Example 2: Transportation Problem.

Minimize the costs of shipping goods from production plants to warehouses near metropolitan demand centers, while not exceeding the supply available from each plant and meeting the demand from each metropolitan area.

		Number to ship from plant x to warehouse y (at intersection):				
Plants:	*Total*	*San Fran*	*Denver*	*Chicago*	*Dallas*	*New York*
S. Carolina	5	1	1	1	1	1
Tennessee	5	1	1	1	1	1
Arizona	5	1	1	1	1	1
		---	---	---	---	---
Totals:		3	3	3	3	3
Demands by Whse -->		180	80	200	160	220
Plants:	*Supply*	*Shipping costs from plant x to warehouse y (at intersection):*				
S. Carolina	310	10	8	6	5	4
Tennessee	260	6	5	4	3	6
Arizona	280	3	4	5	5	9
Shipping:	**$83**	$19	$17	$15	$13	$19

Color Coding

- Target cell
- Changing cells
- Constraints

The problem presented in this model involves the shipment of goods from three plants to five regional warehouses. Goods can be shipped from any plant to any warehouse, but it obviously costs more to ship goods over long distances than over short distances. The problem is to determine the amounts to ship from each plant to each warehouse at minimum shipping cost in order to meet the regional demand, while not exceeding the plant supplies.

Problem Specifications

Target cell	B20	Goal is to minimize total shipping cost.
Changing cells	C8:G10	Amount to ship from each plant to each warehouse.
Constraints	B8:B10<=B16:B18	Total shipped must be less than or equal to supply at plant.
	C12:G12>=C14:G14	Totals shipped to warehouses must be greater than or equal to demand at warehouses.
	C8:G10>=0	Number to ship must be greater than or equal to 0.

You can solve this problem faster by selecting the **Assume linear model** check box in the **Solver Options** dialog box before clicking **Solve**. A problem of this type has an optimum solution at which amounts to ship are integers, if all of the supply and demand constraints are integers.