (also known as Boolean) does not have a value. You can apply a tag attribute to one or more accounts, and you can use a tag attribute in a formula to identify accounts that have that tag attribute.

Dimension attributes

Dimension attributes are like ordinary (structural) dimensions in that they: contain members (dimension member attributes) that refine the types of accounts that exist in your model. And, dimension attributes, like structural dimensions, appear in OLAP cubes.

For example, the dimension attribute, FixedVariable, can contain the dimension member attributes Fixed and Variable. By applying either the dimension member attribute Fixed or the dimension member attribute Variable to accounts you can distinguish fixed costs from variable costs in your model.

Note: Like numeric and stage attributes, dimension attributes can appear in the OLAP cubes that are generated from your model. Text and tag attributes do not appear in OLAP cubes.

Properties

Properties have values that are true of the elements of a model. For some properties you enter the value yourself. For example, EnteredCost is a property whose value you enter, whereas Cost is a property whose value is calculated by the system.

Drivers

A driver distributes cost in a source account to one or more destination accounts. There are four types of drivers:

Evenly assigned

Distributes the cost evenly to each of the destination accounts.

Percentage

Distributes the cost by percentages that you specify to each of the destination accounts.

Standard

Uses a system-defined formula for distributing the cost to each of the destination accounts. The formula is system-defined, but you determine the values of the items in the formula.

Calculated standard

Uses a user-defined formula for distributing the cost to each of the destination accounts. You define the formula, and you determine the values of the items in the formula.

Assignments

An assignment is a particular distribution of costs between accounts using a driver. The amount of cost that flows is controlled by the driver. A single source account can make assignments to any number of destination accounts, but each source account can have only one driver.

Column Layouts

A column layout is the set of properties and attributes that display when you view the modules in your model or when you view the dimension members in your model. You can customize column layouts so that the properties and attributes that are displayed are the ones that you want to see. You can create any number of column layouts.

Basic Steps to Building a Model

The following list of steps summarizes the method that you will use in this tutorial for setting up and analyzing information in SAS Cost and Profitability Management models.

1. Create a paper plan.

Collect resource (expenditure), activity, and cost object (products and services) information to design your model. Determine the goal of the model (what kind of information you want to get from it), and determine the appropriate dimensions, periods, and scenarios to achieve that goal.

2. Create periods and scenarios.

Create the periods and scenarios to be used by your model. (Periods and scenarios are shared by all models on a server.)

3. Create dimensions, modules, and accounts.

Create the dimensions and dimension members that you will use to build the modules. Build the resource, activity, and cost object modules by defining the accounts (dimension intersections) of each module.

4. Define attributes.

Define and add attributes to the appropriate accounts.

5. Define drivers.

Define drivers that measure the consumption of expenses and activities.

6. Make assignments.

Select the relevant driver for each source account. Make cost assignments from source accounts to destination accounts.

7. Calculate costs.

Calculate costs and display the results.

8. Add bills of costs.

Define and link external unit costs to accounts.

9. Enter sales and revenue data.

Enter sales volumes and calculate profit and unit cost.

Parcel Express

Parcel Express is a fictitious organization that is using activity-based costing to determine whether this method more clearly conveys costs and profitability information than traditional costing methods.

A later chapter outlines the main business activities of Parcel Express and the company's goals in using SAS Cost and Profitability Management.

Chapter 3

Create a Paper Plan

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Overview

Cost and Profitability management projects begin with a plan. After you have determined the analysis goals of the model and defined the dimensions that will enable that analysis, you can begin data collection. Information concerning resources (expenditures), activities (tasks), and cost objects (products and services produced) provides the basis for building an model.

Building by Design

Before beginning to build a model, evaluate and make preliminary decisions about the design of the model. Just as a building contractor needs a plan before beginning to build a house, a model builder needs a plan for the structure of a model before beginning to build the model. Factors that influence a model's design include the following:

- goal of the model—the operational or strategic questions the model is intended to answer
- data already collected and its format
- data needed that is not being collected
- types of OLAP cubes that will be needed

This tutorial uses a simple design and focuses on the steps for building a model. The design of the model and the effort that it takes can be simple or complex. The model builder will need to understand these factors, and other factors that are unique to each

modeling situation, to arrive at a design. The model used with this tutorial is named Parcel Express. The Parcel Express Tutorial case study provides fictitious company data.

The Parcel Express Tutorial Model

Company Background

Parcel Express began operations in Beaverton, Oregon, in 1990 as a ground parcel delivery service. In 1995, with 125 employees and \$1 million in sales, the company began expanding to overnight delivery and second-day delivery.

In the first quarter of 2004, total sales revenue was approximately \$5.5 million. Costs for the same period were about \$3.8 million, for a profit of about \$1.7 million.

Goals

Parcel Express aims to trace operating costs to individual products and services so that the overall costs and profit of each product and service can be determined and improved. Parcel Express is concerned that the current accounting system, which divides the business into about 10 product groupings, might not accurately reflect the different costs of doing business for the two express services: Overnight Express and 2nd Day Guaranteed.

Management wants to know how each product is performing. The company's competitors have dominated in the second-day delivery market, and management has recently slashed prices on that product. Sales volumes have increased as a result, but it's unclear how much profit Parcel Express is making, if any. The company would like to meet a target profit margin of at least 10% on the 2nd Day Guaranteed product, and at least 25% on all others. It is willing to adjust pricing or modify processes to reach that goal.

Model Structure

Overview

Parcel Express has assembled a modeling team whose members have become familiar with the structure of models. Together, they have determined that the following module structure most accurately reflects the way Parcel Express conducts its operations.

Resource Module

Resources will be structured by region and general ledger account. The two main processing plants are Beaverton and Eugene, Oregon. General ledger accounts include:

- wages (salary and overtime)
- operating expenses and office supplies
- equipment depreciation

Activity Module

Activities will be structured by region and activity. The activities Parcel Express has chosen to model are:

- branch collection

- sorting and inspection
- air and land distribution
- resolution of customer complaints

The Eugene facility does not have an air distribution function, so it will have one less account than Beaverton.

Cost Object Module

Parcel Express needs to be able to track not only the costs of products and services, but the costs of its channels as well. Therefore, Parcel Express will organize the cost object module by channel and products and services.

The three channels are:

- drop box
- walk in
- commercial pick up

The three products and services are:

- Standard Ground
- 2nd Day Guaranteed
- Overnight Express

External Unit Module

Each product has packaging costs that must be accounted for. Materials for packaging will be tracked as accounts in the External Unit module, including:

- envelopes
- flats
- boxes

Data Collection

The following data will be collected for entry into the model:

Wages

Wage information, including salaries and overtime, will come from the general ledger system. Wages will be entered as dollar amounts, and assigned to activities according to the number of full-time employees, or FTEs (Full-Time Equivalents), who are associated with an activity.

Operating Expenses

Operating expenses and supply costs will come from the general ledger. These costs will be assigned to activities in dollar amounts.

Equipment Expenses

Equipment expenses, including depreciation, will come from the general ledger. These costs will be assigned by percentage.

Collection and Distribution

Branch managers will collect data from their control systems regarding the number of packages that are collected, moved to warehouses, sorted, inspected, and distributed by land and air. Accurate numbers here are critical to the success of the modeling effort. Activity accounts will assign costs by number of packages.

Complaints

The number of customer complaints will be collected by branch managers. Costs that are associated with complaint resolution will be assigned according to the number of complaints that are received.

Revenue

Revenue will come from the sales accounting system. Revenue will be associated with cost objects according to the sales quantity for each product.

Chapter 4

User Interface

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Overview

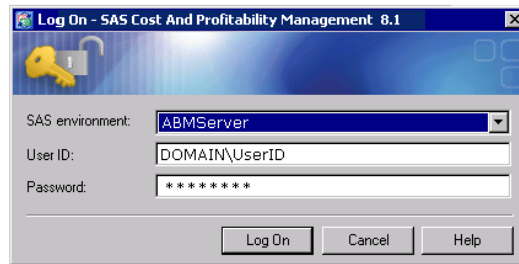
The SAS Cost and Profitability Management solution is Web-enabled. Its server typically resides on your company's intranet, and the client software resides on your computer. This tutorial assumes that you have installed the software on your computer, and that you are familiar with basic software usage techniques, such as using menus, dialog boxes, and other windows and Web controls.

Logging On

Log on to SAS Cost and Profitability Management from the **Start** menu.

1. Select **Start** ⇒ **Programs** ⇒ **SAS** ⇒ **Cost and Profitability Management 8.1** ⇒ **Cost and Profitability Management Solution**.

You see the Log On dialog box.



2. Select an environment from the **SAS environment** drop-down list or specify **default** to choose the default environment.

An “environment” is a shortcut to the URL of a SAS server program that authenticates your logon information and provides a connection to a SAS Cost and Profitability Management Metadata Server. Because you logon first to the SAS server program rather than directly to a Metadata Server, the Metadata Server can change without your having to modify your logon procedure.

3. Type your domain and User ID (for example, HQJohnD).
4. Type your **Password**.
5. Click **Log On**.

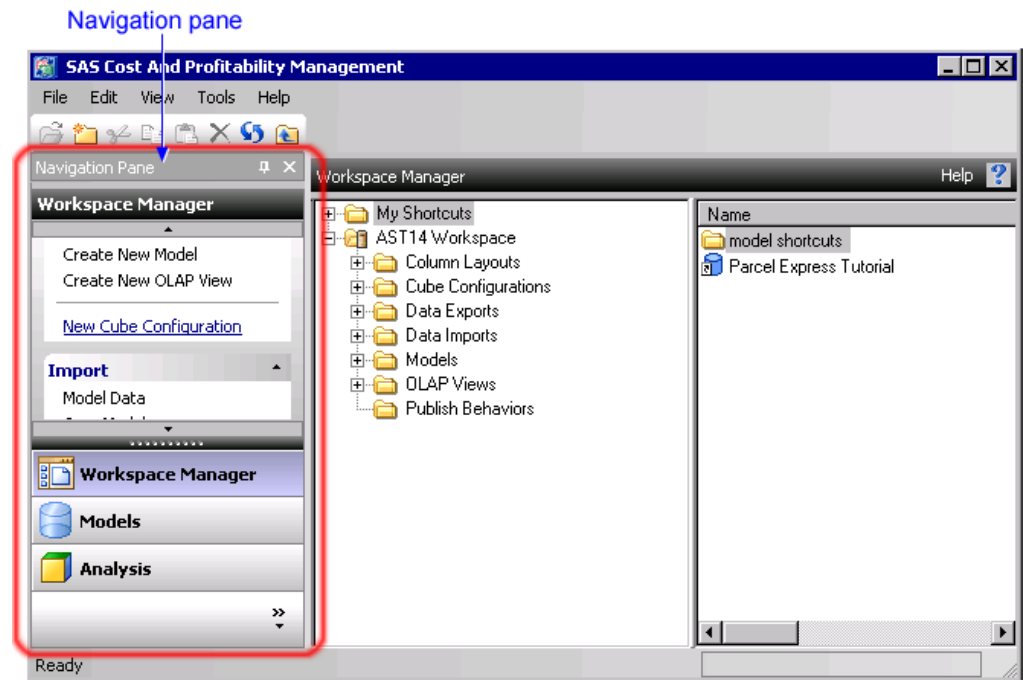
SAS Cost and Profitability Management opens.

Note: If multiple languages are installed on your computer, the language that is used is determined by your location setting in Windows (select **Settings** ⇒ **Control Panel** ⇒ **Regional and Language Options**).

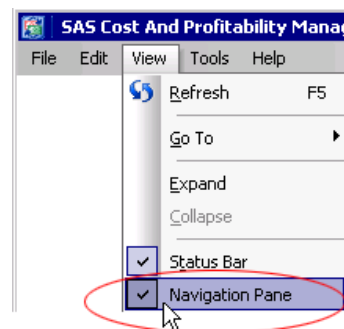
Navigation Pane

The Navigation pane allows you to navigate among the workspaces that constitute SAS Cost and Profitability Management:

- Workspace Manager
- Models
- Analysis



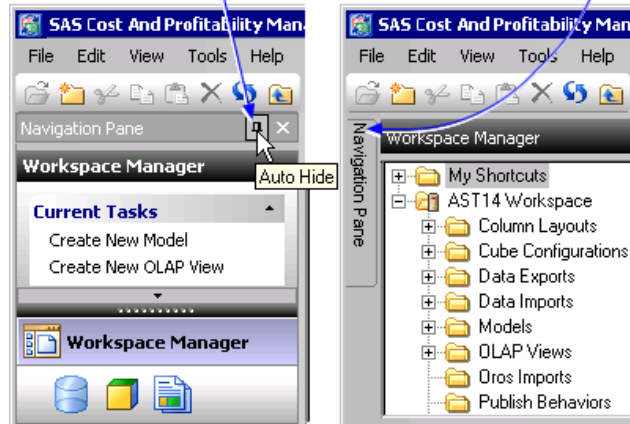
If the Navigation pane is not visible, then select **View** ⇒ **Navigation pane**.



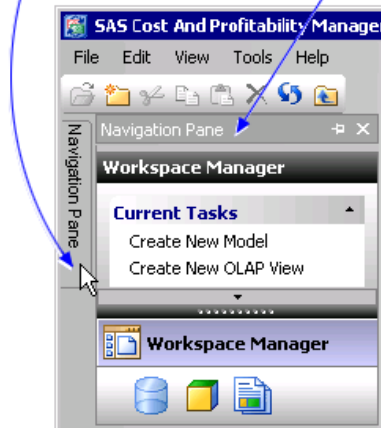
Minimizing the Navigation Pane

1. Click the Auto hide icon to minimize the Navigation pane.
When you roll over the minimized tab with the cursor, the Navigation pane is restored, but only temporarily.
2. Click the Auto Hide icon again (the push-pin) to make the Navigation pane stay open (or select **View** ⇒ **Navigation Pane**).

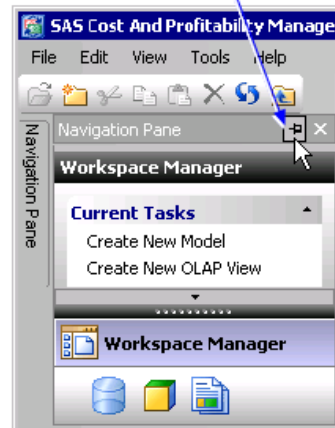
1. Click Auto hide,
and the Navigation Pane is minimized.



2. Roll over the tab,
and the Navigation Pane reappears (temporarily).



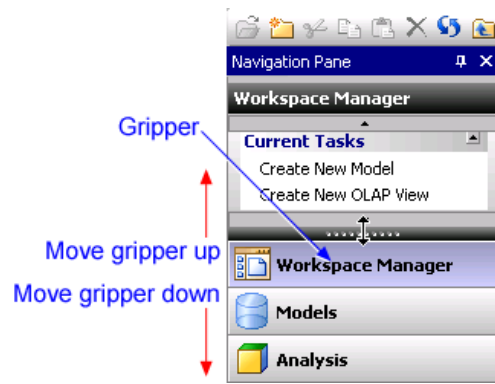
3. Click the push pin,
and the Navigation Pane stays open.



Partitioning the Navigation Pane

Move the gripper up or down to change the relative size of the task area and the button area in the Navigation pane.

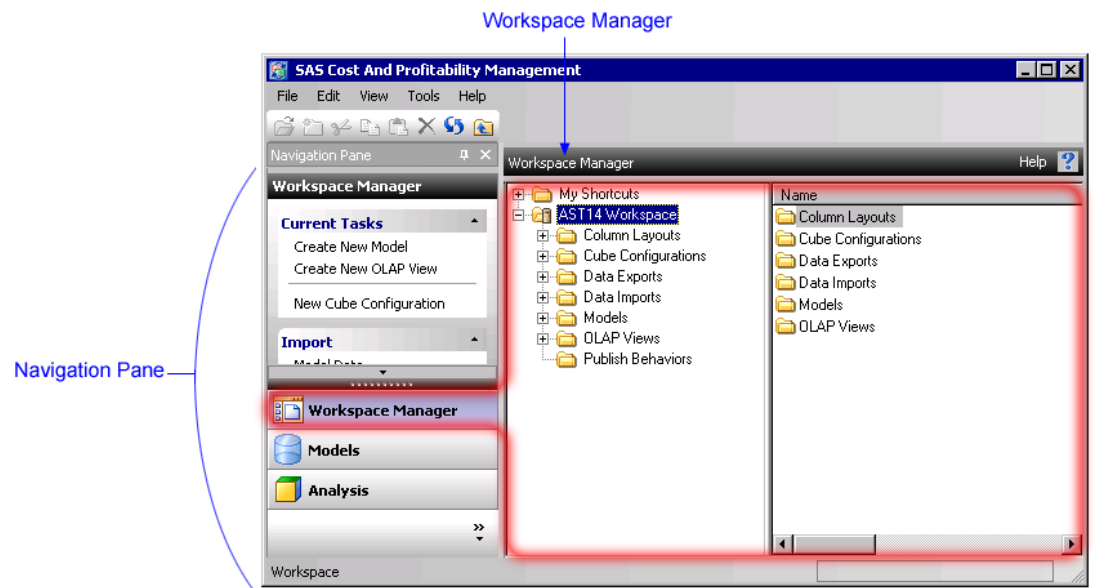
Note: You cannot move the gripper up further than is necessary to fully display all the buttons in the button area.




The Workspace Manager

Overview

The following display shows the SAS Cost and Profitability Management Workspace Manager. The Workspace Manager provides a treeview of all SAS Cost and Profitability Management elements—from models to cube configurations—and gives you access to them all.

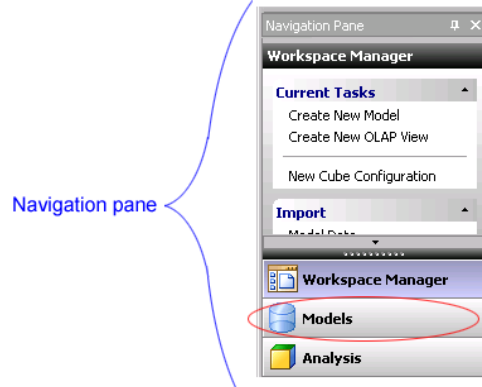


Read the online Help (click ) for a description of the Workspace Manager. Any existing models to which you have access rights appear in the Models folder or its subfolders. You can create shortcuts to your models in the My Shortcuts folder.

Go to the Models Workspace

From the Workspace Manager, to go to the Models workspace:

1. On the Navigation pane of Workspace Manager, click **Models**.



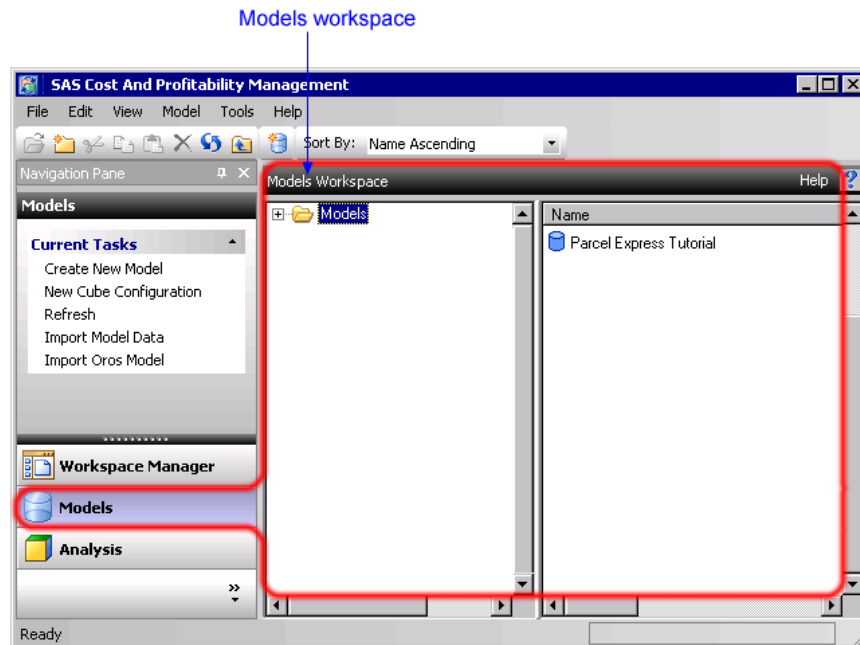
Note: If the Navigation pane is not visible, select **View** ⇌ **Navigation Pane**.

2. You see the Models workspace. If you have just started SAS Cost and Profitability Management, you will see the Models folder. If you have been working with a model, you will see the model page you were working on last.

Models Workspace

Overview

The Models workspace lists the models to which you have access rights. From this workspace, you can open, create, or delete models.



Module Views

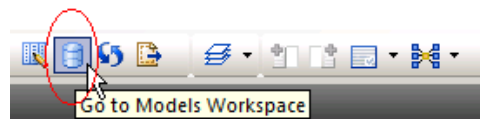
When you open a model, you usually go to the Resource module view. If you change to a different view such as an OLAP view and then return to the model, you go to the model page you were working on most recently.

The following picture shows the Resource module of the model that you will be building in this tutorial.

Display Name	Display Reference	Cost
RESOURCE (PRIMARY PANE)		\$3,647,900.00
USA	USA	\$3,647,900.00
Oregon	Oregon	\$3,647,900.00
Beaverton	Beaverton	\$1,930,900.00
Equipment Expenses	Equipment Expenses	\$54,300.00
Operating Expenses	Operating Expenses	\$238,000.00
Wages	Wages	\$1,638,600.00
Eugene	Eugene	\$1,717,000.00
Wages	Wages	\$1,408,000.00
Salaries	ES	\$1,298,000.00
Overtime	EOT	\$110,000.00
Operating Expenses	Operating Expenses	\$271,000.00
Operating Expenses	EOE	\$263,000.00
Office Supplies	EOS	\$8,000.00
Equipment Expenses	Equipment Expenses	\$38,000.00
Equipment Depreciation	EED	\$38,000.00

When a model is open, if you want to open a model different from the currently open model, do one of the following:

- Click the **Go to Models Workspace** button on the Models Workspace Toolbar.



- Select **Model** ⇒ **Change Model or Context** from the menu bar.
- Go to the Workspace Manager and navigate to the Models folder.



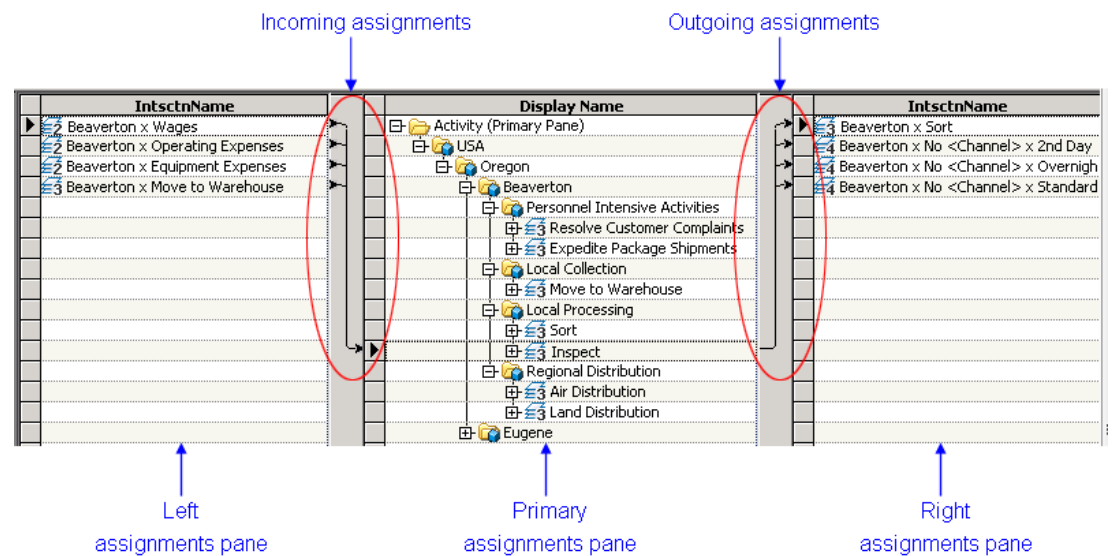
In this tutorial, you will be directed to use the menus most of the time. Occasionally, you will be instructed to use a button or an icon. As you become more familiar with the software, you can choose the method you prefer to initiate tasks.

Assignments Panes

One of the main objectives of Cost and Profitability management is to accurately assess how company costs are consumed—for example, you can see how costs flow from general ledger accounts to activities to products and services. SAS Cost and Profitability Management provides you with several graphical tools to help you see and manage this flow. Among these tools are the left and right assignments panes, which allow you to view and assign costs from one module to another and within a single module.

By default, each module opens in a single-pane view, the primary pane. The primary pane contains the structure of a module, which includes the dimension intersections (accounts) and each account's cost elements. You can open the left assignments pane to see the accounts from which costs flow (sometimes called source accounts). You can open the right assignments pane to see the accounts to which costs flow (sometimes called destination accounts).

The following display shows the Activity module of the model that you will be building in this tutorial. All three panes are open.



In this display, the arrows that point from the left assignments pane to the primary pane indicate costs that are flowing into the Beaverton Inspect account in the Activity module. The arrows that point from the primary pane to the right assignments pane indicate costs that then flow from the Beaverton Inspect account into other accounts.

In this tutorial, you will use the right assignments pane to assign costs from one account to another.

Column Layouts

Overview

A column layout is a set of column headers for module views and for the Dimensions view along with the specification for how information in those columns should appear.

Display Name	Cost	IdlQty	IdlPcnt	InvQty	OutQty	OutQtyUE	SoldQty	TDQ	TDQCalc
ACTIVITY (PRIMARY PANE)	\$3,647,900.0								
USA	\$3,647,900.0								
Oregon	\$1,717,000.0								
Eugene	\$743,326.79								
Local Processing	\$225,422.36								
Inspect	\$718,279.86	0.00	0.00%	0.00	18,000.00			18,000.00	18,000.00
Comprehensive A	\$187,700.00								133,000.00

You can customize a column layout to display various information, such as properties, attributes, and dimensions. When you have customized it, you can save a column layout by name so that you can retrieve it later. You see saved column layouts in the Workspace Manager and in the Column Layout list when you view a module or when you open the Dimensions view.

When you save a column layout, the following information is saved:

- description
- column headings
- information that is displayed in each column and the period/scenario association to which it applies
- format for each column and order of the columns from left to right
- model
- column widths

TIP All column layouts that are saved by all users on the same server are listed in the Workspace Manager. Therefore, your organization might want to set guidelines for saving and naming column layouts.

Properties, Attributes, and Dimensions in Column Layouts

The columns of a column layout are derived from the following model elements:

Properties

A property is a model item that holds values that are entered by a user or calculated by the software. Examples of properties include Cost, Unit Cost, Output Quantity, Sold Quantity, and Profit. The more familiar you become with SAS Cost and Profitability Management modeling, the more you will be able to use properties creatively to achieve your analysis goals.

Attributes

An attribute is a user-defined label or numeric value that is attached to an account. Each attribute is a particular characteristic that is used for analysis. An attribute conveys information about the item to which it is attached.

Dimensions

A dimension is a category by which data will be or is analyzed. You define the dimensions of your model when you use the New Model Wizard.

Analysis Workspace for OLAP Cubes

A cube is the main object in OLAP, a technology that provides fast access to data in a model. A cube contains a set of data that is constructed from a subset of model data and that is organized and summarized into a multidimensional structure. SAS Cost and Profitability Management cubes are standard OLAP cubes.

You use SAS Cost and Profitability Management software to connect to and interact with the cubes on a SAS Cost and Profitability Management server. For each model, you can generate cubes that you can manipulate with the SAS OLAP Analyzer to interactively analyze business data.

- Change to the Analysis workspace to access OLAP cubes.

From the Navigation pane, click **Analysis**.



You see the Analysis workspace.

When you have opened an OLAP view, if you want to open an OLAP view different from the currently open one, do one of the following:

- Click the **Go to Analysis Workspace** button on the Analysis Workspace Toolbar.



- Go to the Workspace Manager and navigate to the OLAP Views folder.



Chapter 5

Create Periods and Scenarios

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Overview

A period is an interval of time in which Cost and Profitability management data is maintained. A period can represent any unit of time: a month, a quarter, a year, and so on. A model can hold data for different periods, but only one period at a time is active. You can create a hierarchy of periods, such as FY2014 > Q1 > January. By default, each level is given a name, such as Period L1.

You can compare model data that you have entered for different periods. For example, you can examine the costs for March versus the costs for February.

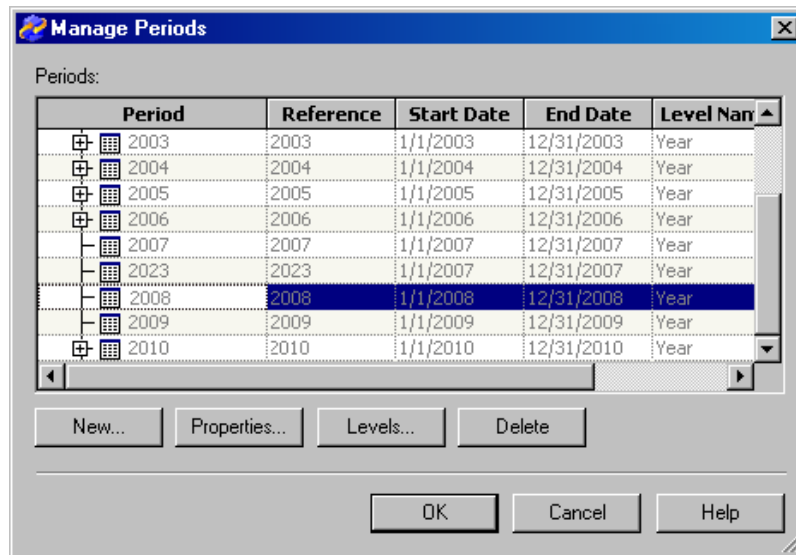
Scenarios are generally used to manage different variations of data within a period. A scenario can be any set of data: actual, budget, aggressive plan, conservative plan, and so on. The default scenarios are Actual and Budget. You can create a hierarchy of scenarios, such as Budget > Aggressive. By default, each level is given a name, such as Scenario L1. However, these names are not descriptive when you generate cubes. So, you can rename a default scenario level.

Create a Period

Parcel Express analyzes costs by quarters. Because this tutorial was originally created in 2008, the period that you will create is 2008 Q1.

1. Select **Tools** ⇒ **Manage Periods**.

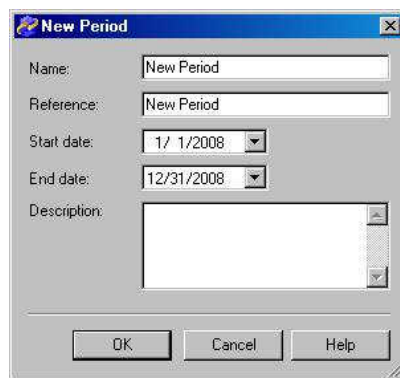
You see the Manage Periods dialog box.



2. Select the **2008** period and click **New**.

Note: These periods might already exist on your server.

You see the New Period dialog box.



3. For **Name**, replace **New Period** with **2008 Q1**.
4. For **Reference**, type **08Q1**.
5. Select a **Start date** of January 1, 2008.

Note: In addition to using the graphical calendar, you can simply overwrite the start or end date:



6. Select an **End date** of March 31, 2008.

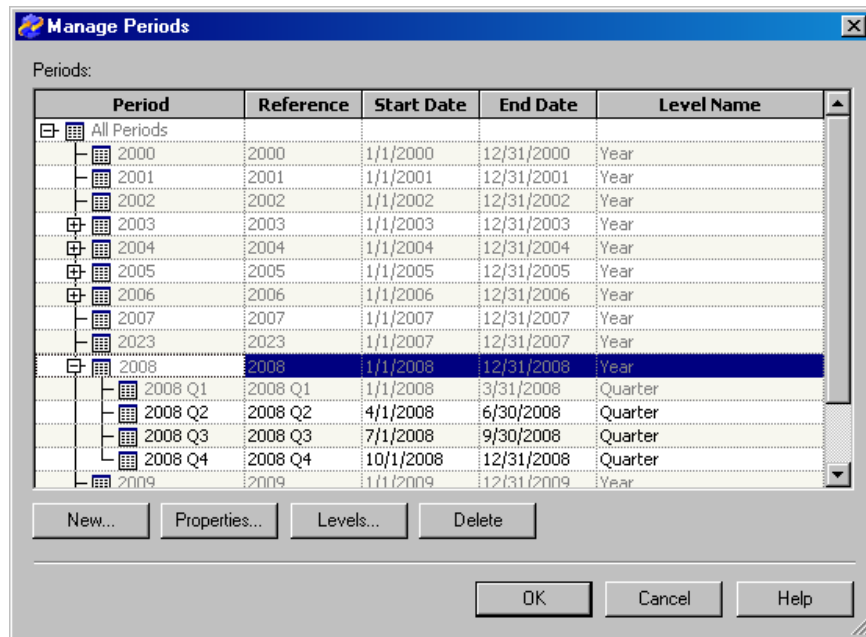
Note: SAS Cost and Profitability Management enables you to enter descriptions for the items that you create. In this tutorial, you do not enter descriptions.

7. Click **OK**.

You see the new period added to the list below the 2008 period.

8. Create three more periods that are named **2008 Q2**, **2008 Q3**, and **2008 Q4**. Specify appropriate date ranges and references for each period. All period references must be unique.

When you are done, you should see the following periods in the Manage Periods dialog box:



9. Click **OK**.

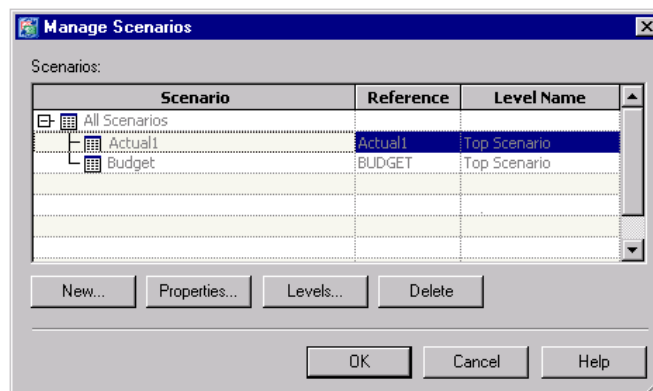
Create a Scenario

Parcel Express wants to compare actual costs that it incurred on a quarterly basis. It will analyze the profit and loss trends in these costs to make decisions about resource allocation, process control, and pricing. For these purposes, the Actual default scenario is adequate.

However, so that you gain experience, assume that the company had specific profit targets that it wanted to model in SAS Cost and Profitability Management. You could create a scenario named Target.

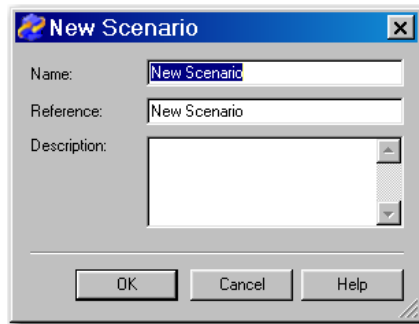
1. Select **Tools** ⇒ **Manage Scenarios**

You see the Manage Scenarios dialog box.



2. Select **All Scenarios** and click **New**.

You see the New Scenario dialog box.



3. For **Name**, replace **New Scenario** with **Target**.
4. For **Reference**, type **Target**.
5. Click **OK**.

You see the new scenario added to the list below the Actual scenario.

6. Click **OK**.

Deleting Periods and Scenarios

You can delete a period or scenario from the Manage Periods or Manage Scenarios dialog boxes, respectively:

1. Select **Tools** ⇒ **Manage Periods** or **Tools** ⇒ **Manage Scenarios**.
2. Select a period or scenario.
3. Click **Delete**.

Note: This procedure makes the period or scenario unavailable for any model. If a period/scenario association is already assigned to a model, then you first need to delete the association from every such model. To do so:

1. Open the model and select **Model** ⇒ **Period and Scenario Associations Page**.
2. Right-click a period/scenario association.
3. Select **Delete**.

Chapter 6

Create a New Model with Its Dimensions

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Overview

A model is an ordered set of modules; and a module is an ordered set of accounts; and an account is an intersection of dimension members. So, before creating the creating and defining the modules and accounts in your model, you must first define the dimensions as specified in the paper plan.

The following table shows the dimensions that you will create for the tutorial along with the default dimensions that are created automatically if you do not specify them yourself.

Module	Tutorial Dimensions	Default Dimensions
External Unit	Materials	Materials
Resource	Region	Organization
	General Ledger	General Ledger
Activity	Region	Organization
	Activities	Activities

Module	Tutorial Dimensions	Default Dimensions
Cost Object	Region	Customer
	Channel	Products and Services
	Products and Services	

Use the New Model Wizard

Overview

A main purpose of the New Model Wizard is to establish the dimensions of your model. These are the dimensions that you will use to create accounts and the structure of the modules. Most important, these are the dimensions that will eventually enable you to generate meaningful cubes and to analyze the profits and losses that result from your business activities.

Now, you will create the model named Parcel Express Tutorial. The model's monetary data will be in U.S. dollars.

Step 1: Start the New Model Wizard

1. Select **File** ⇒ **New** ⇒ **Model**.

You see Step 1 of the New Model Wizard.

New Model - Model Name, Reference and Currency Step 1 of 7

Model Name, Reference and Currency

The model you create will appear in Workspace Manager in the Models folder. You can move it into another folder later.

* Model Name:

* Model Reference:

Select the base currency:

- Tanzanian Shilling(TSh) - TZS
- Thai baht(฿) - THB
- Timor Escudo() - TPE
- Tongan Pa'anga(PT o) - TOP
- Trinidad and Tobago Dollar(TT\$) - TTD
- Tunisian Dinar(TD) - TND
- Turkish Lira(₺) - TRL
- Turkish New Lira(₺) - TRY
- Turkmenistan Mana(TM) - TMM
- UAE Dirham(Dh) - AED
- Uganda Shilling(Ush) - UGX
- Ukrainian Hryvna(₴) - UAH
- US Dollar(\$) - USD**
- Uzbekistan Sum() - UZS

Once you set the base currency, you CANNOT change it later.

The New Model Wizard contains seven steps. If you accept the default dimensions for your model, you will not perform every step. For this tutorial, you will define your own dimensions and perform every step in the New Model Wizard.

2. For the name, type **Parcel Express Tutorial**.

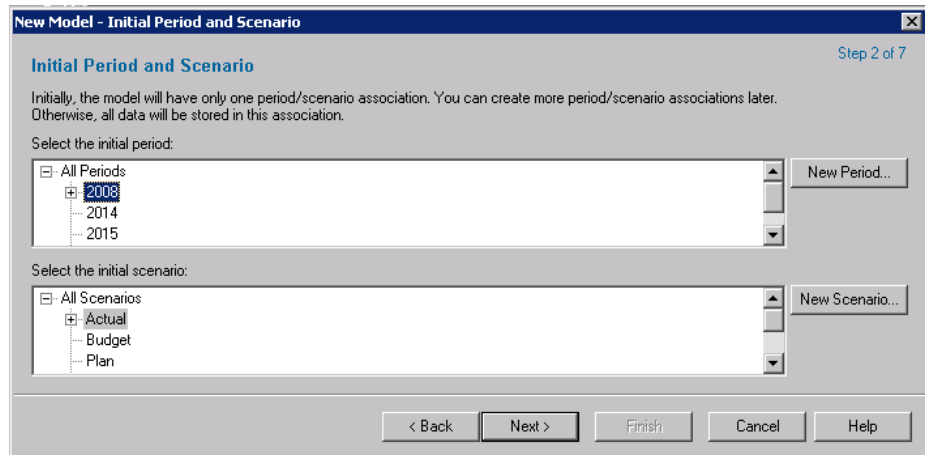
Note: Each model name must be unique on a SAS Cost and Profitability Management server.

3. For the reference, type **PExpress**. This short reference is used in public views.
4. Verify that the base currency is **US Dollar(\$)**.
5. Click **Next**.

You see Step 2 of the New Model Wizard.

Step 2: Select a Starting Period and Scenario

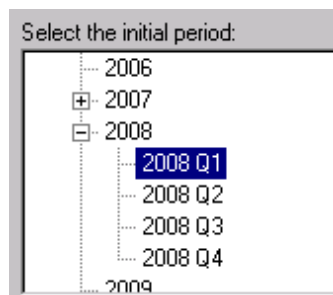
1. Select a period and a scenario as your initial period/scenario association.



A period/scenario association is a pair consisting of one period and one scenario. All model data resides in a period/scenario association. Until you add other period/scenario associations to your model, all your data will reside in this initial period/scenario association.

You can select any period and scenario, but this tutorial model was first created in 2008 so that is the year that we will choose.

- a. Expand **2008** and select the **2008 Q1** period.

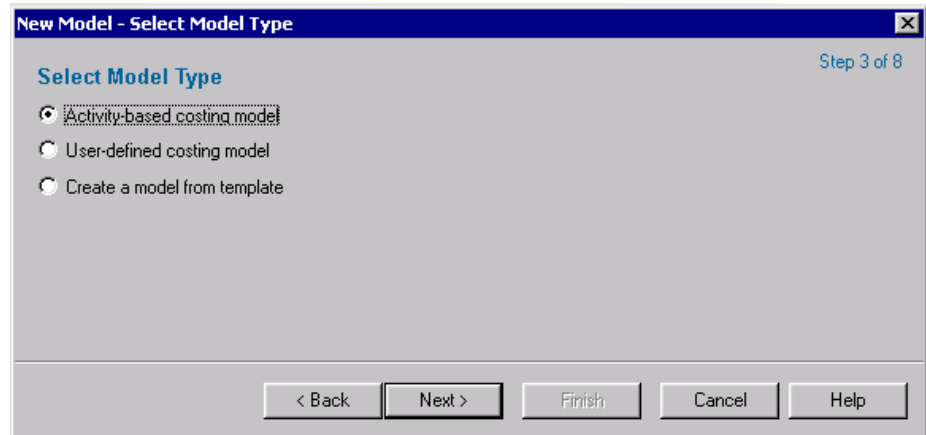


- b. Select the **Actual** scenario.
2. Click **Next**.

You see Step 3 of the New Model Wizard.

Step 3: Select the Type of Model

1. Select **Activity-based costing model** as the type of model to be created.



Possible model types are the following:

Activity-based costing model

By default, with this type of model there are four modules: External Unit, Resource, Activity, and Cost Object. You can, however, change the number of modules and rename them.

User-defined costing model

A user-defined costing model can have any number of modules with any name you choose.

Create a model from template

When you create a model from a template, you provide information contained in the template to the new model. A template includes the following information:

- the model's modules, including their order, name, and reference
- the dimensions included in each module

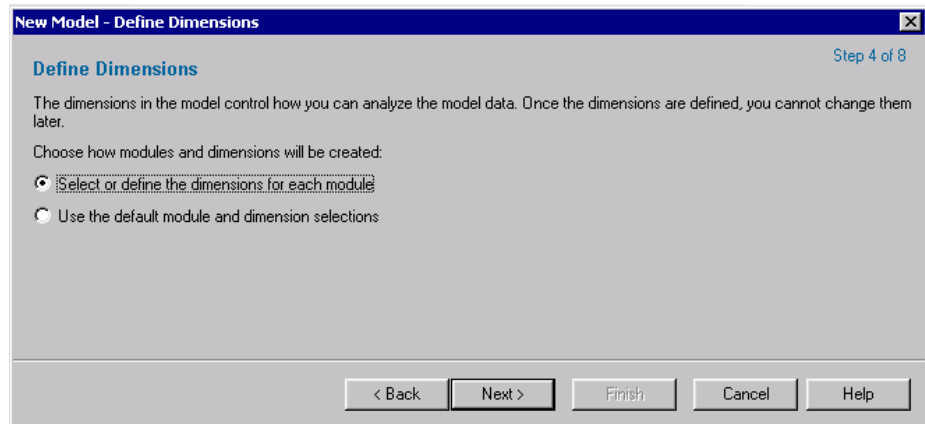
You can override the template information when you create a new model.

2. Click **Next**.

You see Step 4 of the New Model Wizard.

Step 4: Select the method for defining dimensions

1. Verify that the **Select or define the dimensions for each module** option is selected.



This option enables you to create new dimensions, rearrange dimensions, or use the default dimensions for some modules but not others. The dimensions that you will create for the tutorial are:

Module	Dimensions
External Unit	Materials
Resource	Region General Ledger
Activity	Region Activities
Cost Object	Region Channel Products and Services

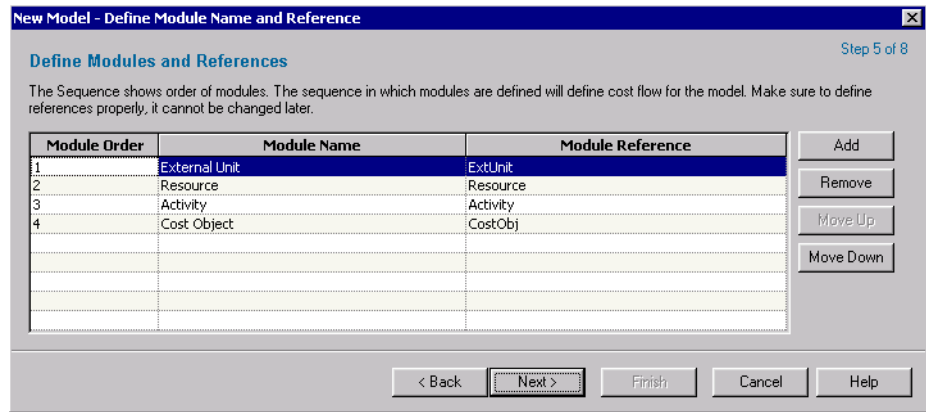
2. Click **Next**.

You see Step 5 of the New Model Wizard.

Step 5: Optionally Change the Number of Modules

1. Verify that your model has the following four modules: External Unit, Resource, Activity, and Cost Object.

Optionally, you can add, remove, and rename modules. For this tutorial you use the default modules.



2. Click **Next**.

You see Step 6 of the New Model Wizard.

Step 6: Define the Dimensions for Each Module

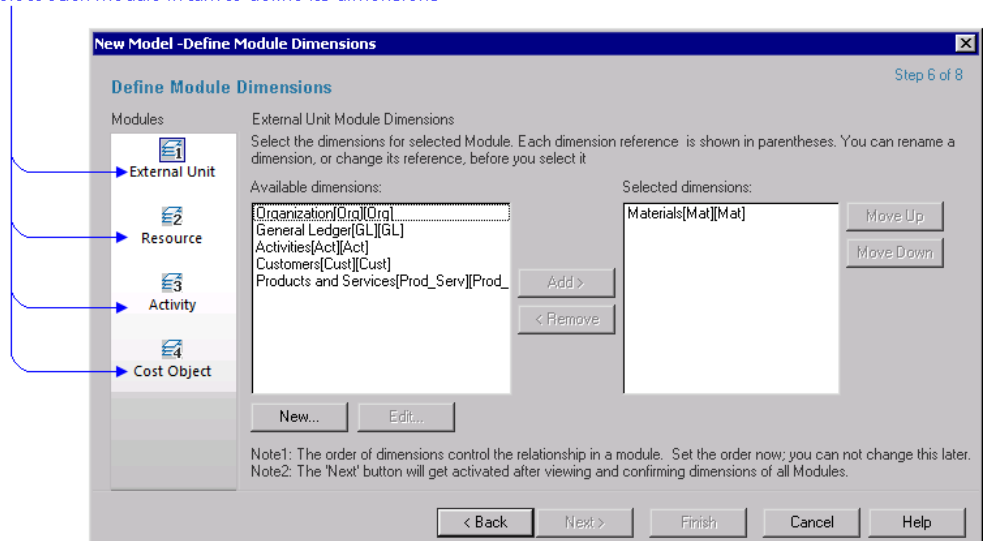
Overview

In this step of creating a model, you specify the dimensions for each module.

Click each module in turn and specify its dimensions.

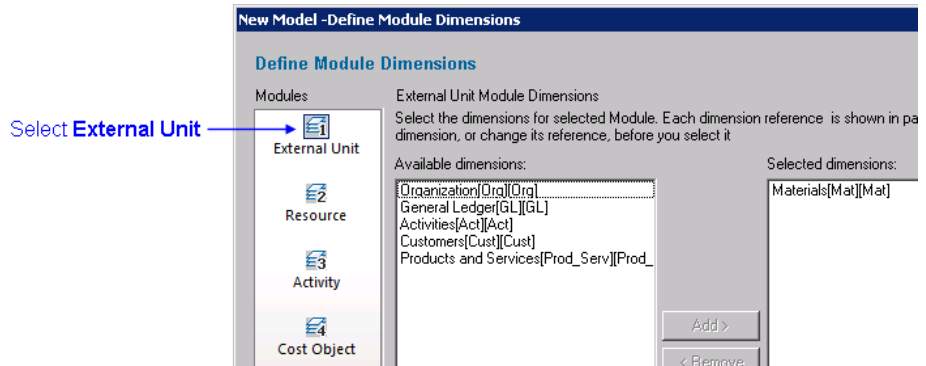
Note: You must define the dimensions for every module before the **Next** button is enabled for you to proceed to the next step.

Select each module in turn to define its dimensions



Define Dimensions for the External Unit Module

1. Select **External Unit**.

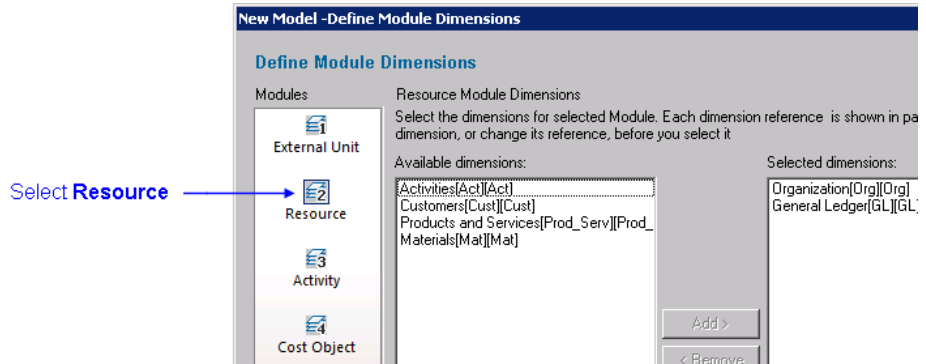


2. Verify that **Materials** is the only dimension in the **Selected dimensions** list.

Module	Dimensions
External Unit	Materials

Define Dimensions for the Resource Module

1. Select **Resource**.



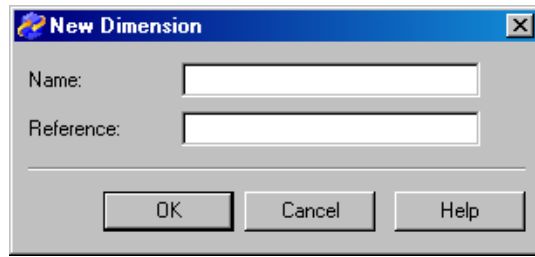
2. Create the following dimensions in the Resource module:

Module	Dimensions
Resource	Region General Ledger

The order of dimensions in the list determines the hierarchy of dimensions in the module. In this case, Parcel Express wants to organize its resources by **Region**, and then by **General Ledger**.

In order to create those two dimensions, you have to:

- a. Remove the **Organization** dimension from the **Selected dimensions** list.
- b. Click **New**.
You see the New Dimension dialog box.



- c. For **Name**, type **Region**.
- d. For **Reference**, use **Region**.
- e. Click **OK**.

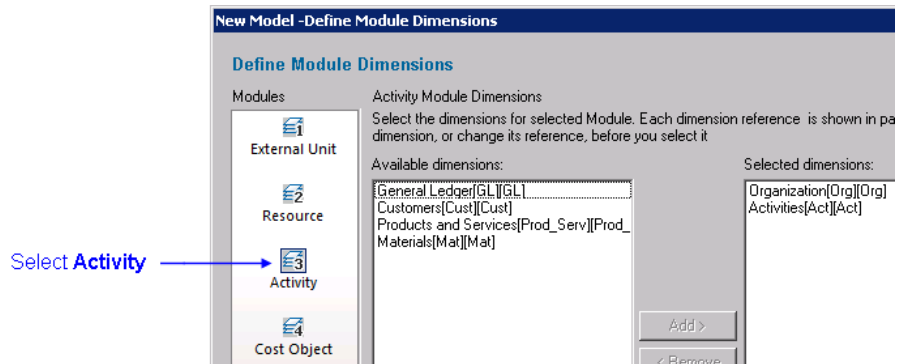
The New Dimension dialog box closes and you see that the **Region** dimension has been added to the **Available dimensions** list.

- f. Select the **Region** dimension and click **Add >**.
- g. Move **Region** to the top of the list.

Define Dimensions for the Activity Module

Now, you will define the dimensions for the activity module by using these same techniques.

- 1. Select **Activity**.



- 2. Create the following dimensions in the Activity module:

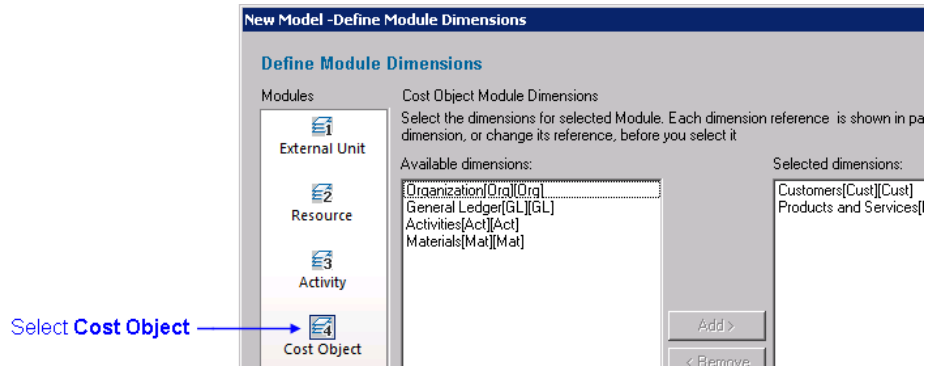
Module	Dimensions
Activity	Region Activities

In order to create those two dimensions, you have to:

- a. Remove the **Organization** dimension from the **Selected dimensions** list.
- b. Select the **Region** dimension and click **Add >**.
- c. Move **Region** to the top of the list.

Define Dimensions for the Cost Object Module

- 1. Select **Cost Object**.



2. Create the following dimensions in the Cost Object module:

Module	Dimensions
Cost Object	Region Channel Products and Services

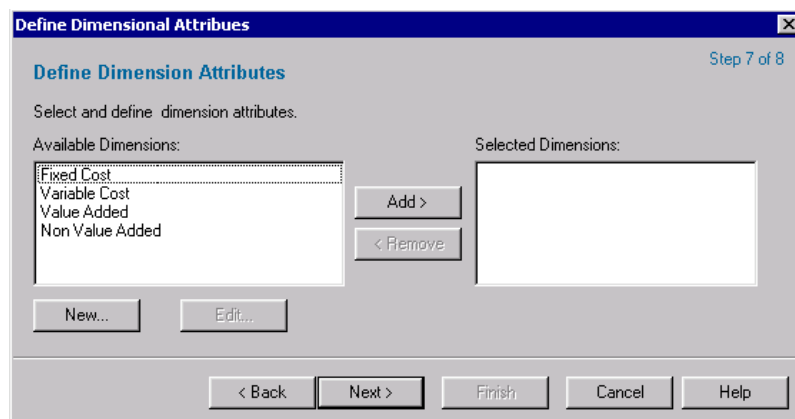
In order to create those dimensions, you must:

- a. Remove the **Customer** dimension from the **Selected dimensions** list.
 - b. Create a new dimension named **Channel** that has a reference of **Channel**.
 - c. Move the **Channel** dimension to the **Selected dimensions** list.
3. Click **Next**.

You see Step 7 of the New Model Wizard.

Step 7: Define Dimension Attributes

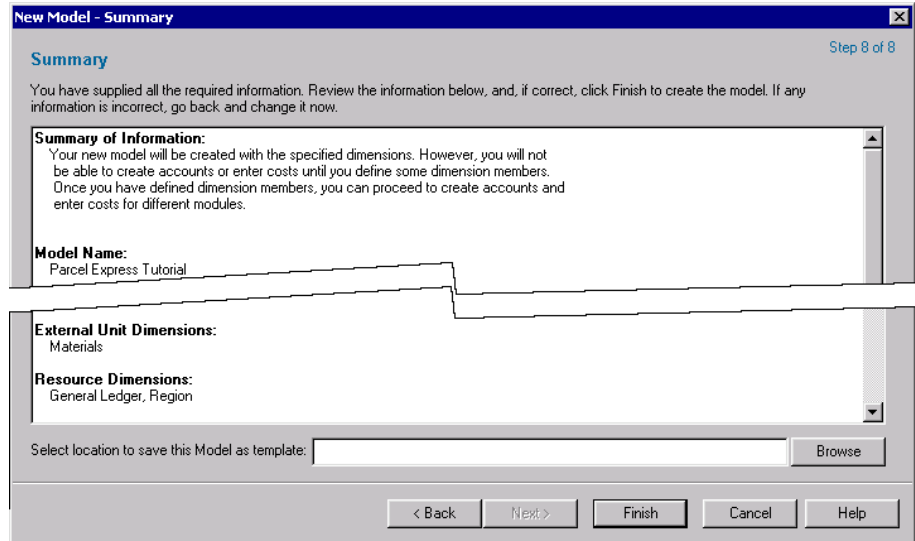
In this step, you have the option of creating dimension attributes. A dimension attribute is like an ordinary attribute in that it can be applied to accounts. But, unlike an ordinary attribute, a dimension attribute is displayed in cubes. We will not create any dimension attributes with this step of creating the tutorial model, but we will create one later. See “Create a Dimension Attribute” on page 60.



Click **Next**.

Step 8: Finish the New Model Wizard

1. Review the **Summary of Information** and dimensions in each module, as shown:



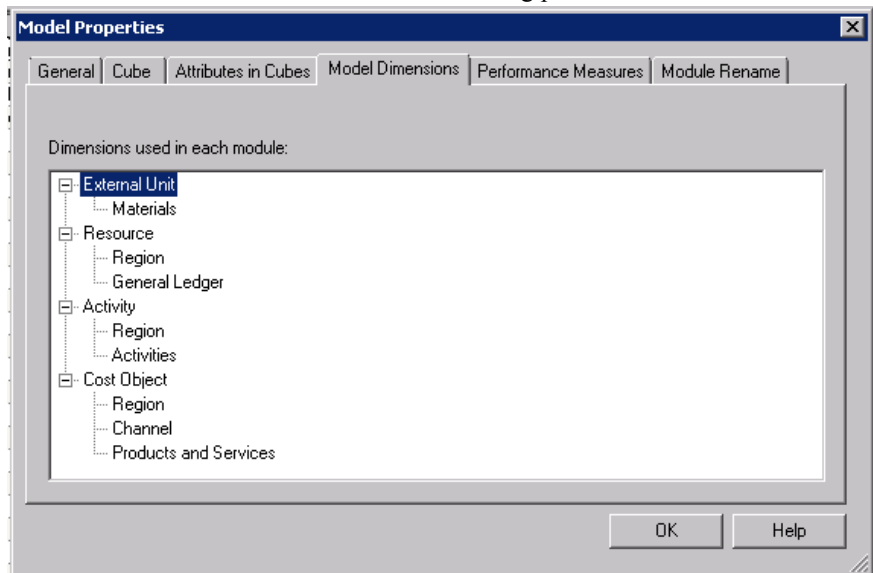
If any of the information in the summary is incorrect, click **Back** to move to the page that requires changes. After making the corrections, click **Next** to return to the summary.

2. Click **Finish**.

You see the **Dimensions** page that now has the following dimensions:

	Name	Reference
▶	Region	Region
+	General Ledger	GL
+	Activities	Act
+	Channel	Channel
+	Products and Services	Prod_Serv
+	Materials	Mat

Note: If you select **Model** ⇒ **Properties** and click the **Model Dimensions** tab, you can see the dimensions as shown in the following picture:



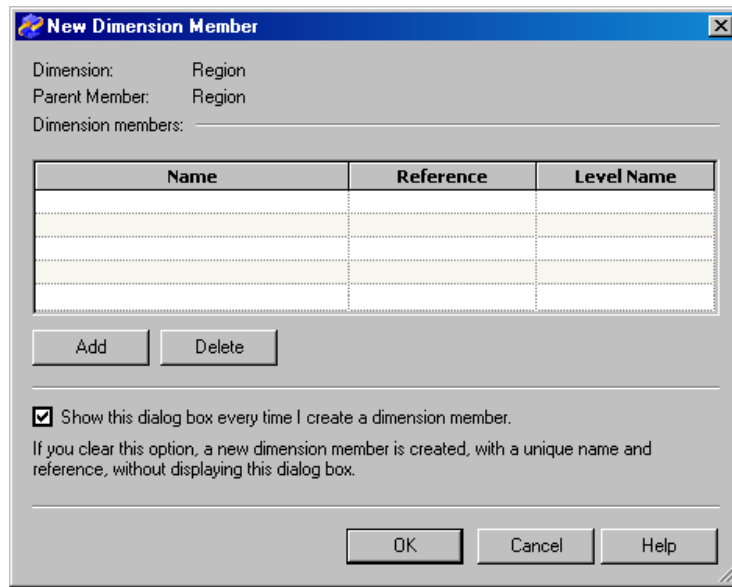
These dimensions are the basic building blocks that you will use to construct the modules of your model. First, however, you must create the members of each dimension.

Create Dimension Members

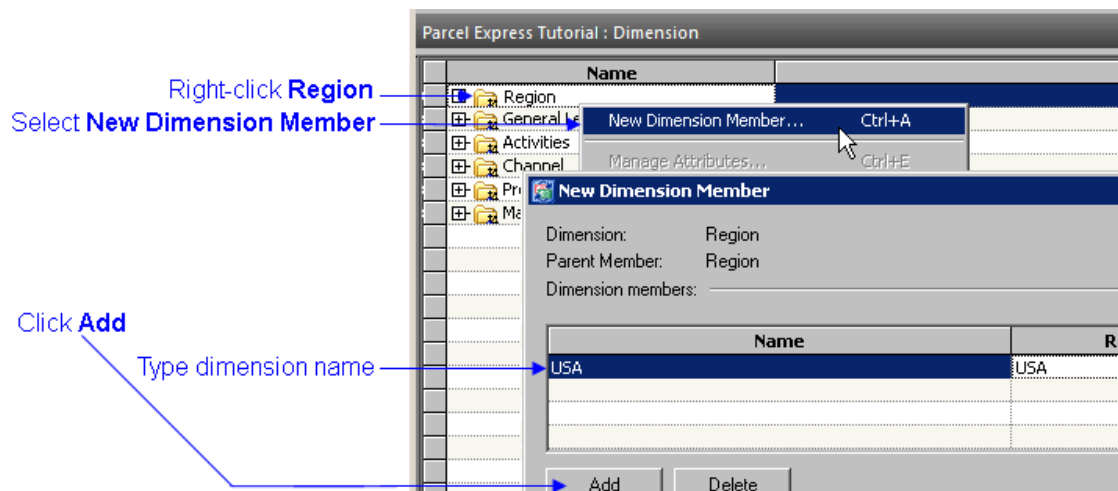
Dimension members are the unique elements of a dimension level. For example, the Region dimension of the Parcel Express Tutorial model will have levels that include countries, states, and cities. Beaverton and Eugene are dimension members at the same level of the Region dimension.

1. On the **Dimensions** page, select **Region**.
2. Select **Edit** ⇒ **New Dimension Member** (or right-click **Region**).

You see the New Dimension Member dialog box.



3. Click **Add**.
4. For **Name**, type **USA**.



TIP After clicking **Add**, you can simply begin typing. The focus is automatically given to the **Name** field, and you do not have to move the cursor there.

5. Click **OK**.

You see that the **USA** dimension member has been added below **Region**.

TIP When you click **OK**, you see that the **Reference** field is automatically made to be the same as the **Name** field. In this tutorial, you will not change the references of dimensions; however, for the models that you create for your company, you might want to devise a standard referencing methodology.

6. Select the **USA** dimension member.
7. Create a new dimension member under **USA** named **Oregon**.

Note that the level is **Level2**. The reason for this is that you are adding a dimension member below a **Level1** dimension member.

8. Using the techniques that you have learned, create the following dimension members:

Name	Reference	DimLevelName
Region	Region	
USA	USA	Level1
Oregon	Oegon	Level2
Beaverton	Beaverton	Level3
Eugene	Eugene	Level3
General Ledger	GL	
Wages	Wages	Level1
Operating Expenses	Operating Expenses	Level1
Equipment Expenses	Equipment Expenses	Level1
Activities	Act	
Personnel Intensive Activities	Personnel Intensive Activities	Level1
Resolve Customer Complaints	Resolve Customer Complaints	Level2
Expedite Package Shipment	Expedite Package Shipment	Level2
Local Collection	Local Collection	Level1
Move to Warehouse	Move to Warehouse	Level2
Local Processing	Local Processing	Level1
Sort	Sort	Level2
Inspect	Inspect	Level2
Regional Distribution	Regional Distribution	Level1
Air Distribution	Air Distribution	Level2
Land Distribution	Land Distribution	Level2
Channel	Channel	
Drop Box	Drop Box	Level1
Walk In	Walk In	Level1
Commercial Pick Up	Commercial Pick Up	Level1
Products and Services	Prod_Serv	
2nd Day Guaranteed	2nd Day Guaranteed	Level1
Overnight Express	Overnight Express	Level1
Standard Ground	Standard Ground	Level1
Materials	Mat	

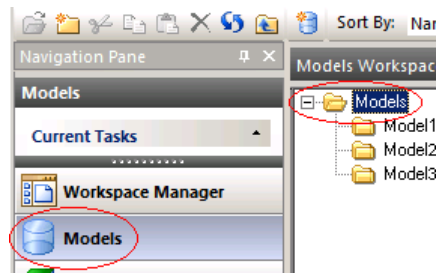
Note: You will not create dimension members for the Materials dimension yet. You will add those dimension members when you create bills of cost.

Appendix: Acquiring a Write Lock on a Model

To edit a model you must first acquire a Write lock on it. A Write lock prevents other users from modifying the same model that you are editing or even looking at it while you are editing it. When you use the New Model wizard to create a model, you automatically acquire a Write lock on it. However, if for some reason you lose the Write lock (for example, if an Administrator releases the lock), then you will have to acquire the lock again before you can continue editing.

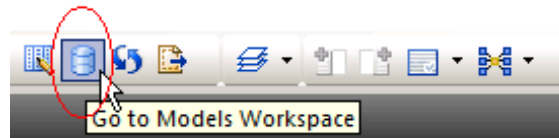
To open a model with a Write lock for editing:

1. Click the **Models** tab in the Navigation Pane.



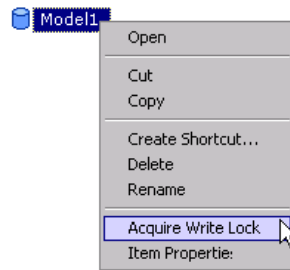
Note:

- If a model is already open, then you can click the **Go to Models Workspace** icon on the toolbar.



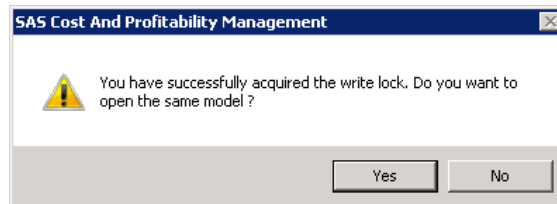
- You can also click the **Workspace Manager** tab and then select the **Models** folder.
2. Right-click the model and select **Acquire Write Lock**.

When you have a Write lock, no one else can acquire a Write lock or even open the model for viewing while you are in the process of changing it.



A dialog appears asking if you want to open the model.

3. Click **Yes** to open the model.



Note: Once you have acquired the Write lock, you can reopen the model subsequently (even after closing and reopening the client application) by double-clicking the model.

Chapter 7

Create Modules and Accounts

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Overview

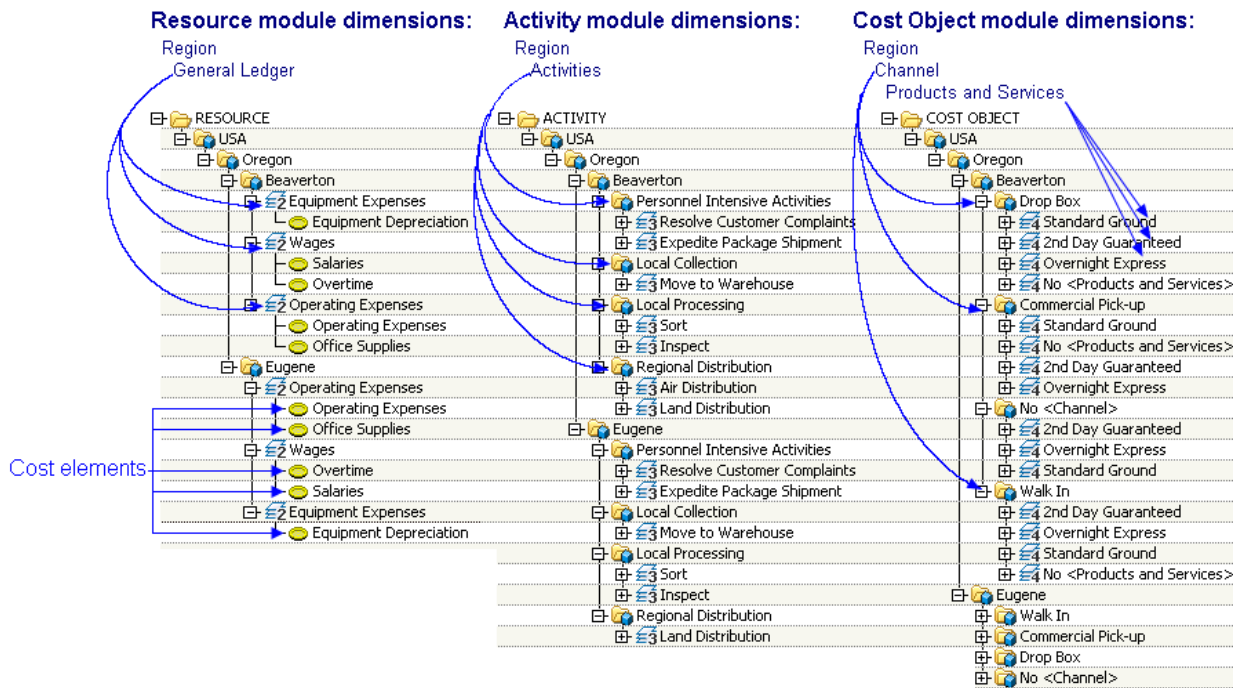
An account is the basic repository of costs in a model. You create an account in SAS Cost and Profitability Management by defining an intersection between dimension members. For example, in the Parcel Express Tutorial model, you will create an account for tracking the costs of inspecting packages in Beaverton. You create this account by defining an intersection between **Region** and **Activity** dimension members, as shown here:

```
Region > USA > Oregon > Beaverton
      x
Activity > Regional Sorting > Inspect
```

Shorthand for the resulting account, or dimension intersection, is **Beaverton x Inspect**.

The costs of an account are derived from cost elements, which can either be added directly to the account or assigned from other accounts.

The following picture shows the accounts and cost elements that you will create in this chapter for each module:



In the following picture you can see that the account 2nd Day Guaranteed is the intersection of the dimension members Beaverton x Drop Box x 2nd Day Guaranteed. Those dimension members are, in turn, members of the dimensions Region x Channel x Products and Services respectively. You can notice that the display name of the account, 2nd Day Guaranteed, is the name of the last member in the intersection of the dimension members when the order of dimension members is the order of their containing dimensions—Region, Channel, Products. The order of dimensions is the order in which you define them when you create a model

The screenshot shows two overlapping dialog boxes:

- Model Properties:**
 - Dimensions used in each module: Resource, Activity, Cost Object, Region, Channel, Products and Services, External Unit.
 - Dimension members tree:
 - Region: USA, Oregon, Eugene
 - General Ledger: Activities, Channel, Products and Services
 - Channel: Drop Box, Walk In, Commercial Pick-up
 - Products and Services: 2nd Day Guaranteed
- Item Properties and Attributes:**
 - Display name: 2nd Day Guaranteed
 - Dimensional identifier: Beaverton x Drop Box x 2nd Day Guaranteed
 - Display reference: 2nd Day Guaranteed
 - Type: Account
 - ID: 1113

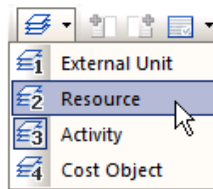
Red annotations highlight the '2nd Day Guaranteed account' in the 'Display Name' field and the 'Dimensional identifier' field, with a red circle around the identifier text.

Build the Resource Module Structure

Create Resource Accounts

Start by creating a structure to hold the resource costs in the model.

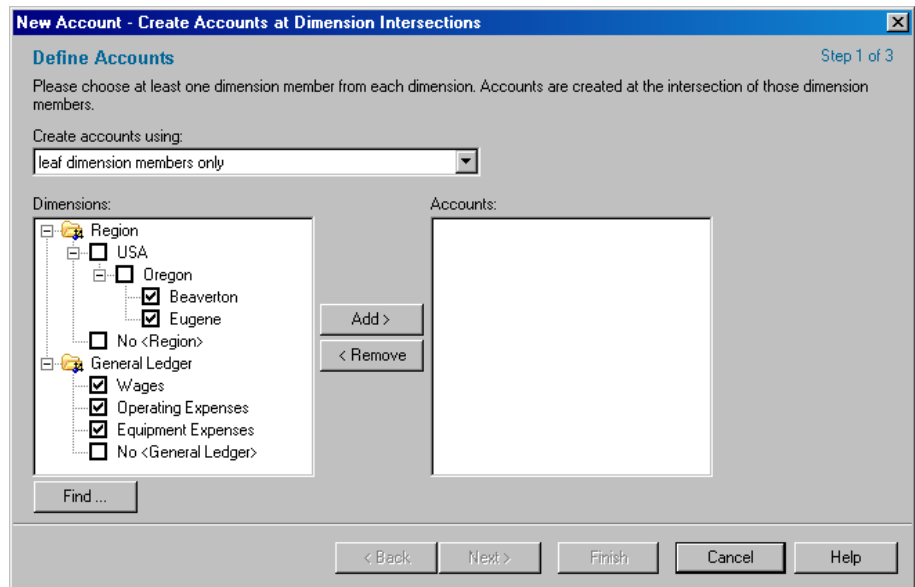
1. To open the resource module, select **Model** ⇒ **Module** ⇒ **Resource** (or click the Select Module icon on the toolbar, and then select **Resource** from the drop-down list).



2. Select **Edit** ⇒ **New Account**. (or right-click RESOURCE (PRIMARY PANE) and select **New Account**).

You see Step 1 of the New Account Wizard.

The **Dimensions** area contains the dimensions of the resource module. The **Accounts** area will contain the accounts that you create.



3. Expand **Region** to display all of its dimension members.
4. In the **Dimensions** list, select the following dimension members:

Beaverton

Eugene

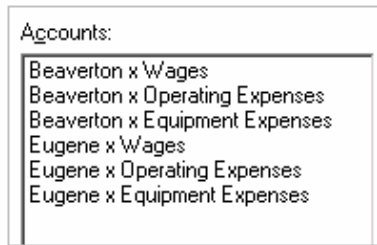
Wages

Operating Expenses

Equipment Expenses

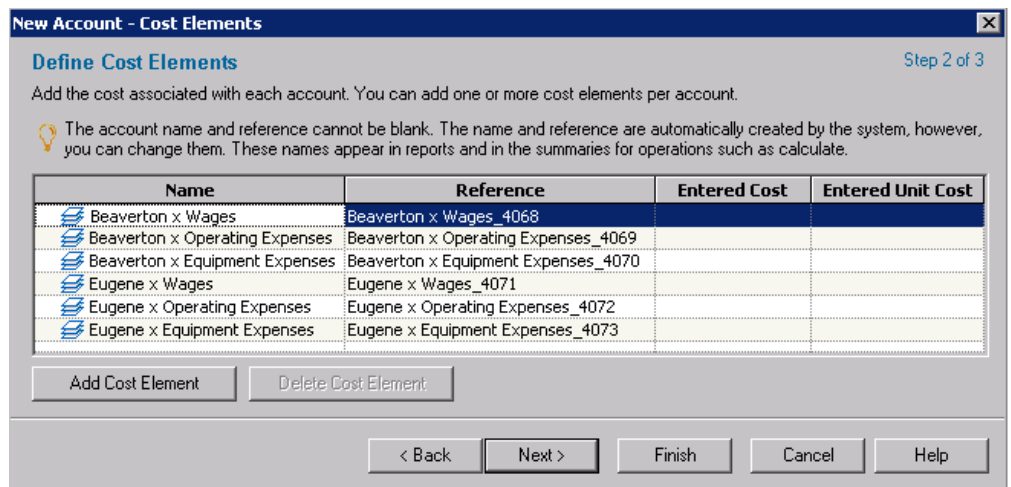
5. Verify that **leaf dimension members only** is selected in the Create accounts using field.
6. Click **Add**.

You see that the following accounts have been added to the **Accounts** list:



7. Click **Next**.

You see Step 2 of the New Account Wizard. Here, you will add the cost elements and costs of each account.



TIP The system has automatically generated a unique name and reference for each account. The names and references that you see will be different from those shown in the window. These names and references are used in operational summaries, but they do not appear elsewhere on a page, unless you add columns to display them. Your company can decide whether to use the system-generated names or to use a naming and referencing methodology. If your models are extremely large, it will probably be more convenient to use system-generated account names and references.

Add Cost Elements with Entered Costs

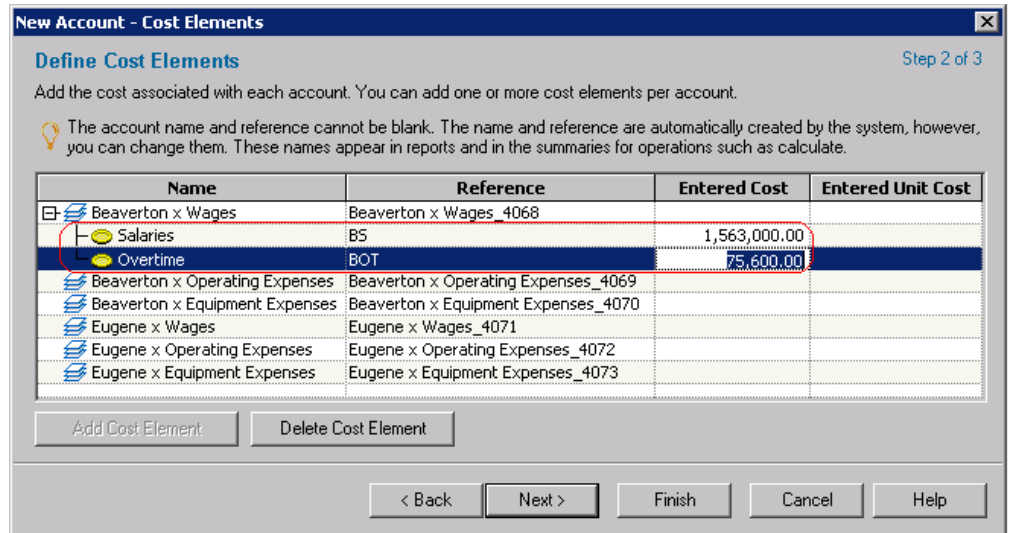
1. Select the **Beaverton x Wages** account and click **Add Cost Element** twice.

You see that two cost elements have been added to the account table. The names and references of these cost elements are system-generated. In the account table, you can add costs and change the names and references of cost elements.

2. Change the names and references of the two cost elements that you added and enter their costs, as follows:

Cost Element Name	Cost Element Reference	Entered Cost
Salaries	BS	1,563,000.00
Overtime	BOT	75,600.00

The New Account window should look like the following:



Note: In large models, entered costs might be imported from other sources, such as a database. In that case, you could create the cost elements, but leave the entered costs empty.

- Using the techniques that you have learned, create cost elements and entered costs as follows:

Account	Cost Element Name	Cost Element Reference	Entered Cost
Beaverton x Operating Expenses	Operating Expenses	BOE	228,000.00
	Office Supplies	BOS	10,000.00
Beaverton x Equipment Expenses	Equipment Depreciation	BED	54,300.00
Eugene x Wages	Salaries	ES	1,298,000.00
	Overtime	EOT	110,000.00
Eugene x Operating Expenses	Operating Expenses	EOE	263,000.00
	Office Supplies	EOS	8,000.00
Eugene x Equipment Expenses	Equipment Depreciation	EED	38,000.00

Note: You can also create entered cost elements by right-clicking an account and selecting **New Entered Cost Element**.

Display Name	Display Reference	Cost
Resource (Primary Pane)		\$0.00
USA	USA	\$0.00
Oregon	Oregon	\$0.00
Beaverton	Beaverton	\$0.00
Wages	Wages	\$0.00
Salaries	BS	\$1,563,000.0
Overtime	BOT	\$75,600.00
Operating Expenses	Operating Expenses	\$0.00
Equipment Expenses	Equipment Expenses	\$0.00
Eugene	Eugene	\$0.00
Wages	Wages	\$0.00
Operating Expenses	Operating Expenses	\$0.00
Equipment Expenses	Equipment Expenses	\$0.00

New Account...	Ctrl+A
New Entered Cost Element...	Ctrl+O
Manage Attributes...	Ctrl+E
Go To Account	Ctrl+G

4. Click **Next**.


You see Step 3 of the New Account Wizard. This step contains a summary of the accounts, cost elements, and costs you are about to create.

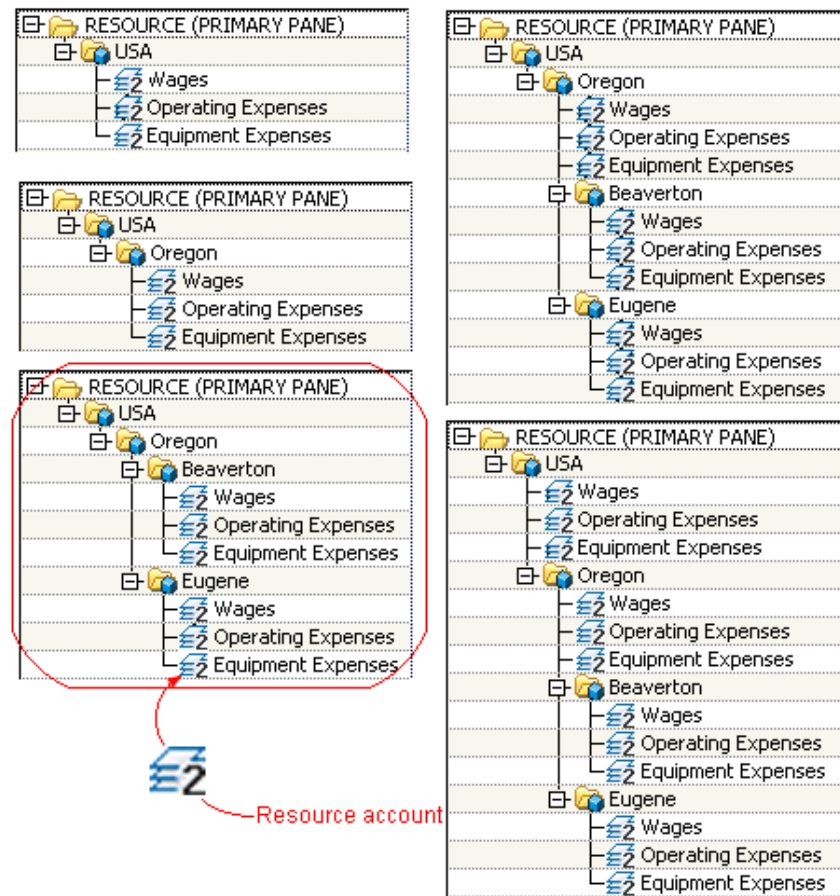
5. Click **Finish**.

You see that the accounts have been added to the resource module.

Display Name	Display Reference	Cost
Resource (Primary Pane)		\$0.00
USA	USA	\$0.00
Oregon	Oregon	\$0.00
Beaverton	Beaverton	\$0.00
Wages	Wages	\$0.00
Salaries	BS	\$1,563,000.0
Overtime	BOT	\$75,600.00
Operating Expenses	Operating Expenses	\$0.00
Operating Expenses	BOE	\$228,000.00
Office Supplies	BOS	\$10,000.00
Equipment Expenses	Equipment Expenses	\$0.00
Equipment Depreciation	BED	\$54,300.00
Eugene	Eugene	\$0.00
Wages	Wages	\$0.00
Salaries	ES	\$1,298,000.0
Overtime	EOT	\$110,000.00
Operating Expenses	Operating Expenses	\$0.00
Operating Expenses	EOE	\$263,000.00
Office Supplies	EOS	\$8,000.00
Equipment Expenses	Equipment Expenses	\$0.00
Equipment Depreciation	EED	\$38,000.00

The system automatically rolls up costs from cost elements, to accounts, to higher-dimension levels.

The following picture shows some alternative arrangements of accounts that you could have adopted from the available dimensions and dimension members by not selecting the option to add **leaf dimension members only**. (The arrangement chosen for this tutorial is circled.) Notice that the icon  indicates that the accounts belong to the resource module.




Build the Activity Module Structure

An activity is a task that consumes resources. Examples of activities include setting up a machine to produce a particular part, scheduling production of a certain number of products, and inspecting a batch of parts. In a model, you identify activities and calculate their costs.

Creating Activity Accounts

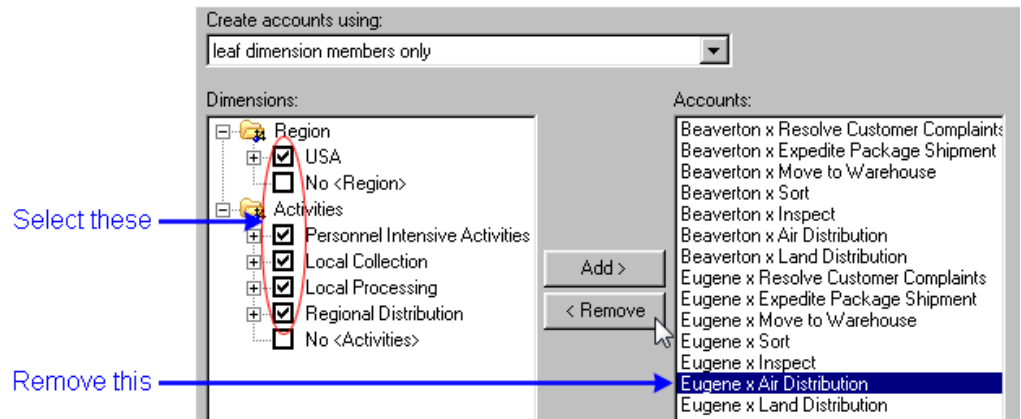
In the activity module, you will create activity accounts.


- To open the activity module, select **Model** ⇒ **Modules** ⇒ **Activity** (or click the Select Module icon  on the toolbar, and then select **Activity** from the drop-down list).
- Select **Edit** ⇒ **New Account**.
You see the New Account Wizard.
- Using the New Account Wizard, create the following accounts:

Note: Do not create cost elements. Costs will be assigned to these accounts from other accounts.

Dimension Intersection	
Personnel Intensive Activities	Beaverton x Resolve Customer Complaints Beaverton x Expedite Package Shipments
Local Collection	Beaverton x Move to Warehouse
Local Processing	Beaverton x Sort Beaverton x Inspect
Regional Distribution	Beaverton x Air Distribution Beaverton x Land Distribution
Personnel Intensive Activities	Eugene x Resolve Customer Complaints Eugene x Expedite Package Shipments
Local Collection	Eugene x Move to Warehouse
Local Processing	Eugene x Sort Eugene x Inspect
Regional Distribution	Eugene x Land Distribution <i>Note: There is no Air Distribution from Eugene.</i>

Note: A quick way to create the Activity module accounts is to add the dimensions shown in the following picture and then remove the one Eugene x Air Distribution account.



After completing the steps of the New Account Wizard, you see the following activity module structure (notice that the icon  indicates that the accounts belong to the activity module):

Display Name	Display Reference	Cost
ACTIVITY (PRIMARY PANE)		\$0.00
USA	USA	\$0.00
Oregon	Oregon	\$0.00
Beaverton	Beaverton	\$0.00
Personnel Intensive Activities	Personnel Intensive Activities	\$0.00
Resolve Customer Complaints	Resolve Customer Complaints	\$0.00
Expedite Package Shipment	Expedite Package Shipment	\$0.00
Local Collection	Local Collection	\$0.00
Move to Warehouse	Move to Warehouse	\$0.00
Local Processing	Local Processing	\$0.00
Sort	Sort	\$0.00
Inspect	Inspect	\$0.00
Regional Distribution	Regional Distribution	\$0.00
Air Distribution	Air Distribution	\$0.00
Land Distribution	Land Distribution	\$0.00
Eugene	Eugene	\$0.00
Personnel Intensive Activities	Personnel Intensive Activities	\$0.00
Resolve Customer Complaints	Resolve Customer Complaints	\$0.00
Expedite Package Shipment	Expedite Package Shipment	\$0.00
Local Collection	Local Collection	\$0.00
Move to Warehouse	Move to Warehouse	\$0.00
Local Processing	Local Processing	\$0.00
Sort	Sort	\$0.00
Inspect	Inspect	\$0.00
Regional Distribution	Regional Distribution	\$0.00
Land Distribution	Land Distribution	\$0.00

Note: You have not entered cost elements for these accounts, and no costs have been assigned yet, so cost is \$0.00.

Build the Cost Object Module Structure

The cost object module will hold information about Parcel Express Tutorial's products and services. Its dimensions are Channel and Products and Services.

Omitting a Dimension from an Account

You can create accounts that omit one or more dimensions of a module. In the cost object module of the Parcel Express Tutorial model, you will create accounts that have a Channel dimension member, but no Products and Services dimension member, and vice versa. The purpose of these omissions is to track the unique costs of a channel that are unassociated with any product, and to track the unique costs of a product that are unassociated with any channel. To omit a dimension from an account, you select the *No* option in the New Account Wizard.

Examples of accounts that omit a dimension are:

- Drop Box x No <Products and Services>
(tracks unique costs that are associated with the Drop Box channel)
- No <Channel> x 2nd Day Guaranteed
(tracks unique costs that are associated with the 2nd Day Guaranteed product)

Creating Cost Object Accounts

Using the techniques that you have learned, create the following accounts in the cost object module for each regional office Beaverton and Eugene:

Note: Do not create cost elements. Costs will be assigned to these accounts from other accounts.

Dimension Intersection

Drop Box x 2nd Day Guaranteed

Drop Box x Overnight Express

Drop Box x Standard Ground

Drop Box x No <Products and Services>

Walk In x 2nd Day Guaranteed

Walk In x Overnight Express

Walk In x Standard Ground

Walk In x No <Products and Services>

Commercial Pick Up x 2nd Day Guaranteed

Commercial Pick Up x Overnight Express

Commercial Pick Up x Standard Ground

Commercial Pick Up x No <Products and Services>

No <Channel> x 2nd Day Guaranteed

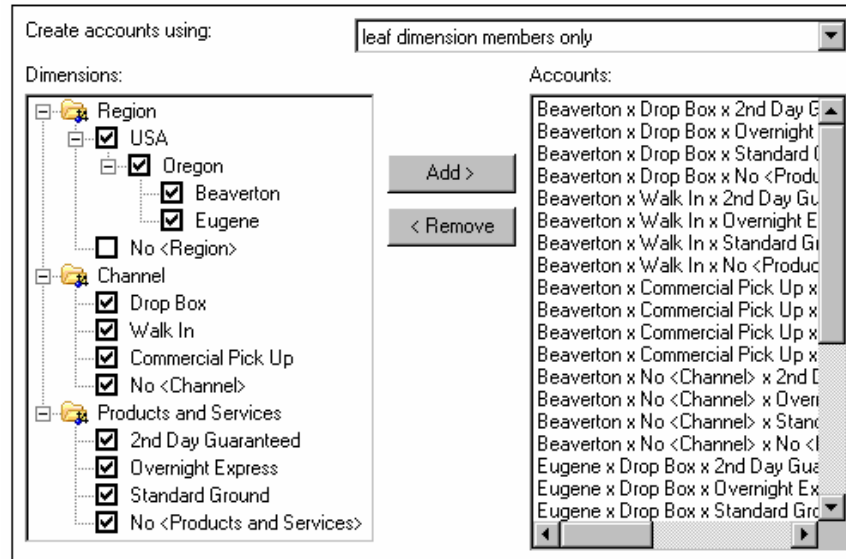
No <Channel> x Overnight Express

No <Channel> x Standard Ground

Note: You can create these accounts all at once by checking the leaf dimension members that are shown in the following display. This quick method, however, results in creating two meaningless accounts that you can delete afterward:

Beavertonx No <Channel> x No <Products and Services>

Eugenex No <Channel> x No <Products and Services>



After you have created these accounts, you see the following cost object module structure:

Display Name	Display Reference	Cost
[-] COST OBJECT (PRIMARY PANE)		\$0.00
[-] USA	USA	\$0.00
[-] Oegon	Oegon	\$0.00
[-] Beaverton	Beaverton	\$0.00
[-] Drop Box	Drop Box	\$0.00
[-] 2nd Day Guaranteed	2nd Day Guaranteed	\$0.00
[-] Overnight Express	Overnight Express	\$0.00
[-] Standard Ground	Standard Ground	\$0.00
[-] No<Products and Services>	No<Prod_Serv>	\$0.00
[-] Walk In	Walk In	\$0.00
[-] 2nd Day Guaranteed	2nd Day Guaranteed	\$0.00
[-] Overnight Express	Overnight Express	\$0.00
[-] Standard Ground	Standard Ground	\$0.00
[-] No<Products and Services>	No<Prod_Serv>	\$0.00
[-] Commercial Pick Up	Commercial Pick Up	\$0.00
[-] 2nd Day Guaranteed	2nd Day Guaranteed	\$0.00
[-] Overnight Express	Overnight Express	\$0.00
[-] Standard Ground	Standard Ground	\$0.00
[-] No<Products and Services>	No<Prod_Serv>	\$0.00
[-] No<Channel>	No<Channel>	\$0.00
[-] 2nd Day Guaranteed	2nd Day Guaranteed	\$0.00
[-] Overnight Express	Overnight Express	\$0.00
[-] Standard Ground	Standard Ground	\$0.00
[-] Eugene	Eugene	\$0.00
[-] Drop Box	Drop Box	\$0.00
[-] 2nd Day Guaranteed	2nd Day Guaranteed	\$0.00
[-] Overnight Express	Overnight Express	\$0.00
[-] Standard Ground	Standard Ground	\$0.00
[-] No<Products and Services>	No<Prod_Serv>	\$0.00
[-] Walk In	Walk In	\$0.00
[-] 2nd Day Guaranteed	2nd Day Guaranteed	\$0.00
[-] Overnight Express	Overnight Express	\$0.00
[-] Standard Ground	Standard Ground	\$0.00
[-] No<Products and Services>	No<Prod_Serv>	\$0.00
[-] Commercial Pick Up	Commercial Pick Up	\$0.00
[-] 2nd Day Guaranteed	2nd Day Guaranteed	\$0.00
[-] Overnight Express	Overnight Express	\$0.00
[-] Standard Ground	Standard Ground	\$0.00
[-] No<Products and Services>	No<Prod_Serv>	\$0.00
[-] No<Channel>	No<Channel>	\$0.00
[-] 2nd Day Guaranteed	2nd Day Guaranteed	\$0.00
[-] Overnight Express	Overnight Express	\$0.00
[-] Standard Ground	Standard Ground	\$0.00

Chapter 8

Create Attributes

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Apply additional attributes to accounts	66

Types of Attributes

Overview

An attribute is a label or identification tag that is attached to an account or roll-up account. The attribute conveys information about the object to which it is attached.

Attributes have many purposes. You can use them to do the following:

- group cost and profitability management data to simplify interpretation
- create different dimensions of data
- group similar cost categories across cost centers
- classify cost components as fixed or variable, value-added or non-value-added

- use them in the definition of a calculated driver

There are five attribute types:

- Text
- Numeric
- Calculated
- Dimension
- Tag

Text

A text attribute describes model information. You can use text attributes to annotate a model. You can use them to provide information about a model. You will see an example in this chapter.

Note: Text attributes cannot be viewed in OLAP.

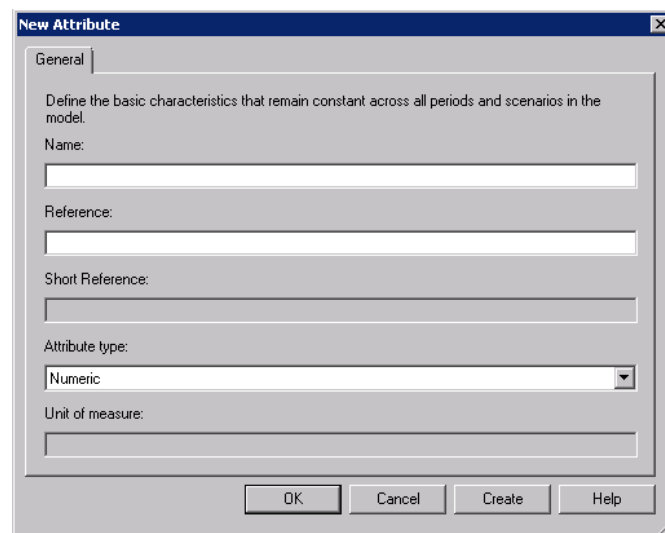
Numeric

A numeric attribute enables you to enter data that is not entered or otherwise generated in a model.

Typically, numeric attributes are measures or quantities of units that contribute to the total cost of an activity, such as number of cases, number of pounds, number of orders, or number of times an activity is performed.

You can establish numeric attributes as performance measures for special purposes, such as tracking productivity (number of inputs or rejects, cycle time, and quality), or classifying information (level of complexity or number of subassemblies). Use the **Default Value** field under the **Advanced** tab to define data that is specific to that attribute.

Use the Default Value field under the Advanced tab to define data that is specific to that attribute.



The screenshot shows a dialog box titled "New Attribute" with a close button (X) in the top right corner. The "General" tab is selected. Below the title bar, there is a text area with the instruction: "Define the basic characteristics that remain constant across all periods and scenarios in the model." Below this are four text input fields labeled "Name:", "Reference:", "Short Reference:", and "Unit of measure:". Below the "Short Reference:" field is a dropdown menu for "Attribute type:" with "Numeric" selected. At the bottom of the dialog are four buttons: "OK", "Cancel", "Create", and "Help".

Calculated

Numeric attributes can be calculated. Calculated numeric attributes are also user-defined, but they rely on a formula to express their characteristics. This formula is developed by the user to capture unique business data. Calculated numeric attributes can be used in a driver definition.

Dimension

A dimension attribute reflects a dimension, and a dimension member attribute reflects a dimension member. Dimension attributes enable you to categorize, select, and subtotal information. For example, activities can be grouped by summary-level processes, such as detailed manufacturing activities rolling up to manufacturing, and detailed distribution activities rolling up to distribution. The names of these higher-level processes are defined as dimension member attributes and are attached to their respective activities. Most importantly, you can query for dimension member attributes in OLAP.

Other examples of dimension attributes include:

- value-added categories (high, medium, low) that are attached to activities
- fixed cost/variable cost that is attached to resources enables you to group activity or cost object costs by fixed and variable cost components
- cost object groupings that are used to roll up products by product family, brand, market segment, or package type, or to group customers by region, channel, or salesperson

Tag

A tag attribute is one that is either attached (tagged) to an account or not. You can use the HasAttribute function to test whether an account has the attribute.

Note: Tag attributes used to be called Boolean attributes in previous releases of SAS Cost and Profitability Management. Tag attributes cannot be viewed in OLAP.

Create Attributes

You will create a text attribute, numeric attribute, calculated numeric attribute, and a dimension attribute.

Create a Text Attribute

1. Select **Model** ⇒ **Attributes Page**.
2. Select **Edit** ⇒ **New Attribute** (or right-click ATTRIBUTES (PRIMARY PANE) and select **New Attribute**).

You see the New Attribute dialog box.

3. For **Name**, type **Manager**.
4. For **Reference**, accept **Manager**.
5. Select an **Attribute type** of **Text**.
6. Click **OK**.

You see that the Manager attribute has been added to the list.

Create a Numeric Attribute

1. Select **Model** ⇒ **Attributes Page**.
 2. Select **Edit** ⇒ **New Attribute**.
- You see the New Attribute dialog box.
3. For **Name**, type **Number of Inspections**.
 4. For **Reference**, type **Num of Ins**.
 5. Select an **Attribute type** of **Numeric**.

TIP You can type “n” to change the selection to Numeric in addition to using the drop-down list.

6. For **Unit of Measure**, type **Inspections**.

To summarize:

Name	Reference	Type	Unit of Measure
Number of Inspections	Num of Ins	Numeric	Inspections

7. Click **OK**.
- You see that the Number of Inspections attribute has been added to the list.
8. Create three more numeric attributes.

Name	Reference	Type	Unit of Measure
Inspections Passed	I_P	Numeric	Units Passed
Completed Expedite Requests	Completed Expedite Requests	Numeric	Completed Requests
Average Time to Expedite	Average Time to Expedite	Numeric	Hours

Create a Calculated Numeric Attribute

Name	Reference	Type	Unit of Measure	Formula
Cost per Inspection	Cost per Inspection	Numeric Calculated	Dollars	Cost / "Num of Ins"

1. Select **Edit** ⇒ **New Attribute**.
2. For **Name**, type **Cost per Inspection**.
3. For **Reference**, type **Cost per Inspection**.
4. Select an **Attribute type** of **Numeric**.
5. Select **Dollars** for Unit of Measure.
6. Select the **Advanced** tab.

New Attribute

General

Define the basic characteristics that remain constant across all periods and scenarios in the model.

Name:

Reference:

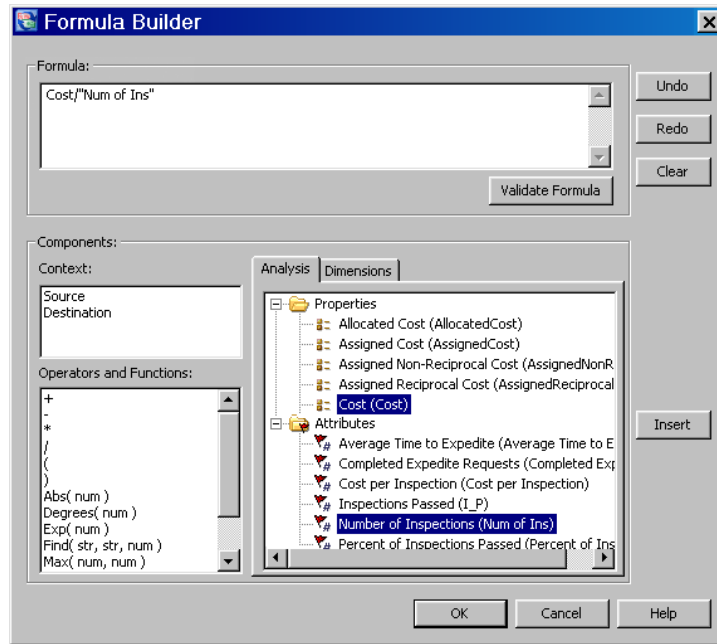
Short Reference:

Attribute type:

Unit of measure:

OK Cancel Create Help

7. Verify that the period is **2008 Q1 / Actual**.
 8. Select the **Calculated** check box. This allows you to enter a formula.
 9. Click **Formula Builder**.
- You see the Formula Builder dialog box.



10. The cost of inspection would be derived from a formula of **Cost** divided by the **Number of Inspections**. Create this formula by double-clicking each element. The formula will appear in the **Formula** area.
11. Click **Validate Formula** to verify the syntax of the formula.
12. Click **OK** to dismiss the message box.
13. Click **OK** to accept the formula.
14. Click **OK** to create the attribute.
15. Create a calculated numeric attribute for **Percent of Inspections Passed**.

Name	Reference	Type	UoM	Formula
Percent of Inspections Passed	Percent of Inspections	Numeric Calculated	Percentage	"I_P"/"Num of Ins"

Create a Dimension Attribute

Name	Reference	Type
Fixed_Variable	FV	Dimension

1. Select **Edit** ⇒ **New Attribute**.
2. For **Name**, type **Fixed_Variable**.
3. For **Reference**, type **FV**.
4. For **Short Reference**, type **FV**.
5. Select a **Type** of **Dimension**.

6. For **Short Reference**, type **FV**.
7. Click **OK**.

Notice that the attribute is created as a folder to contain its dimension member attributes which you create next.

8. Select the **Fixed_Variable** attribute folder.
9. Create the following two dimension member attributes:

Name	Reference	Type
Fixed	F	Dimension Member
Variable	V	Dimension Member

You see that the **Fixed_Variable** dimension and its two-dimension members have been added to the list of your model's dimensions.

Name	Reference	Type	UoM	DefaultValue	Formula
ATTRIBUTES	ATTRIBUTES				
Average Time to Expedite	Average Time to Exp	Numeric	Hours		
Completed Expedite Requests	Completed Expedite	Numeric	Completed Re		
Cost per Inspection	Cost per Inspection	Numeric	Dollars		Cost / "Num of Ins"
Fixed_Variable	FV	Dimension			
Fixed	F	Dimension Me			
Variable	V	Dimension Me			
Inspections Passed	I_P	Numeric	Units Passed		
Number of Inspections	Num of Ins	Numeric	Inspections		
Percent of Inspections Passed	Percent of Inspectio	Numeric	Percentage		"I_P" / "Num of Ins"
Manager	Manager	Text			

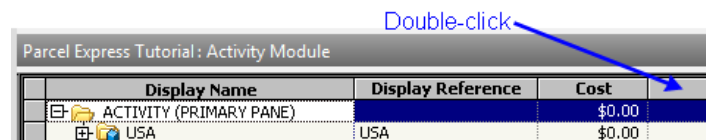
Create a Column Layout

Open the Column Layout Dialog

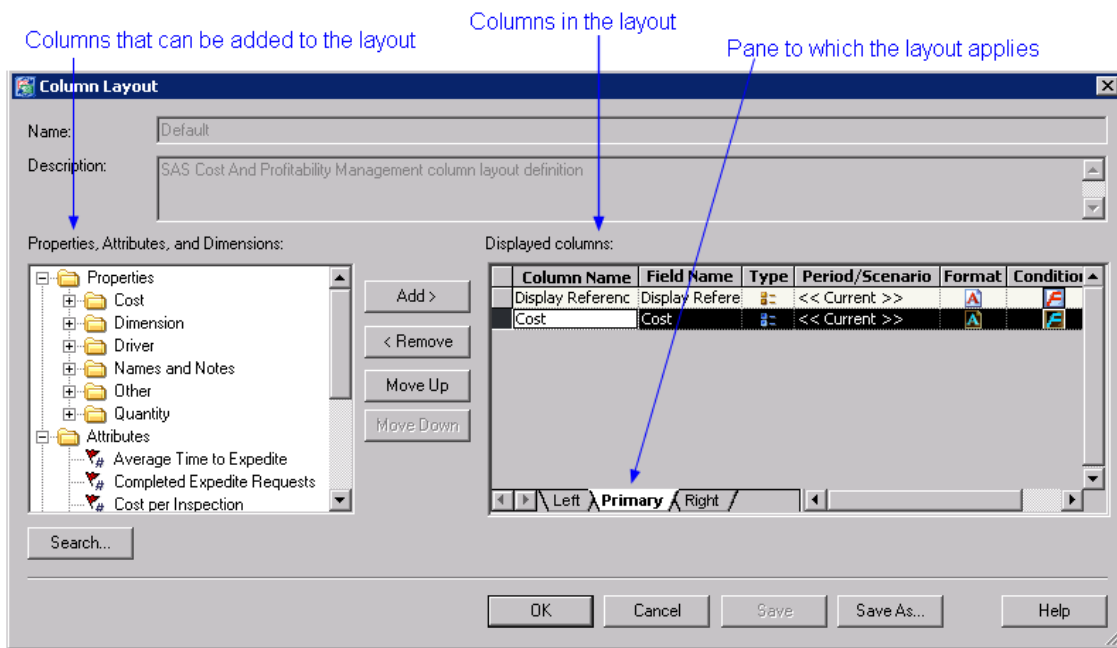
To view the attributes in the model, we will create a column layout named Cost Assignments to which are added columns for attributes.

1. Select **Model** ⇒ **Modules** ⇒ **Activity**.
2. Select **Model** ⇒ **Column Layout** ⇒ **Edit Columns**.

Note: You can also double-click the column header to open the Column Layout dialog box.



You see the Column Layout dialog box.



The columns that you see in the **Displayed columns** list are the columns for a specific pane. In the illustration, you see the column layout for the **Primary** pane.

Note: A column layout is a view of columns that already exist in tables in your model. Adding or removing a column from a column layout does not add or remove any property from the model

Add Attributes to the Layout

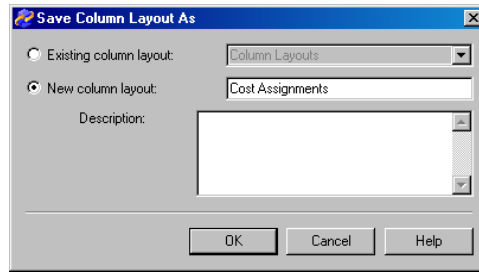
1. Verify that the **Primary** pane tab is selected.
2. Remove **Display Reference** from the **Displayed columns** list.

Removing this column from the layout will provide more screen space for columns that are relevant to making driver assignments.

3. From the **Properties, Attributes, and Dimensions** list, add the following two properties (both are under the **Attributes** folder):
 - Inspections Passed
 - Manager

Save the Layout

1. Click **Save As**.
You see the Save Column Layout As dialog box.



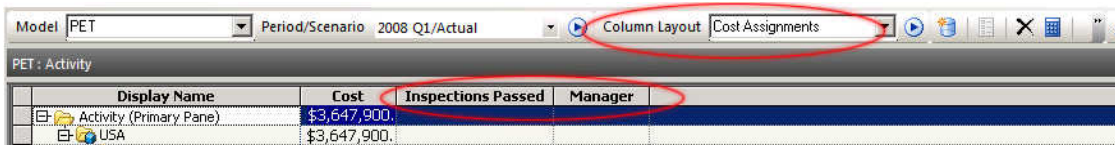
2. Verify that the **New column layout** option is selected, and then type **Cost Assignments**.

3. Click **OK** to close the Save Column Layout As dialog.

You see that the column layout **Name** has been changed to **Cost Assignments**.

4. Click **OK** to close the Column Layout dialog..

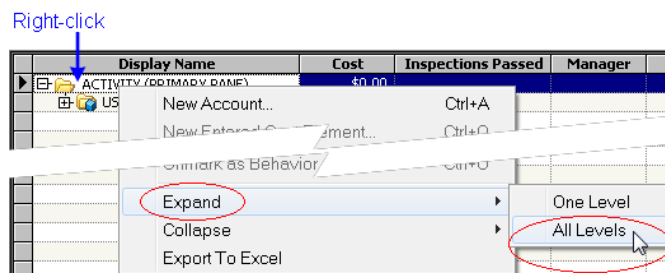
You see the changes that you made to the column layout. **Cost Assignments** is the active column layout, and **Inspections Passed** and **Manager** appear in the column layout list.



Entering Attribute Values

Now, you will enter attribute values.

1. Expand the Activity module by right-clicking the **Activity** row and selecting **Expand** ⇨ **All Levels**



2. In the **Inspections Passed** column for the **Beaverton x Inspect** account, type **43400**.

3. In the **Inspections Passed** column for the **Eugene x Inspect** account, type **1100**.

4. In the **Manager** column for the **Beaverton x Sort** account, type **Smith**.

5. In the **Manager** column for the **Eugene x Sort** account, type **Jones**.


	Display Name	Cost	Inspections Passed	Manager
[-]	ACTIVITY (PRIMARY PANE)	\$0.00		
[-]	USA	\$0.00		
[-]	Oregon	\$0.00		
	Beaverton	\$0.00		
	Personnel Intensive Activities	\$0.00		
	Local Collection	\$0.00		
	Local Processing	\$0.00		
	Sort	\$0.00		Smith
	Inspect	\$0.00	43,400.00	
	Regional Distribution	\$0.00		
	Eugene	\$0.00		
	Personnel Intensive Activities	\$0.00		
	Local Collection	\$0.00		
	Local Processing	\$0.00		
	Sort	\$0.00		
	Inspect	\$0.00	1,100.00	Jones
	Regional Distribution	\$0.00		

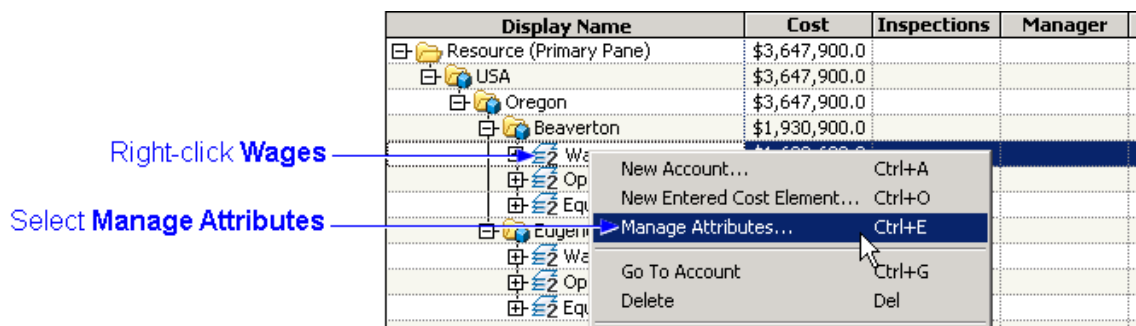
Applying Additional Attributes to Accounts

Apply one attribute

Having created the dimension attribute `Fixed_Variable` with its two dimension member attributes, `Fixed` and `Variable`, you can apply the dimension member attributes to accounts.

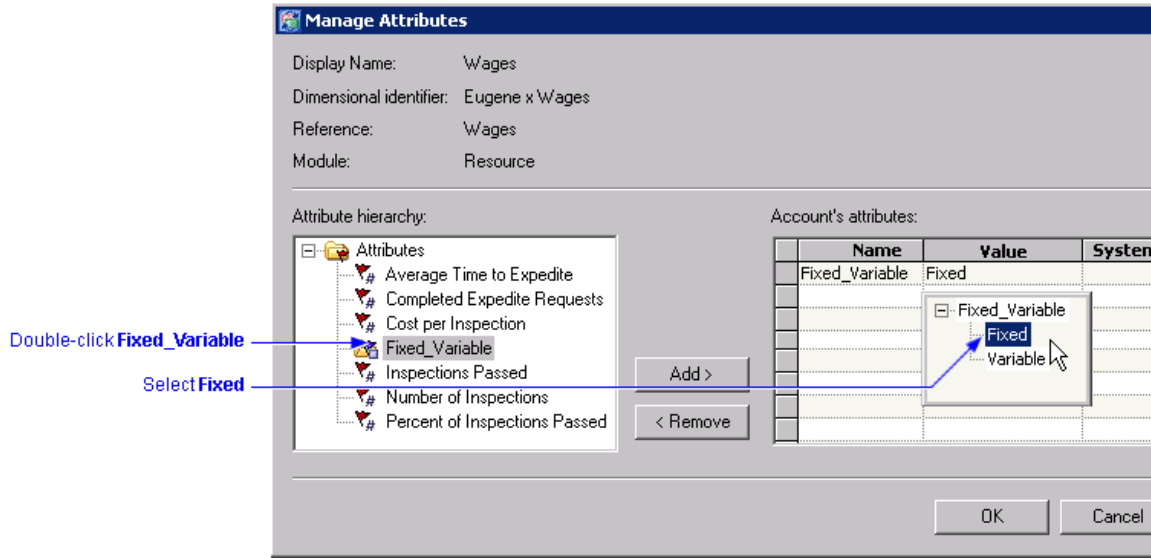
Note: You can attach attributes to accounts, but not to cost elements or to roll-up accounts.

1. Switch to the **Resources** page (remember that you can click the Select Module icon  on the toolbar).
2. Expand the Resource module by right-clicking the **Resource** row and selecting **Expand** ⇌ **All Levels**
3. Right-click the **Beaverton x Wages** account, and then select **Manage Attributes** from the pop-up menu.



The Manage Accounts dialog box opens.

4. From the Manage Accounts dialog box, double-click **Fixed_Variable** to add it to the list of the account's attributes. (Or, select **Fixed_Variable** and click **Add**.)
5. Select **Fixed** from the drop-down list of dimension member attributes.



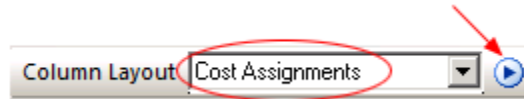
6. Click **OK** to apply the attribute **Fixed** to the **Wages** account.

The attribute is added to the account.

Add a Fixed_Variable column to the column layout

Before adding the Fixed or Variable attribute to additional accounts, let's add the Fixed_Variable attribute column to the layout so that we can add the attributes more easily and better see the results.

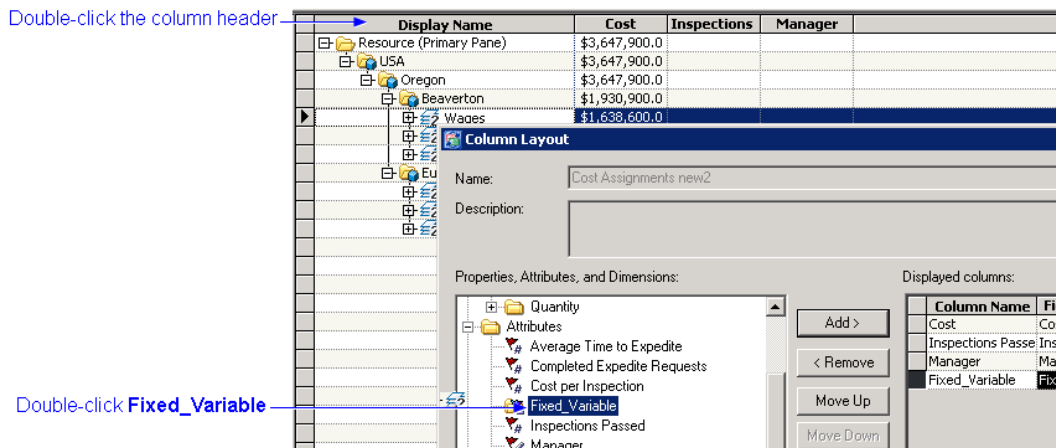
1. If it is not already active, activate the saved column layout, **Cost Assignments**, by selecting it from the drop-down list of column layouts and clicking the arrow button.



2. Double-click the column header (or, select **Model** ⇒ **Column Layout** ⇒ **Edit Columns**).

The Column Layout dialog box opens.

3. In the Column Layout dialog box, double-click **Fixed_Variable** (under the Attributes folder). (Or, select **Fixed_Variable** and click **Add**.)



4. Click **Save** to save the column layout.
5. Click **OK** to add the Fixed_Variable column to the column layout.

Display Name	Cost	Inspections	Manager	Fixed_Variable
Resource (Primary Pane)	\$3,647,900.0			
USA	\$3,647,900.0			
Oregon	\$3,647,900.0			
Beaverton	\$1,930,900.0			
Wages	\$1,638,600.0			Fixed
Operating Expenses	\$238,000.00			
Equipment Expenses	\$54,300.00			
Eugene	\$1,717,000.0			
Wages	\$1,408,000.0			
Operating Expenses	\$271,000.00			
Equipment Expenses	\$38,000.00			

Apply additional attributes to accounts

Now we can more easily apply additional **Fixed** and **Variable** attributes to accounts.

1. Select the **Beaverton x Operating Expenses** account.
2. From the menu in the **Fixed_Variable** column, select **Variable**.

Display Name	Cost	Inspections	Manager	Fixed_Variabl
Resource (Primary Pane)	\$3,647,900.0			
USA	\$3,647,900.0			
Oregon	\$3,647,900.0			
Beaverton	\$1,930,900.0			
Wages	\$1,638,600.0			Fixed
Operating Expenses	\$238,000.00			
Equipment Expenses	\$54,300.00			
Eugene	\$1,717,000.0			
Wages	\$1,408,000.0			
Operating Expenses	\$271,000.00			
Equipment Expenses	\$38,000.00			

3. Repeat the process to apply the following dimension member attributes to the following accounts:

Attribute	Account
Fixed	Eugene x Wages
Variable	Eugene x Operating Expenses

Note that it is not necessary to apply the attribute to all the resource accounts, as we are not applying it to the Equipment Expenses account.

Later, when we describe the SAS OLAP Analyzer, we will see that OLAP analysis allows, in this case, querying fixed-cost contributions versus variable-cost contributions. Dimension member attributes allow much of the functionality of real dimensions, without some of the overhead. In fact, they can provide a method of adding "dimensions" to a model, whereas the model itself cannot have dimensions added after the initial model definition.

Chapter 9

Create Drivers

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Overview

An important aspect of Cost and Profitability management is the understanding of how activities in an organization consume expenses and how products consume activities. These consumptions are governed by relevant drivers, which measure the frequency or intensity of the cost demands that are placed on resources and activities.

A driver distributes cost in an account to one or more destination accounts. The basic mechanism for distributing costs is by calculating three properties:

Driver Quantity Calculated (DrvQtyCalc)
the number of units going to each destination account

Driver Rate (DrvRate)
the cost per unit for any destination account

Driver Driven Cost (DrvDrvnCost)
the cost going to each destination account

It is calculated by multiplying DrvQtyCalc (number of units) times DrvRate (cost per unit)

There are four types of drivers:

Evenly Assigned
distributes equal cost to each destination account.

The system assigns a value of 1 to DrvQtyCalc for each assignment so that DrvDrvnCost is the same for each destination account.

Percentage
distributes a percentage of the total cost to each destination account.

You specify the percentage by specifying the DQF (Driver Quantity Fixed) for each assignment. During calculation, the system does the following:

1. assigns to DrvQtyCalc for each assignment the DQF (percentage) that you specify for that assignment
2. calculates DrvRate as the cost that is to be distributed to each destination account per percentage point
3. calculates DrvDrvnCost as cost per percentage point times the number of percentage points going to each destination account

Standard

uses the following formula to calculate DrvQtyCalc:

$$\text{DrvQtyCalc} = (\text{DQF} \times \text{DWF}) + (\text{DQV} \times \text{DWV} \times \text{Dest.TDQ})$$

where:

DQF	Driver Quantity Fixed represents the part of cost that is “pushed” by a source account to destination accounts, i.e., fixed costs.
DWF	Driver Weight Fixed allows you to quantify the relative importance of a fixed cost by giving it a weight.
DQV	Driver Quantity Variable represents the part of cost that is “pulled” by demand from destination accounts. When you use DQV, cost varies with demand.
DWV	Driver Weight Variable allows you to quantify the relative importance of a variable cost by giving it a weight.
Dest.TDQ	Total Driver Quantity on a destination account represents how much is going out of that destination account to other accounts. That amount is what is demanded of the source account by that destination account. The amount, Dest.TDQ, is calculated by the system based on values that you specify for the destination account.

The standard driver is very flexible because it allows you to consider numerous factors in driving costs through the model. In the Parcel Express tutorial you will create drivers that use DQF and one driver that uses DQV. You will not use any weights, DWF or DWV, in this tutorial.

Calculated

A calculated driver is a variety of standard driver. It is one that, instead of using the standard formula for calculating DrvQtyCalc, uses a formula—referred to as a Driver Formula—that you specify as a user. The formula can use any number of properties and attributes and can be as simple or as complicated as you want.

The first step in assigning resource costs to activities and activity costs to cost objects is building drivers. In this tutorial you will create the following drivers:

Driver Name	Driver Type	Purpose
FTEs	Standard	Tracks the cost of wages from the resource module to the activity module.
Dollars	Standard	Tracks the cost of operating expenses from the resource module to the activity module.
Number of Customer Complaints	Standard	Tracks the number of customer complaints per channel.

Driver Name	Driver Type	Purpose
Number of Packages	Standard	Tracks the number of packages that were collected, sorted, and distributed.
Number of Expedite Requests	Calculated	Tracks the packages that are expedited regionally.

Create a Standard Driver

To create a Standard driver:

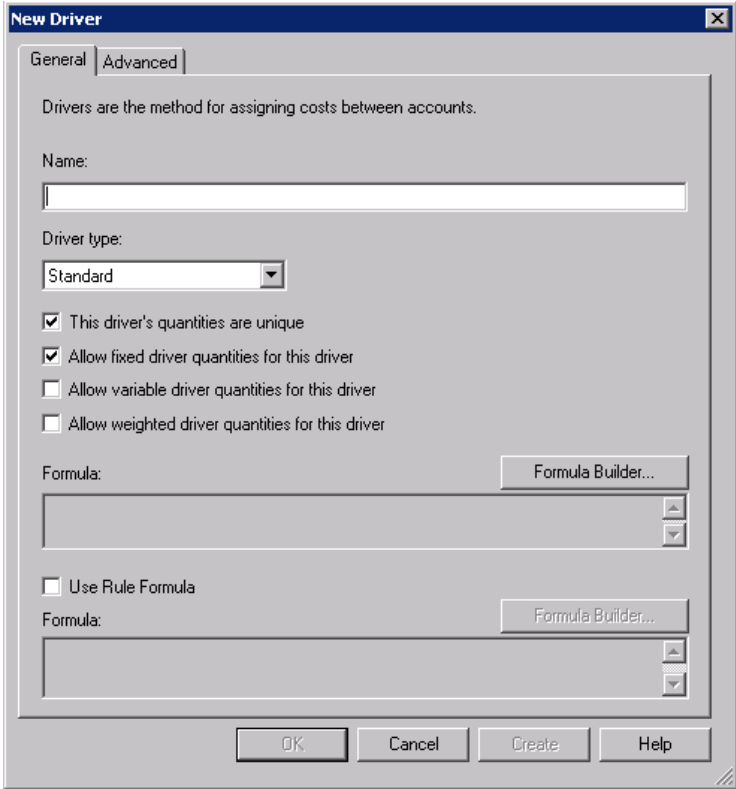
1. Select **Model** ⇒ **Drivers Page**.

You see the following list of system-defined drivers:

DrvName	DrvType	UniqD	UseFixQty	UseVarQty	UseWeight	UECostAlloc	Formula	Seq	FixedDQOverride	VariableDQOverrid
DRIVERS										
Evenly Assigned	Evenly Assign	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		1		
Percentage	Percentage	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		1		
Standard	Standard	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		1		

2. Select **Edit** ⇒ **New Driver**. (Or, right-click **Drivers** and select **New Driver**.)

You see the New Driver dialog box.



3. For **Name**, type **FTEs**.
4. Verify that the **Driver type** is **Standard**.

5. Verify that the **This driver's quantities are unique** option is checked.
6. Verify that **Allow fixed driver quantities for this driver** is checked.
7. Click **OK**.

You see that **FTEs** has been added to the list of drivers.

Create Additional Standard Drivers

Use the procedure that you have learned for creating a driver to create the following additional Standard drivers

Driver
Dollars
Number of Customer Complaints
Number of Packages

Select the following options for **Dollars** and **Number of Customer Complaints**:

<input checked="" type="checkbox"/> This driver's quantities are unique
<input checked="" type="checkbox"/> Allow fixed driver quantities for this driver
<input type="checkbox"/> Allow variable driver quantities for this driver
<input type="checkbox"/> Allow weighted driver quantities for this driver

Select the following options for the **Number of Packages** driver:

<input checked="" type="checkbox"/> This driver's quantities are unique
<input checked="" type="checkbox"/> Allow fixed driver quantities for this driver
<input checked="" type="checkbox"/> Allow variable driver quantities for this driver
<input type="checkbox"/> Allow weighted driver quantities for this driver

Create a Calculated Driver

The Number of Expedite Requests is a *calculated driver*. A calculated driver is a variety of Standard driver. It is one that, instead of using the standard formula for calculating `DrvQtyCalc`, uses a formula—referred to as a Driver Formula—that you specify as a user. Calculated drivers expand system capability, enabling you to define cost drivers that are unique to your business. You define these calculated drivers with formulas that you create using the properties and attributes that satisfy your needs. The calculated

driver in this tutorial will use attributes that you have just created and numeric properties generated by the system.

Driver	Formula
Number of Expedite Requests	(“Average Time to Expedite” * “Completed Expedite Requests”) / DriverQuantityFixed

1. Add **Number of Expedite Requests** as a calculated driver. For **Driver type**, select **Standard**.
2. Verify that the **This driver's quantities are unique** option is checked.
3. Verify that **Allow fixed driver quantities for this driver** is checked.

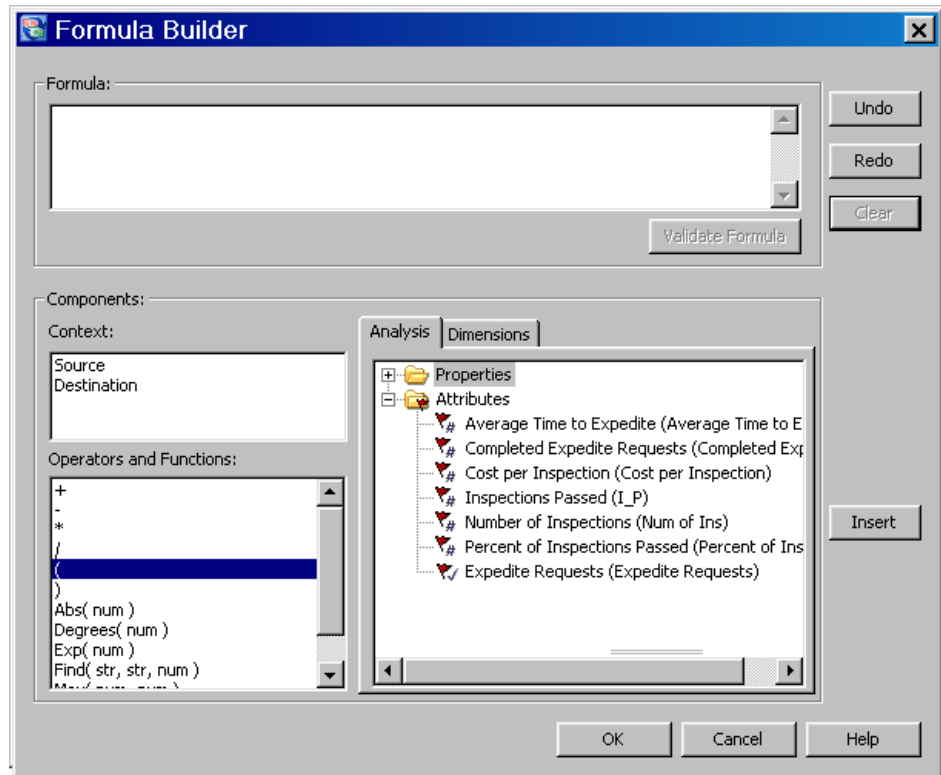
The screenshot shows the 'New Driver' dialog box with the following details:

- Title Bar:** New Driver
- Tabs:** General (selected), Advanced
- Description:** Drivers are the method for assigning costs between accounts.
- Name:** Number of Expedite Requests
- Driver type:** Standard
- Options:**
 - This driver's quantities are unique
 - Allow fixed driver quantities for this driver
 - Allow variable driver quantities for this driver
 - Allow weighted driver quantities for this driver
- Formula:** (Empty text box) **Formula Builder...** (button circled in red)
- Use Rule Formula:** Use Rule Formula
- Formula:** (Empty text box) **Formula Builder...** (button)
- Buttons:** OK, Cancel, Apply, Help

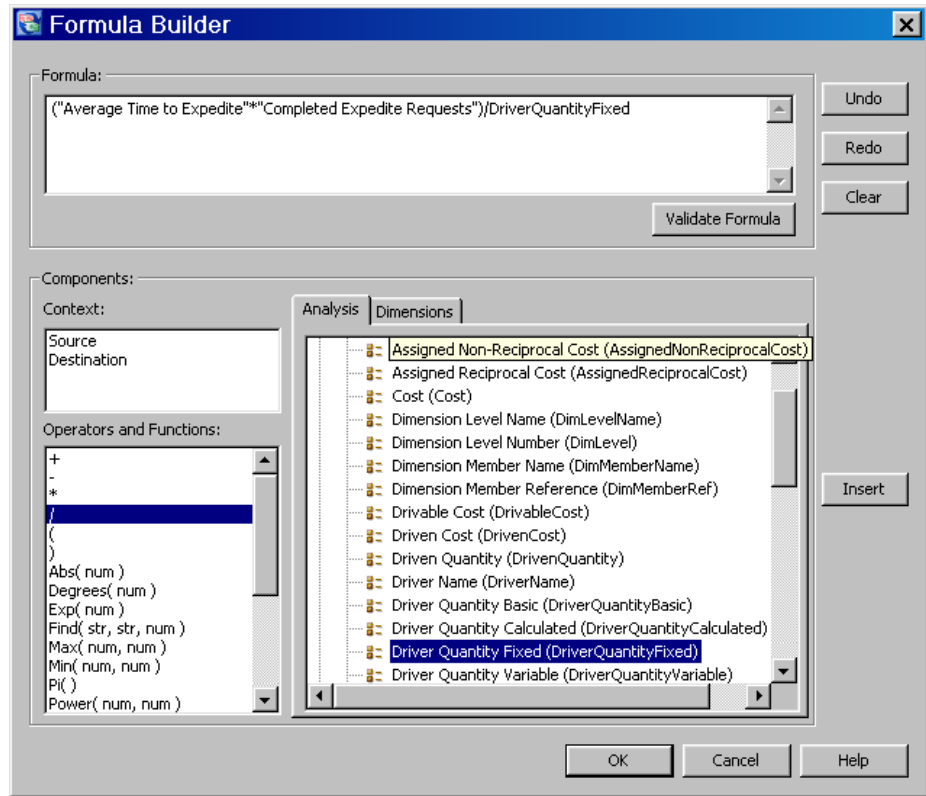
4. Click **Formula Builder**.

You see the Formula Builder dialog box.

Note: In the following instructions, you can choose an element of the formula either by double-clicking the element, or by selecting it and clicking **Insert**.



5. Choose (from the **Operators** list.
6. Chose **Average Time to Expedite** from the **Attributes** list.
7. Choose * from the **Operators** list.
8. Choose **Completed Expedite Requests** as the multiplier from the **Attributes** list.
9. Choose) to close the set.
10. Choose / from the Operators list.
11. Choose **DriverQuantityFixed** from the Numeric properties list.
 DriverQuantityFixed is the user-entered fixed quantity that flows from one account to another. You can change this value only on assigned cost elements with a driver that allows fixed driver quantities.
12. Click **Test** to verify the syntax of the formula.
13. Click **OK** to accept the formula.
14. Click **OK** to create the driver.



Summary

Review the list of drivers.

DrvName	DrvType	UniqD	UseFixQty	UseVarQ	UseWeight	UECostAll	Formula
DRIVERS							
Evenly Assigned	Evenly Assig	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Percentage	Percentage	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Standard	Standard	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
FTEs	Standard	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Dollars	Standard	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Number of Complaints	Standard	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Packages	Standard	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Number of Expedite Requests	Standard	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	("Average Time to Expedite"*"Completed Expedite Requests")/DriverQuantityFixed

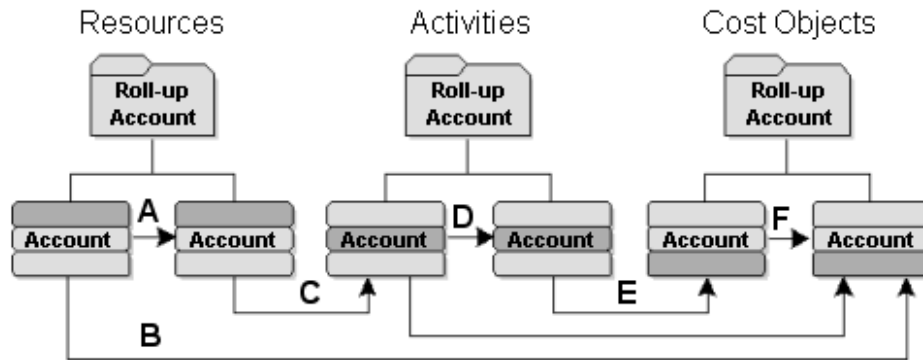
Chapter 10

Make Assignments

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Overview

An assignment links source accounts to destination accounts. Costs flow along this path from resources to activities to cost objects—from expenses to activities to products, services, or customers. A source account is the source of a cost assignment. A destination account receives the results of a cost assignment.



As shown, the possible assignments between accounts, as indicated by letters, are:

- A** resource to resource
- B** resource to cost object
- C** resource to activity
- D** activity to activity
- E** activity to cost object
- F** cost object to cost object

Modify the Column Layout

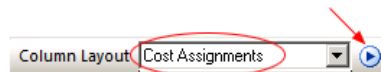
Overview

In a previous section, you created a column layout named Cost Assignments. In the following sections, you will add additional columns to the layout.

While building the model structure, you have been working in the single pane view. To make assignments, you need to open an assignments pane. When the primary pane and an assignments pane are open, you can see source accounts, destination accounts, assignments, driver names, and driver quantities. To assign resource costs to activity accounts, you will open the right assignments pane.

Open the Right Assignments Pane

1. Select **Model** ⇒ **Modules** ⇒ **Resource**.
2. If it is not already active, activate the **Cost Assignments** saved column layout.



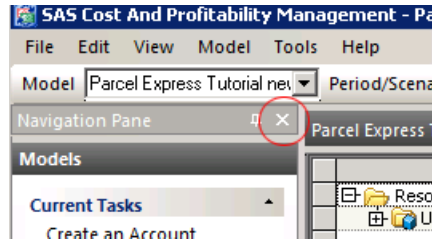
3. In the resource module, select **Model** ⇒ **Assignments** ⇒ **Show right assignments pane**.

You see the right assignments pane (to the right of the resource module primary pane)

TIP You can split the assignments panes simply by clicking the Show Left and Right Assignments Panes button.



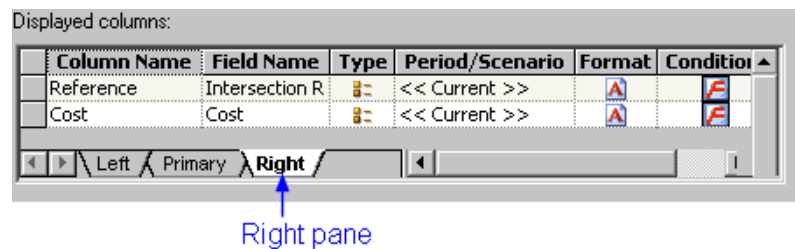
TIP You might want to hide the Navigation Pane on the left side of the window to display more data. To do this, click the **x** in the upper-right corner of the pane. To re-open the Navigation Pane, select **View** ⇒ **Navigation Pane**.



Specify Columns for the Right Pane

1. Select **Model** ⇒ **Column Layout** ⇒ **Edit Columns** (or double-click the column header).

The columns that you see in the **Displayed columns** list are for a specific pane. Because you are currently viewing the right pane, you see the column layout for that pane. The default columns are Reference, and Cost.

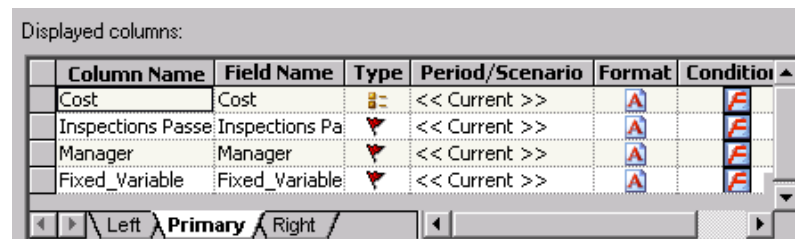


2. Remove the **Reference** column from the **Displayed columns** list.
3. Add the **Driver Quantity Fixed (DQF)** property to the **Displayed columns** list.

Specify Columns for the Primary Pane

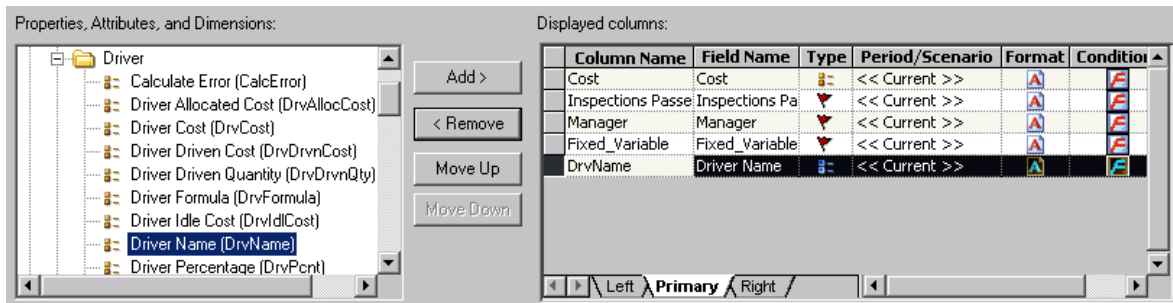
1. Select the **Primary** pane

You can see the columns that you previously added to the primary pane of the Cost Assignments layout.



2. In **Drivers**, select **Driver Name (DrvName)**.

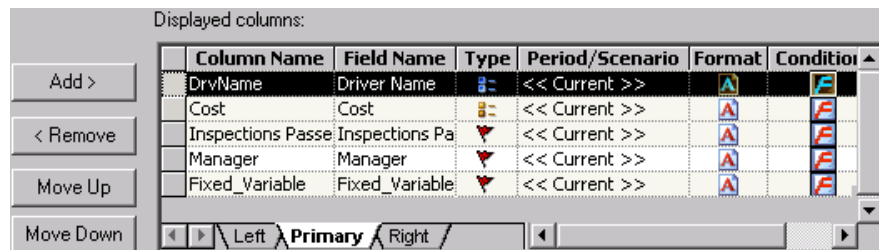
TIP To find **Driver Name (DrvName)**, scroll down to **Driver** and expand it.



3. Click **Add**.

You see that **Driver Name (DrvName)** has been added to the **Displayed columns** list.

4. Click **Move** to move the **DrvName** column to the top of the list.



Save the Column Layout

1. Click **Save**.
2. Click **OK** to dismiss the Column Layout dialog box.

In the module view, you see the changes that you made to the Cost Assignments column layout.

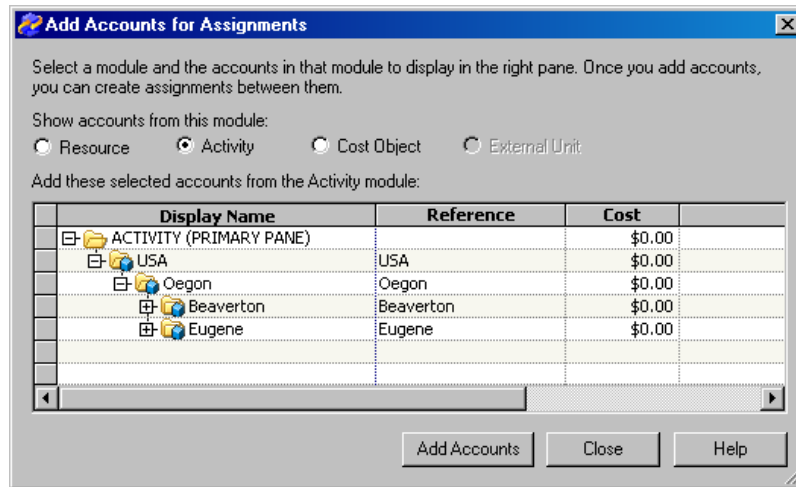
Make Assignments from Resources to Activities

Add Accounts for Assignments

The first assignments that you make will be inter-modular; that is, assignments from the resource module to the activity module.

1. Select **Model** ⇒ **Assignments** ⇒ **Add Accounts in Right Pane** (or click the Add accounts button ).

You see the Add Accounts for Assignments dialog box.



2. Verify that the **Activity** module is selected.
3. Expand **Activity** so that you can see the **Beaverton** and **Eugene** roll-up accounts.
4. Select the **Beaverton** roll-up account, and then click **Add Accounts**.
 You see that the Beaverton activity accounts have been added to the right pane.
5. Add the **Eugene** activity accounts to the right pane.
6. Click **Close**.

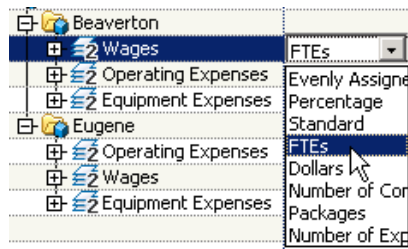
Note: To avoid mixing up assignments between Beaverton resources and Eugene accounts (and vice versa), consider adding only the Beaverton accounts first to the right pane. Next, make the assignments. Then, do the same for Eugene.

Note: Clearing accounts from the right pane does not delete assignments from your model. It removes the accounts from view.

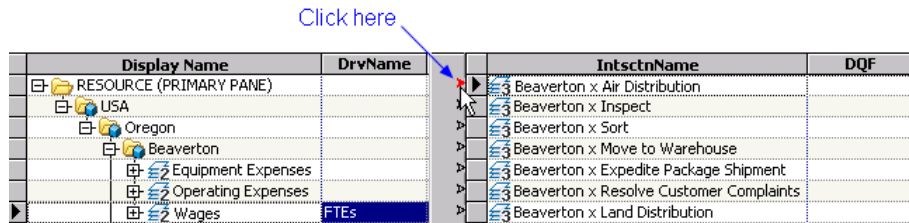
Make Assignments

Now that the intended destination accounts are displayed, you can make assignments from resource accounts to activity accounts.

1. In the primary pane, expand **Resource** to display all of its accounts.
TIP Select **View** ⇒ **Expand** to display subfolders. In this tutorial, you do not need to expand the module hierarchies to display the cost elements of each account. If the cost elements are displayed, collapse the hierarchy to hide them.
2. Select the **Wages** account under **Beaverton**.
 You see that arrows appear next to each account in the right pane. These arrows indicate that you can make assignments from Beaverton Wages to any of the listed accounts. Logically, the cost of wages in Beaverton would be assigned only to Beaverton activities, not Eugene activities.
3. In the **Wages** row under **Beaverton** click on the cell in the **DrvName** column.
 You see a list of available drivers, including system-defined and user-defined drivers.
4. Select **FTEs**.



5. Make assignments to all of the Beaverton accounts in the right pane by clicking the arrow next to each account.



Note: You can use the hotkey F7 to create assignments between the selected account and all of the accounts in the other assignments pane.

You see that a line now connects Beaverton Wages to each of the arrows that you clicked.

6. Type the following values in the **DQF** column in the right pane (the order of accounts might be different from the order that is shown; be careful to assign values to the correct accounts):

DQF Column

IntsctnName	Cost	DQF
Beaverton x Air Distribution	\$0.00	9.00
Beaverton x Inspect	\$0.00	3.00
Beaverton x Sort	\$0.00	4.00
Beaverton x Move to Warehouse	\$0.00	8.00
Beaverton x Expedite Package Shipment	\$0.00	2.00
Beaverton x Resolve Customer Complaints	\$0.00	3.00
Beaverton x Land Distribution	\$0.00	12.00

Note: The total cost of Beaverton Wages will be consumed by these seven activity accounts according to the number of FTEs that you have entered. SAS Cost and Profitability Management performs the math for you when you calculate costs in a later lesson.

After making the assignments, your model should look like this (the order of accounts might differ):

Display Name	DrvName	IntsctnName	DQF
RESOURCE (PRIMARY PANE)			
USA			
Oregon			
Beaverton			
Equipment Expenses			
Operating Expenses			
Wages	FTEs	Beaverton x Air Distribution	9.00
		Beaverton x Inspect	3.00
		Beaverton x Sort	4.00
		Beaverton x Move to Warehouse	8.00
		Beaverton x Expedite Package Shipment	2.00
		Beaverton x Resolve Customer Complaints	3.00
		Beaverton x Land Distribution	12.00

Make Other Assignments

Note: Remember that when making assignments, you must first select a driver before you can select a destination account and assign a numeric value to the account.

1. In the primary pane, select **Operating Expenses** for **Beaverton** and make the following assignments:

Resource Account	Driver	Activity Account	DQF
Beaverton x	Dollars	Beaverton x	6,500.00
Operating Expenses		Resolve Customer Complaints	
		Beaverton x	8,000.00
		Expedite Package Shipments	
		Beaverton x	15,000.00
		Move to Warehouse	
		Beaverton x	23,000.00
		Sort	
		Beaverton x	54,000.00
		Inspect	
		Beaverton x	83,000.00
		Air Distribution	
		Beaverton x	56,500.00
		Land Distribution	

After making the assignments, you model should look like the following (again the order of accounts might be different):

Display Name	DrvName	IntsctnName	DQF
RESOURCE (PRIMARY PANE)		Beaverton x Resolve Customer Complaints	6,500.00
USA		Beaverton x Expedite Package Shipments	8,000.00
Oregon		Beaverton x Move to Warehouse	15,000.00
Beaverton		Beaverton x Sort	23,000.00
Wages	FTEs	Beaverton x Inspect	54,000.00
Operating Expenses	Dollars	Beaverton x Air Distribution	83,000.00
Equipment Expenses	Percentage	Beaverton x Land Distribution	56,500.00

2. In the primary pane, select **Equipment Expenses** for **Beaverton** and make the following assignments:

Resource Account	Driver	Activity Account	DQF
Beaverton x Equipment Expenses	Percentage	Beaverton x Resolve Customer Complaints	5
		Beaverton x Expedite Package Shipments	3
		Beaverton x Move to Warehouse	7
		Beaverton x Sort	20
		Beaverton x Inspect	25
		Beaverton x Air Distribution	25
		Beaverton x Land Distribution	15

Note: The total equals 100 because 100% of equipment expenses are used by Parcel Express.

After making the assignments, you model should look like the following (again the order of accounts might be different):

Display Name	DrvName	IntsctnName	DQF
RESOURCE (PRIMARY PANE)		Beaverton x Land Distribution	15.00
USA		Beaverton x Air Distribution	25.00
Oregon		Beaverton x Inspect	25.00
Beaverton		Beaverton x Sort	20.00
Wages	FTEs	Beaverton x Move to Warehouse	7.00
Operating Expenses	Dollars	Beaverton x Expedite Package Shipment	3.00
Equipment Expenses	Percentage	Beaverton x Resolve Customer Complaints	5.00

- In the primary pane, select **Wages** for **Eugene** and make the following assignments:

Resource Account	Driver	Activity Account	DQF
Eugene x Wages	FTEs	Eugene x Resolve Customer Complaints	2
		Eugene x Expedite Package Shipments	1
		Eugene x Move to Warehouse	5
		Eugene x Sort	3
		Eugene x Inspect	2
		Eugene x Land Distribution	12

After making the assignments, you model should look like the following:

Display Name	DrvName	IntsctnName	DQF
RESOURCE (PRIMARY PANE)			
USA			
Oregon			
Beaverton			
Eugene			
Wages	FTEs	Eugene x Inspect	2.00
Operating Expenses	Dollars	Eugene x Sort	3.00
Equipment Expenses	Percentage	Eugene x Move to Warehouse	5.00
		Eugene x Expedite Package Shipment	1.00
		Eugene x Resolve Customer Complaints	2.00
		Eugene x Land Distribution	12.00

- In the primary pane, select **Operating Expenses** for **Eugene** and make the following assignments:

Resource Account	Driver	Activity Account	DQF
Eugene x	Dollars	Eugene x	7,700.00
Operating Expenses		Resolve Customer Complaints	
		Eugene x	9,000.00
		Expedite Package Shipments	
		Eugene x	69,000.00
		Move to Warehouse	
		Eugene x	38,000.00
		Sort	
		Eugene x	58,300.00
		Inspect	
		Eugene x	98,000.00
		Land Distribution	

After making the assignments, your model should look like the following:

Display Name	DrvName	IntsctnName	DQF
RESOURCE (PRIMARY PANE)		Eugene x Inspect	58,300.00
USA		Eugene x Sort	38,000.00
Oregon		Eugene x Move to Warehouse	69,000.00
Beaverton		Eugene x Expedite Package Shipment	9,000.00
Eugene		Eugene x Resolve Customer Complaints	7,700.00
Wages	FTEs	Eugene x Land Distribution	98,000.00
Operating Expenses	Dollars		
Equipment Expenses	Percentage		

- In the primary pane, select **Equipment Expenses** for **Eugene** and make the following assignments:

Resource Account	Driver	Activity Account	DQF
Eugene x Equipment Expenses	Percentage	Eugene x Resolve Customer Complaints	5
		Eugene x Expedite Package Shipments	2
		Eugene x Move to Warehouse	8
		Eugene x Sort	20
		Eugene x Inspect	25
		Eugene x Land Distribution	40

After making the assignments, your model should look like the following:

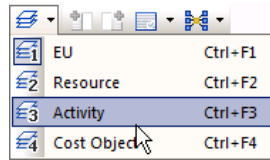
Display Name	DrvName	IntsctnName	DQF
RESOURCE (PRIMARY PANE)		Eugene x Inspect	25.00
USA		Eugene x Sort	20.00
Oregon		Eugene x Move to Warehouse	8.00
Beaverton		Eugene x Expedite Package Shipment	2.00
Eugene		Eugene x Resolve Customer Complaints	5.00
Wages	FTEs	Eugene x Land Distribution	40.00
Operating Expenses	Dollars		
Equipment Expenses	Percentage		

Make Assignments from Activities to Other Activities

The costs of some activities flow to other activities. For example, at Parcel Express, when packages are moved to a warehouse, they must then be sorted or inspected. Therefore, in the Parcel Express Tutorial model, the costs of the Move to Warehouse activity flow to the Sort and Inspect activities. These are known as intra-modular assignments.


Add Accounts for Assignments

1. Select **Model** ⇒ **Modules** ⇒ **Activity** (or click the Select Module button).



2. If the **Cost Assignments** layout is not already active, select it from the **Column Layout** list, and then click the arrow



3. If it is not already open, open the right assignments pane by selecting **Model** ⇒ **Assignments** ⇒ **Show right assignments pane** (or by clicking the Assignments pane button ).

4. Open the Add Accounts for Assignments dialog box by selecting **Model** ⇒ **Assignments** ⇒ **Add Accounts in Right Pane** (or by clicking the Add accounts button ).

5. Select the **Activity** module.

6. Add the following accounts to the right pane:

TIP To see these accounts, expand the hierarchy in the Add Accounts for Assignments dialog box. You can add the accounts individually or select them all at once by holding down the CTRL key, and then clicking **Add Accounts**.

Activity Account
Beaverton x Inspect
Beaverton x Sort
Beaverton x Air Distribution
Beaverton x Land Distribution
Eugene x Inspect
Eugene x Sort
Eugene x Land Distribution

7. Click **Close**.

Make assignments

1. In the primary pane, select **Move to Warehouse** for **Beaverton** and make the following assignments:

Activity Account (Primary Pane)	Driver	Activity Account (Right Pane)	DQF
Beaverton x Move to Warehouse	Number of Packages	Beaverton x Sort	203,000
		Beaverton x Inspect	50,000

After making the assignments, your model should look like the following:

Display Name	DrvName	IntsctnName	DQF
ACTIVITY (PRIMARY PANE)		Beaverton x Sort	203,000.00
USA		Beaverton x Inspect	50,000.00
Oregon			
Beaverton			
Personnel Intensive Activities			
Resolve Customer Complaints			
Expedite Package Shipment			
Local Collection			
Move to Warehouse	Number of Packages		

- In the primary pane, select **Inspect** for **Beaverton** and make the following assignments:

Activity Account (Primary Pane)	Driver	Activity Account (Right Pane)	DQF
Beaverton x Inspect	Number of Packages	Beaverton x Sort	44,000

After making the assignments, you model should look like the following:

Display Name	DrvName	IntsctnName	DQF
ACTIVITY (PRIMARY PANE)		Beaverton x Sort	44,000.00
USA			
Oregon			
Beaverton			
Personnel Intensive Activities			
Resolve Customer Complaints			
Expedite Package Shipment			
Local Collection			
Move to Warehouse	Number of Packages		
Local Processing			
Sort	Number of Packages		
Inspect	Number of Packages		

- In the primary pane, select **Sort** for **Beaverton** and make the following assignments:

Activity Account (Primary Pane)	Driver	Activity Account (Right Pane)	DQF
Beaverton x Sort	Number of Packages	Beaverton x Land Distribution	107,000
		Beaverton x Air Distribution	140,000

After making the assignments, you model should look like the following:

Display Name	DrvName	IntsctnName	DQF
ACTIVITY (PRIMARY PANE)			
USA			
Oregon			
Beaverton			
Personnel Intensive Activities			
Resolve Customer Complaints			
Expedite Package Shipment			
Local Collection			
Move to Warehouse	Number of Packages		
Local Processing			
Sort	Number of Packages		
Inspect	Number of Packages		
		Beaverton x Air Distrib	140,000.00
		Beaverton x Land Distri	107,000.00

4. In the primary pane, select **Move to Warehouse** for **Eugene** and make the following assignments:

Activity Account (Primary Pane)	Driver	Activity Account (Right Pane)	DQF
Eugene x	Number of Packages	Eugene x Sort	117,000
Move to Warehouse		Eugene x Inspect	18,000

After making the assignments, your model should look like the following:

Display Name	DrvName	IntsctnName	DQF
ACTIVITY (PRIMARY PANE)			
USA			
Oregon			
Beaverton			
Eugene			
Personnel Intensive Activities			
Resolve Customer Complaints			
Expedite Package Shipment			
Local Collection			
Move to Warehouse	Number of Packages		
		Eugene x Sort	117,000.00
		Eugene x Inspect	18,000.00

5. In the primary pane, select **Inspect** for **Eugene** and make the following assignments:

Activity Account (Primary Pane)	Driver	Activity Account (Right Pane)	DQF
Eugene x Inspect	Number of Packages	Eugene x Sort	16,000

After making the assignments, your model should look like the following:

Display Name	DrvName	IntsctnName	DQF
ACTIVITY (PRIMARY PANE)			
USA			
Oregon			
Beaverton			
Eugene			
Personnel Intensive Activities			
Resolve Customer Complaints			
Expedite Package Shipment			
Local Collection			
Move to Warehouse	Number of Packages		
Local Processing			
Sort	Number of Packages		
Inspect	Number of Packages		
		Eugene x Sort	16,000.00

6. In the primary pane, select **Sort** for **Eugene** and make the following assignments:

Activity Account (Primary Pane)	Driver	Activity Account (Right Pane)	DQF
Eugene x Sort	Number of Packages	Eugene x Land Distribution	133,000

After making the assignments, your model should look like the following:

Display Name	DrvName	IntsctnName	DQF
ACTIVITY (PRIMARY PANE)		Eugene x Land Distribu	133,000.00
USA			
Oregon			
Beaverton			
Eugene			
Personnel Intensive Activities			
Resolve Customer Complaints			
Expedite Package Shipment			
Local Collection			
Move to Warehouse	Number of Packages		
Local Processing			
Sort	Number of Packages		
Inspect	Number of Packages		

Make Assignments from Activities to Cost Objects

Add Accounts for Assignments

- If there are accounts in the right pane, clear the accounts as follows:
 - Select the highest branch of the **Activity** hierarchy in the primary pane.
 - Select **Model** ⇒ **Assignments** ⇒ **Clear Right**.

You see that the right pane has been cleared of accounts. This does not delete the assignments it only removes them from view.

- Open the **Add Accounts for Assignments** dialog box.
- Verify that the **Cost Object** module is selected.
- Add all of the **Cost Object** accounts to the right pane.

Note: To avoid mixing up activities and cost objects from Beaverton and Eugene, consider first adding only the Beaverton accounts and making assignments to those accounts. Then, clear the right pane. And then, add all of the Eugene accounts and make assignments. Also, note that clearing accounts from a pane does not delete assignments from your model. It removes the accounts from view temporarily.

- Click **Close**.

Make Assignments for Beaverton

- In the primary pane, select **Resolve Customer Complaints** for **Beaverton** and make the following assignments:

Activity Account	Driver	Cost Object Account for Beaverton	DQF
Beaverton x Resolve Customer Complaints	Number of Customer Complaints	Commercial Pick Up x No <Products and Services>	25
		Walk In x No <Products and Services>	85
		Drop Box x No <Products and Services>	15

After making the assignments, your model should look like the following:

Display Name	DrvName	IntsctnName	DQF
ACTIVITY (PRIMARY PANE)			
USA			
Oregon			
Beaverton			
Personnel Intensive Activities			
Resolve Customer Complaints	Number of Customer Complaints	Beaverton x Commercial Pick Up x No <Products and Services>	25.00
Expedite Package Shipment		Beaverton x Walk In x No <Products and Services>	85.00
		Beaverton x Drop Box x No <Products and Services>	15.00

- In the primary pane, select **Expedite Package Shipments** for **Beaverton** and make the following assignments:

Activity Account	Driver	Cost Object Account for Beaverton	DQF
Beaverton x Expedite Package Shipments	Number of Expedite Requests	No <Channel> x Standard Ground	3,000
		No <Channel> x Overnight Express	26,000
		No <Channel> x 2nd Day Guaranteed	15,000

After making the assignments, your model should look like the following:

Display Name	DrvName	IntsctnName	DQF
ACTIVITY (PRIMARY PANE)			
USA			
Oregon			
Beaverton			
Personnel Intensive Activities			
Resolve Customer Complaints	Number of Customer Complaints	Beaverton x No <Channel> x Standard Ground	3,000.00
Expedite Package Shipment	Number of Expedite Requests	Beaverton x No <Channel> x Overnight Express	26,000.00
		Beaverton x No <Channel> x 2nd Day Guaranteed	15,000.00

- In the primary pane, select **Inspect** for **Beaverton** and create the following assignments:

Activity Account	Driver	Cost Object Account for Beaverton	DQF
Beaverton x Inspect	Number of Packages	No <Channel> x Standard Ground	500
		No <Channel> x Overnight Express	4,500
		No <Channel> x 2nd Day Guaranteed	1,000

After making the assignments, your model should look like the following:

Display Name	DrvName	IntsctnName	DQF
ACTIVITY (PRIMARY PANE)		Beaverton x Sort	44,000.00
USA		Beaverton x No <Channel> x Standard Ground	500.00
Oregon		Beaverton x No <Channel> x Overnight Express	4,500.00
Beaverton		Beaverton x No <Channel> x 2nd Day Guaranteed	1,000.00
Personnel Intensive Activities			
Resolve Customer Complaints	Number of Customer Complaints		
Expedite Package Shipment			
Local Collection			
Move to Warehouse	Number of Packages		
Local Processing			
Sort	Number of Packages		
Inspect	Number of Packages		

You can notice that in addition to the assignments to three Cost Activity accounts, there is an additional assignment to the **Beaverton x Sort** Activity account.

- In the primary pane, select **Air Distribution** for **Beaverton** and make the following assignments:

Activity Account	Driver	Cost Object Account for Beaverton	DQF
Beaverton x	Number of Packages	No <Channel> x Standard Ground	50,000
Air Distribution		No <Channel> x Overnight Express	65,000
		No <Channel> x 2nd Day Guaranteed	25,000

After making the assignments, your model should look like the following:

Display Name	DrvName	IntsctnName	DQF
ACTIVITY (PRIMARY PANE)		Beaverton x No <Channel> x Standard Ground	50,000.00
USA		Beaverton x No <Channel> x Overnight Express	65,000.00
Oregon		Beaverton x No <Channel> x 2nd Day Guaranteed	25,000.00
Beaverton			
Personnel Intensive Activities			
Resolve Customer Complaints	Number of Customer Complaints		
Expedite Package Shipment			
Local Collection			
Move to Warehouse	Number of Packages		
Local Processing			
Sort	Number of Packages		
Inspect	Number of Packages		
Regional Distribution			
Air Distribution	Number of Packages		
Land Distribution	Number of Packages		

- In the primary pane, select **Land Distribution** for **Beaverton** and make the following assignments:

Activity Account	Driver	Cost Object Account for Beaverton	DQF
Beaverton x	Number of Packages	No <Channel> x Standard Ground	67,000
Land Distribution		No <Channel> x Overnight Express	15,000
		No <Channel> x 2nd Day Guaranteed	25,000

After making the assignments, your model should look like the following:

Display Name	DrvName	IntsctnName	DQF
ACTIVITY (PRIMARY PANE)			
USA			
Oregon			
Beaverton			
Personnel Intensive Activities			
Resolve Customer Complaints	Number of Customer Complaints	Beaverton x No <Channel> x Standard Ground	67,000.00
Expedite Package Shipment		Beaverton x No <Channel> x Overnight Express	15,000.00
Local Collection		Beaverton x No <Channel> x 2nd Day Guaranteed	25,000.00
Move to Warehouse	Number of Packages		
Local Processing			
Sort	Number of Packages		
Inspect	Number of Packages		
Regional Distribution			
Air Distribution	Number of Packages		
Land Distribution	Number of Packages		

Make Assignments for Eugene

- In the primary pane, select **Resolve Customer Complaints** for **Eugene** and make the following assignments:

Activity Account	Driver	Cost Object Account for Eugene	DQF
Eugene x Resolve Customer Complaints	Number of Customer Complaints	Commercial Pick Up x No <Products and Services>	10
		Walk In x No <Products and Services>	32
		Drop Box x No <Products and Services>	25

After making the assignments, you model should look like the following:

Display Name	DrvName	IntsctnName	DQF
ACTIVITY (PRIMARY PANE)			
USA			
Oregon			
Beaverton			
Eugene			
Personnel Intensive Activities			
Resolve Customer Complaints	Number of Customer Complaints	Eugene x Commercial Pick Up x No <Products and Se	10.00
Expedite Package Shipment	Number of Expedite Requests	Eugene x Walk In x No <Products and Services>	32.00
		Eugene x Drop Box x No <Products and Services>	25.00

- In the primary pane, select **Expedite Package Shipments** for **Eugene** and make the following assignments:

Activity Account	Driver	Cost Object Account for Eugene	DQF
Eugene x Expedite Package Shipments	Number of Expedite Requests	No <Channel> x Standard Ground	25,000
		No <Channel> x Overnight Express	1,000
		No <Channel> x 2nd Day Guaranteed	10,000

After making the assignments, you model should look like the following:

Display Name	DrvName	IntsctnName	DQF
ACTIVITY (PRIMARY PANE)			
USA			
Oregon			
Beaverton			
Eugene			
Personnel Intensive Activities			
Resolve Customer Complaints	Number of Customer Complaints	Eugene x No <Channel> x Standard Ground	25,000.00
Expedite Package Shipment	Number of Expedite Requests	Eugene x No <Channel> x Overnight Express	1,000.00
		Eugene x No <Channel> x 2nd Day Guaranteed	10,000.00

3. In the primary pane, select **Inspect** for **Eugene** and create the following assignments:

Activity Account	Driver	Cost Object Account for Eugene	DQF
Eugene x Inspect	Number of Packages	No <Channel> x Standard Ground	1,000
		No <Channel> x Overnight Express	500
		No <Channel> x 2nd Day Guaranteed	500

After making the assignments, you model should look like the following:

Display Name	DrvName	IntsctnName	DQF
ACTIVITY (PRIMARY PANE)			
USA			
Oregon			
Beaverton			
Eugene			
Personnel Intensive Activities			
Resolve Customer Complaints	Number of Customer Complaints	Eugene x Sort	16,000.00
Expedite Package Shipment	Number of Expedite Requests	Eugene x No <Channel> x Standard Ground	1,000.00
Local Collection		Eugene x No <Channel> x Overnight Express	500.00
Move to Warehouse	Number of Packages	Eugene x No <Channel> x 2nd Day Guaranteed	500.00
Local Processing			
Sort	Number of Packages		
Inspect	Number of Packages		

You can notice that in addition to the assignments to three Cost Activity accounts, there is an additional assignment to the **Eugene x Sort** Activity account.

4. In the primary pane, select **Land Distribution** for **Eugene** and make the following assignments:

Activity Account	Driver	Cost Object Account for Eugene	DQF
Eugene x Land Distribution	Number of Packages	No <Channel> x Standard Ground	75,000
		No <Channel> x Overnight Express	16,000
		No <Channel> x 2nd Day Guaranteed	42,000

After making the assignments, you model should look like the following:

Display Name	DrvName	IntsctnName	DQF
ACTIVITY (PRIMARY PANE)			
USA			
Oregon			
Beaverton			
Eugene			
Personnel Intensive Activities			
Resolve Customer Complaints	Number of Customer Complaints	Eugene x No <Channel> x Standard Ground	75,000.00
Expedite Package Shipment	Number of Expedite Requests	Eugene x No <Channel> x Overnight Express	16,000.00
Local Collection		Eugene x No <Channel> x 2nd Day Guaranteed	42,000.00
Move to Warehouse	Number of Packages		
Local Processing			
Sort	Number of Packages		
Inspect	Number of Packages		
Regional Distribution			
Land Distribution	Number of Packages		

Adding Attributes to Cost Accounts

Overview

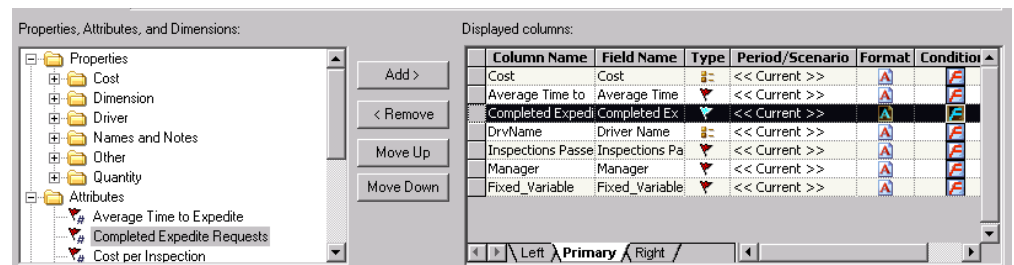
When you created the cost drivers for the Parcel Express Tutorial model, you built one calculated driver, named Number of Expedite Requests, that was composed of two attributes, named Average Time to Expedite and Completed Expedite Requests (See Calculated Drivers). The value of those attributes must be added to the cost accounts to which they apply.

Add Additional Attributes to the Column Layout

To enter numeric values for attributes, the attributes must be added to the column layout for the cost object account:

1. Select **Model** ⇒ **Module** ⇒ **Cost Object**.
2. Make sure the current column layout is **Cost Assignments**.
3. Select **Model** ⇒ **Column Layout** ⇒ **Edit Columns**. The Column Layout window opens.
4. Make sure the **Primary** pane tab is selected.
5. Add the following two attributes to the column layout:
 - Average Time to Expedite
 - Completed Expedite Requests
6. Move the two attributes up after Cost.

The column layout should look like the following:



7. Click **OK**. The attributes are added to the primary pane. There is no need to save the column layout.

Add Attribute Quantities

1. Now, add the following attribute quantities for Beaverton:

Destination Account	Average Time to Expedite	Completed Expedite Requests
No <Channel> x Standard Ground	1.75	4,000
No <Channel> x Overnight Express	1.75	15,000
No <Channel> x 2nd Day Guaranteed	1.75	25,000

2. Add the following attribute quantities for Eugene:

Destination Account	Average Time to Expedite	Completed Expedite Requests
No <Channel> x Standard Ground	3	6,000
No <Channel> x Overnight Express	3	15,000
No <Channel> x 2nd Day Guaranteed	3	20,000

Summary

The resulting attribute assignments should look like the following:

Display Name	Cost	Average Time to Expedite	Completed Expedite Requests
[-] COST OBJECT (PRIMARY PANE)	\$0.00		
[-] USA	\$0.00		
[-] Oregon	\$0.00		
[-] Beaverton	\$0.00		
[-] Drop Box	\$0.00		
[-] Walk In	\$0.00		
[-] Commercial Pick Up	\$0.00		
[-] No <Channel>	\$0.00		
[-] 2nd Day Guaranteed	\$0.00	1.75	25,000.00
[-] Overnight Express	\$0.00	1.75	15,000.00
[-] Standard Ground	\$0.00	1.75	4,000.00
[-] Eugene	\$0.00		
[-] Drop Box	\$0.00		
[-] Walk In	\$0.00		
[-] Commercial Pick Up	\$0.00		
[-] No <Channel>	\$0.00		
[-] 2nd Day Guaranteed	\$0.00	3.00	20,000.00
[-] Overnight Express	\$0.00	3.00	15,000.00
[-] Standard Ground	\$0.00	3.00	6,000.00

Chapter 11

Calculate Costs

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Overview

Typically, costs are entered in a model at the end of a defined period. These costs come from an organization's general ledger accounts and from external bills of costs. Additional cost information can come from a Material Requirements Planning (MRP) system. Production data is also entered in a model at the end of a defined period.

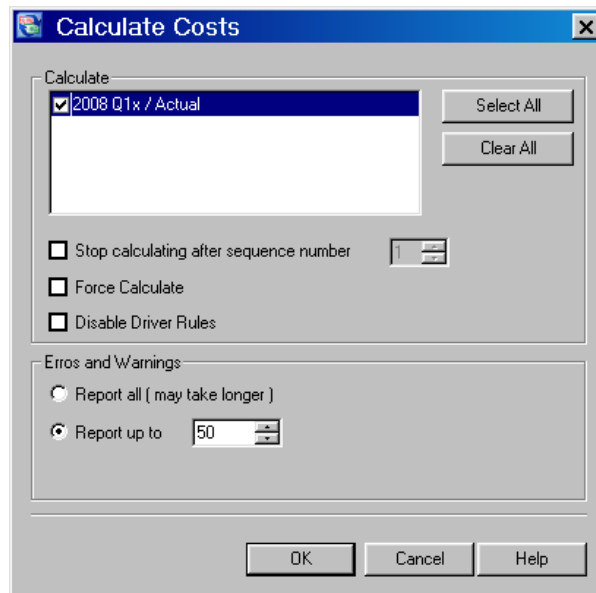
At any time during the development of a model, you can calculate the cost of each account according to its driver and driver quantities.

Calculate Costs

You entered Parcel Express costs and quantities for the 2008 Q1 period, so calculations will be performed for this period.

1. Select **Model** ⇒ **Calculate Costs**.

You see the Calculate Costs dialog box.



2. Select the period/scenario **2008 Q1/Actual**.

Note: You can select to force calculations even if the flag is set that says that calculations are up to date. To speed processing, SAS Cost and Profitability Management skips calculating if it thinks that calculations are up to date. Use this option to force calculations anyway.

3. Click **OK**.

You see a message in the status bar, at the bottom of the window, indicating that the calculation is in progress.

The calculation takes more or less time depending on the speed of your SAS Cost and Profitability Management server and your connection to it. When the calculation is completed, you see the Operation Summary window. You should have 0 fatal errors and 0 errors.

Viewing and Verifying Calculation Results

Experienced Cost and Profitability costing users calculate a model after they create accounts, assignments, and driver quantities, or after they enter cost data, as a validation and quality assurance technique.

The following displays show the total costs for the resource, activity, and cost object modules, along with the key roll-up accounts in each module. Verify that the modules and accounts in your model match the costs.

[-] RESOURCE (PRIMARY PANE)		\$3,647,900.00
[-] USA	USA	\$3,647,900.00
[-] Oregon	Oregon	\$3,647,900.00
[-] Beaverton	Beaverton	\$1,930,900.00
[-] Wages	Wages	\$1,638,600.00
[-] Operating Expenses	Operating Expenses	\$238,000.00
[-] Equipment Expenses	Equipment Expenses	\$54,300.00
[-] Eugene	Eugene	\$1,717,000.00
[-] Wages	Wages	\$1,408,000.00
[-] Operating Expenses	Operating Expenses	\$271,000.00
[-] Equipment Expenses	Equipment Expenses	\$38,000.00

[-] ACTIVITY (PRIMARY PANE)		\$3,647,900.00
[-] USA	USA	\$3,647,900.00
[-] Oregon	Oregon	\$3,647,900.00
[-] Beaverton	Beaverton	\$1,930,900.00
[-] Personnel Intensive A	Personnel Intensive Activities	\$218,201.72
[-] Local Collection	Local Collection	\$338,040.02
[-] Local Processing	Local Processing	\$716,731.93
[-] Regional Distribution	Regional Distribution	\$1,682,395.54
[-] Eugene	Eugene	\$1,717,000.00
[-] Personnel Intensive A	Personnel Intensive Activities	\$187,783.21
[-] Local Collection	Local Collection	\$351,422.14
[-] Local Processing	Local Processing	\$743,326.79
[-] Regional Distribution	Regional Distribution	\$1,504,169.86

[-] COST OBJECT (PRIMARY PANE)		\$3,647,900.00
[-] USA	USA	\$3,647,900.00
[-] Oregon	Oregon	\$3,647,900.00
[-] Beaverton	Beaverton	\$1,930,900.00
[-] Drop Box	Drop Box	\$15,468.14
[-] Walk In	Walk In	\$87,652.80
[-] Commercial Pick Up	Commercial Pick Up	\$25,780.24
[-] No <Channel>	No <Channel>	\$1,801,998.82
[-] Eugene	Eugene	\$1,717,000.00
[-] Drop Box	Drop Box	\$45,519.59
[-] Walk In	Walk In	\$58,265.07
[-] Commercial Pick Up	Commercial Pick Up	\$18,207.84
[-] No <Channel>	No <Channel>	\$1,595,007.50

Chapter 12

Add Bills of Costs

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Adding Bills of Costs

A *bill of costs* provides a convenient mechanism for adding material and unit costs directly to accounts, for bidding on jobs, or for implementing activity accounting.

Use a bill of costs when either of the following is true:

- Costs outside of the general ledger need to be introduced into a model. Not all costs that are assigned through a model come from the general ledger. For example, material costs (the cost of purchased components) can be additional product cost information that often comes from a Material requirements planning (MRP) system.
- A model's unit cost elements that are associated with product families need to be tracked.

Steps for Building Bills of Costs

To build bills of costs:

1. Define a dimension in the external unit module.

You did this step for the Parcel Express Tutorial model when you completed the New Model wizard. The dimension is Materials.

2. Create dimension members.

For the Parcel Express tutorial, the Materials dimension members represent packaging materials.

3. Create accounts in the external unit module.

You will use the New Account wizard to add external unit accounts to the model.

4. Create assignments from the external unit accounts to accounts in other modules, using a Standard driver.

Packaging materials in the Parcel Express Tutorial model contribute to the unique costs of a product. You will make assignments from accounts in the external unit module to accounts in the cost object module.

5. Enter a fixed or variable driver quantity.

You will enter both types of quantities.

6. If you enter a variable driver quantity, you must also enter a number to quantify demand so that cost can be calculated. You can specify this number with the SoldQty property for destination accounts.

You will enter sold quantities in a later chapter.

Fixed and Variable Quantities

A Standard driver can include variable or fixed quantities or both.

Fixed Quantities

With a fixed quantity driver, the cost that flows out of an account does not depend on demand. The cost is “pushed” by the quantity supplied. To calculate cost, the driver’s unit cost is multiplied by the fixed driver quantity (DQF).

For example, assume that a company manufactures bicycles. It buys 1,000 tires from another company at the beginning of each year. The tires might be used in any model of bicycle that the manufacturer produces, or they might not be used at all if some bicycles are not produced. In this case, the driver’s unit cost does not vary with the number of bicycles produced or sold; it’s always \$5,000 (1,000 x \$5). The cost of tires is pushed by how many of them are already on hand—not by how many are ultimately needed.

Variable Quantities

With a variable quantity driver, the cost that flows out of an account depends on the quantity demanded. The cost is “pulled” by how many are needed at their final destination. To calculate cost, the bill of cost’s unit cost is multiplied by the variable driver quantity (DQV) and the total driver quantity (TDQ) of the destination account. The total driver quantity can be either a system-calculated quantity (TDQ) or a user-entered quantity (TDQUE).

Note: TDQ, as a system-calculated quantity, ultimately depends on user-entered quantities such as SoldQty and DQF.

For example, assume that the bicycle manufacturer purchases tires from another company for \$5 each for each bicycle that it sells. Because each bicycle requires two tires, the unit cost is \$10. If the company sells 100 bicycles (SoldQty), the total cost is \$1,000 (100 x \$5 x 2). The cost of tires depends on the demand for them. In other words, the cost of tires is “pulled” by how many of them must be sent to their final destination.

Creating External Unit Accounts and Bills of Costs

Introduction

Parcel Express buys the following components from outside vendors:

- standard envelopes
- 2nd day flats
- overnight flats
- large boxes
- small boxes

These costs must be accounted for in the model. To account for them, you will create external unit accounts and assign them to cost object accounts, thereby creating bills of costs.


Create the Dimension Members for Materials

1. Select **Model** ⇒ **Dimensions Page**.
2. Using the techniques that you have learned, create the following Materials dimension members:

	Name	Reference	DimLevelName
[-] Region	Region	Region	
[-] General Ledger	GL	GL	
[-] Activities	Act	Act	
[-] Channel	Chnrl	Chnrl	
[-] Products and Services	Prod_Serv	Prod_Serv	
[-] Materials	Mat	Mat	
[-] Envelopes	ENV	ENV	Level1
[-] Standard Envelopes	SENV	SENV	Level2
[-] Flats	FTS	FTS	Level1
[-] 2nd Day Flat	2DF	2DF	Level2
[-] Overnight Flat	ONF	ONF	Level2
[-] Boxes	Boxes	Boxes	Level1
[-] Large Box	LBX	LBX	Level2
[-] Small Box	SBX	SBX	Level2

TIP Select **Edit** ⇒ **New Dimension Member** to open the New Dimension Member dialog box or right-click the dimension name.

Create External Unit Accounts

1. To open the External Unit module, select **Model** ⇒ **Modules** ⇒ **External Unit** (or click the Select Module icon  on the toolbar, and then select **External Unit** from the drop-down list).

You see the external unit module, which has no structure yet.

2. Select **Edit** ⇒ **New Account**.

You see the New Account wizard.

3. Select the following dimension members:

- Standard Envelope
- 2nd Day Flat
- Overnight Flat
- Large Box
- Small Box

4. Click **Add** and then click **Next**.

You see Step 2 of the New Account wizard.

5. Enter the following entered unit costs:

Account	Entered Unit Cost
Standard Envelope	.06
2nd Day Flat	.14
Overnight Flat	.14
Large Box	.95
Small Box	.75

6. Click **Finish**.

You see the following external unit structure:

	Display Name	Display Reference	EntUnitCost	Cost
▶	External Unit (Primary Pane)			\$0.00
▶	Envelopes	ENW		\$0.00
▶	Standard Envelopes	SENV	\$0.06	\$0.00
▶	Flats	FTS		\$0.00
▶	2nd Day Flat	2DF	\$0.14	\$0.00
▶	Overnight Flat	ONF	\$0.14	\$0.00
▶	Boxes	Boxes		\$0.00
▶	Large Box	LBX	\$0.95	\$0.00
▶	Small Box	SBX	\$0.75	\$0.00

Modify the Cost Assignments Column Layout

1. In the external unit module, show the right assignments pane.
2. If the **Cost Assignments** layout is not already selected, select it from the **Column Layout** list, and then click the arrow.



3. Select **Model** ⇒ **Column Layout** ⇒ **Edit Columns**. The **Column Layout** dialog box opens.
4. Modify the right pane by adding **Driver Quantity Variable (DQV)**.
5. Click **Save** and then click **OK**.

Add Accounts for Assignments

1. Select **Model** ⇒ **Assignments** ⇒ **Show Right Assignments Pane**.
2. Open the Add Accounts for Assignments dialog box (select **Model** ⇒ **Assignments** ⇒ **Add Accounts in Right Pane**).
3. Add the following **Cost Object** accounts under Beaverton and Eugene to the right pane:

Cost Object Account
No <Channel> x 2nd Day Guaranteed
No <Channel> x Overnight Express
No <Channel> x Standard Ground

Make Assignments and Calculate

1. Make assignments that have the following driver quantities:

External Unit Account	Cost Object Account	DQF	DQV
Standard Envelope	Beaverton x No <Channel> x Overnight Express	17,333	
Standard Envelope	Eugene x No <Channel> x Overnight Express	8,677	
2nd Day Flat	Beaverton x No <Channel> x 2nd Day Guaranteed		1.00

External Unit Account	Cost Object Account	DQF	DQV
2nd Day Flat	Eugene x No <Channel> x 2nd Day Guaranteed		1.00
Overnight Flat	Beaverton x No <Channel> x Overnight Express	123,500	
Overnight Flat	Eugene x No <Channel> x Overnight Express	6,500	
Large Box	Beaverton x No <Channel> x Standard Ground	120,833	
Large Box	Eugene x No <Channel> x Standard Ground	4,167	
Small Box	Beaverton x No <Channel> x Standard Ground	73,950	
Small Box	Eugene x No <Channel> x Standard Ground	2,550	

2. Select **Model** ⇒ **Assignments** ⇒ **Show Single Pane**.
3. Calculate the model, and then close the **Operation Summary**.

Note: Warnings occur because costs are still unassigned.

You see the following external unit costs:

Display Name	EntUnitCost	Cost	DrvName
External Unit (Primary Pane)		\$195,885.60	
Envelopes		\$1,560.60	
Standard Envelopes	\$0.06	\$1,560.60	Standard
Flats		\$18,200.00	
2nd Day Flat	\$0.14	\$0.00	Standard
Overnight Flat	\$0.14	\$18,200.00	Standard
Boxes		\$176,125.00	
Large Box	\$0.95	\$118,750.00	Standard
Small Box	\$0.75	\$57,375.00	Standard

The **2nd Day Flat** external unit does not have a cost yet because you assigned a variable driver quantity of 1. Until you know how many are needed, the system cannot calculate the cost of **2nd Day Flat**. The next chapter describes how the cost is calculated. See “[Calculation of Variable Costs Based On Demand](#)” on page 123.

Summary

The following picture shows how the Cost is derived for each external unit account by multiplying its TDQ times its EnteredUnitCost. Because there is no variable cost in this case, we can simply add the two DQFs to derive the TDQ.

	Standard Ground	Overnight Flat	Large Box	Small Box	
DQF (Beaverton)	17,333.00	123,500.00	120,833.00	73,950.00	
DQF (Eugene)	8,677.00	6,500.00	4,167.00	2,550.00	
TDQ (Total Driver Quantiy = DQF + DQF)	26,010.00	130,000.00	125,000.00	76,500.00	
EnteredUnitCost	\$0.06	\$0.14	\$0.95	\$0.75	
Cost (TDQ x EnteredUnitCost)	\$1,560.60	\$18,200.00	\$118,750.00	\$57,375.00	\$195,885.60

Chapter 13

Enter Sales and Revenue Data

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Working with Sold Quantity

Some of the most critical calculations in a model rely on the number of products that are sold as well as on sales revenue. From these values, you can determine unit costs (calculated unit costs as opposed to entered unit costs) and profit. SAS Cost and Profitability Management provides properties for the input and calculation of these values.

Modify the Cost Assignments Column Layout

Before doing the main work of this chapter, we first modify the column layout.

1. Select **Model** ⇒ **Module** ⇒ **Cost Object** .
2. Select **Model** ⇒ **Column Layout** ⇒ **Edit Columns**. The Column Layout dialog box opens.
3. Modify the primary pane by Add **Sold Quantity (SoldQy)** and moving it up after **DrvName**.
4. Click **Save** and then click **OK**.

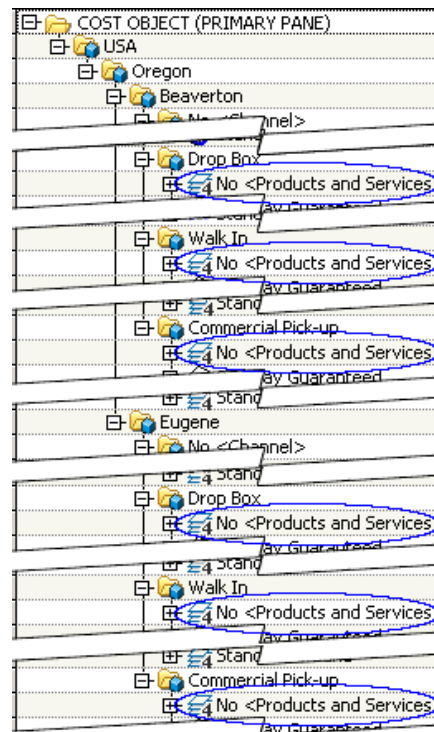
Create a Rule-Based Driver

Up to now in this tutorial you have made assignments manually by attaching a driver to a source account and connecting it to destination accounts to which to drive costs. Now we will create a driver that you attach to a source account and let the system generate assignments to destination accounts according to a rule that you define for selecting destination accounts. Such a driver is referred to as a “rule-based driver.” A rule-based driver is an ordinary driver with an associated rule formula. The formula determines for which destination accounts an assignment is automatically generated from every source account to which the driver is attached. For a discussion of rule-based drivers, see “[Postscript on Generating Assignments According to a Rule](#)” on page 128. In this chapter we use a rule-based driver to make assignments as shown in the following table:

Source Accounts	Destination Accounts
From: products not associated with any particular channel	To: the following products associated with a particular channel (e.g., Drop Box)
	(similar accounts for Eugene)

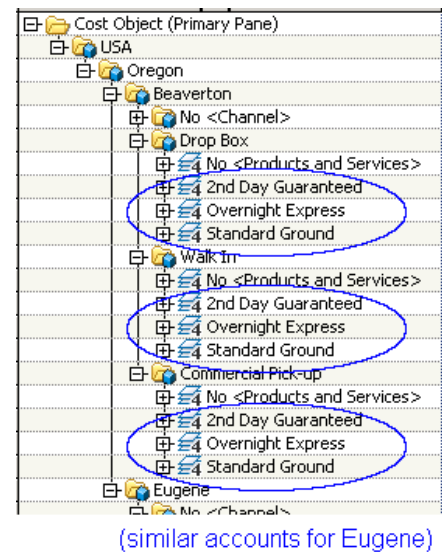
Source Accounts

From: channels (e.g., Drop Box) not associated with any particular product



Destination Accounts

To: the following products (same as above) associated with a particular channel



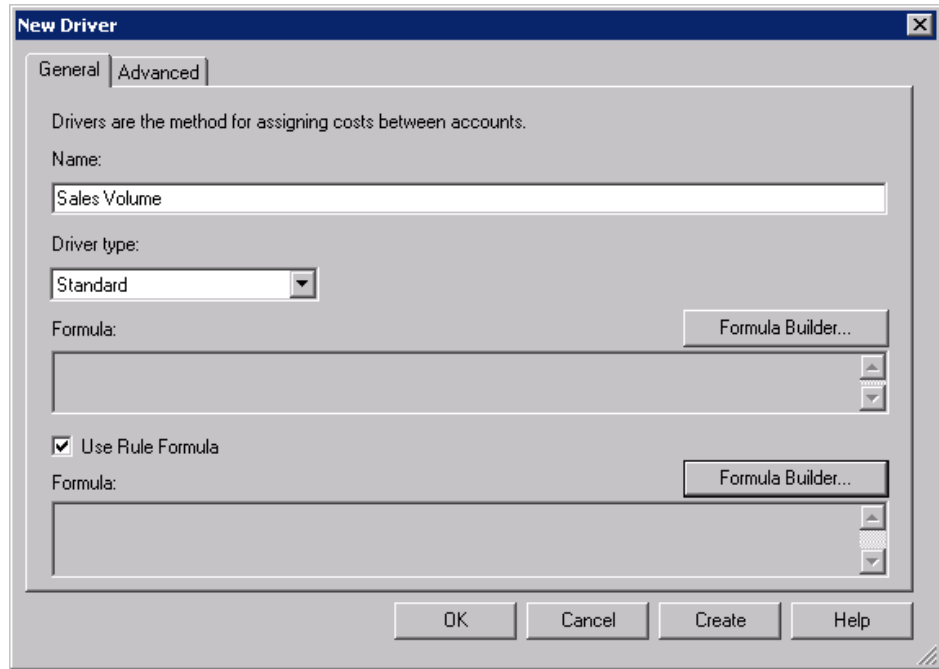
In addition to being a rule-based driver, the driver that we will create has a user-specified driver formula for calculating, `DrvQtyCalc`, the total number of units going to each destination account.

To create the driver:

1. Select **Model** ⇒ **Drivers** to open the Drivers view.
2. Right-click inside the Drivers view, and then select **New Driver**.

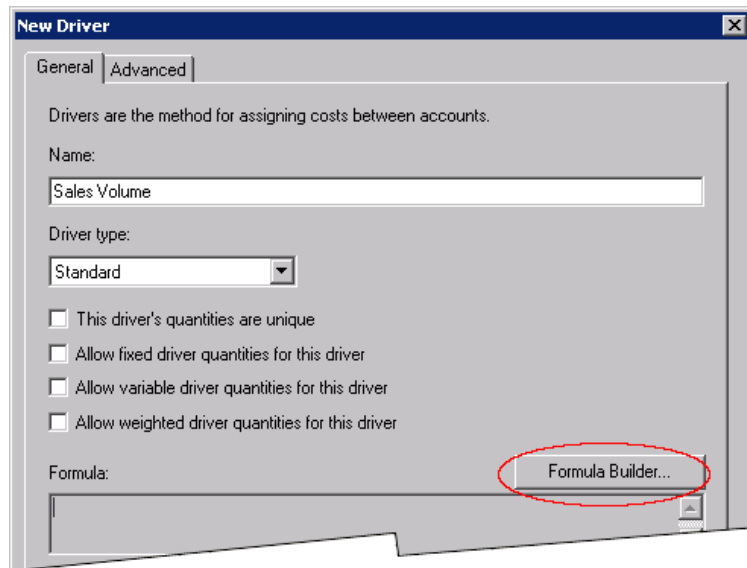
You can also select **Create a Driver** from the left-hand Navigation Pane.

The New Driver dialog box appears.

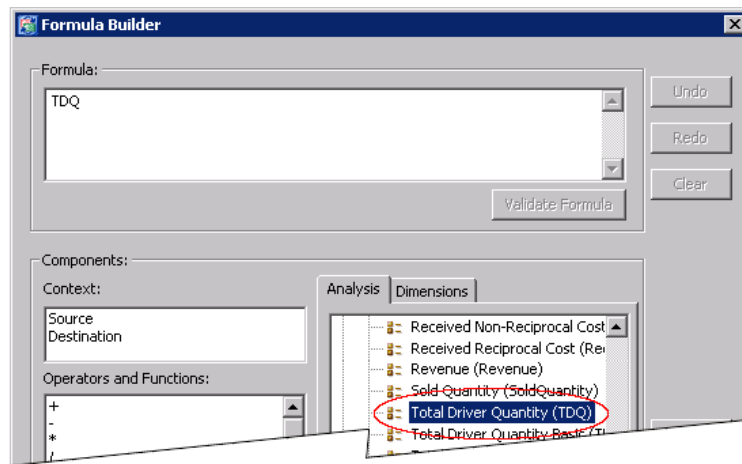


3. For **Name**, type *Sales volume*.
4. For **Driver Type**, select **Standard**.
5. Select **Formula Builder** (the topmost **Formula Builder** button).

The Formula Builder dialog box opens.



6. In the Formula Builder dialog box:
 - a. Select **Total Driver Quantity** (under **Properties**).



That is, instead of using the general formula

$$\text{DrvQtyCalc} = (\text{DQF} \times \text{DWF}) + (\text{DQV} \times \text{DWV} \times \text{Dest.TDQ})$$

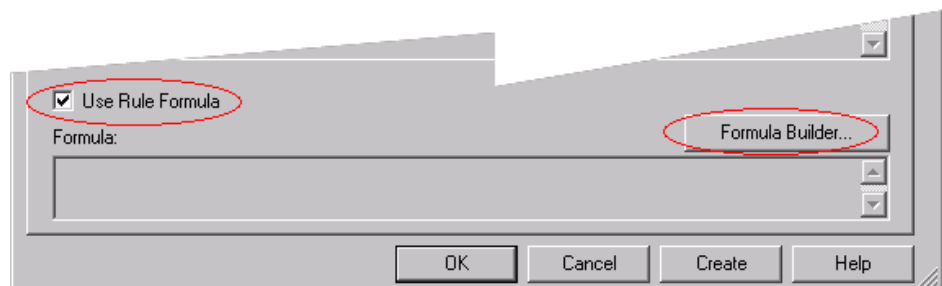
to calculate the total number of units going to each destination account, the calculated driver uses the formula **DrvQtyCalc=TDQ**.

Note: You might also use the formula

$$\text{SoldQuantity} (\text{DrvQtyCalc}=\text{SoldQuantity})$$

because, in general, **TDQ=SoldQuantity** unless TDQ is overridden by TDQUE or the destination account has outgoing assignments in turn.

- b. Click **Insert** (or, double-click **Total Driver Quantity**).
 - c. Click **OK** to close the Formula Builder.
7. In the New Driver dialog box, select **Use Rule Formula**, and then click **Formula Builder** (to the immediate right)..

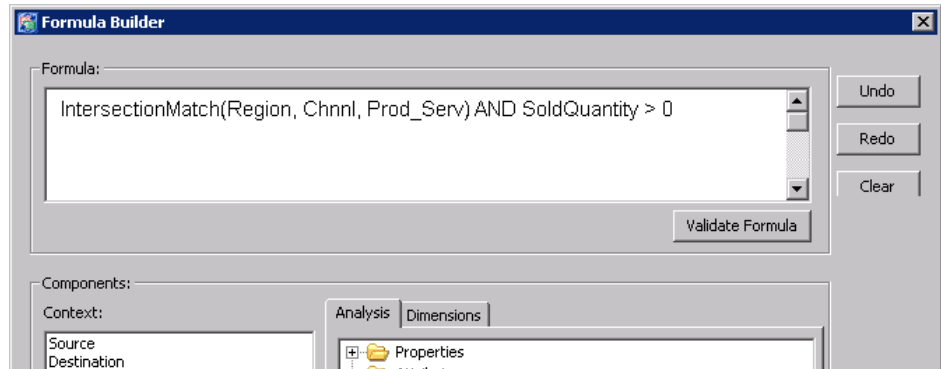


The Formula Builder dialog box opens.

8. Use the Formula Builder to build the following formula, and then click **OK** to close the Formula Builder.

$$\text{IntersectionMatch}(\text{Region}, \text{Chnnl}, \text{Prod_Serv}) \text{ AND } \text{SoldQuantity} > 0$$

You can either type the formula or use selections and the **Insert** button to build the formula.



Note: This formula which uses the `IntersectionMatch()` function is equivalent to the following formula, which is much longer but possibly easier to understand:

```
(Source.Region.DimMemRef="None"
OR Source.Region.DimMemRef=Destination.Region.DimMemRef)
AND
(Source.Chnnl.DimMemRef="None"
OR Source.Chnnl.DimMemRef=Destination.Chnnl.DimMemRef)
AND
(Source.Prod_Serv.DimMemRef="None"
OR Source.Prod_Serv.DimMemRef=Destination.Prod_Serv.DimMemRef)
AND
SoldQuantity > 0
```

It is also equivalent to the following, somewhat simpler formula, that uses the function `isNone()`:

```
(Source.Region.isNone()
OR Source.Region.DimMemRef=Destination.Region.DimMemRef)
AND
(Source.Chnnl.isNone()
OR Source.Chnnl.DimMemRef=Destination.Chnnl.DimMemRef)
AND
(Source.Prod_Serv.isNone()
OR Source.Prod_Serv.DimMemRef=Destination.Prod_Serv.DimMemRef)
AND
SoldQuantity > 0
```

9. Click **OK** to close the New Driver dialog box and create the new driver named *Sales Volume*.

Note: Rule-based drivers are discussed at greater length in [“Postscript on Generating Assignments According to a Rule”](#) on page 128.

Attach the Driver to Source Accounts

1. Expand the Cost Object module by selecting **COST OBJECT (PRIMARY PANE)**, right-clicking, and then selecting **Expand** ⇌ **All Levels**.
2. Delete the **No <Channel> x No <Products and Services>** accounts for both Eugene and Beaverton. (Right-click each account and select **Delete**.)

Note: You might have deleted them already when creating the cost object accounts.

3. Assign the **Sales Volume** driver to the following accounts for both Beaverton and Eugene:

Cost Object Account

Drop Box x No <Products and Services>

Walk In x No <Products and Services>

Commercial Pick Up x No <Products and Services>

4. Assign the **Sales Volume** driver to each of the **No <Channel>** accounts for both Beaverton and Eugene:

Cost Object Account

No <Channel> x 2nd Day Guaranteed

No <Channel> x Overnight Express

No <Channel> x Standard Ground

The Cost Object module should look like this:

Display Name	Cost	DrvName	SoldQty
[-] COST OBJECT (PRIMARY PANE)	\$3,843,785.60		
[-] USA	\$3,843,785.60		
[-] Oregon	\$3,843,785.60		
[-] Beaverton	\$2,119,483.83		
[-] No <Channel>	\$1,990,582.65		
[-] 2nd Day Guaranteed	\$393,336.15	Sales volume	
[-] Overnight Express	\$564,408.05	Sales volume	
[-] Standard Ground	\$1,032,838.45	Sales volume	
[-] Drop Box	\$15,468.14		
[-] No <Products and Services	\$15,468.14	Sales volume	
[-] 2nd Day Guaranteed	\$0.00		
[-] Overnight Express	\$0.00		
[-] Standard Ground	\$0.00		
[-] Walk In	\$87,652.80		
[-] No <Products and Services	\$87,652.80	Sales volume	
[-] 2nd Day Guaranteed	\$0.00		
[-] Overnight Express	\$0.00		
[-] Standard Ground	\$0.00		
[-] Commercial Pick Up	\$25,780.24		
[-] No <Products and Services	\$25,780.24	Sales volume	
[-] 2nd Day Guaranteed	\$0.00		
[-] Overnight Express	\$0.00		
[-] Standard Ground	\$0.00		
[-] Eugene	\$1,724,301.77		
[-] No <Channel>	\$1,602,309.27		
[-] 2nd Day Guaranteed	\$488,895.07	Sales volume	
[-] Overnight Express	\$245,887.62	Sales volume	
[-] Standard Ground	\$867,526.58	Sales volume	
[-] Drop Box	\$45,519.59		
[-] No <Products and Services	\$45,519.59	Sales volume	
[-] 2nd Day Guaranteed	\$0.00		
[-] Overnight Express	\$0.00		
[-] Standard Ground	\$0.00		
[-] Walk In	\$58,265.07		
[-] No <Products and Services	\$58,265.07	Sales volume	
[-] 2nd Day Guaranteed	\$0.00		
[-] Overnight Express	\$0.00		
[-] Standard Ground	\$0.00		
[-] Commercial Pick Up	\$18,207.84		
[-] No <Products and Services	\$18,207.84	Sales volume	
[-] 2nd Day Guaranteed	\$0.00		
[-] Overnight Express	\$0.00		
[-] Standard Ground	\$0.00		

Enter Sold Quantity for Destination Accounts

You enter sales volumes using the SoldQuantity property. In the primary pane, enter the following values for **SoldQuantity** for the following accounts:

Account	SoldQuantity
Beaverton x Drop Box x 2nd Day Guaranteed	9,000
Beaverton x Drop Box x Overnight Express	4,000
Beaverton x Drop Box x Standard Ground	21,666

Account	SoldQuantity
Beaverton x Walk In x 2nd Day Guaranteed	29,840
Beaverton x Walk In x Overnight Express	37,330
Beaverton x Walk In x Standard Ground	73,300
Beaverton x Commercial Pick Up x 2nd Day Guaranteed	20,000
Beaverton x Commercial Pick Up x Overnight Express	26,000
Beaverton x Commercial Pick Up x Standard Ground	34,000
Eugene x Drop Box x 2nd Day Guaranteed	4,500
Eugene x Drop Box x Overnight Express	2,000
Eugene x Drop Box x Standard Ground	10,834
Eugene x Walk In x 2nd Day Guaranteed	16,000
Eugene x Walk In x Overnight Express	18,670
Eugene x Walk In x Standard Ground	36,700
Eugene x Commercial Pick Up x 2nd Day Guaranteed	10,000
Eugene x Commercial Pick Up x Overnight Express	13,000
Eugene x Commercial Pick Up x Standard Ground	17,000

After adding the sold quantities, the Cost Object module should look like the following:

Display Name	Cost	DryName	SoldQty
[-] COST OBJECT (PRIMARY PANE)	\$3,843,785.60		383,840.00
[-] USA	\$3,843,785.60		383,840.00
[-] Oregon	\$3,843,785.60		383,840.00
[-] Beaverton	\$2,119,483.83		255,136.00
[-] No <Channel>	\$1,990,582.65		
[-] 2nd Day Guaranteed	\$393,336.15	Sales volume	
[-] Overnight Express	\$564,408.05	Sales volume	
[-] Standard Ground	\$1,032,838.45	Sales volume	
[-] Drop Box	\$15,468.14		34,666.00
[-] No <Products and Services	\$15,468.14	Sales volume	
[-] 2nd Day Guaranteed	\$0.00		9,000.00
[-] Overnight Express	\$0.00		4,000.00
[-] Standard Ground	\$0.00		21,666.00
[-] Walk In	\$87,652.80		140,470.00
[-] No <Products and Services	\$87,652.80	Sales volume	
[-] 2nd Day Guaranteed	\$0.00		29,840.00
[-] Overnight Express	\$0.00		37,330.00
[-] Standard Ground	\$0.00		73,300.00
[-] Commercial Pick Up	\$25,780.24		80,000.00
[-] No <Products and Services	\$25,780.24	Sales volume	
[-] 2nd Day Guaranteed	\$0.00		20,000.00
[-] Overnight Express	\$0.00		26,000.00
[-] Standard Ground	\$0.00		34,000.00
[-] Eugene	\$1,724,301.77		128,704.00
[-] No <Channel>	\$1,602,309.27		
[-] 2nd Day Guaranteed	\$488,895.07	Sales volume	
[-] Overnight Express	\$245,887.62	Sales volume	
[-] Standard Ground	\$867,526.58	Sales volume	
[-] Drop Box	\$45,519.59		17,334.00
[-] No <Products and Services	\$45,519.59	Sales volume	
[-] 2nd Day Guaranteed	\$0.00		4,500.00
[-] Overnight Express	\$0.00		2,000.00
[-] Standard Ground	\$0.00		10,834.00
[-] Walk In	\$58,265.07		71,370.00
[-] No <Products and Services	\$58,265.07	Sales volume	
[-] 2nd Day Guaranteed	\$0.00		16,000.00
[-] Overnight Express	\$0.00		18,670.00
[-] Standard Ground	\$0.00		36,700.00
[-] Commercial Pick Up	\$18,207.84		40,000.00
[-] No <Products and Services	\$18,207.84	Sales volume	
[-] 2nd Day Guaranteed	\$0.00		10,000.00
[-] Overnight Express	\$0.00		13,000.00
[-] Standard Ground	\$0.00		17,000.00

Calculate the Model to Generate Assignments

Select **Model** ⇒ **Calculate Costs** to cause the system to use your rule-based driver to create assignments from source accounts to the appropriate destination accounts.

You see that costs are now assigned to the nine accounts (for each location) that previously did not have costs.

Display Name	Cost	DrvName	SoldQty
[-] COST OBJECT (PRIMARY PANE)	\$3,856,293.20		383,840.00
[-] USA	\$3,856,293.20		383,840.00
[-] Oregon	\$3,856,293.20		383,840.00
[-] Beaverton	\$2,127,721.43		255,136.00
[-] No <Channel>	\$1,998,820.25		
[-] 2nd Day Guaranteed	\$401,573.75	Sales volume	
[-] Overnight Express	\$564,408.05	Sales volume	
[-] Standard Ground	\$1,032,838.45	Sales volume	
[-] Drop Box	\$283,937.13		34,666.00
[-] No <Products and Services>	\$15,468.14	Sales volume	
[-] 2nd Day Guaranteed	\$65,439.43		9,000.00
[-] Overnight Express	\$35,315.67		4,000.00
[-] Standard Ground	\$183,182.03		21,666.00
[-] Walk In	\$1,191,263.92		140,470.00
[-] No <Products and Services>	\$87,652.80	Sales volume	
[-] 2nd Day Guaranteed	\$222,273.37		29,840.00
[-] Overnight Express	\$336,220.46		37,330.00
[-] Standard Ground	\$632,770.10		73,300.00
[-] Commercial Pick Up	\$652,520.38		80,000.00
[-] No <Products and Services>	\$25,780.24	Sales volume	
[-] 2nd Day Guaranteed	\$142,941.92		20,000.00
[-] Overnight Express	\$226,329.11		26,000.00
[-] Standard Ground	\$283,249.36		34,000.00
[-] Eugene	\$1,728,571.77		128,704.00
[-] No <Channel>	\$1,606,579.27		
[-] 2nd Day Guaranteed	\$493,165.07	Sales volume	
[-] Overnight Express	\$245,887.62	Sales volume	
[-] Standard Ground	\$867,526.58	Sales volume	
[-] Drop Box	\$278,528.18		17,334.00
[-] No <Products and Services>	\$45,519.59	Sales volume	
[-] 2nd Day Guaranteed	\$84,579.19		4,500.00
[-] Overnight Express	\$19,857.80		2,000.00
[-] Standard Ground	\$174,091.19		10,834.00
[-] Walk In	\$946,675.03		71,370.00
[-] No <Products and Services>	\$58,265.07	Sales volume	
[-] 2nd Day Guaranteed	\$271,771.63		16,000.00
[-] Overnight Express	\$151,586.40		18,670.00
[-] Standard Ground	\$523,317.00		36,700.00
[-] Commercial Pick Up	\$503,368.56		40,000.00
[-] No <Products and Services>	\$18,207.84	Sales volume	
[-] 2nd Day Guaranteed	\$166,245.43		10,000.00
[-] Overnight Express	\$100,854.85		13,000.00
[-] Standard Ground	\$236,268.28		17,000.00

View Assignments Generated by the Rule-Based Driver

View Assignments from One Source Account

It is helpful to understand that while you typically make assignments manually from source accounts to destination accounts, the Sales Volume driver automatically assigns costs to destination accounts that satisfy the rule formula criteria. You do not have to make explicit assignments. To see the assignments that are generated, follow these steps:


1. Display the right pane by selecting **Model** ⇒ **Assignments** ⇒ **Show Right Assignments Pane**.

2. In the primary pane, select the **Beaverton x Drop Box x No <Products and Services>** account.
3. Select **Model** ⇒ **Assignments** ⇒ **Show Right**.





TIP You can display assignments simply by clicking the **Show Assignments** icon. It is not necessary to pull down the menu.



You see that assignments have automatically been made to three accounts in the right pane. You can see that the assignments have been generated by the fact that the arrows connecting the source and destination accounts is red.

Also, from the fact that the account icon  is the same for both source and destination accounts, you can see that the three destination accounts are all in the Cost Object module. The Sales Volume driver has generated three Cost-Object to Cost-Object assignments.

Red arrows indicate generated assignments

Display Name	Cost	DrvName	IntsctnName	SoldQty
[-] COST OBJECT (PRIMARY PANE)	\$3,856,293.			
[-] USA	\$3,856,293.			
[-] Oregon	\$3,856,293.			
[-] Beaverton	\$2,127,721.			
[-] No <Channel>	\$1,998,820.			
[-] Drop Box	\$283,937.1			
[-]  No <Products and Services>	\$15,468.14	Sales volume		
[-]  2nd Day Guaranteed	\$65,439.43		Beaverton x Drop Box x 2nd Day Guaranteed	9,000.00
[-]  Overnight Express	\$35,315.67		Beaverton x Drop Box x Overnight Express	4,000.00
[-]  Standard Ground	\$183,182.0		Beaverton x Drop Box x Standard Ground	21,666.00

To understand why the Sales volume driver generated these assignments, remember that its rule formula is equivalent to the following:

```
Destination.Region.DimMemRef=Source.Region.DimMemRef
AND Destination.Channel.DimMemRef=Source.Channel.DimMemRef
AND SoldQuantity > 0
```

The following table shows the source account in the picture to which the Sales volume driver is attached and the destination accounts to which the driver generated assignments.

Source account	Destination accounts
Beaverton x Drop Box x No <Products and Services>	Beaverton x Drop Box x 2nd Day Guaranteed
	Beaverton x Drop Box x Overnight Express
	Beaverton x Drop Box x Standard Ground

And, the following table lists each condition of the driver’s rule formula and shows that it is satisfied by each of the destination accounts to which the driver generated an assignment.

Condition	Satisfaction
Destination.Region.DimMemRef=Source.Region.DimMemRef	Beaverton (source) = Beaverton (destination: in all three destination accounts)
Destination.Channel.DimMemRef=Source.Channel.DimMemRef	Drop Box (source) = Drop Box (destination: in all three destination accounts)
SoldQuantity > 0	<p>SoldQuantity=9,000 in 1st destination account</p> <p>SoldQuantity=4,000 in 2nd destination account</p> <p>SoldQuantity=21,666 in 3rd destination account</p> <p>See “Enter Sold Quantity for Destination Accounts” on page 116.</p>

View Assignments from Another Source Account

Now let’s view the assignments that are generated from another source account.

1. In the primary pane, select the **Eugene x No <Channel> x 2nd Day Guaranteed** account.
2. Select **Model** ⇒ **Assignments** ⇒ **Show Right**.

Again, you see in the following picture that assignments have automatically been made to three accounts in the right pane.

Display Name	Cost	DrvName	SoldQty	IntsctnName	Cost	SoldQty
COST OBJECT (PRIMARY PANE)	\$3,856,293.2		383,840.00	Eugene x Commercial Pick-up x 2nd Day Guaranteed	\$166,245.43	10,000.00
USA	\$3,856,293.2		383,840.00	Eugene x Drop Box x 2nd Day Guaranteed	\$84,579.19	4,500.00
Oregon	\$3,856,293.2		383,840.00	Eugene x Walk In x 2nd Day Guaranteed	\$271,771.63	16,000.00
Beaverton	\$2,127,721.4		255,136.00			
Eugene	\$1,728,571.7		128,704.00			
No <Channel>	\$1,606,579.2					
2nd Day Guaranteed	\$493,165.07	mySalesVolume				
Overnight Express	\$245,887.62	mySalesVolume				
Standard Ground	\$867,526.58	mySalesVolume				
Drop Box	\$278,528.18		17,334.00			
No <Products and Services>	\$45,519.59	mySalesVolume				
2nd Day Guaranteed	\$84,579.19		4,500.00			
Overnight Express	\$19,857.60		2,000.00			
Standard Ground	\$174,091.19		10,834.00			
Walk In	\$946,675.03		71,370.00			
No <Products and Services>	\$58,265.07	mySalesVolume				
2nd Day Guaranteed	\$271,771.63		16,000.00			
Overnight Express	\$151,586.40		18,670.00			
Standard Ground	\$523,317.00		36,700.00			
Commercial Pick-up	\$503,368.56		40,000.00			
No <Products and Services>	\$18,207.84	mySalesVolume				
2nd Day Guaranteed	\$166,245.43		10,000.00			
Overnight Express	\$100,854.85		13,000.00			
Standard Ground	\$236,268.28		17,000.00			

The following table shows the source account in the picture to which the Sales volume driver is attached and the destination accounts to which the driver generated assignments.

Source account	Destination accounts
Eugene x No <Channels> x 2nd Day Guaranteed	Eugene x Drop Box x 2nd Day Guaranteed
	Beaverton x Drop Box x Overnight Express
	Beaverton x Drop Box x Standard Ground

And, the following table lists each condition of the driver’s rule formula and shows that it is satisfied by each of the destination accounts to which the driver generated an assignment.

Condition	Satisfaction
Destination.Region.DimMemRef=Source.Region.DimMemRef	Eugene in source = Beaverton in destination in all three destination accounts
Destination.Channel.DimMemRef=Source.Channel.DimMemRef	No <Channel> in source = Drop Box in destination in all three destination accounts. <i>Note:</i> No <...> acts like a wildcard in rules-based drivers. It matches anything.
SoldQuantity > 0	SoldQuantity=4,500 in 1st destination account SoldQuantity=16,000 in 2nd destination account SoldQuantity=10,000 in 3rd destination account See “Enter Sold Quantity for Destination Accounts” on page 116.

Of course, you can show the assignments that have been made for any account to which the Sales volume driver is assigned and verify that each destination account satisfies the rule formula. The following picture shows most of the assignments made by the Sales volume driver. Not all of the assignments are shown so as not to unduly clutter the picture, but you should be able easily to see which assignments are not shown.

Display Name	Cost	DrvName	SoldQty
[-] COST OBJECT (PRIMARY PANE)	\$3,856,293.20		383,840.00
[-] USA	\$3,856,293.20		383,840.00
[-] Oregon	\$3,856,293.20		383,840.00
[-] Beaverton	\$2,127,721.43		255,136.00
[-] No <Channel>	\$1,998,820.25		
[-] 2nd Day Guaranteed	\$481,573.75	Sales volume	
[-] Overnight Express	\$564,408.05	Sales volume	
[-] Standard Ground	\$1,032,838.45	Sales volume	
[-] Drop Box	\$283,937.13		34,666.00
[-] No <Products and Services>	\$15,468.14	Sales volume	
[-] 2nd Day Guaranteed	\$65,439.43		9,000.00
[-] Overnight Express	\$35,315.67		4,000.00
[-] Standard Ground	\$183,182.03		21,666.00
[-] Walk In	\$1,191,263.92		140,470.00
[-] No <Products and Services>	\$87,652.80	Sales volume	
[-] 2nd Day Guaranteed	\$222,273.37		29,840.00
[-] Overnight Express	\$336,220.46		37,330.00
[-] Standard Ground	\$632,770.10		73,300.00
[-] Commercial Pick Up	\$652,520.38		80,000.00
[-] No <Products and Services>	\$25,780.24	Sales volume	
[-] 2nd Day Guaranteed	\$142,941.92		20,000.00
[-] Overnight Express	\$226,329.11		26,000.00
[-] Standard Ground	\$283,249.36		34,000.00
[-] Eugene	\$1,728,571.77		128,704.00
[-] No <Channel>	\$1,606,579.27		
[-] 2nd Day Guaranteed	\$493,165.07	Sales volume	
[-] Overnight Express	\$245,807.62	Sales volume	
[-] Standard Ground	\$867,526.58	Sales volume	
[-] Drop Box	\$278,528.18		17,334.00
[-] No <Products and Services>	\$45,519.50	Sales volume	
[-] 2nd Day Guaranteed	\$84,579.19		4,500.00
[-] Overnight Express	\$19,857.80		2,000.00
[-] Standard Ground	\$174,091.19		10,834.00
[-] Walk In	\$946,675.03		71,370.00
[-] No <Products and Services>	\$58,265.07	Sales volume	
[-] 2nd Day Guaranteed	\$271,771.63		16,000.00
[-] Overnight Express	\$151,586.40		18,670.00
[-] Standard Ground	\$523,317.00		36,700.00
[-] Commercial Pick Up	\$503,368.56		40,000.00
[-] No <Products and Services>	\$18,207.84	Sales volume	
[-] 2nd Day Guaranteed	\$166,245.43		10,000.00
[-] Overnight Express	\$100,854.85		13,000.00
[-] Standard Ground	\$236,268.28		17,000.00

Calculation of Variable Costs Based On Demand

If you return to the External Unit module, you see that a cost has now been generated for the **2nd Day Flat** account.

Display Name	EntUnitCost	Cost	DrvName
External Unit (Primary Pane)		\$208,393.20	
Envelopes		\$1,560.60	
Standard Envelopes	\$0.06	\$1,560.60	Standard
Flats		\$30,707.60	
2nd Day Flat	\$0.14	\$12,507.60	Standard
Overnight Flat	\$0.14	\$18,200.00	Standard
Boxes		\$176,125.00	
Large Box	\$0.95	\$118,750.00	Standard
Small Box	\$0.75	\$57,375.00	Standard

The reason that the cost has been calculated is that you assigned a Bill of Costs driver that uses the DQV property to the **2nd Day Flat** account. To calculate the cost of an item that uses a DQV driver, you must know how many units of the item are required. Now that you have entered a Sold Quantity for the **2nd Day Guaranteed** accounts (which are the final destination accounts for **2nd Day Flat**), the cost of **2nd Day Flat** can be calculated.

Let's look more closely at how the cost of \$12,507.60 for **2nd Day Flat** is calculated. Remember that you made assignments from the External Unit account, **2nd Day Flat**, using a BOC driver with a Driver Quantity Variable. (See “[Make Assignments and Calculate](#)” on page 105.)

Display Name	EntUnitCost	Cost	DrvName	IntsctnName	Cost	DQF	DQV
External Unit (Primary Pane)		\$208,393.20		Eugene x No <Channel> x 2nd Day Guaranteed	\$493,165.07	0.00	1.00
Envelopes		\$1,560.60		Beaverton x No <Channel> x 2nd Day Guaranteed	\$401,573.75	0.00	1.00
Standard Envelopes	\$0.06	\$1,560.60	Standard				
Flats		\$30,707.60					
2nd Day Flat	\$0.14	\$12,507.60	Standard				

Unlike an account whose driver uses only DQF (whose cost is determined by an amount supplied) the cost of an account whose driver uses DQV is determined by an amount demanded. The cost on an assignment (DrvQtyCalc) is determined by the following formula:

$$\text{DrvQtyCalc} = (\text{DQF} * \text{DWF}) + (\text{DQV} * \text{DWV} * \text{Dest.TDQ})$$

Notice that when DQV is non-zero, then DrvQtyCalc depends on the TDQ of the destination account (Dest.TDQ). In the case of the **2nd Day Flat** account, the destination accounts are the following accounts in the Cost Object module, as you can see in the following picture:

- Eugene x Commercial Pick Up x 2nd Day Guaranteed
- Eugene x Drop Box x 2nd Day Guaranteed
- Eugene x Walk In x 2nd Day Guaranteed
- Beaverton x Commercial Pick Up x 2nd Day Guaranteed
- Beaverton x Drop Box x 2nd Day Guaranteed
- Beaverton x Walk In x 2nd Day Guaranteed

Display Name	DrvName	IntsctnName	DrvName	IntsctnName	SoldQty	TDQ
External Unit (Primary Pane)		Eugene x No <Channel> x 2nd Day Guaranteed	Sales volume	Eugene x Commercial Pick Up x 2nd Day Guaranteed	10,000.00	10,000.00
Envelopes		Beaverton x No <Channel> x 2nd Day Guaranteed	Sales volume	Eugene x Drop Box x 2nd Day Guaranteed	4,500.00	4,500.00
Standard Envelopes	Standard			Eugene x Walk In x 2nd Day Guaranteed	16,000.00	16,000.00
Flats				Beaverton x Walk In x 2nd Day Guaranteed	29,840.00	29,840.00
2nd Day Flat	Standard			Beaverton x Commercial Pick Up x 2nd Day Guaranteed	20,000.00	20,000.00
				Beaverton x Drop Box x 2nd Day Guaranteed	9,000.00	9,000.00

Note: You can not recreate this picture in the UI. It is created by combining multiple images in an image editor.

Note: Remember that the assignments to the final destination accounts result from your having attached the Sales Volume driver to the following two intermediary accounts:

- Eugene x No <Channel> x 2nd Day Guaranteed
- Beaverton x No <Channel> x 2nd Day Guaranteed

(See “[Attach the Driver to Source Accounts](#)” on page 114.)

You can see from the picture that the TDQ of the final destination accounts results from your having assigned a Sold Quantity to those accounts, as shown in the following table. (See “[Enter Sold Quantity for Destination Accounts](#)” on page 116.)

Final Destination Account	Sold Quantity	Total Driver Quantity (TDQ)
Eugene x Commercial Pick Up x 2nd Day Guaranteed	10,000	10,000
Eugene x Drop Box x 2nd Day Guaranteed	4,500	4,500
Eugene x Walk In x 2nd Day Guaranteed	16,000	16,000
Beaverton x Commercial Pick Up x 2nd Day Guaranteed	20,000	20,000
Beaverton x Drop Box x 2nd Day Guaranteed	9,000	9,000
Beaverton x Walk In x 2nd Day Guaranteed	29,840	29,840

In the following table, you can see how the cost of \$12,507.60 is calculated for the **2nd Day Flat** account using the following formulas:

1. $DrvQtyCalc = (DQF * DWF) + (DQV * DWV * Dest.TDQ)$
2. $TDQ = \sum(DrvQtyCalc)$
3. $Cost = EntUnitCost \times TDQ$

Note: The abbreviations used in the formulas are the following:


DrvQtyCalc	Driver Quantity Calculated
DQF	Driver Quantity Fixed
DWF	Driver Weight Fixed
DQV	Driver Quantity Variable
DWV	Driver Weight Variable
Dest	Destination
TDQ	Total Driver Quantity

	DrvQtyCalc= (DQF*DWF) + (DQV*DWV*Dest.TDQ)					
Final Destination Account	DQF	DWF	DQV	DWV	Dest.TDQ	DrvQtyCalc
Eugene x Commercial Pick Up x 2nd Day Guaranteed	0	1	1	1	10,000	10,000
Eugene x Drop Box x 2nd Day Guaranteed	0	1	1	1	4,500	4,500
Eugene x Walk In x 2nd Day Guaranteed	0	1	1	1	16,000	16,000
Beaverton x Commercial Pick Up x 2nd Day Guaranteed	0	1	1	1	20,000	20,000
Beaverton x Drop Box x 2nd Day Guaranteed	0	1	1	1	9,000	9,000
Beaverton x Walk In x 2nd Day Guaranteed	0	1	1	1	29,840	29,840
TDQ of 2nd Day Flat = sum of DrvQtyCalc for individual assignments						TDQ: 89,340
Cost of 2nd Day Flat = EntUnitCost x TDQ = .14 * 89,340 = 12,507.60						Cost: 12,507.60

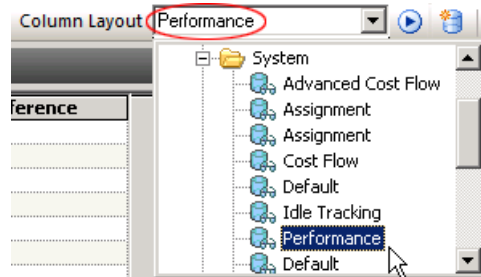
Enter Revenue and Calculate Profit

Profit and loss can be calculated after you enter sales data in the Revenue property.

Create a new column layout

1. Select **Model** ⇒ **Module** ⇒ **Cost Object Module**.
2. Activate the **Default** column layout 
3. Select **Model** ⇒ **Assignments** ⇒ **Show Single Pane**.
4. Open the Column Layout dialog box.
5. Modify the primary pane as follows:
 - Remove the **Display Reference** column.
 - Add the **UnitCost**, **Sold Quantity**, **Revenue**, and **Profit** columns.
6. Save the new column layout with the name **Profit**.
7. Close the Column Layout dialog box.

Note: Instead of creating your own column layout to show Profit, you might want to use the predefined system column layout named Performance



Enter revenue and calculate profit

1. In the **Revenue** column, type the following values:

Cost Object Account	Revenue
Beaverton x Drop Box x 2nd Day Guaranteed	72,550
Beaverton x Drop Box x Overnight Express	59,800
Beaverton x Drop Box x Standard Ground	379,166
Beaverton x Walk In x 2nd Day Guaranteed	321,667
Beaverton x Walk In x Overnight Express	558,133
Beaverton x Walk In x Standard Ground	123,333
Beaverton x Commercial Pick Up x 2nd Day Guaranteed	139,000
Beaverton x Commercial Pick Up x Overnight Express	388,700
Beaverton x Commercial Pick Up x Standard Ground	595,000
Eugene x Drop Box x 2nd Day Guaranteed	61,275
Eugene x Drop Box x Overnight Express	29,900
Eugene x Drop Box x Standard Ground	189,584
Eugene x Walk In x 2nd Day Guaranteed	215,834
Eugene x Walk In x Overnight Express	279,061
Eugene x Walk In x Standard Ground	641,667
Eugene x Commercial Pick Up x 2nd Day Guaranteed	69,500
Eugene x Commercial Pick Up x Overnight Express	194,350
Eugene x Commercial Pick Up x Standard Ground	297,500

2. Calculate the model, and then close the Operation Summary.

You see the following profit and loss information:

Display Name	Cost	UnitCost	SoldQty	Revenue	Profit
[-] COST OBJECT (PRIMARY PANE)	\$3,856,293.20		383,840.00	\$4,616,020.0	\$759,726.80
[-] USA	\$3,856,293.20		383,840.00	\$4,616,020.0	\$759,726.80
[-] Oregon	\$3,856,293.20		383,840.00	\$4,616,020.0	\$759,726.80
[-] Beaverton	\$2,127,721.43		255,136.00	\$2,637,349.0	\$509,627.57
[-] No <Channel>	\$1,998,820.25				
[-] 2nd Day Guaranteed	\$401,573.75	\$6.82			
[-] Overnight Express	\$564,408.05	\$8.38			
[-] Standard Ground	\$1,032,838.45	\$8.01			
[-] Drop Box	\$283,937.13		34,666.00	\$511,516.00	\$227,578.87
[-] No <Products and Service	\$15,468.14	\$0.45			
[-] 2nd Day Guaranteed	\$65,439.43	\$7.27	9,000.00	\$72,550.00	\$7,110.57
[-] Overnight Express	\$35,315.67	\$8.83	4,000.00	\$59,800.00	\$24,484.33
[-] Standard Ground	\$183,182.03	\$8.45	21,666.00	\$379,166.00	\$195,983.97
[-] Walk In	\$1,191,263.92		140,470.00	\$1,003,133.0	(\$188,130.92)
[-] No <Products and Service	\$87,652.80	\$0.62			
[-] 2nd Day Guaranteed	\$222,273.37	\$7.45	29,840.00	\$321,667.00	\$99,393.63
[-] Overnight Express	\$336,220.46	\$9.01	37,330.00	\$558,133.00	\$221,912.54
[-] Standard Ground	\$632,770.10	\$8.63	73,300.00	\$123,333.00	(\$509,437.10)
[-] Commercial Pick Up	\$652,520.38		80,000.00	\$1,122,700.0	\$470,179.62
[-] No <Products and Service	\$25,780.24	\$0.32			
[-] 2nd Day Guaranteed	\$142,941.92	\$7.15	20,000.00	\$139,000.00	(\$3,941.92)
[-] Overnight Express	\$226,329.11	\$8.70	26,000.00	\$388,700.00	\$162,370.89
[-] Standard Ground	\$283,249.36	\$8.33	34,000.00	\$595,000.00	\$311,750.64
[-] Eugene	\$1,728,571.77		128,704.00	\$1,978,671.0	\$250,099.23
[-] No <Channel>	\$1,606,579.27				
[-] 2nd Day Guaranteed	\$493,165.07	\$16.17			
[-] Overnight Express	\$245,887.62	\$7.30			
[-] Standard Ground	\$867,526.58	\$13.44			
[-] Drop Box	\$278,528.18		17,334.00	\$280,759.00	\$2,230.82
[-] No <Products and Service	\$45,519.59	\$2.63			
[-] 2nd Day Guaranteed	\$84,579.19	\$18.80	4,500.00	\$61,275.00	(\$23,304.19)
[-] Overnight Express	\$19,857.80	\$9.93	2,000.00	\$29,900.00	\$10,042.20
[-] Standard Ground	\$174,091.19	\$16.07	10,834.00	\$189,584.00	\$15,492.81
[-] Walk In	\$946,675.03		71,370.00	\$1,136,562.0	\$189,886.97
[-] No <Products and Service	\$58,265.07	\$0.82			
[-] 2nd Day Guaranteed	\$271,771.63	\$16.99	16,000.00	\$215,834.00	(\$55,937.63)
[-] Overnight Express	\$151,586.40	\$8.12	18,670.00	\$279,061.00	\$127,474.60
[-] Standard Ground	\$523,317.00	\$14.26	36,700.00	\$641,667.00	\$118,350.00
[-] Commercial Pick Up	\$503,368.56		40,000.00	\$561,350.00	\$57,981.44
[-] No <Products and Service	\$18,207.84	\$0.46			
[-] 2nd Day Guaranteed	\$166,245.43	\$16.62	10,000.00	\$69,500.00	(\$96,745.43)
[-] Overnight Express	\$100,854.85	\$7.76	13,000.00	\$194,350.00	\$93,495.15
[-] Standard Ground	\$236,268.28	\$13.90	17,000.00	\$297,500.00	\$61,231.72

Postscript on Generating Assignments According to a Rule

Overview

You have probably noticed a significant amount of repetition in the assignments that you made. With a rule-based driver, you can establish a general rule for making assignments for the driver and let the system generate the assignments for you in accordance with the rule instead of having to make the assignments yourself.

You use rule-based drivers to generate cost assignments automatically during calculation. The feature works by allowing you to attach a formula—referred to as a rule

formula—to an existing driver. When you attach the driver with its rule formula to a source account, the calculation evaluates for which potential destination accounts the rule formula tests true and creates an assignment from the source account to each such destination account.

The following picture shows some assignments in the Parcel Express Tutorial model that are candidates for generating according to a rule. Notice that the driver, Number of Expedite Requests, is attached to two different source accounts each of which assigns costs to three different destination accounts. If we can find a rule formula to pick out just those destination accounts, then with one driver and a rule we can generate six assignments.

Display Name	DrvName	IntsctnName
ACTIVITY (PRIMARY PANE)		
USA		
Oregon		
Beaverton		
Personnel Intensive Activities		
Resolve Customer Complaints	Number of Customer Complaints	
Expedite Package Shipments	Number of Expedite Requests	
Local Collection		
Local Processing		
Regional Distribution		
Eugene		
Personnel Intensive Activities		
Resolve Customer Complaints	Number of Customer Complaints	
Expedite Package Shipments	Number of Expedite Requests	
Local Collection		
Local Processing		
Regional Distribution		
		Beaverton x No <Channel> x 2nd Day Guaranteed
		Beaverton x No <Channel> x Overnight Express
		Beaverton x No <Channel> x Standard Ground

Display Name	DrvName	IntsctnName
ACTIVITY (PRIMARY PANE)		
USA		
Oregon		
Beaverton		
Personnel Intensive Activities		
Resolve Customer Complaints	Number of Customer Complaints	
Expedite Package Shipments	Number of Expedite Requests	
Local Collection		
Local Processing		
Regional Distribution		
Eugene		
Personnel Intensive Activities		
Resolve Customer Complaints	Number of Customer Complaints	
Expedite Package Shipments	Number of Expedite Requests	
Local Collection		
Local Processing		
Regional Distribution		
		Eugene x No <Channel> x 2nd Day Guaranteed
		Eugene x No <Channel> x Overnight Express
		Eugene x No <Channel> x Standard Ground

Attaching a Formula and Generating Assignments

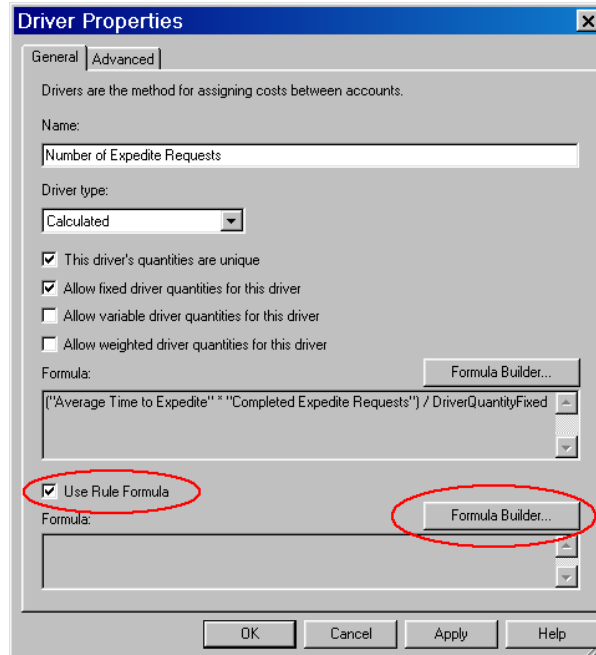
Before describing some rule formulas that will pick out the desired destination accounts, let's first see how to attach a rule formula to a driver. Knowing how to attach a rule formula to a driver will help to establish some context of what we are talking about when we refer to rule-based drivers.

To attach a rule formula to a driver do the following:

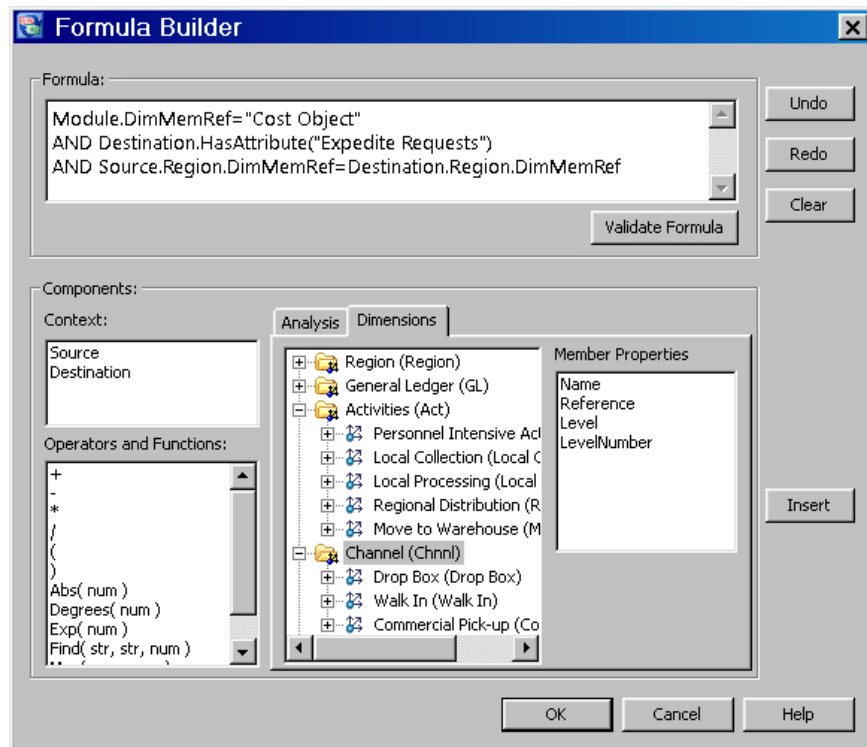
1. Go to the Drivers page (select **Model** ⇒ **Drivers Page**).
2. Select the driver to which you want to attach a rule formula and select **Edit** ⇒ **Item Properties**.

The Driver Properties dialog box opens.

3. Select **Use Rule Formula** and then click **Formula Builder**.



The Formula Builder dialog box opens.



4. Either use selections and the **Insert** key to build the formula, or type the complete formula in the text field.
5. Click **OK** to close the Formula Builder, and then click **OK** to close the Driver Properties dialog box.
6. Repeat the preceding steps for each driver to which you want to attach a rule formula.

- Attach each rule-based driver to the appropriate source accounts.

Of course, assuming that you have already attached these drivers to source accounts while doing this tutorial, the calculation will simply recreate the assignments that you have already made (assuming that you define an appropriate rule formula). The point is that rule-based drivers give you an alternative to creating the assignments manually.

- To generate assignments, calculate the model.

The assignments are generated—which you can verify by viewing the appropriate assignments panes. You can also verify that the cost flows, as shown below, are the same as when you attached the drivers manually.

Display Name	DrvName	IntsctnName	(\$ Cost
ACTIVITY (PRIMARY PANE)			
USA			
Oregon			
Eugene			
Local Processing			
Personnel Intensive Activities			
Expedite Package Shipments	Number of Expedite Requests	Eugene x No <Channel> x 2nd Day Guaranteed	493,165.07
Resolve Customer Complaints	Number of Customer Complaints	Eugene x No <Channel> x Standard Ground	867,526.58
Local Collection		Eugene x No <Channel> x Overnight Express	188,645.12
Regional Distribution			
Beaverton			

Display Name	DrvName	IntsctnName	(\$ Cost
ACTIVITY (PRIMARY PANE)			
USA			
Oregon			
Eugene			
Beaverton			
Personnel Intensive Activities			
Expedite Package Shipments	Number of Expedite Requests	Beaverton x No <Channel> x 2nd Day Guarante	401,573.75
Resolve Customer Complaints	Number of Customer Complaints	Beaverton x No <Channel> x Overnight Express	564,408.05
Local Processing		Beaverton x No <Channel> x Standard Ground	1,032,838.4
Regional Distribution			
Local Collection			

Selecting the Destination Accounts—First Pass

Now let's talk about what rule formula to define. Probably the easiest way to select the desired destination accounts is to add a tag attribute to each. A tag attribute is one that either you add or you don't add to an account. (In previous releases of SAS Cost and Profitability Management, tag attributes were called Boolean attributes.) Then you can use the HasAttribute() function in a formula to test for the presence of the attribute. As shown below, the tag attribute, Expedite Requests, is attached to the six destination accounts.

Display Name	Expedite Requests
[-] COST OBJECT (PRIMARY PANE)	
[-] USA	
[-] Oregon	
[-] Beaverton	
[-] Drop Box	
[-] Commercial Pick-up	
[-] No <Channel>	
[-] 2nd Day Guaranteed	<input checked="" type="checkbox"/>
[-] Overnight Express	<input checked="" type="checkbox"/>
[-] Standard Ground	<input checked="" type="checkbox"/>
[-] Walk In	
[-] Eugene	
[-] Walk In	
[-] Commercial Pick-up	
[-] Drop Box	
[-] No <Channel>	
[-] 2nd Day Guaranteed	<input checked="" type="checkbox"/>
[-] Overnight Express	<input checked="" type="checkbox"/>
[-] Standard Ground	<input checked="" type="checkbox"/>

So, the following rule formula selects just these destination accounts:

```
"Module".DimMemRef="CostObject"
AND Destination.HasAttribute("Expedite Requests")
```

The first condition, testing for the Cost Object module, is not necessary because the Expedite Requests attribute is attached to accounts only in the Cost Object module. However, adding the condition can speed up assignment generation because the system knows that it does not have to check other modules for potential destination accounts. The condition also helps ensure that you do not generate assignments to accounts other than those you intend. In particular, it can help prevent generating reciprocal costing where an account, directly or indirectly, assigns costs to itself.

Similarly, the “Destination” modifier is also not necessary because the system assumes by default that any unmodified account is a destination account. However, adding the modifier can make your rule formula easier to understand.

The rule formula, however, is not yet complete. Notice that if you were to apply this rule formula, it would generate assignments from a Beaverton source account not only to Beaverton destination accounts but also to the similar Eugene destination accounts. And, it would generate assignments from a Eugene source account to Beaverton destination accounts. Clearly you want Beaverton source accounts to assign costs only to Beaverton destination accounts, and Eugene source accounts only to Eugene destination accounts. The following sections sketch two solutions to this problem.

Selecting the Destination Accounts—Second Pass

The first solution entails creating distinct attributes for the Beaverton and Eugene destination accounts:

- Expedite Requests Beaverton
- Expedite Requests Eugene

The following picture shows these attributes attached to the respective destination accounts:

Display Name	Expedite Requests Beaverton	Expedite Requests Eugene
Activity (Primary Pane)		
USA		
Oregon		
Beaverton		
No <Channel>		
2nd Day Guaranteed	<input checked="" type="checkbox"/>	
Overnight Express	<input checked="" type="checkbox"/>	
Standard Ground	<input checked="" type="checkbox"/>	
Drop Box		
Walk In		
Commercial Pick-up		
Eugene		
No <Channel>		
2nd Day Guaranteed		<input checked="" type="checkbox"/>
Overnight Express		<input checked="" type="checkbox"/>
Standard Ground		<input checked="" type="checkbox"/>
Drop Box		
Walk In		
Commercial Pick-up		

In order to test for these attributes you also need two distinct drivers each with its own rule formula—one for Beaverton and one for Eugene. The rule formula for the Beaverton driver is the following:

```
"Module".DimMemRef="CostObject"
AND Destination.HasAttribute("Expedite Requests Beaverton")
```

And, the rule formula for the Eugene driver is the following:

```
"Module".DimMemRef="CostObject"
AND Destination.HasAttribute("Expedite Requests Eugene")
```

The following pictures show the assignments that are generated by these rule formulas from the Beaverton and Eugene source accounts:

Display Name	DrvName	IntsctnName	Expedite Requests Beaverton	Expedite Requests Eugene
Activity (Primary Pane)				
USA				
Oregon				
Beaverton				
Personnel Intensive Activities				
Resolve Customer Complaints	Number of Customer Complaints	Beaverton x No <Channel> x 2nd Day Guaranteed	<input checked="" type="checkbox"/>	
Expedite Package Shipments	Number of Expedite Requests	Beaverton x No <Channel> x Overnight Express	<input checked="" type="checkbox"/>	
Local Collection		Beaverton x No <Channel> x Standard Ground	<input checked="" type="checkbox"/>	
Local Processing				
Regional Distribution				
Eugene				
Personnel Intensive Activities				
Resolve Customer Complaints	Number of Customer Complaints			
Expedite Package Shipments	Number of Expedite Requests			
Local Collection				
Local Processing				

Rule Formula:
 Module.DimMemRef="Cost Object"
 AND Destination.HasAttribute("Expedite Requests Beaverton")

Display Name	DrvName	IntsctnName	Expedite Requests Beaverton	Expedite Requests Eugene
Activity (Primary Pane)				
USA				
Oregon				
Beaverton				
Personnel Intensive Activities				
Resolve Customer Complaints	Number of Customer Complaints			
Expedite Package Shipments	Number of Expedite Requests			
Local Collection				
Local Processing				
Regional Distribution				
Eugene				
Personnel Intensive Activities				
Resolve Customer Complaints	Number of Customer Complaints	Eugene x No <Channel> x 2nd Day Guaranteed		<input checked="" type="checkbox"/>
Expedite Package Shipments	Number of Expedite Requests	Eugene x No <Channel> x Overnight Express		<input checked="" type="checkbox"/>
Local Collection		Eugene x No <Channel> x Standard Ground		<input checked="" type="checkbox"/>
Local Processing				
Regional Distribution				

Rule Formula:
 Module.DimMemRef="Cost Object"
 AND Destination.HasAttribute("Expedite Requests Eugene")

Selecting the Destination Accounts—Third Pass

This section describes an alternative solution. Remember that you want Beaverton source accounts to assign costs only to Beaverton destination accounts, and Eugene

source accounts only to Eugene destination accounts. In short, you want the source region to equal the destination region. You can accomplish this with the following condition:

```
Source.Region.DimMemRef=Destination.Region.DimMemRef
```

So, the complete rule formula to select the destination accounts is the following:

```
"Module".DimMemRef="CostObject"
AND Destination.HasAttribute("Expedite Requests")
AND Source.Region.DimMemRef=Destination.Region.DimMemRef
```

With this one rule formula you can avoid creating distinct attributes for Beaverton and Eugene and also avoid duplicating the driver. This rule formula that is attached to a single driver generates exactly the assignments desired.

An Alternative Formula for Selecting the Destination Accounts

Let's look more closely at the destination accounts to see if it is possible to define a rule that selects just those destination accounts without even having to add an attribute. The display below shows the destination accounts with the CostObject module as the primary pane. Notice that all six destination accounts have the following property in common:

The DimMemRef of their dimension member in the Channel dimension is None.

Display Name	Reference	DimMemRef	DimName	DimRef
COST OBJECT (PRIMARY PANE)				
USA		USA	Region	Region
Oregon		Oregon	Region	Region
Beaverton		Beaverton	Region	Region
Drop Box		Drop Box	Channel	Channel
Commercial Pick-up		Commercial Pick-up	Channel	Channel
No <Channel>		No <Chnnl>	Channel	Channel
2nd Day Guaranteed	Beaverton x None x 2nd Day Guaranteed_2052	2nd Day Guaranteed	Products and Services	Prod_Serv
Overnight Express	Beaverton x None x Overnight Express_2053	Overnight Express	Products and Services	Prod_Serv
Standard Ground	Beaverton x None x Standard Ground_2054	Standard Ground	Products and Services	Prod_Serv
Walk In		Walk In	Channel	Channel
Eugene		Eugene	Region	Region
Walk In		Walk In	Channel	Channel
Commercial Pick-up		Commercial Pick-up	Channel	Channel
Drop Box		Drop Box	Channel	Channel
No <Channel>		No <Chnnl>	Channel	Channel
2nd Day Guaranteed	Eugene x None x 2nd Day Guaranteed_2068	2nd Day Guaranteed	Products and Services	Prod_Serv
Overnight Express	Eugene x None x Overnight Express_2069	Overnight Express	Products and Services	Prod_Serv
Standard Ground	Eugene x None x Standard Ground_2070	Standard Ground	Products and Services	Prod_Serv

Therefore, the following formula selects just these destination accounts:

```
"Module".DimMemRef="CostObject"
AND Destination.Channel.DimMemRef="None"
AND Source.Region.DimMemRef=Destination.Region.DimMemRef
```

Notes:

- Although the assignments pane shows “No <Channel>” as the DimMemRef of the dimension member in the Channel dimension, you must use the constant “None” in your formula. “None” is the internal name. “No <Channel>” is a translatable label that is just for display.

Note: You can also use the function isNone() as follows:

```
"Module".DimMemRef="CostObject"
AND Destination.Channel.isNone()
AND Source.Region.DimMemRef=Destination.Region.DimMemRef
```

- Similarly, you can use either “DimMemRef” in your formula or “Reference”. In this context “Channel.DimMemRef” and “Channel.Reference” are synonymous. The dimension in this case is Channel, and the possible dimension members are Drop Box, Walk In, Commercial Pick-Up, and None. You refer to the dimension members using the compound notation: “Channel.Drop Box”, “Channel.Walk In”, “Channel.Commercial Pick-Up”, and “Channel.None”. Channel is the dimension, and the item that follows the period is a dimension member. More generally, you can write either “Channel.DimMemRef” or “Channel.Reference” because they are synonymous. The column heading in the assignments pane uses the label “DimMemRef” to distinguish it from the Reference of an account.

Chapter 14

Generate Cubes

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Overview

A cube is the basic unit of analysis in OLAP, a technology that provides fast, interactive access to data in a model. A cube is a storage unit that combines all of a model's dimensions and the measures they contain into one unit. You use SAS Cost and Profitability Management to connect to and interact with the cubes on a SAS Cost and Profitability Management server. For each model, you can generate cubes and manipulate them on the OLAP page to interactively analyze business data.

An OLAP cube is called a cube even if it has more than the three dimensions of an ordinary geometric cube. An OLAP cube can represent any number of dimensions of data. SAS Cost and Profitability Management cubes are standard OLAP cubes.

Types of Cubes

Multi-Stage Contribution Cube

Use this type of cube to perform tasks and to answer questions such as:

- Why is product A not profitable? You want to trace the costs back through activities and then to resources that contribute costs to this product.
- What are the costs for Product B that originate in salary resources and that are assigned through the Inspection activity to this product?

The multi-stage contribution cube enables you to analyze cost contributions into and out of stages that are defined in a model. The Cube Explorer view enables you to visually trace cost contributions through all the stages.

Resource Contribution Cube

Use this type of cube to analyze resource accounts that contribute costs to other accounts. Or, use this type of cube to analyze the accounts that receive costs from resources.

The resource contribution cube enables you to analyze cost contributions from original accounts (where costs were entered) to final accounts that do not assign costs to other accounts. Generally, these contributions are from resource accounts to cost object accounts, but it does not matter where the original or final accounts reside.

Single-Stage Contribution Cube

Use this type of cube to answer questions such as:

- Which activity costs contribute to product, customer, service costs, and so on?
- When costs are assigned within the cost object module, which subassembly costs contribute to product costs?
- What are the costs of resources that contribute to activities?

The single-stage contribution cube enables you to analyze cost contributions from one assignment level back. It does not matter where the costs originate or end. Typically, cost is contributed from:

- activities to cost objects
- resources to activities

Overview of Cube Generation

Generating a cube is a two-step process.

Step 1: Create a cube configuration

From a single model, you can generate multiple cubes. A cube configuration remembers your choices for a particular cube. If you update the model and need to regenerate the

cube, you don't have to specify the cube characteristics again. In short, one model can have multiple cube configurations, and each cube configuration contains the specifications for a single cube.

Step 2: Generate the cube

After a model has been calculated, you generate cubes by specifying which of the cube configurations belonging to the model is to be used, and which periods are to be included. For each cube configuration that you select, a cube is generated. If the model has not been calculated, you are asked if you want the calculation to be done so that cube generation can proceed.

Cube Configurations

Overview

For this tutorial, you will create three cube configurations:

- “Resource Contribution Cube” on page 139
- “Multi-Stage Contribution Cube” on page 142
- “Minimal Multi-Stage Contribution Cube” on page 144

Resource Contribution Cube

1. Go to the Workspace Manager.



2. Select **File** ⇒ **New** ⇒ **Cube Configuration**.

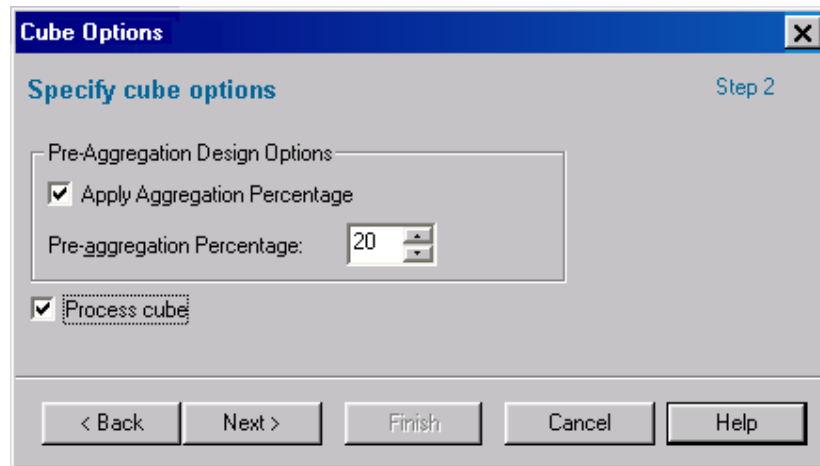
Step 1 of the New Cube Configuration wizard opens.

Specify the following for step 1:

- For **Model name**, select **Parcel Express Tutorial**.
 - For **Cube configuration name**, type **Parcel Express Resource**.
 - For **Cube configuration reference**, type **PE_Resource**.
 - In the **Generate** section, select **Cube and Fact table**.
 - For **Type**, select **Resource Contribution**.
3. Click **Next**. Step 2 opens.

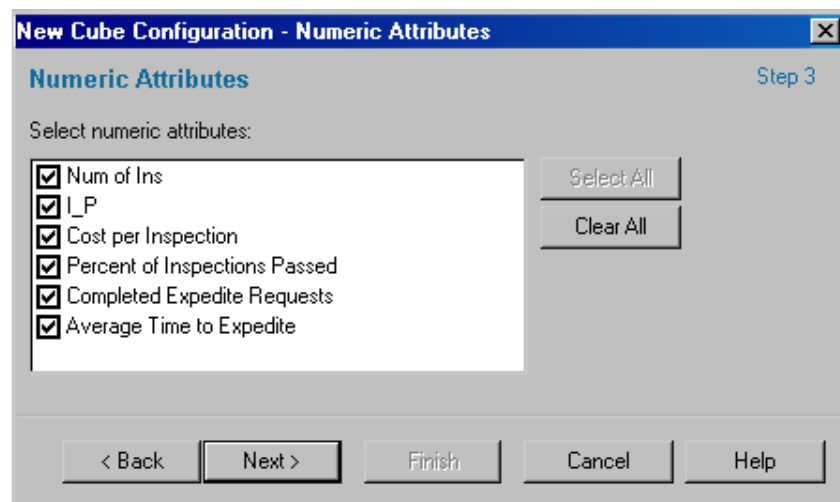
This step allows you to specify options for cube generation. The options available depend on whether you are using SAS OLAP or Microsoft Analysis Services to display cubes. The following picture shows the options for SAS OLAP cubes.

The following picture shows the options for Microsoft Analysis Services cubes.



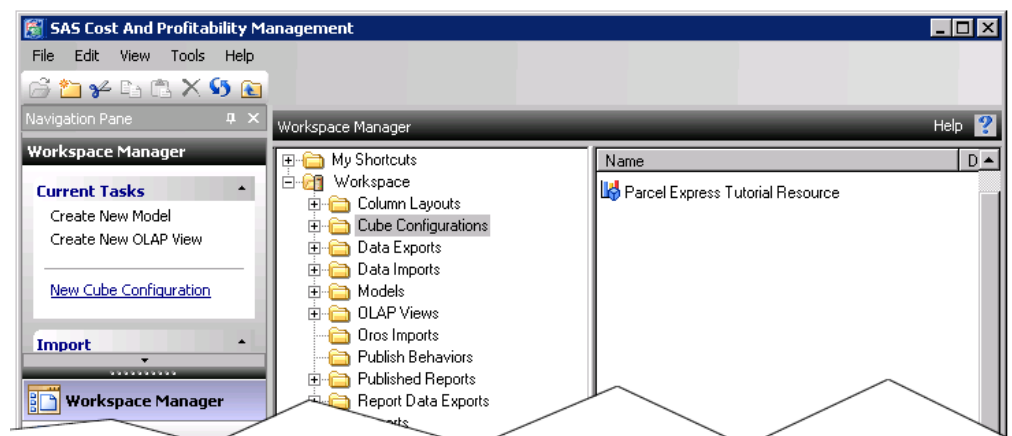
For this tutorial you can accept the default options.

4. Click **Next**. Step 3 opens.
5. Select all numeric attributes to be included in the resource contribution cube. Since the Parcel Express Tutorial model is relatively small, you can select all of the numeric attributes.



6. Click **Next**. Review your options, and then click **Finish**.

The cube configuration is added to the Cube Configurations folder.



The cube configuration is added to the Cube Configurations folder.

Multi-Stage Contribution Cube

With a multi-stage contribution cube, you can select what goes into the cube. This allows you to create smaller cubes for particular purposes.

1. Select **File** ⇒ **New** ⇒ **Cube Configuration**. Step 1 opens.

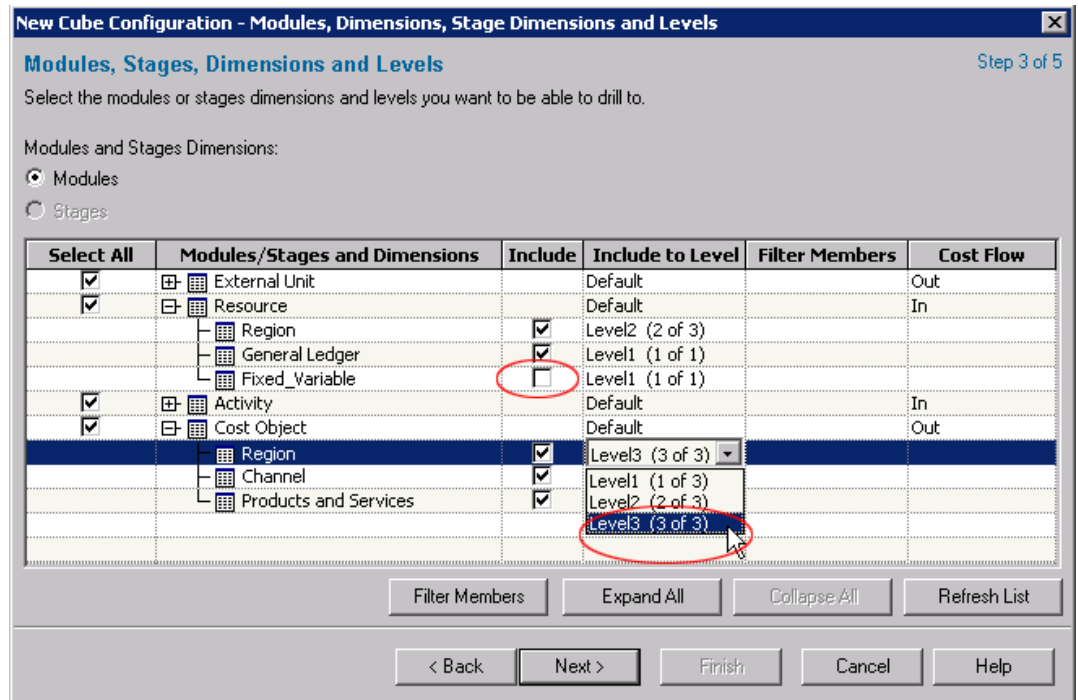
Specify the following for step 1:

- For **Model name**, select **Parcel Express Tutorial**.
 - For **Cube configuration name**, enter **Parcel Express Multi-Stage**.
 - For **Cube configuration reference**, enter **PE_MultiStage**.
 - In the **Generate** section, select **Cube and Fact table**.
 - For **Type**, select **Multi-Stage Contribution**.
2. Click **Next**. Step 2 opens.

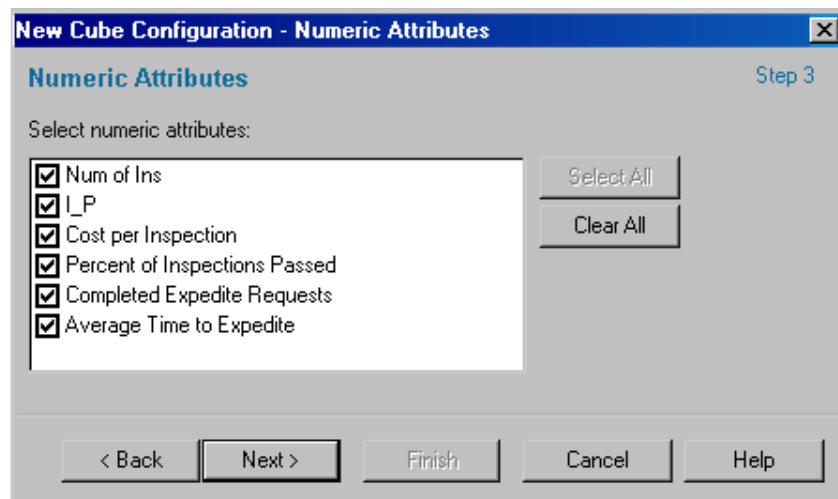
This step allows you to specify options for cube generation. The options available depend on whether you are using SAS OLAP or Microsoft Analysis Services to display cubes. Whichever you are using, for this step in the tutorial you can accept the default options.

3. Click **Next**.

Step 3 opens. In this step, you can select not only which modules or stages to include in the cube, but also the level at which to include them.



- Click the **Modules** checkbox. This means that each module defines a separate stage in the order shown.
 - Click the plus sign to expand the Resource module, and uncheck **Fixed_Variable**. The cube will be smaller if you exclude some accounts.
 - Click the plus sign to expand the Cost Object module, and under the **Include to Level** column, select **Level 3** from the drop-down list for **Region**. Selecting **Level3** for Region includes the details for Beaverton and Eugene in the cube.
 - Leave the defaults under **Cost Flow** as shown. We'll look more closely at what this choice means later in the chapter.
4. Click **Next**. Step 4 opens.
 5. Select all the numeric attributes to be included in the cube.



6. Click **Next**. Review your options, and then click **Finish**.

The cube configuration is added to the Cube Configurations folder.

Minimal Multi-Stage Contribution Cube

The next cube configuration that you create is an interesting one because it is very small. It provides an illustration of the utility of custom multi-stage contribution cubes. Even though this one is small, it is useful because it allows you to concentrate on total costs without worrying about where they come from.

1. Select **File** ⇒ **New** ⇒ **Cube Configuration**. Step 1 opens.

Specify the following for step 1:

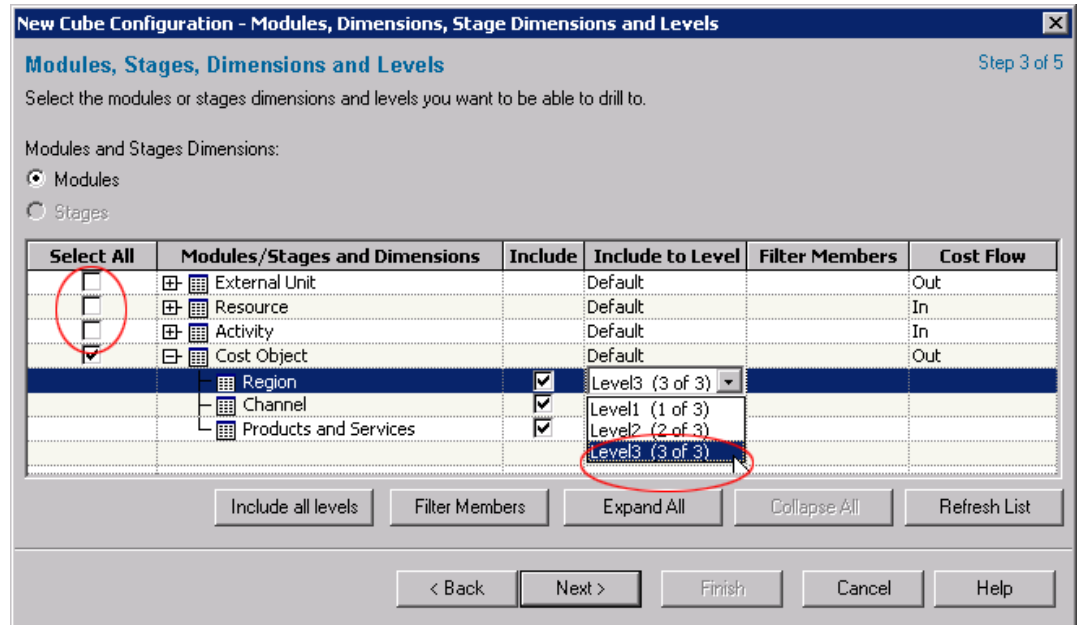
- For **Model name**, select **Parcel Express Tutorial**.
 - For **Cube configuration name**, enter **Parcel Express Multi-Stage Mini**.
 - For **Cube configuration reference**, enter **PE_MultiStageMini**.
 - In the **Generate** section, select **Cube and Fact table**.
 - For **Type**, select **Multi-Stage Contribution**.
2. Click **Next**.

Step 2 opens. This step allows you to specify options for cube generation. The options available depend on whether you are using SAS OLAP or Microsoft Analysis Services to display cubes.

Once again, you can accept the default options.

3. Click **Next**.

Step 3 opens. In this step, you can select not only which modules or stages to include in the cube, but also the level at which to include them.



- Click the **Modules** checkbox.
 - Uncheck the first three modules: **ExternalUnit**, **Resource**, and **Activity**. In this cube, you want to see only final costs.
 - Click the plus sign to expand the Cost Object module, and under the **Include to Level** column, select **Level 3** from the drop-down list for Region. Selecting **Level3** for Region includes the details for Beaverton and Eugene in the cube. The default is to include up to and including Level 2.
 - Leave the defaults under **Cost Flow** as shown.
4. Click **Next**. Step 4 opens.
 5. Select all the numeric attributes to be included in the cube.
 6. Click **Next**. Review your options, and then click **Finish**.

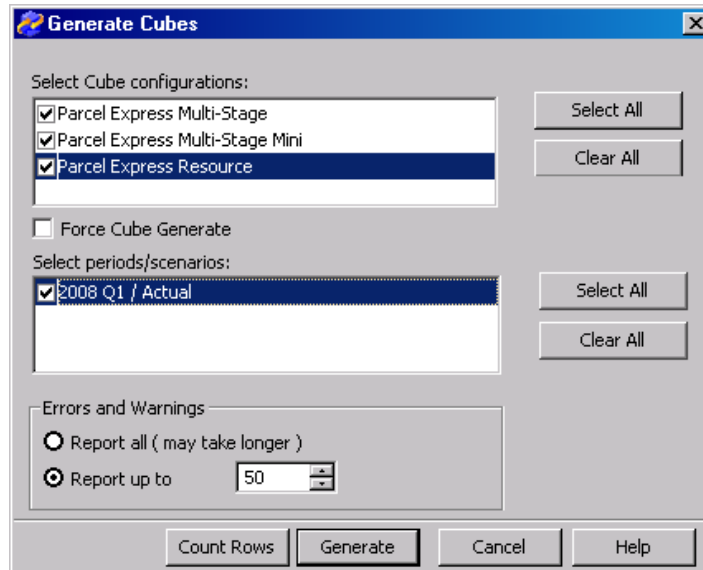
The cube configuration is added to the Cube Configurations folder.

Generate Cubes

Having created four cube configurations, you can use them to generate cubes.

1. If the Parcel Express Tutorial is not already open, return to model mode and open the tutorial model.
2. Select **Model** ⇒ **Generate Cubes**.

The Generate Cubes dialog opens.



3. Select the four cube configurations that you created.
4. Select the period/scenario **2008 Q1/Actual**.

Note: In previous releases of SAS Cost and Profitability Management, you could not select a subset of periods/scenarios for inclusion.

5. Click **Generate**.

One cube is generated for each cube configuration that is selected.

Select Cost Flow: In or Out

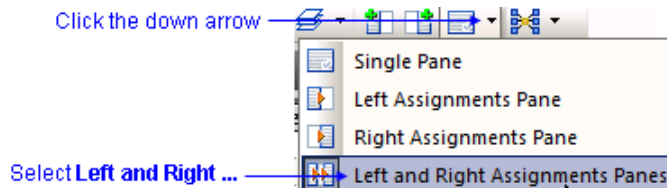
With some models, it makes a difference in generating a cube whether you select to show costs flowing into a module/stage or out of a module/stage. It makes a difference in case the model has assignments from accounts within a module/stage to accounts within the same module/stage. For the Parcel Express Tutorial model in Chapter 3, Making Assignments, you made assignments from activities to activities. One such example is shown in the following picture.

Resource module

IntsctnName	Display Name	IntsctnName	Cost
Eugene x Wages	ACTIVITY (PRIMARY PANE)	Eugene x Sort	\$718,279.86
Eugene x Operating Expenses	USA	Eugene x Inspect	\$225,422.36
Eugene x Equipment Expenses	Oregon		
	Eugene		
	Local Processing		
	Personnel Intensive Acti		
	Local Collection		
	Move to Warehouse		
	Regional Distribution		
	Beaverton		
Beaverton x Wages	ACTIVITY (PRIMARY PANE)	Beaverton x Sort	\$686,429.20
Beaverton x Operating Expense	USA	Beaverton x Inspect	\$252,522.79
Beaverton x Equipment Expense	Oregon		
	Eugene		
	Beaverton		
	Personnel Intensive Acti		
	Local Processing		
	Regional Distribution		
	Local Collection		
	Move to Warehouse		

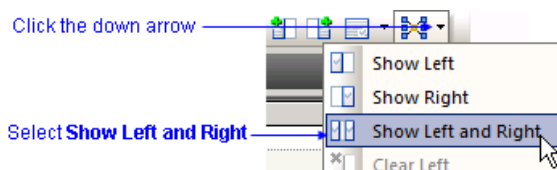
Note: To display these assignments:

1. Select the Activity module.
2. Select **Left and Right Assignments Panes** from the View Assignments Panes icon.



TIP You can simply click the **View Assignments Panes** icon . It is not necessary to pull down the menu.

3. Select the **Move to Warehouse** account.
4. Select **Show Left and Right** from the Show Assignments icon.



TIP You can simply click the **Show Assignments** icon . It is not necessary to pull down the menu.

When you generate a cube, you must specify what cost assignments you want to appear in the cube for each module/stage. Sticking with the current example, you must choose assignments into the Activity module (Move to Warehouse), or out of the Activity Module (Sort and Inspect). You can't choose both because that would result in double-counting final costs (part of Sort and Inspect costs are Move to Warehouse costs).

The following picture shows the results of showing costs flowing into the Activity module. Notice that Move to Warehouse has non-zero cost because it receives

assignments from the Resource module. Inspect and Sort also have non-zero costs because they also receive assignments from the Resource module.

<i>All_Products_and_Services</i>		+ All
<i>MeasuresLevel</i>		Cost
<i>Level1</i>	<i>Level2</i>	
+ All		
- Local Collection	Local Collection	689,462.17
	Local Collection (direct)	.
	Move to Warehouse	689,462.17
- Local Processing	Local Processing	770,596.55
	Inspect	364,282.53
	Local Processing (direct)	.
	Sort	406,314.02
+ None		208,393.20
+ Personnel Intensive Activities		405,984.94
+ Regional Distribution		1,781,856.34

By contrast, the following picture shows the results of showing costs flowing out of the Activity module. Notice that Move to Warehouse now has zero cost because it has no assignments out of the Activity module into the Cost Object module; its assignments are entirely within the Activity module.

<i>All_Products_and_Services</i>		+ All
<i>MeasuresLevel</i>		Cost
<i>Level1</i>	<i>Level2</i>	
+ All		.
- Local Collection	Local Collection	.
	Local Collection (direct)	.
	Move to Warehouse	.
- Local Processing	Local Processing	55,349.66
	Inspect	55,349.66
	Local Processing (direct)	.
	Sort	.
+ None		208,393.20
+ Personnel Intensive Activities		405,984.94
+ Regional Distribution		3,186,565.40

If a model has no cost assignments from accounts within a module/stage to accounts within the same module/stage, then the choice of showing cost flows into or out of a module/stage makes no difference (Every cost into a module/stage is also a cost out of the module/stage.). By defining multiple stages such that there are no assignments within a single stage, you avoid having to make the choice of showing cost flows in or out.

Manage Cube Permissions

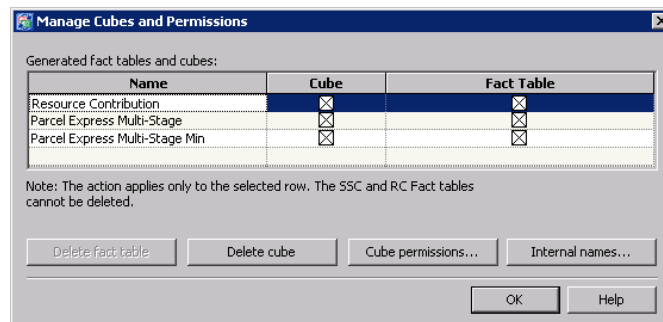
After generating a cube, you can change its owner and control who has permission to access it. Permission is granted by role. All users who are authorized to a role can receive permission (or be denied permission) to view a cube. Roles are created, and users are assigned to roles, in the SAS Cost and Profitability Management Administrator program.

Note: The ability to manage permissions in this way is restricted to cubes stored in Microsoft Analysis Services (MSAS).

Manage cube permissions

1. Select **Model** ⇒ **Manage Cubes and Permissions**.

The Manage Cubes and Permissions dialog box opens.

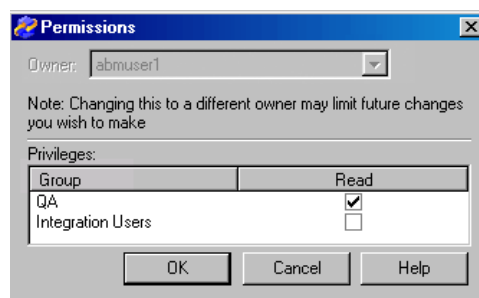


2. Select the cube whose permissions you want to manage.

Note: You can change only one cube at a time.

3. Click **Permissions**.

The Permissions dialog box opens.



4. You can add or remove Read access to groups. All members of the group inherit the permissions that you select for that group.

Chapter 15

Use the SAS OLAP Analyzer

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Using the Cube Explorer View	169

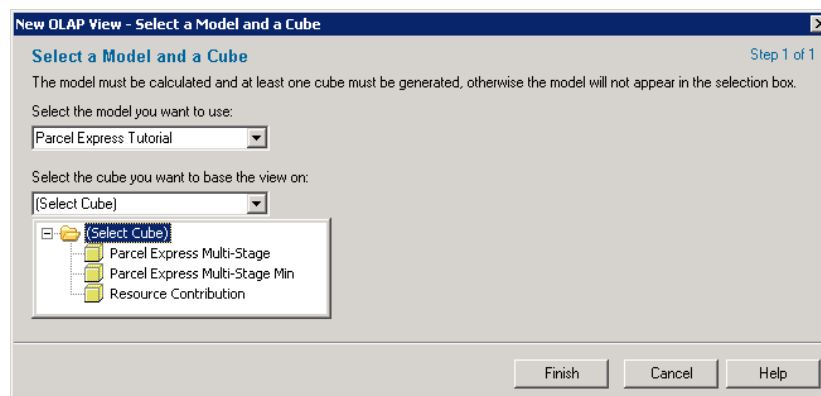
Creating OLAP Views

Once you have generated cubes, you use the SAS OLAP Analyzer to view the cube.

Create an OLAP view

1. Select **File** ⇒ **New** ⇒ **OLAP View**.

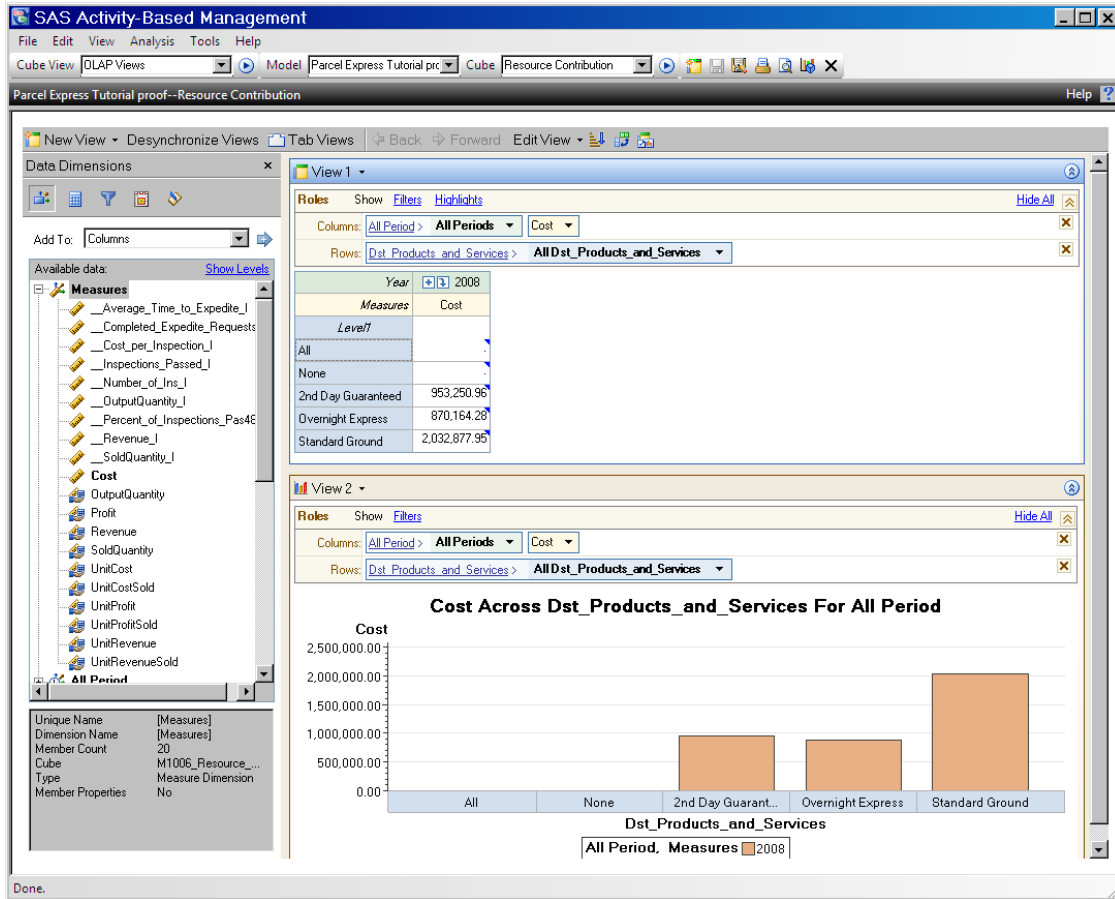
You see Step 1 of the New OLAP View Wizard. The New OLAP View Wizard has only one step.



2. Select the **Parcel Express Tutorial** model.
3. Select the **Resource Contributions** cube.

4. Click **Finish**.

You see the resource contributions cube for the Parcel Express Tutorial model.



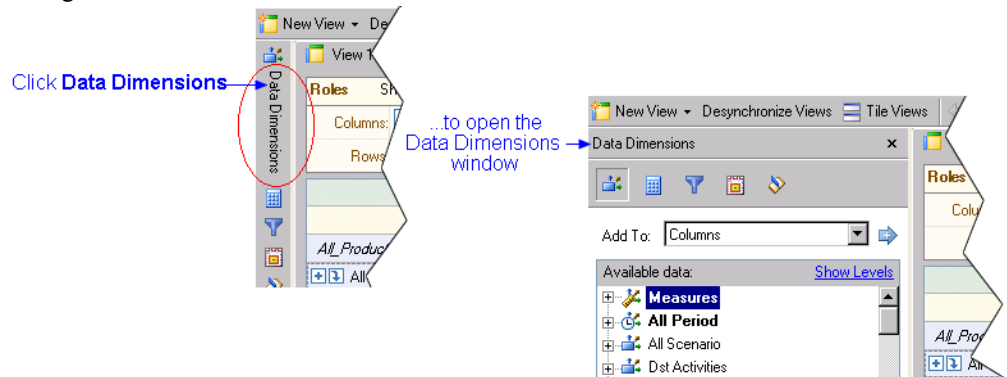
The cube view will be slightly different if you generated the cube using SAS OLAP than if you generated it using Microsoft SQL Server Analysis Services. For example, if the cube was generated using Microsoft SQL Server Analysis Services, then the Product and Services row is collapsed rather than expanded. This chapter shows a cube generated by using SAS OLAP.

Analyzing OLAP Cubes

Overview

So far, the only information that the cube has provided is the costs for periods and scenarios. To perform an interactive analysis of the cube, you will select specific dimensions for analysis. You use the Data Dimensions window to select dimensions for display in OLAP cubes.

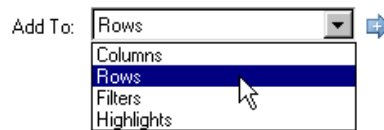
Note: If the Data Dimensions window is not visible, click the **Data Dimensions** tab to enlarge it.



Selecting and Displaying Dimensions in Cubes

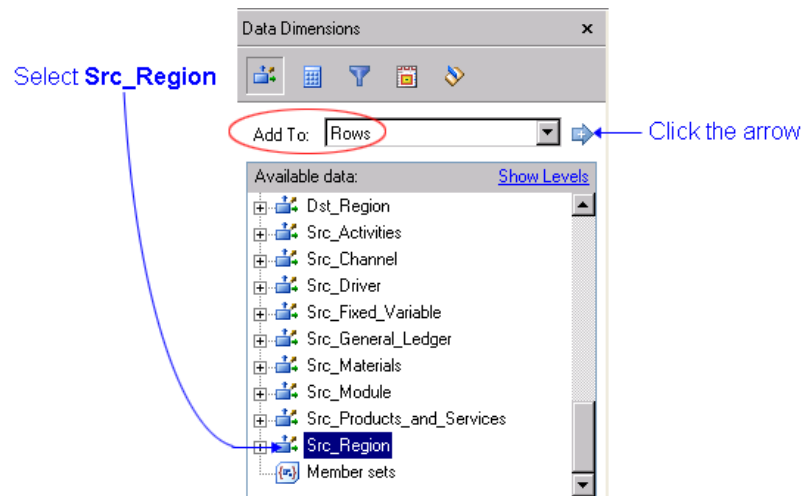
Select dimensions

1. Select **Rows** from the **Add To** drop-down list.

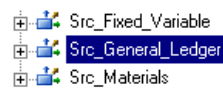


2. Select **Src_Region** and click the add arrow

Note: Make sure that **Rows** is selected to add to rows.

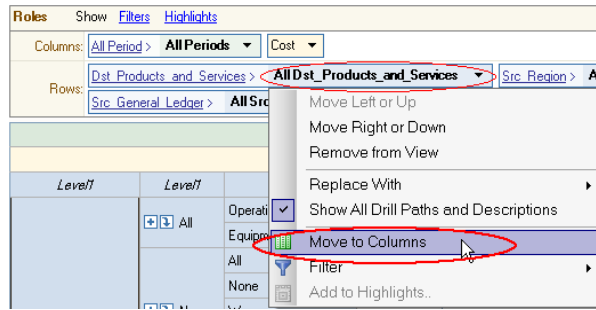


3. Select **Src_General_Ledger** and click the add arrow to add to **Row**.



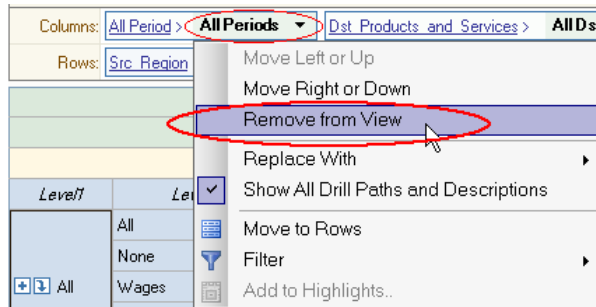
4. Move **All Dst_Products_and_Services** from rows to columns.

To do this, click the down-arrow next to **All Dst_Products_and_Services** and select **Move to Columns** on the menu.



5. Remove **AllPeriods** from columns.

To do this, click the down-arrow next to **AllPeriods** and select **Remove from View** on the menu.



The table view should now look like the following:

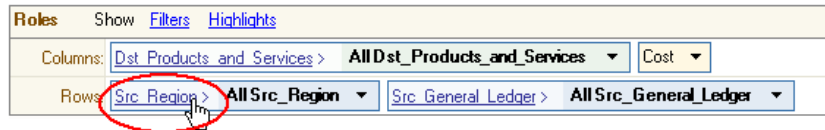
Level/		All	None	2nd Day Guaranteed	Overnight Express	Standard Ground
Measures		Cost	Cost	Cost	Cost	Cost
+ All	Level/					
	All	.	.	.	.	.
	None	.	.	.	.	.
	Wages	.	.	.	.	.
	Operating Expenses	.	.	.	.	.
+ None	Level/					
	All	.	.	.	.	.
	None	.	.	12,507.60	19,760.60	176,125.00
	Wages	.	.	.	.	.
	Operating Expenses	.	.	.	.	.
+ USA	Level/					
	All	.	.	.	.	.
	None	.	.	.	.	.
	Wages	.	.	785,033.01	706,383.49	1,555,183.51
	Operating Expenses	.	.	132,723.21	120,263.66	256,013.13
Equipment Expenses	.	.	22,987.15	23,756.53	45,556.32	

The data in the table view has been updated according to the dimensions that you have selected. To see the details, you must drill through the dimensions.

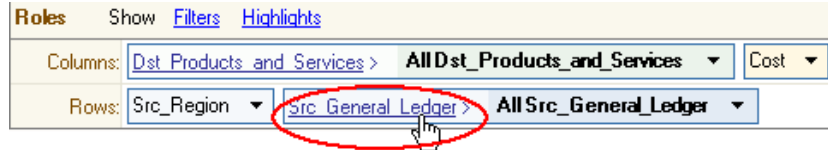
Collapse the table

Click the links in the table header to collapse rows or columns to produce a more compact table.

1. Click **Src_Region** in the table header.



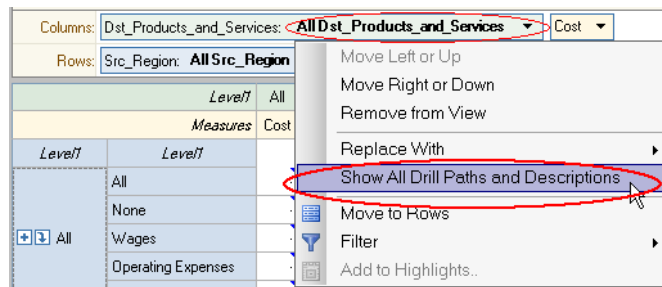
2. Click **Src_General_Ledger** in the table header.



Your table should now look like the following.



Level1		All	None	2nd Day Guaranteed	Overnight Express	Standard Ground
Measures		Cost	Cost	Cost	Cost	Cost
All Src_Region	All Src_General_Ledger					
+ All Src_Region	+ All Src_General_Ledger	.	.	953,250.96	870,164.28	2,032,877.95

Note: If links are not active in the table header, you can make them active by clicking the down arrow next to any item in the header and selecting **Show All Drill Paths and Descriptions**.



Drill through dimensions

1. Click the down arrow next to the **All Src_General_Ledger** row in the grid.

Note: Use  to drill down (the node that you click is *replaced* by its children). Use  to expand (the node that you click is displayed *along with* its children).

Click the down arrow

Level1		All	None	2nd Day Guaranteed	Overnight Express	Standard Ground
Measures		Cost	Cost	Cost	Cost	Cost
All Src_Region	All Src_General_Ledger					
+ All Src_Region	+ All Src_General_Ledger	.	.	953,250.96	870,164.28	2,032,877.95

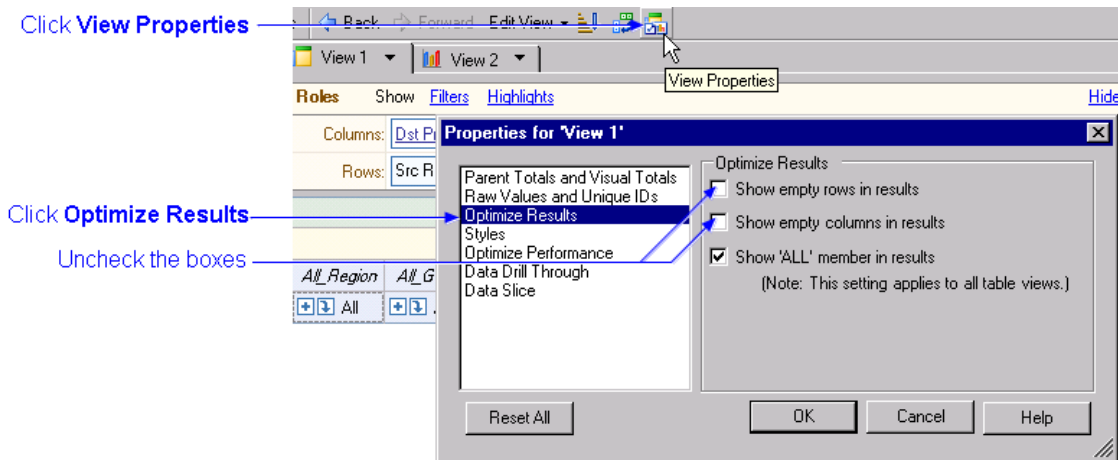
You see the **SrcGeneral_Ledger** dimension expand, showing the costs for each item.

Level1		All	None	2nd Day Guaranteed	Overnight Express	Standard Ground
Measures		Cost	Cost	Cost	Cost	Cost
All Src_Region	Level1					
	All	.	.	.	.	.
	None	.	.	12,507.60	19,760.60	176,125.00
+ All Src_Region	Wages	.	.	785,033.01	706,383.49	1,555,183.51
	Operating Expenses	.	.	132,723.21	120,263.66	256,013.13
	Equipment Expenses	.	.	22,987.15	23,756.53	45,556.32

You can eliminate empty rows and columns

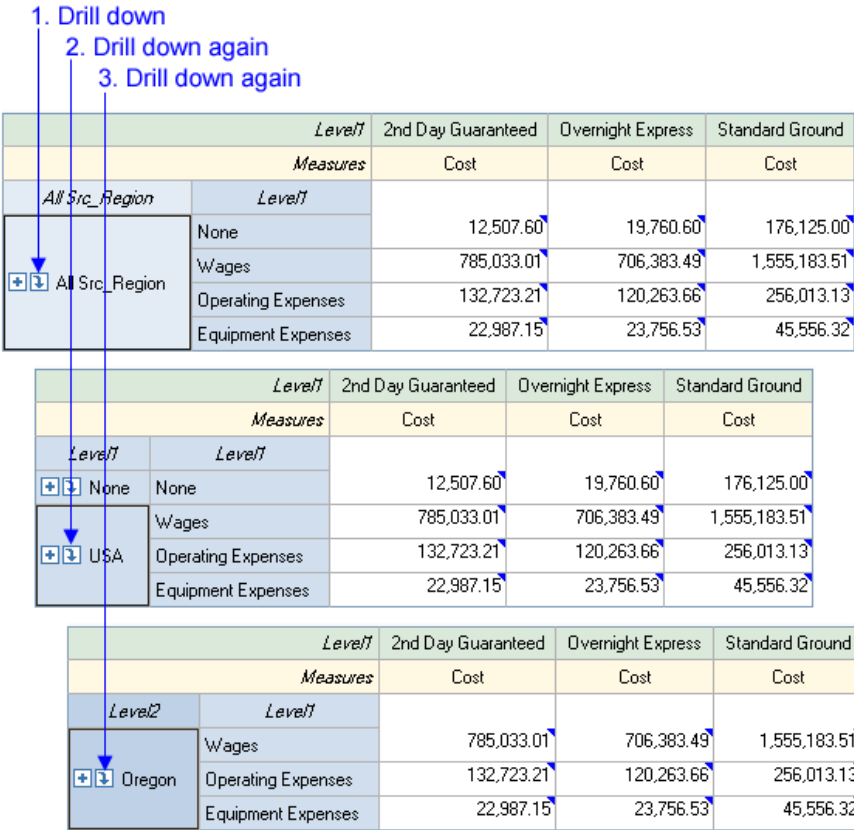
2. Delete empty rows and columns by clicking the **View Properties** button on the toolbar. Then click **Optimize Results** and uncheck the following two boxes:

- **Show empty rows in results**
- **Show empty columns in results**

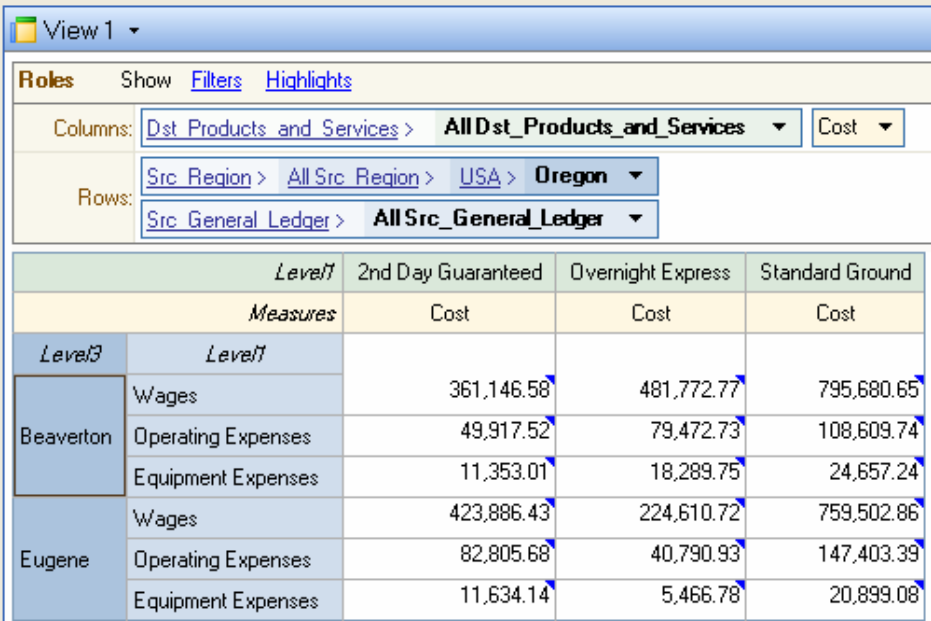


You see that the empty rows and columns have been removed from the grid and bar chart.

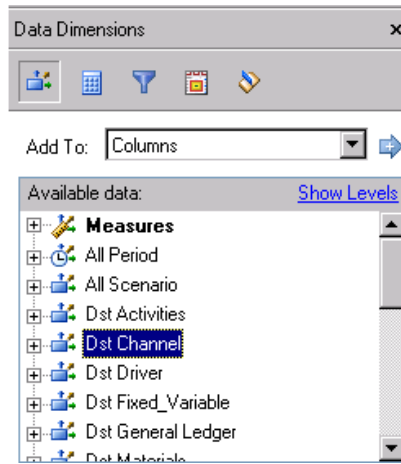
3. Drill down on the **AllSrc_Region** row multiple times until you see the general ledger expenses for Eugene and Beaverton.



Both the grid and bar chart show the contribution of resource accounts to each product.



4. In the Data Dimensions window, add Dst_Channel to Column.



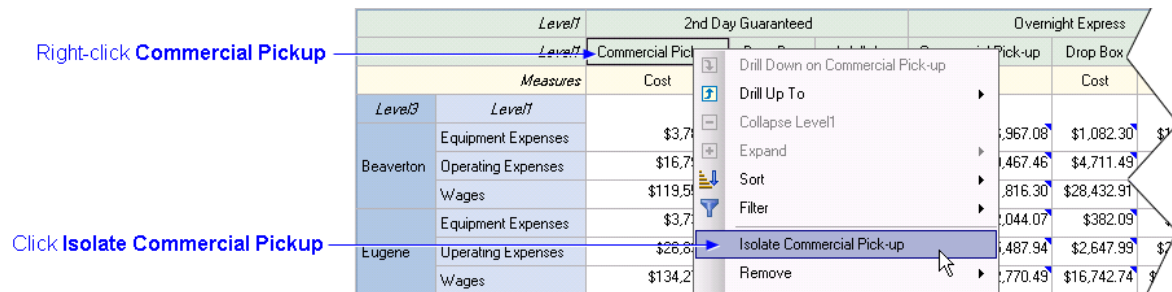
You see that the **All_Channel** dimension has been added to the grid and bar chart.

The table view should look like the following, showing the cost per channel for each product and service:

Level1		2nd Day Guaranteed			Overnight Express			Standard Ground
Level1		Commercial Pick-up	Drop Box	Walk In	Commercial Pick-up	Drop Box	Walk In	Commercial Pick-up
Measures		Cost	Cost	Cost	Cost	Cost	Cost	Cost
Level3	Level1							
Beaverton	Equipment Expenses	\$3,786.49	\$1,727.42	\$5,839.10	\$6,967.08	\$1,082.30	\$10,240.37	\$6,362.79
	Operating Expenses	\$16,799.40	\$7,614.15	\$25,503.97	\$30,467.46	\$4,711.49	\$44,293.78	\$28,314.35
	Wages	\$119,556.03	\$54,837.86	\$186,752.70	\$181,816.30	\$28,432.91	\$271,523.56	\$203,687.27
Eugene	Equipment Expenses	\$3,735.08	\$1,832.93	\$6,066.13	\$2,044.07	\$382.09	\$3,040.62	\$5,354.50
	Operating Expenses	\$26,837.99	\$12,673.87	\$43,293.82	\$15,487.94	\$2,647.99	\$22,655.01	\$38,238.24
	Wages	\$134,272.35	\$69,442.39	\$220,171.68	\$82,770.49	\$16,742.74	\$125,097.49	\$191,128.92

A very useful navigational aid is the ability to isolate portions of a table.

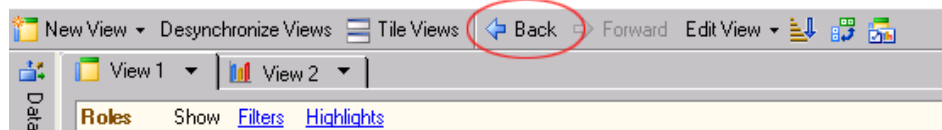
5. Right-click the **Commercial Pick-up** column under **2nd Day Guaranteed**, and then select **Isolate Commercial Pick-up** from the pop-up menu.



The resulting table allows you to focus your attention on the Commercial-Pick up channel.

Level1		2nd Day Guaranteed	Overnight Express	Standard Ground
Level1		Commercial Pick-up	Commercial Pick-up	Commercial Pick-up
Measures		Cost	Cost	Cost
Level3	Level1			
Beaverton	Equipment Expenses	\$3,786.49	\$6,967.08	\$6,362.79
	Operating Expenses	\$16,799.40	\$30,467.46	\$28,314.35
	Wages	\$119,556.03	\$181,816.30	\$203,687.27
Eugene	Equipment Expenses	\$3,735.08	\$2,044.07	\$5,354.50
	Operating Expenses	\$26,837.99	\$15,487.94	\$38,238.24
	Wages	\$134,272.35	\$82,770.49	\$191,128.92

Don't forget that you can click the Back button to return to a previous view.



6. Click the Back button to return to the previous view in which all channels are displayed (Commercial Pick-up, Drop Box, Walk In)

Level1		2nd Day Guaranteed			Overnight Express			Standard Ground	
Level1		Commercial Pick-up	Drop Box	Walk In	Commercial Pick-up	Drop Box	Walk In	Commercial Pick-up	
Measures		Cost	Cost	Cost	Cost	Cost	Cost	Cost	
Level3	Level1								
Beaverton	Equipment Expenses	\$3,786.49	\$1,727.42	\$5,839.10	\$6,967.08	\$1,082.30	\$10,240.37	\$6,362.79	\$
	Operating Expenses	\$16,799.40	\$7,614.15	\$25,503.97	\$30,467.46	\$4,711.49	\$44,293.78	\$28,314.35	\$17
	Wages	\$119,556.03	\$54,837.86	\$186,752.70	\$181,816.30	\$28,432.91	\$271,523.56	\$203,687.27	\$
Eugene	Equipment Expenses	\$3,735.08	\$1,832.93	\$6,066.13	\$2,044.07	\$382.09	\$3,040.62	\$5,354.50	\$
	Operating Expenses	\$26,837.99	\$12,673.87	\$43,293.82	\$15,487.94	\$2,647.99	\$22,655.01	\$38,238.24	\$
	Wages	\$134,272.35	\$69,442.39	\$220,171.68	\$82,770.49	\$16,742.74	\$125,097.49	\$191,128.92	\$147

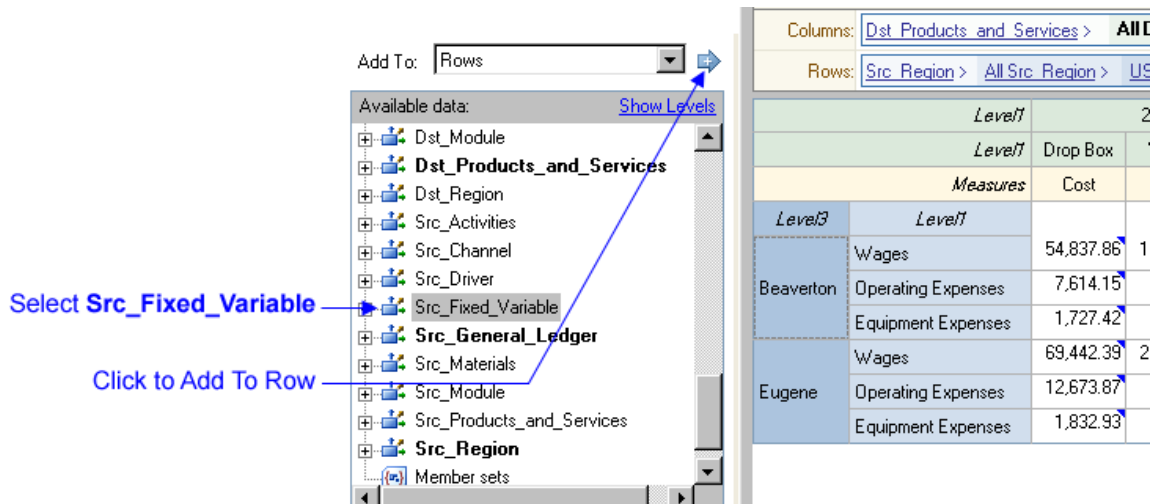
Displaying Dimension Attributes

In addition to displaying dimensions in the rows and columns of an OLAP view, you can display dimension attributes.

Select the Fixed_Variable dimension attribute

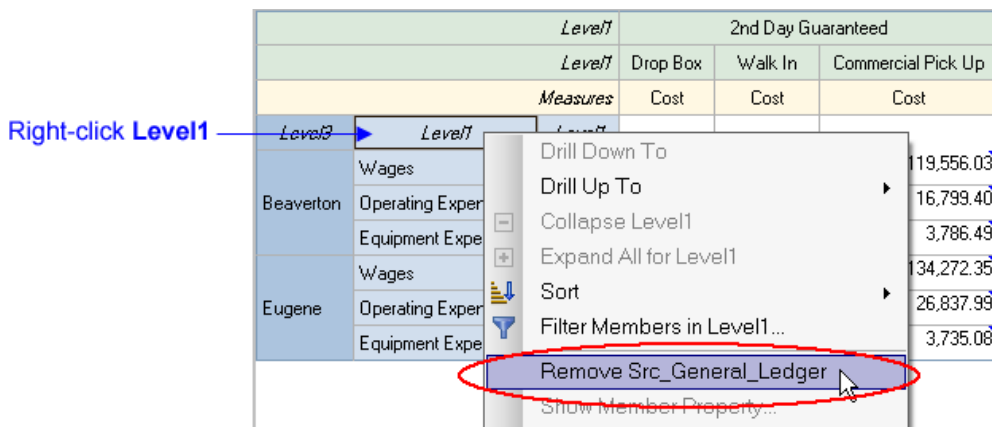
1. Select **Src_Fixed_Variable** from the Data Dimensions window and click the add arrow to add to **Row**.

Notice that the dimension attribute, Fixed_Variable, appears in the Data Dimension window along with other cube dimensions.



2. Right-click the row header, **Level1**, and then select **Remove Src_General_Ledger** from the pop-up menu.

This step is not necessary, but we are doing it so as to isolate the Fixed_Variable attribute.



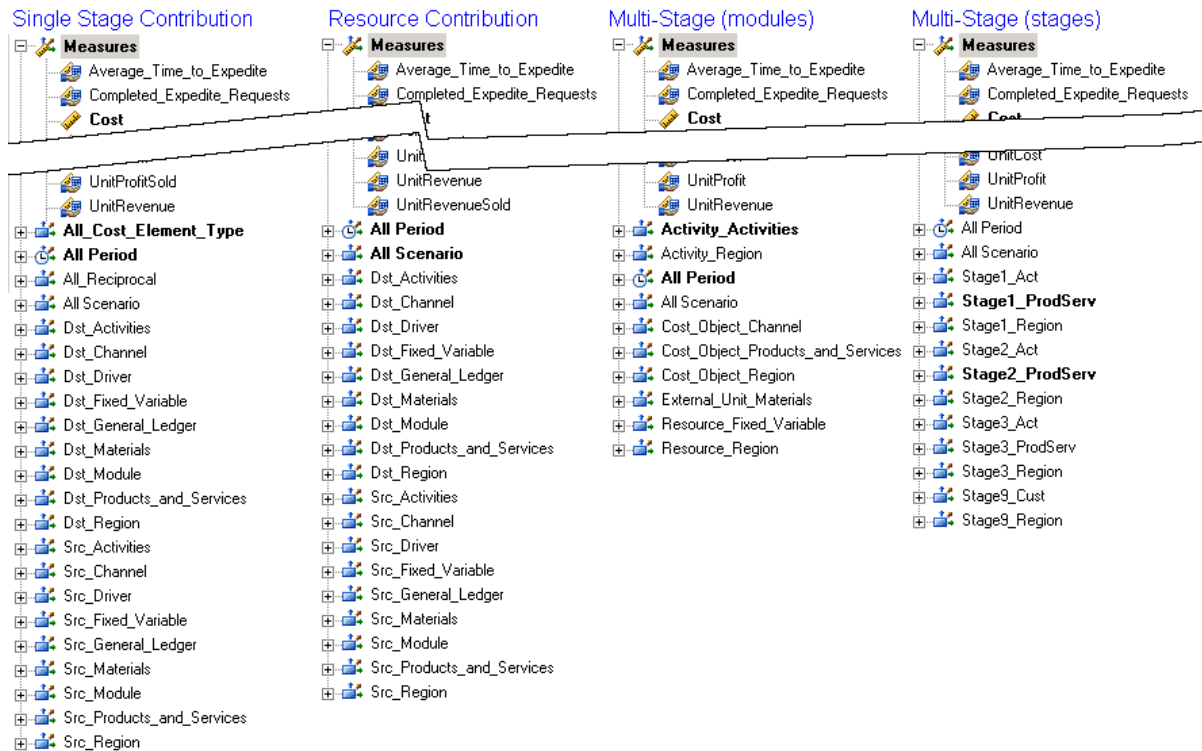
Your OLAP view should now look like the following. Notice that costs are broken down into fixed costs and variable costs (and those that are neither fixed nor variable). Dimension attributes can serve the same purpose as full-fledged dimensions.

Roles Show Filters Highlights Hide All									
Columns: Dst_Products_and_Services > AllDst_Products_and_Services > Dst_Channel > AllDst_Channel > Cost									
Rows: Src_Region > AllSrc_Region > USA > Oregon > Src_Fixed_Variable > AllSrc_Fixed_Variable									
		2nd Day Guaranteed			Overnight Express			Standard Ground	
		Drop Box	Walk In	Commercial Pick Up	Drop Box	Walk In	Commercial Pick Up	Drop Box	Walk In
		Cost	Cost	Cost	Cost	Cost	Cost	Cost	Cost
Level3	Level1								
Beaverton	None	1,727.42	5,839.10	3,786.49	1,082.30	10,240.37	6,967.08	4,111.16	14,183.00
	Fixed	54,837.86	186,752.70	119,556.03	28,432.91	271,523.56	181,816.30	132,294.68	459,698.70
	Variable	7,614.15	25,503.97	16,799.40	4,711.49	44,293.78	30,467.46	18,173.92	62,121.00
Eugene	None	1,832.93	6,066.13	3,735.08	382.09	3,040.62	2,044.07	3,778.69	11,770.00
	Fixed	69,442.39	220,171.68	134,272.35	16,742.74	125,097.49	82,770.49	143,521.08	424,852.00
	Variable	12,673.87	43,293.82	26,837.99	2,647.99	22,655.01	15,487.94	25,805.76	83,359.00

Summary: Rows and Columns

The following picture shows for each type of cube the elements that are available in the OLAP Analyser for adding to rows or columns.

Note: The picture shows the elements available for a cube containing stages, which is a feature that is not exhibited by the Parcel Express Tutorial, so this option is not available for the tutorial.



Saving OLAP Views

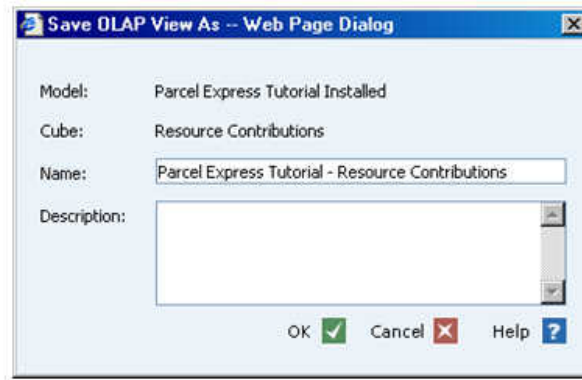
During the analysis, changes that you make to the Grid View, Chart View, and Cube Explorer View are retained during a session, even when you return to the OLAP page after viewing other tabs. However, when you close the session or when you close Grid View, Chart View, or Cube Explorer View, your changes are lost.

To save these changes so that they will be available later, you must save the OLAP view. When you save an OLAP view, you save the layout and contents of the view. However, the window positions and states are not saved.

Save an OLAP view

1. Select **Analysis** ⇒ **Save View As**.

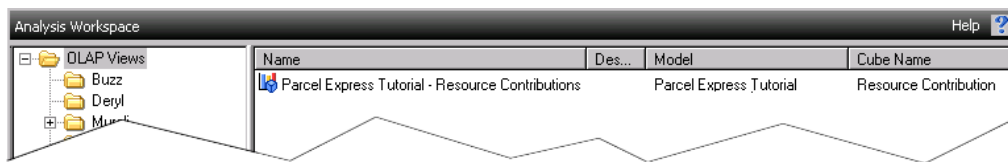
You see the Save OLAP View As dialog box.



2. For **Name**, type **Parcel Express Tutorial – Resource Contributions**. Click **OK**.
3. On the toolbar, click the **Go to Analysis Workspace** icon.



You see a link to **Parcel Express Tutorial Resource Contributions** in the **OLAP Views** list.



Using Measures in Cubes

A measure is a property or an attribute that you can use to analyze OLAP information. The default measure is Cost. Now, you will create a new OLAP view using different measures. You will also create a custom measure.

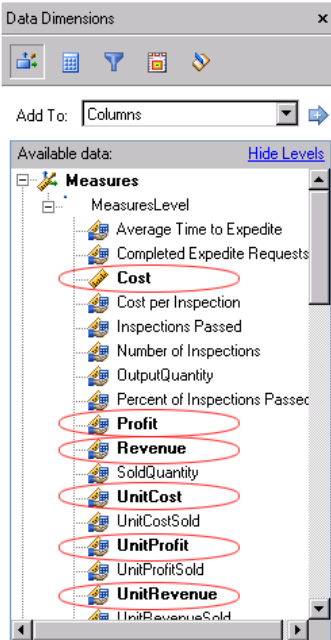
Working with measures in OLAP

1. Select **File** ⇒ **New** ⇒ **OLAP View** (or click **New OLAP View**).
2. Select the **Parcel Express Tutorial** model.
3. Select the **Resource Contributions** cube.
4. Click **Finish**.

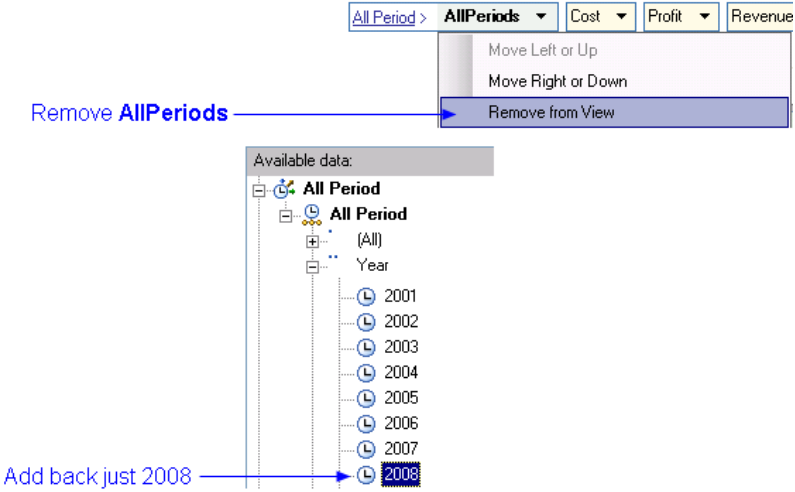
The resource contributions cube for the Parcel Express Tutorial model opens.

5. From the Data Dimensions window, add the following Measures to Columns:

- Cost
- Profit
- Revenue
- UnitCost
- UnitProfit
- UnitRevenue



Note: If there are too many periods displayed in columns of the cube, you can remove AllPeriods from columns and then add back just the period 2008 as shown in the following picture.

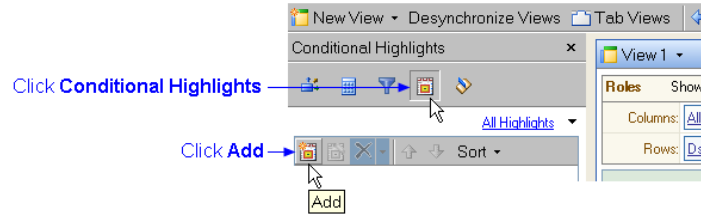


6. You see that the **2nd Day Guaranteed** product is losing money, while the other two products are profitable.

Year	2008					
Measures	Cost	Profit	Revenue	UnitCost	UnitProfit	UnitRevenue
Level						
All	.	.	.	.	.	.
None	.	.	.	.	.	.
2nd Day Guaranteed	953,250.96	-73,424.96	879,826.00	10.67	-0.82	9.85
Overnight Express	870,164.28	639,779.72	1,509,944.00	8.62	6.33	14.95
Standard Ground	2,032,877.95	193,372.05	2,226,250.00	10.51	1.00	11.51

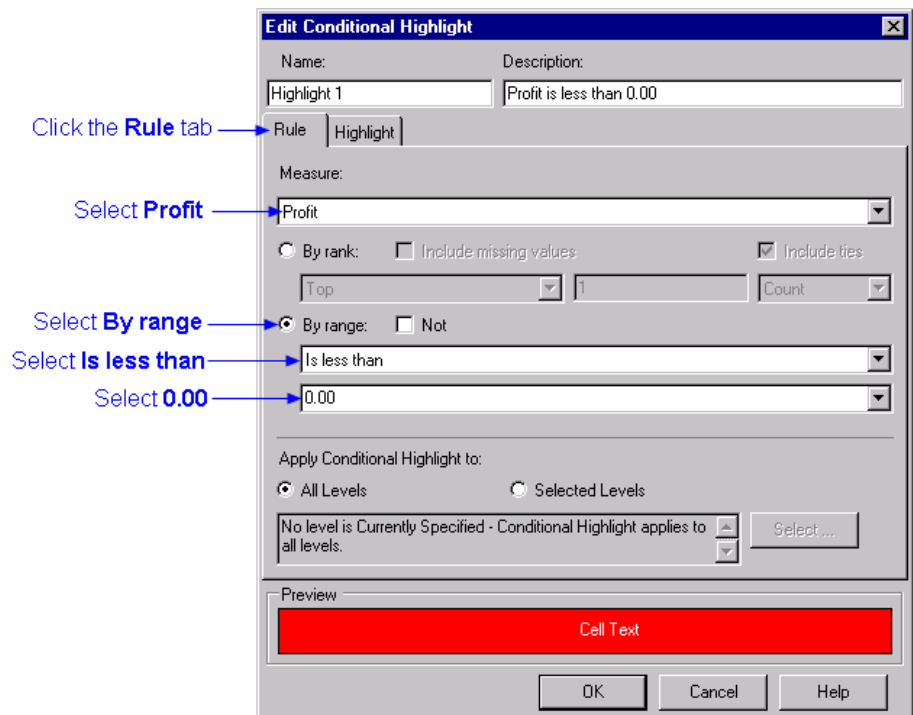
7. Let's highlight the unprofitable product.
 a. Click the **Conditional Highlights** button.

- b. Click **Add**.

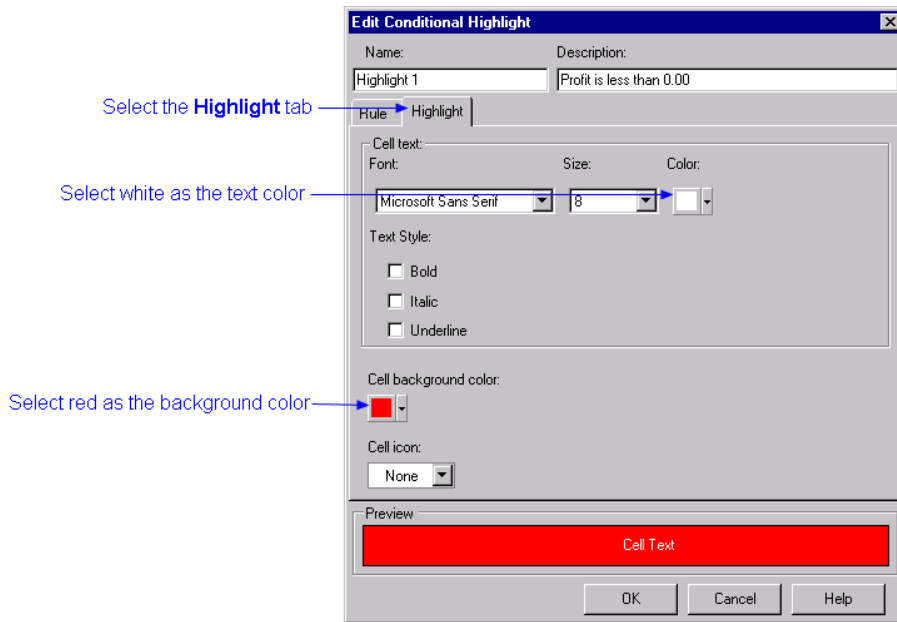


The Add Conditional Highlight window opens.

- c. Select **Profit** as the item to be highlighted.
- d. Select **By range**.
- e. Select **Is less than**.
- f. Select **0.00**.



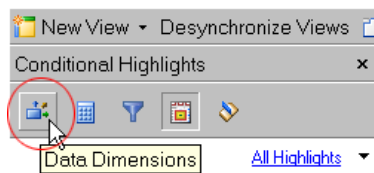
- g. Click the **Highlight** tab.
- h. Select white as the text color.
- i. Select red as the background color, and click **OK**.



The display now appears as follows. Notice that the negative profit is displayed with a red background.

Year	2008					
Measures	Cost	Profit	Revenue	UnitCost	UnitProfit	UnitRevenue
Level						
All	.	.	.	.	.	.
None	.	.	.	.	.	.
2nd Day Guaranteed	953,250.96	-73,424.96	879,826.00	10.67	-0.82	9.85
Overnight Express	870,164.28	639,779.72	1,509,944.00	8.62	6.33	14.95
Standard Ground	2,032,877.95	193,372.05	2,226,250.00	10.51	1.00	11.51

- Click the **Data Dimensions** button to return to the Data Dimensions tab.



- Add **Dst_Channel** to Row.

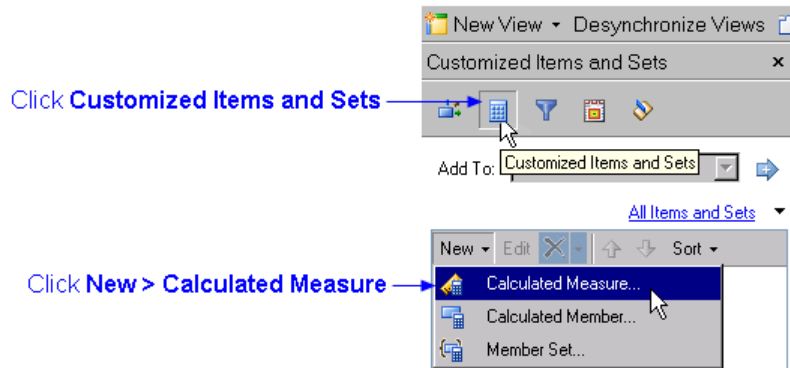
This will enable you to see whether this trend is similar across all channels. One of management's goals was to make a profit of at least 10% on the 2nd Day Guaranteed product, and at least 25% on all other products. SAS Cost and Profitability Management has shown that the company's profit picture is not what management expected. Competitive pressures forced the company to lower the price of their 2nd Day Guaranteed product, but it did not know that it was losing money on all products but the Walk In product.

Year		2008					
Measures		Cost	Profit	Revenue	UnitCost	UnitProfit	UnitRevenue
Level1	Level2						
2nd Day Guaranteed	Drop Box	150,018.62	-16,193.62	133,825.00	11.11	-1.20	9.91
	Walk In	494,045.00	43,456.00	537,501.00	10.78	0.95	11.73
	Commercial Pick Up	309,187.34	-100,687.34	208,500.00	10.31	-3.36	6.95
Overnight Express	Drop Box	55,173.47	34,526.53	89,700.00	9.20	5.75	14.95
	Walk In	487,806.86	349,387.14	837,194.00	8.71	6.24	14.95
	Commercial Pick Up	327,183.96	255,866.04	583,050.00	8.39	6.56	14.95
Standard Ground	Drop Box	357,273.22	211,476.78	568,750.00	10.99	6.51	17.50
	Walk In	1,156,087.09	-391,087.09	765,000.00	10.51	-3.56	6.95
	Commercial Pick Up	519,517.64	372,982.36	892,500.00	10.19	7.31	17.50

Now, you will create a custom measure to calculate gross margin.

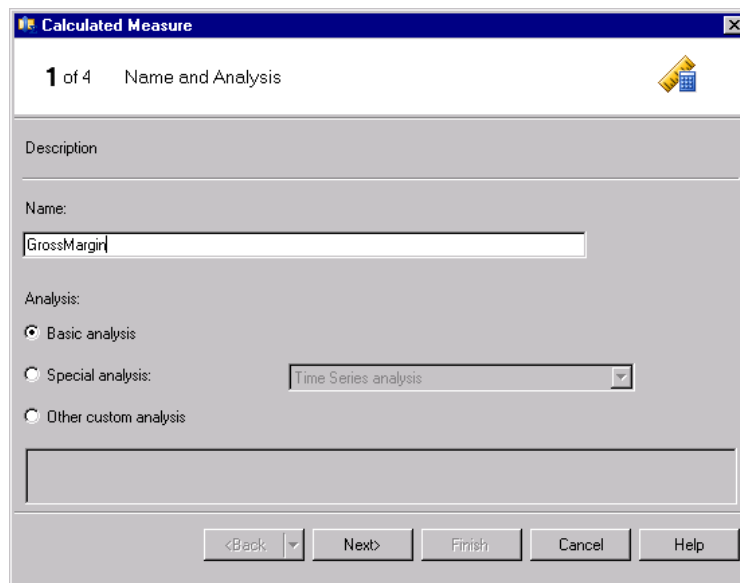
Create a custom measure

1. Click the **Customized Items and Sets** button..
2. Click **New** ⇒ **Calculated Measure**.



You see Step 1 of the Create New Calculated Member.

3. For **Name**, type **GrossMargin**, and then click **Next**.
Leave **Basic Analysis** selected.



4. Select **Ratio** and **Profit / Revenue**, and then click **Next**.

5. Select **Percent** for the **Format**, and then click **Next**.

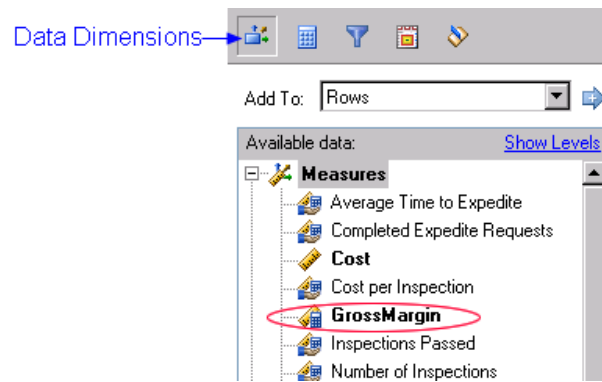
Note: The option **Publicly, to all users at all times** is available only for cubes in SAS OLAP Server. The option is not available for cubes in Microsoft Analysis Services.

6. Review the summary, and then click **Finish**.

You see the profit margin of each product. Based on the stated goals of the company, the 2nd Day Guaranteed is underperforming significantly.

Year		2008						
Measures		Cost	Profit	Revenue	UnitCost	UnitProfit	UnitRevenue	GrossMargin
Level1	Level2							
2nd Day Guaranteed	Drop Box	150,018.62	-16,193.62	133,825.00	11.11	-1.20	9.91	-0.12
	Walk In	494,045.00	43,456.00	537,501.00	10.78	0.95	11.73	0.08
	Commercial Pick Up	309,187.34	-100,687.34	208,500.00	10.31	-3.36	6.95	-0.48
Overnight Express	Drop Box	55,173.47	34,526.53	89,700.00	9.20	5.75	14.95	0.38
	Walk In	487,806.86	349,387.14	837,194.00	8.71	6.24	14.95	0.42
	Commercial Pick Up	327,183.96	255,866.04	583,050.00	8.39	6.56	14.95	0.44
Standard Ground	Drop Box	357,273.22	211,476.78	568,750.00	10.99	6.51	17.50	0.37
	Walk In	1,156,087.09	-391,087.09	765,000.00	10.51	-3.56	6.95	-0.51
	Commercial Pick Up	519,517.64	372,982.36	892,500.00	10.19	7.31	17.50	0.42

If you look at the Data Dimensions window, you can see that **GrossMargin** has been added to the list of available measures.



Exporting Cubes

At any point during OLAP analysis, you can export the displayed data to a Microsoft Excel spreadsheet. When you export to Microsoft Excel, you are exporting only the data that is currently displayed, not the entire cube.

Export an OLAP cube

1. Display the OLAP data that you want to export to a Microsoft Excel spreadsheet.
2. Select **Analysis** ⇒ **Export to Excel**.

You see a Microsoft Excel spreadsheet that contains the data that is currently displayed in the cube.

	A	B	C	D	E	F	G	H	I
1	All_Products	Level1	All_Channel	Level1	All Periods - Cost	All Periods - GrossMargin	All Periods - Profit	All Periods - Revenue	All Peri
2									
3	All	2nd Day Guaranteed	All	All					
4	All	2nd Day Guaranteed	All	Commercial Pick-up	309187.3407	-0.482912905	-100687.3407	208500	10.31
5	All	2nd Day Guaranteed	All	Drop Box	150018.6212	-0.12100595	-16193.62121	133825	11.11
6	All	2nd Day Guaranteed	All	None					
7	All	2nd Day Guaranteed	All	Walk In	494045.002	8.08E-02	43455.99805	537501	10.78
8	All	All	All	All					
9	All	All	All	Commercial Pick-up					
10	All	All	All	Drop Box					
	All	All	All	None					

Using the Cube Explorer View

Now, you will analyze the model by using the Cube Explorer View to get more information about the costs that are associated with each product. The management of Parcel Express has learned that margins on the 2nd Day Guaranteed product fall well below expectations. The SAS Cost and Profitability Management OLAP tool will help management assess why costs for that product are higher than costs for other products.

You will create a multi-stage contributions cube view and use the Cube Explorer View to explore costs.

Create a multi-stage contributions cube view

1. Select **File** ⇒ **New** ⇒ **OLAP View** (or click **New OLAP View**).
2. Select the **Parcel Express Tutorial** model.
3. Select the **Parcel Express Multi Stage** cube.

Select the model you want to use:

Parcel Express Tutorial

Select the cube you want to base the view on:

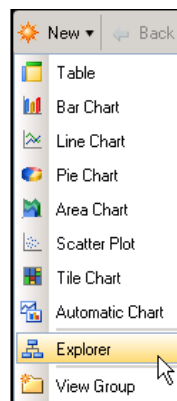
Parcel Express Multi-Stage

4. Click **Finish**.

The multi-stage contributions cube for the Parcel Express Tutorial model opens.

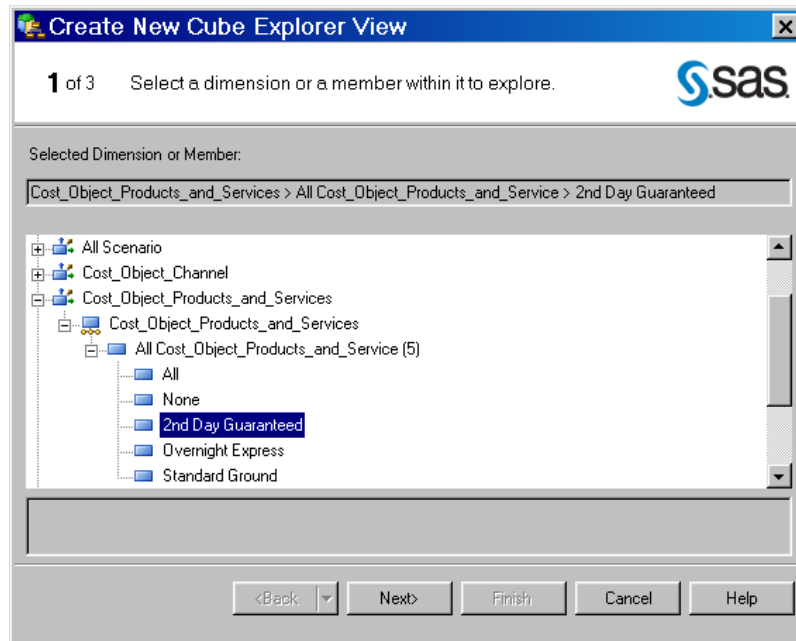
Create a new Cube Explorer View

1. Select **New** ⇒ **Explorer**.



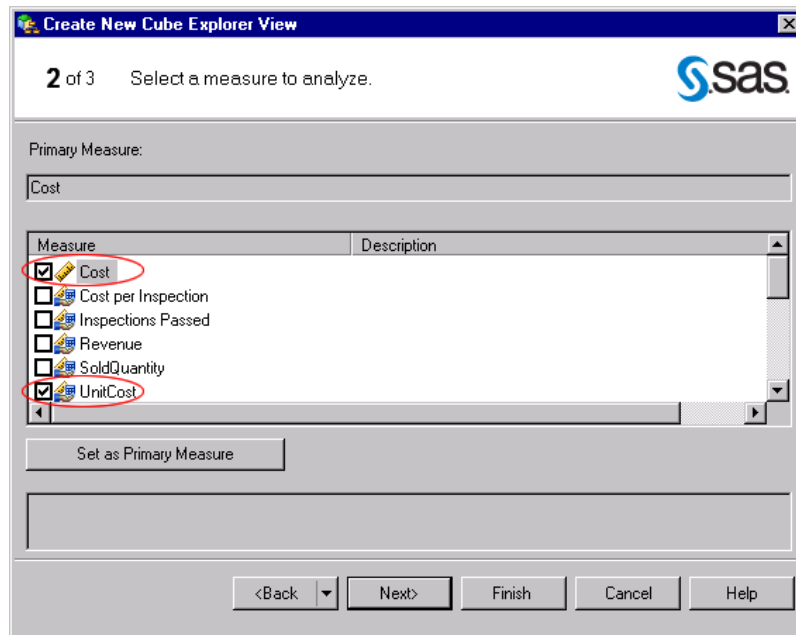
You see the first page of the Create New Cube Explorer View.

2. Click **Cost_Object_Products_and_Services** ⇒ **All** ⇒ **2nd Day Guaranteed**, and then click **Next**. You will open the Cube Explorer View at the 2nd Day Guaranteed product because that is the product whose costs you want to explore.



3. Select **Cost** and **UnitCost** as the measures to analyze, and then click **Finish** (we will skip the third step of applying filters).

Note: The following image has been doctored to show **Cost** and **UnitCost** together.



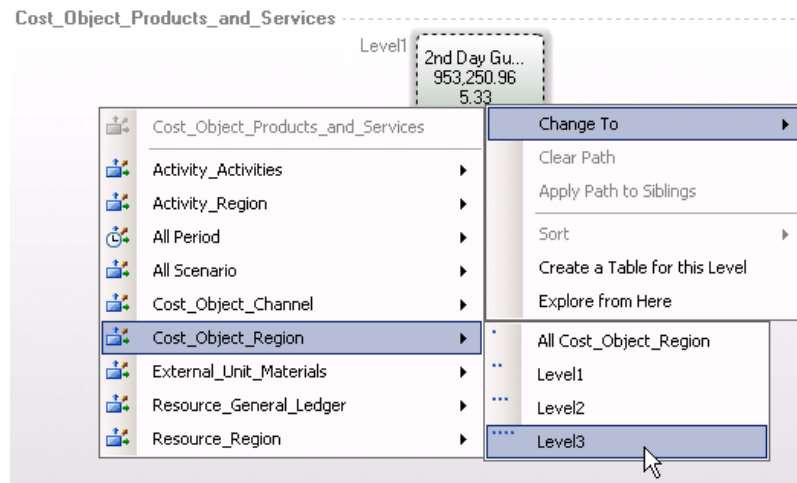
The Cube Explorer View opens at the 2nd Day Guaranteed product.

Measures: Cost, UnitCost

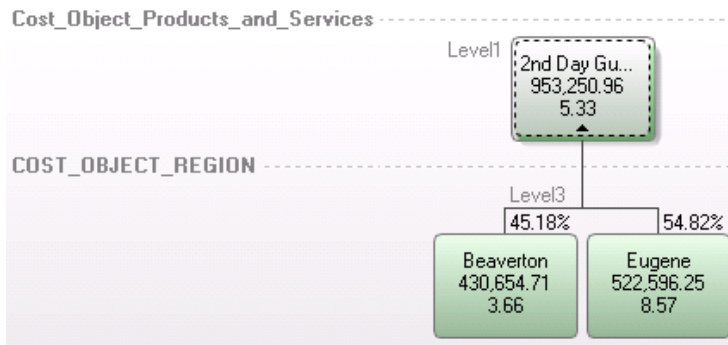


Analyze the model in Cube Explorer View

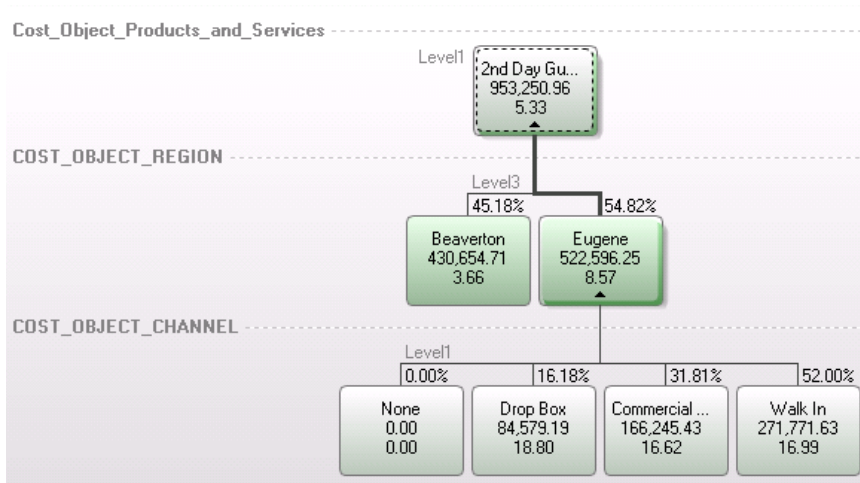
1. Right-click **2nd Day Guaranteed** and select **Change To** ⇒ **Cost_Object_Region** ⇒ **Level3**.



You see the regional costs that contribute to the 2nd Day Guaranteed product.

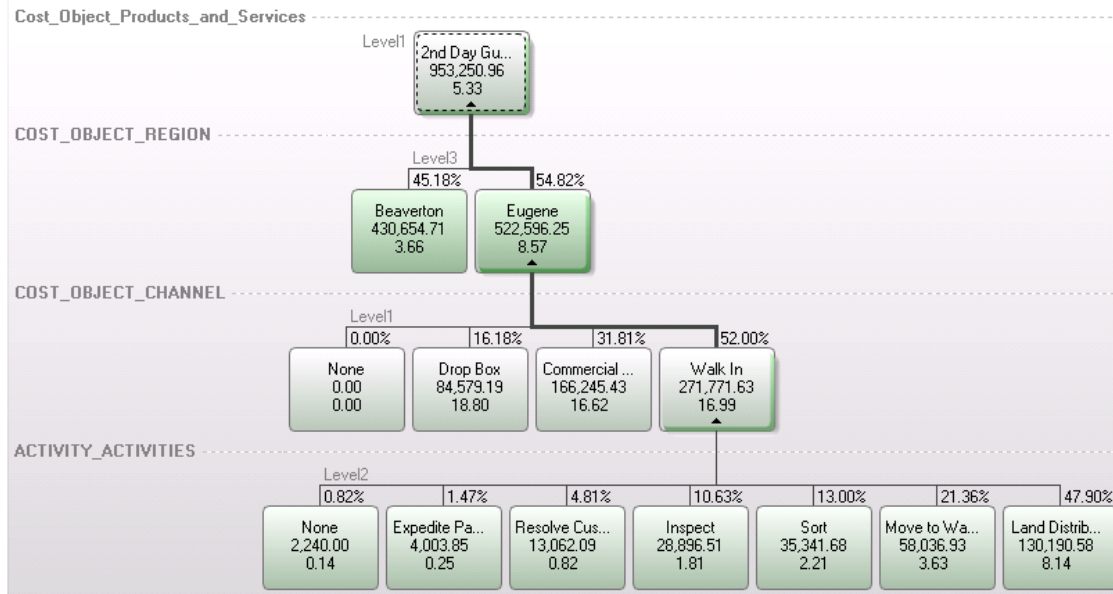


2. Because Eugene accounts for the larger part of costs (54.82%) of the 2nd Day Guaranteed product costs, drill down into **Eugene** to discover where those costs come from. Right-click Eugene and select **Change To** ⇒ **Cost_Object_Channel** ⇒ **Level1**.



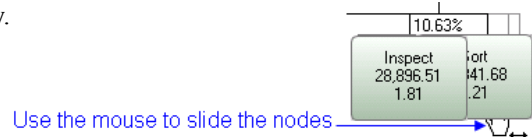
You see that the **Walk In** channel contributes 52% to the costs of the 2nd Day Guaranteed product. Drill down into this channel to explore what accounts for its costs.

3. Right-click **Walk In** and select **Change To** ⇒ **Activity_Activities** ⇒ **Level2**.

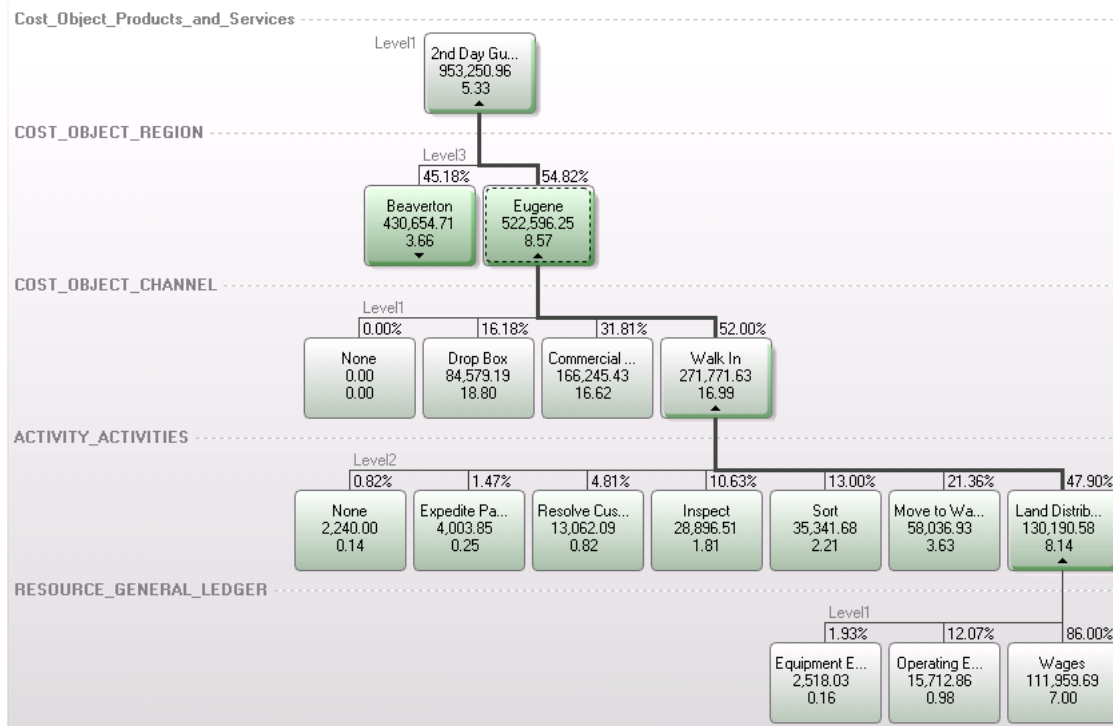


The **Land Distribution** set of activities stands out as constituting 47.90% of costs.

Note: If the Land Distribution node is covered, you can use the mouse to slide the covering nodes away.

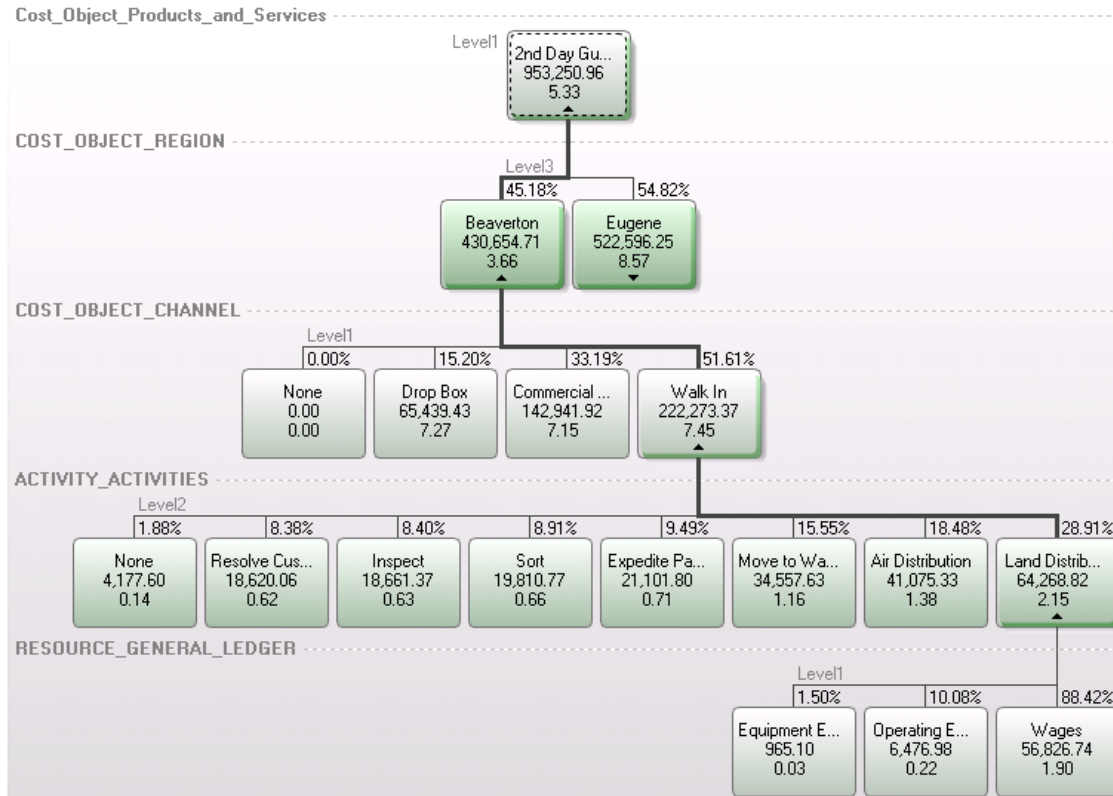


4. Right-click **LandDistribution** and select **Change To** ⇒ **Resource_General_Ledger** ⇒ **Level1**.



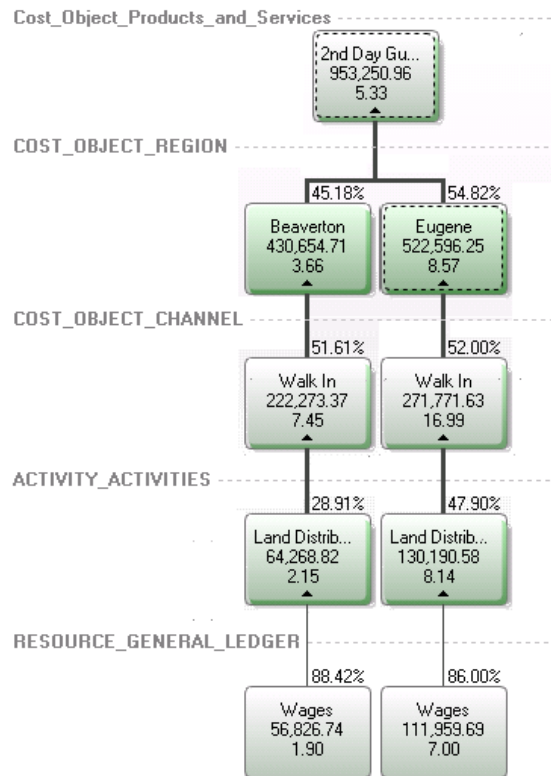
Now you can see that the overwhelming part of this cost is for wages in Eugene a full 86%.

5. To confirm the finding that it is wages in Eugene that account for the high cost of the 2nd Day Guaranteed product, drill down on Beaverton for a comparison.
 - a. Right-click Beaverton and select **Change To** ⇒ **Cost_Object_Channel** ⇒ **Level1**.
 - b. Right-click Walk In and select **Change To** ⇒ **Activity_Activities** ⇒ **Level2**.
 - c. Right-click Land Distribution and select **Change To** ⇒ **Resource_General_Ledger** ⇒ **Level1**.



Even though **Wages** account for a similar percentage of costs for the 2nd Day Guaranteed product in Beaverton, **UnitCost** for Beaverton is a fraction of **UnitCost** for Eugene, and the total cost in Beaverton is half of the total cost in Eugene.

If you could put the two branches of the tree together, the picture would look like the following. The unit cost of wages in Eugene for land distribution (\$7.00) is much higher than the unit cost of wages in Beaverton (\$1.90). These costs play an important role in accounting for the total costs of the 2nd Day Guaranteed product.



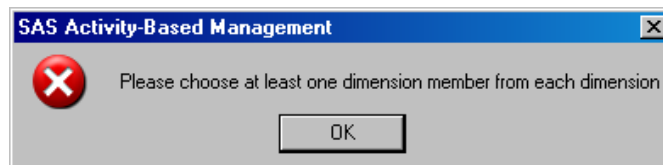
Chapter 16

Handling No-Dimension Accounts

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Introduction

To create an account (an intersection of dimension members), you must specify a dimension member from each dimension in a module. The following error message appears if you omit selecting a dimension member from a particular dimension.



However, you can omit specifying a dimension member from a particular dimension by selecting instead the “No” dimension member that the system automatically generates for each dimension. The “No” dimension member signifies that there is no value for that dimension. For example, in the cost object module of the Parcel Express Tutorial, you created an account for each product for which the product is not associated with any particular channel. And, for each channel, you similarly created an account for which the channel is not associated with any particular product. The following picture shows these accounts. You can see, for example, that the Drop Box x No <Products and Services> account has associated costs of \$15,468.14. These are costs that are associated with the Drop Box channel and not associated with any product.

Display Name	Cost
COST OBJECT (PRIMARY PANE)	\$3,856,293.20
USA	\$3,856,293.20
Oregon	\$3,856,293.20
Beaverton	\$2,127,721.43
Drop Box	\$283,937.13
Standard Ground	\$183,182.03
2nd Day Guaranteed	\$65,439.43
Overnight Express	\$35,315.67
No <Products and Services>	\$15,468.14
Commercial Pick-up	\$652,520.38
Standard Ground	\$283,249.36
No <Products and Services>	\$25,780.24
2nd Day Guaranteed	\$142,941.92
Overnight Express	\$226,329.11
No <Channel>	\$1,998,820.25
2nd Day Guaranteed	\$401,573.75
Overnight Express	\$564,408.05
Standard Ground	\$1,032,838.45
Walk In	\$1,191,263.92
2nd Day Guaranteed	\$222,273.37
Overnight Express	\$336,220.46
Standard Ground	\$632,770.10
No <Products and Services>	\$87,652.80
Eugene	\$1,728,571.77

Annotations: "Products not associated with any channel" points to the "No <Channel>" row. "Channels not associated with any product" points to the "No <Products and Services>" rows.

You should also notice, as shown below, that the Drop Box x No <Products and Services> account is grouped with ordinary accounts in which the Drop Box channel is associated with a particular product.

Display Name	Cost
Beaverton	\$2,127,721.43
Drop Box	\$283,937.13
Standard Ground	\$183,182.03
2nd Day Guaranteed	\$65,439.43
Overnight Express	\$35,315.67
No <Products and Services>	\$15,468.14
Commercial Pick-up	\$652,520.38
Standard Ground	\$283,249.36

Annotation: "No-dimension account is grouped with ordinary accounts." points to the "No <Products and Services>" row.

This mixing of accounts has the somewhat unintuitive results that the total for the Drop Box roll-up account, \$283,937.13, does not include the costs that are associated with the Drop Box x No <Products and Services> account.

Display Name	Cost
COST OBJECT (PRIMARY PANE)	\$3,856,293.20
USA	\$3,856,293.20
Oregon	\$3,856,293.20
Beaverton	\$2,127,721.43
Drop Box	\$283,937.13
Standard Ground	\$183,182.03
2nd Day Guaranteed	\$65,439.43
Overnight Express	\$35,315.67
No <Products and Services>	\$15,468.14
Commercial Pick-up	\$652,520.38
Standard Ground	\$283,249.36
No <Products and Services>	\$25,780.24
2nd Day Guaranteed	\$142,941.92
Overnight Express	\$226,329.11

Standard Ground	\$183,182.03
+ 2nd Day Guaranteed	\$65,439.43
+ Overnight Express	\$35,315.67
=	\$283,937.13

Annotation: "Not part of the total for the Drop Box channel" points to the "No <Products and Services>" row.

The reason for not including the full cost is that doing so would result in double counting. As shown below, the cost of the No <Products and Services > account is distributed to the individual Region x Channel x Product accounts. Rolling up the full cost would result in double counting.

Display Name	Cost	IntsctnName	Cost	DrvDrvnCost
COST OBJECT (PRIMARY PANE)	\$3,856,293.2	Beaverton x Drop Box x 2nd Day Guaranteed	\$65,439.43	\$4,015.84
USA	\$3,856,293.2	Beaverton x Drop Box x Overnight Express	\$35,315.67	+ \$1,784.82
Oregon	\$3,856,293.2	Beaverton x Drop Box x Standard Ground	\$183,182.03	+ \$9,667.48
Beaverton	\$2,127,721.4			\$15,468.14
Drop Box	\$283,937.13			
Standard Ground	\$183,182.03			
2nd Day Guaranteed	\$65,439.43			
Overnight Express	\$35,315.67			
No <Products and Servi	\$15,468.14			

This chapter describes an alternative method for organizing No-dimension accounts that avoids this counterintuitive result and has an even more significant advantages that are described later.

Alternative Method

The alternative method entails the following steps for the module that contains No-dimension accounts. In the Parcel Express Tutorial, it is the cost object module that contains No-dimension accounts.

Create an additional dimension and its dimension members

1. Create an additional dimension. Name this dimension Cost Object Type.
2. Inside the Cost Object Type dimension, create a dimension member for each dimension for which you want a No-dimension account.

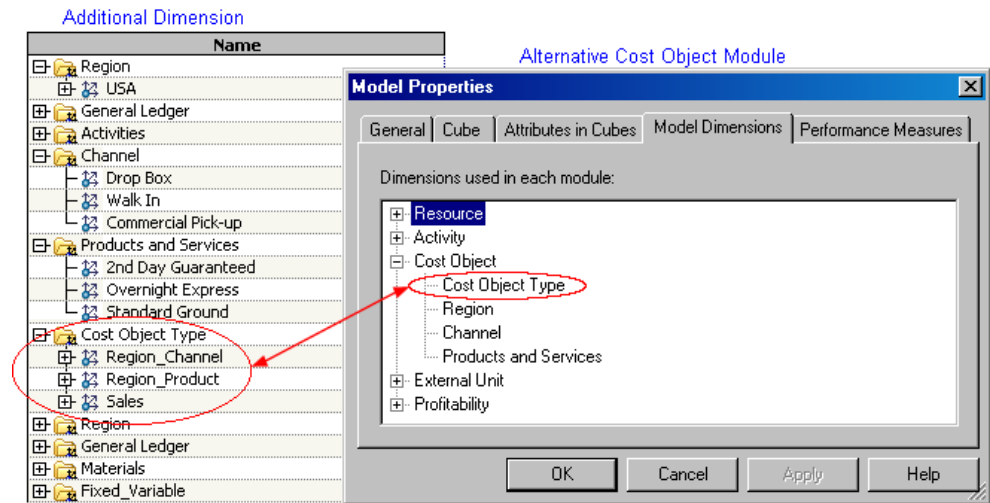
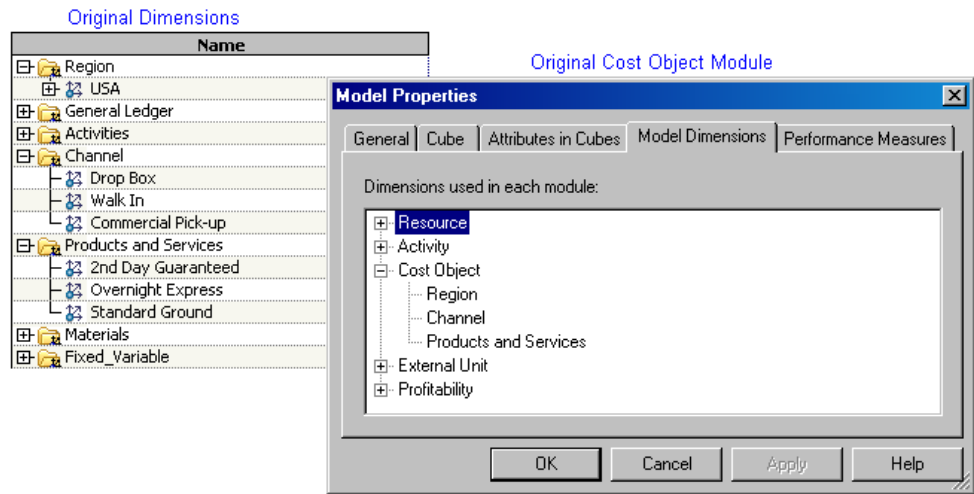
For the Parcel Express Tutorial, that means creating the following dimension members:

- A dimension member for channels that are not associated with any product
Name this dimension member Region_Channel because it is to contain accounts that are the intersection of Region x Channel x No <Products and Services>.
- A dimension member for products that are not associated with any channel
Name this dimension member Region_Product because it is to contain accounts that are the intersection of Region x Product x No <Channel>.

3. Inside the Cost Object Type dimension, create a dimension member to contain No-dimension accounts.

Name this dimension member Sales. It contains accounts that are the intersection of Region x Channel x Products and Services. These accounts represent the last stop in the model. When the final product is sold, you know the exact Product x Channel x Region intersection. All costs, even indirect product costs, are assigned to a final intersection of all dimensions.

The following picture contrasts the original dimensions in the Parcel Express Tutorial with the alternative method being described in this chapter that entails an additional dimension and its dimension members.



Create accounts using the new dimension members

Create the following accounts for Beaverton and Eugene:

Dimension Member	Accounts
Region_Channel	Commercial Pick-up x No <Products and Services> Drop Box x No <Products and Services> Walk In x No <Products and Services>
Region_Product	No <Channel> x 2nd Day Guaranteed No <Channel> x Overnight Express No <Channel> x Standard Ground

Dimension Member	Accounts
Sales	Commercial Pick-up x 2nd Day Guaranteed Commercial Pick-up x Overnight Express Commercial Pick-up x Standard Ground Drop Box x 2nd Day Guaranteed Drop Box x Overnight Express Drop Box x Standard Ground Walk In x 2nd Day Guaranteed Walk In x Overnight Express Walk In x Standard Ground

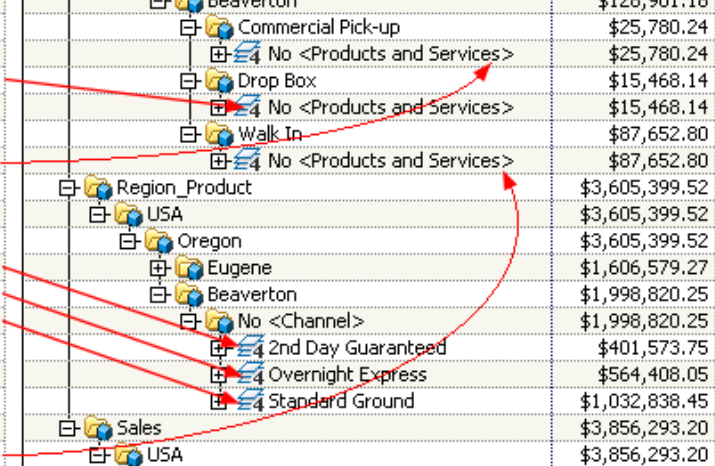
The following picture shows the accounts to be created in the cost object module under Beaverton compared to the original accounts in the Parcel Express Tutorial. The same accounts are created under Eugene.

Original Cost Object Hierarchy

Display Name	Cost
COST OBJECT (PRIMARY PANE)	\$3,856,293.20
USA	\$3,856,293.20
Oregon	\$3,856,293.20
Beaverton	\$2,127,721.43
Drop Box	\$283,937.13
Standard Ground	\$183,182.03
2nd Day Guaranteed	\$65,439.43
Overnight Express	\$35,315.67
No <Products and Services>	\$15,468.14
Commercial Pick-up	\$652,520.38
Standard Ground	\$283,249.36
No <Products and Services>	\$25,780.24
2nd Day Guaranteed	\$142,941.92
Overnight Express	\$226,329.11
No <Channel>	\$1,998,820.25
2nd Day Guaranteed	\$401,573.75
Overnight Express	\$564,408.05
Standard Ground	\$1,032,838.45
Walk In	\$1,191,263.92
2nd Day Guaranteed	\$222,273.37
Overnight Express	\$336,220.46
Standard Ground	\$632,770.10
No <Products and Services>	\$87,652.80
Eugene	\$1,728,571.77

Alternative Cost Object Hierarchy

Display Name	Cost
COST OBJECT (PRIMARY PANE)	\$3,856,293.20
Region_Channel	\$250,893.68
USA	\$250,893.68
Oregon	\$250,893.68
Eugene	\$121,992.50
Beaverton	\$128,901.18
Commercial Pick-up	\$25,780.24
No <Products and Services>	\$25,780.24
Drop Box	\$15,468.14
No <Products and Services>	\$15,468.14
Walk In	\$87,652.80
No <Products and Services>	\$87,652.80
Region_Product	\$3,605,399.52
USA	\$3,605,399.52
Oregon	\$3,605,399.52
Eugene	\$1,606,579.27
Beaverton	\$1,998,820.25
No <Channel>	\$1,998,820.25
2nd Day Guaranteed	\$401,573.75
Overnight Express	\$564,408.05
Standard Ground	\$1,032,838.45
Sales	\$3,856,293.20
USA	\$3,856,293.20
Oregon	\$3,856,293.20
Beaverton	\$2,127,721.43
Commercial Pick-up	\$652,520.38
2nd Day Guaranteed	\$142,941.92
Overnight Express	\$226,329.11
Standard Ground	\$283,249.36
Drop Box	\$283,937.13
2nd Day Guaranteed	\$65,439.43
Overnight Express	\$35,315.67
Standard Ground	\$183,182.03
Walk In	\$1,191,263.92
2nd Day Guaranteed	\$222,273.37
Overnight Express	\$336,220.46
Standard Ground	\$632,770.10
Eugene	\$1,728,571.77



Advantages of Using the Alternative

Recall that mixing No-dimension accounts with ordinary accounts has the somewhat counterintuitive effect that the cost in a roll-up account does not include the cost of No-dimension accounts.

Another aspect of this same phenomenon is the fact that mixing accounts results in the non-display of totals for No-dimension accounts. For example, in the top part of the following picture, you can see that in both the original cost object hierarchy and in the alternative cost object hierarchy, the total is displayed for products that are not associated with any channel (\$1,998,820.25). However, in the bottom part of the picture, you can see that in the original cost object hierarchy, there is no total that is displayed for the cost of channels that are not associated with any product. By contrast, in the alternative cost object hierarchy, in which No-dimension accounts are grouped together, you can easily see that the total cost for channels not associated with any product is \$128,901.18. Thus, it is easier to trace costs that are associated with a No-dimension account for a specific dimension.

Original Cost Object Hierarchy

Display Name	Cost
COST OBJECT (PRIMARY PANE)	\$3,856,293.20
USA	\$3,856,293.20
Oregon	\$3,856,293.20
Beaverton	\$2,127,721.43
Drop Box	\$283,937.13
Standard Ground	\$183,182.03
2nd Day Guaranteed	\$65,439.43
Overnight Express	\$35,315.67
No <Products and Services>	\$15,468.14
Commercial Pick-up	\$652,520.38
Standard Ground	\$283,249.36
No <Products and Services>	\$25,780.24
2nd Day Guaranteed	\$142,941.92
Overnight Express	\$226,329.11
No <Channel>	\$1,998,820.25
2nd Day Guaranteed	\$401,573.75
Overnight Express	\$564,408.05
Standard Ground	\$1,032,838.45
Walk In	\$1,191,263.92
2nd Day Guaranteed	\$222,273.37
Overnight Express	\$336,220.46
Standard Ground	\$632,770.10
No <Products and Services>	\$87,652.80
Eugene	\$1,728,571.77

Alternative Cost Object Hierarchy

Display Name	Cost
COST OBJECT (PRIMARY PANE)	\$3,856,293.20
Region_Channel	\$250,893.68
Region_Product	\$3,605,399.52
USA	\$3,605,399.52
Oregon	\$3,605,399.52
Eugene	\$1,606,579.27
Beaverton	\$1,998,820.25
No <Channel>	\$1,998,820.25
2nd Day Guaranteed	\$401,573.75
Overnight Express	\$564,408.05
Standard Ground	\$1,032,838.45
Sales	\$3,856,293.20
USA	\$3,856,293.20
Oregon	\$3,856,293.20

\$401,573.75
+ \$564,408.05
+ \$1,032,838.45
= \$1,998,820.25

Total for all products, regardless of channel

Original Cost Object Hierarchy

Display Name	Cost
COST OBJECT (PRIMARY PANE)	\$3,856,293.20
USA	\$3,856,293.20
Oregon	\$3,856,293.20
Beaverton	\$2,127,721.43
Drop Box	\$283,937.13
Standard Ground	\$183,182.03
2nd Day Guaranteed	\$65,439.43
Overnight Express	\$35,315.67
No <Products and Services>	\$15,468.14
Commercial Pick-up	\$652,520.38
Standard Ground	\$283,249.36
No <Products and Services>	\$25,780.24
2nd Day Guaranteed	\$142,941.92
Overnight Express	\$226,329.11
No <Channel>	\$1,998,820.25
2nd Day Guaranteed	\$401,573.75
Overnight Express	\$564,408.05
Standard Ground	\$1,032,838.45
Walk In	\$1,191,263.92
2nd Day Guaranteed	\$222,273.37
Overnight Express	\$336,220.46
Standard Ground	\$632,770.10
No <Products and Services>	\$87,652.80
Eugene	\$1,728,571.77

Alternative Cost Object Hierarchy

Display Name	Cost
COST OBJECT (PRIMARY PANE)	\$3,856,293.2
Region_Channel	\$250,893.68
USA	\$250,893.68
Oregon	\$250,893.68
Eugene	\$121,992.50
Beaverton	\$128,901.18
Commercial Pick-up	\$25,780.24
No <Products and Services>	\$25,780.24
Drop Box	\$15,468.14
No <Products and Services>	\$15,468.14
Walk In	\$87,652.80
No <Products and Services>	\$87,652.80
Region_Product	\$3,605,399.5
Sales	\$3,856,293.2
USA	\$3,856,293.2
Oregon	\$3,856,293.2

\$25,780.24
+ \$15,468.14
+ \$87,652.80
= \$128,901.18

Total for all channels, regardless of product

This total was not even visible in the original hierarchy.

An even more significant advantage is that the cost flow from No-dimension accounts to other accounts is more clearly visible. For example, in the following picture you can see how the cost (\$87,652.80) of the account Beaverton x Walk In x No<Products and Services> contributes to the total cost of the Walk In channel.

Display Name	Cost
COST OBJECT (PRIMARY PANE)	\$3,856,293.20
Region_Channel	\$250,893.68
USA	\$250,893.68
Oregon	\$250,893.68
Eugene	\$121,992.50
Beaverton	\$128,901.18
Commercial Pick-up	\$25,780.24
No <Products and Services>	\$25,780.24
Drop Box	\$15,468.14
No <Products and Services>	\$15,468.14
Walk In	\$87,652.80
No <Products and Services>	\$87,652.80
Beaverton x Resolve Customer Complaints	\$87,652.80
Region_Product	\$3,605,399.52
USA	\$3,605,399.52
Oregon	\$3,605,399.52
Eugene	\$1,606,579.27
Beaverton	\$1,998,820.25
No <Channel>	\$1,998,820.25
2nd Day Guaranteed	\$401,573.75
Overnight Express	\$564,408.05
Standard Ground	\$1,032,838.45
Sales	\$3,856,293.20
USA	\$3,856,293.20
Oregon	\$3,856,293.20
Beaverton	\$2,127,721.43
Commercial Pick-up	\$652,520.38
Drop Box	\$283,937.13
2nd Day Guaranteed	\$65,439.43
Overnight Express	\$35,315.67
Standard Ground	\$183,182.03
Walk In	\$1,191,263.92
2nd Day Guaranteed	\$222,273.37
Region_Channel x Beaverton x Walk In x No <Products and Services>	\$18,620.06
Region_Product x Beaverton x No <Channel> x 2nd Day Guaranteed	\$203,653.31
Overnight Express	\$336,220.46
Region_Channel x Beaverton x Walk In x No <Products and Services>	\$23,293.79
Region_Product x Beaverton x No <Channel> x Overnight Express	\$312,926.67
Standard Ground	\$632,770.10
Region_Channel x Beaverton x Walk In x No <Products and Services>	\$45,738.95
Region_Product x Beaverton x No <Channel> x Standard Ground	\$587,031.15
Eugene	\$1,728,571.77

\$18,620.06
 + \$23,293.79
 + \$45,738.95
 = \$87,652.80

In the following picture, you can also see that product costs that are not related to any channel are also passed on to the Walk In channel. However, as you might expect, not all these costs can be attributed to the Walk In channel.

Display Name	Cost
COST OBJECT (PRIMARY PANE)	\$3,856,293.20
Region_Channel	\$250,893.68
USA	\$250,893.68
Oregon	\$250,893.68
Eugene	\$121,992.50
Beaverton	\$128,901.18
Commercial Pick-up	\$25,780.24
No <Products and Services>	\$25,780.24
Drop Box	\$15,468.14
No <Products and Services>	\$15,468.14
Walk In	\$87,652.80
No <Products and Services>	\$87,652.80
Beaverton x Resolve Customer Complaints	\$87,652.80
Region_Product	\$3,605,399.52
USA	\$3,605,399.52
Oregon	\$3,605,399.52
Eugene	\$1,606,579.27
Beaverton	\$1,998,820.25
No <Channel>	\$1,998,820.25
2nd Day Guaranteed	\$401,573.75
Overnight Express	\$564,408.05
Standard Ground	\$1,032,838.45
Sales	\$3,856,293.20
USA	\$3,856,293.20
Oregon	\$3,856,293.20
Beaverton	\$2,127,721.43
Commercial Pick-up	\$652,520.38
Drop Box	\$283,937.13
2nd Day Guaranteed	\$65,439.43
Overnight Express	\$35,315.67
Standard Ground	\$183,182.03
Walk In	\$1,191,263.92
2nd Day Guaranteed	\$222,273.37
Region_Channel x Beaverton x Walk In x No <Products and Services>	\$18,620.06
Region_Product x Beaverton x No <Channel> x 2nd Day Guaranteed	\$203,653.31
Overnight Express	\$336,220.46
Region_Channel x Beaverton x Walk In x No <Products and Services>	\$23,293.79
Region_Product x Beaverton x No <Channel> x Overnight Express	\$312,926.67
Standard Ground	\$632,770.10
Region_Channel x Beaverton x Walk In x No <Products and Services>	\$45,738.95
Region_Product x Beaverton x No <Channel> x Standard Ground	\$587,031.15
Eugene	\$1,728,571.77

Part of these costs...

...flow to each of these destinations.

For example, to see where the \$401,573.75 for the No <Channel> x 2nd Day Guaranteed account goes, expand the roll-up accounts for Commercial Pick-up x 2nd Day Guaranteed and Drop Box x 2nd Day Guaranteed, as shown in the following picture. The following picture shows how cost flows to the different Beaverton 2nd Day Guaranteed accounts for the each of the channels.

Display Name	Cost
COST OBJECT (PRIMARY PANE)	\$3,856,293.2
Region_Channel	\$250,893.68
Region_Product	\$3,605,399.5
USA	\$3,605,399.5
Oregon	\$3,605,399.5
Eugene	\$1,606,579.2
Beaverton	\$1,998,820.2
No <Channel>	\$1,998,820.2
2nd Day Guaranteed	\$401,573.75
Overnight Express	\$564,408.05
Standard Ground	\$1,032,838.4
Sales	\$3,856,293.2
USA	\$3,856,293.2
Oregon	\$3,856,293.2
Beaverton	\$2,127,721.4
Commercial Pick-up	\$652,520.38
2nd Day Guaranteed	\$142,941.92
Region_Channel x Beaverton x Commercial Pick-up x No <Products and Services>	\$6,445.06
Region_Product x Beaverton x No <Channel> x 2nd Day Guaranteed	\$136,496.86
Overnight Express	\$226,329.11
Standard Ground	\$283,249.36
Drop Box	\$283,937.13
2nd Day Guaranteed	\$65,439.43
Region_Channel x Beaverton x Drop Box x No <Products and Services>	\$4,015.84
Region_Product x Beaverton x No <Channel> x 2nd Day Guaranteed	\$61,423.59
Overnight Express	\$35,315.67
Standard Ground	\$183,182.03
Walk In	\$1,191,263.92
2nd Day Guaranteed	\$222,273.37
Region_Channel x Beaverton x Walk In x No <Products and Services>	\$18,620.06
Region_Product x Beaverton x No <Channel> x 2nd Day Guaranteed	\$203,653.31
Overnight Express	\$336,220.46
Region_Channel x Beaverton x Walk In x No <Products and Services>	\$23,293.79
Region_Product x Beaverton x No <Channel> x Overnight Express	\$312,926.67
Standard Ground	\$632,770.10
Region_Channel x Beaverton x Walk In x No <Products and Services>	\$45,738.95
Region_Product x Beaverton x No <Channel> x Standard Ground	\$587,031.15
Eugene	\$1,728,571.77

\$136,496.86
+ \$61,423.59
= \$203,653.31
= \$401,573.75

The following table summarizes the cost flows shown in the preceding picture:

Source/Dest	Account	Cost
Source	Region_Product x Beaverton x No <Channel> x 2nd Day Guaranteed	\$401,573.75
Destination	Sales x Beaverton x Commercial Pick-up x 2nd Day Guaranteed	\$136,496.86
Destination	Sales x Beaverton x Drop Box x 2nd Day Guaranteed	\$61,423.59
Destination	Sales x Beaverton x Walk In x 2nd Day Guaranteed	\$203,653.31

To see in more detail where the product costs that are not associated with a particular channel flow, you can do the following:

1. Display the **Right Assignments Pane**.
2. Select the No-dimension account **No <Channel> x 2nd Day Guaranteed** for Beaverton.
3. Click **Show Right**.
4. In the right assignments pane, display the **Driver Cost (DrvCost)** column.

The resulting display is shown below. You can see that the total for Beaverton x Walk In x 2nd Day Guaranteed (\$222,273.37) is the total of Walk In expenses not related to any product (\$18,620.06) and 2nd Day Guaranteed expenses not related to any channel (\$203,653.31). And, similarly, the total for Beaverton x Walk In (\$1,191,263.92) is the total of the following roll-up accounts:

- Beaverton x Walk In x 2nd Day Guaranteed (\$222,273.37)
- Beaverton x Walk In x Overnight Express (\$336,220.46)
- Beaverton x Walk In x Standard Ground (\$632,770.10).

Display Name	Cost	IntschName	Cost	DrvCost
COST OBJECT (PRIMARY PANE)	\$3,856,293.20			
Region_Channel	\$250,893.66	Sales x Beavertron x Commercial Pick-up x 2nd Day	\$142,941.92	\$136,496.86
Region_Product	\$3,605,399.52	Sales x Beavertron x Drop Box x 2nd Day Guarantee	\$65,439.43	\$61,423.59
USA	\$3,605,399.52	Sales x Beavertron x Walk In x 2nd Day Guarantee	\$222,273.37	\$203,653.31
Oregon	\$3,605,399.52			
Eugene	\$1,606,579.27			
Beavertron	\$1,998,820.25			
No <Channel>	\$401,573.76			
2nd Day Guaranteed	\$564,408.05			
Overnight Express	\$1,032,838.45			
Standard Ground	\$3,856,293.20			
Sales	\$3,856,293.20			
USA	\$3,856,293.20			
Oregon	\$2,127,721.43			
Beavertron	\$652,520.38			
Commercial Pick-up	\$283,937.13			
Drop Box	\$1,191,263.92			
Walk In	\$222,273.37			
2nd Day Guaranteed	\$18,620.06			
Region_Channel x Beavertron x Walk In x No <Products and	\$203,653.31			
Region_Product x Beavertron x No <Channel> x 2nd Day Gu	\$336,220.46			
Overnight Express	\$23,293.79			
Region_Channel x Beavertron x Walk In x No <Products and	\$312,926.67			
Region_Product x Beavertron x No <Channel> x Overnight E	\$632,770.10			
Standard Ground	\$45,738.95			
Region_Channel x Beavertron x Walk In x No <Products and	\$587,031.15			
Region_Product x Beavertron x No <Channel> x Standard G	\$1,728,571.77			
Eugene				

$$\begin{aligned}
 & \$222,273.37 \\
 & - (\$203,653.31) \\
 & = \$18,620.06
 \end{aligned}$$

$$\begin{aligned}
 & \$136,496.86 \\
 & + \$61,423.59 \\
 & + \$203,653.31 \\
 & = \$401,573.76
 \end{aligned}$$

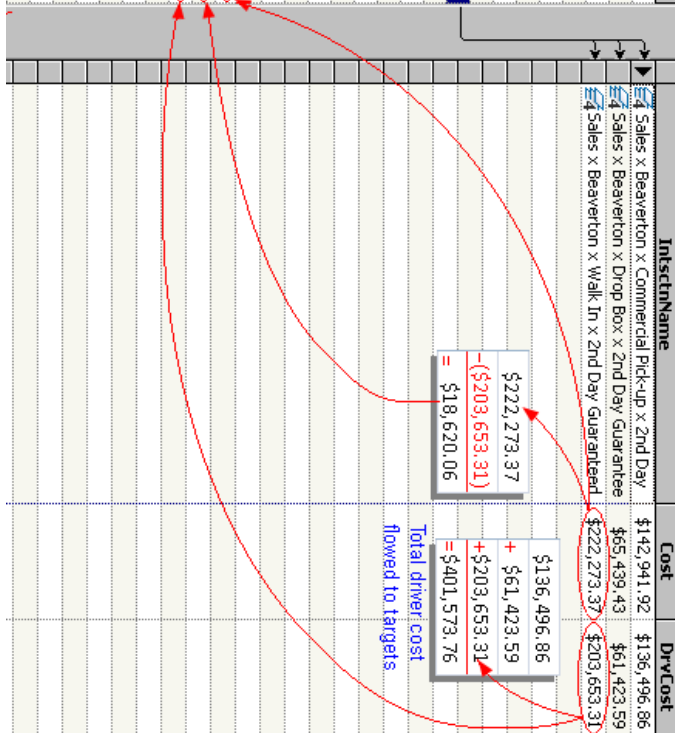
Total driver cost flowed to targets

Costs related to 2nd Day Guaranteed and a channel

Costs related to 2nd Day Guaranteed but no channel

Cost column - DrvCost column

Costs related to a particular channel, but no particular product



Chapter 17

Finishing Up

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Parcel Express Conclusions

Now that you have created a SAS Cost and Profitability Management model and you have learned the basics of model analysis, you can begin designing and implementing your own models.

Using SAS Cost and Profitability Management, Parcel Express was able to see how costs flowed out of resource accounts to activities, and from activities to cost objects. In modeling the flow of costs through its business processes, the company learned that the 2nd Day Guaranteed product, which managers had assumed was not performing as well as the other products, was performing far worse than expected, and was actually losing money across all channels.

An OLAP analysis of the model showed that the percentages of costs that flowed from resource and activity accounts to cost object accounts was consistent across all product categories. Therefore, pricing seemed to be the primary reason for the underperformance. Another revelation was the amount of profit that was being made on the other two products.

Management must now decide how much of a loss, if any, is acceptable for the 2nd Day Guaranteed product. How will a price change affect volume? Is the higher profit on other products enough to offset the loss on the 2nd Day Guaranteed product?

To assess the impact of changes to the pricing structure, Parcel Express can use SAS Cost and Profitability Management to model possible future scenarios.

Additional Features

Many SAS Cost and Profitability Management features are not covered in this tutorial, or they are only briefly covered. These features include:

- importing data from other information systems

- importing models from databases, XML, or Oros
- exporting models to databases or XML
- sharing models
- managing the ownership and permissions for items
- publishing period/scenario associations
- managing item properties
- selecting currencies and exchange rates
- working with internal units
- creating stage attributes
- variable quantity drivers
- assigned idle cost
- allocated cost
- using the SAS Services API

To build effective and complete models for your organization, you will want to use some of these additional features. Because your models will be much larger than the Parcel Express Tutorial model, you might want to read about model size and performance in the online Help. You can also consult the SAS Cost and Profitability Management: User's Guide at <http://support.sas.com/documentation/onlinedoc/abm/>.

What to Do Next

If you felt comfortable using the basic tools and techniques in this tutorial to build the Parcel Express Tutorial model, use them on a simple project of your own.

SAS has a variety of products, including videotapes and training classes, that can help you learn more about Cost and Profitability costing, management, and budgeting. In addition, SAS can help you build models for your organization. If you need additional information, contact your on-site SAS support personnel.