5 Importing and Exporting Data

You can import and export a network using ASCII text files in comma-separated-values (.csv) format. You can create and edit your data files using a spreadsheet or text editor, then save them to CSV files.

Figure 5-1 Example of SP Guru Transport Planner .csv Data File Format

```
"Id","Lat","Long","Type"
"HOUSTON",29.77,-95.41,"EOCC"
"BOSTON",42.3381,-71.0834,"EOCC"
"WASHINGTON",38.9135,-76.9985,"EOCC"
"LOS_ANGELES",34.0103,-118.246,"EOCC"
"NEW_YORK",40.72,-73.996,"EOCC"
```

This import/export capability offers two primary benefits:

- You can edit your data manually using a spreadsheet program such as Excel.
- You can combine different sets of data to create and model “mix-and-match” scenarios. For example, you can create a baseline topology of nodes and links, then import different sets of traffic data to see the effects of different traffic patterns on your network.

For information about how to import and export data, see Import Procedure on page TrP-5-2 and Export Procedure on page TrP-5-3. For information about supported file formats, see Table 5-1 Data Text File Formats: References on page TrP-5-4.

Import Procedure

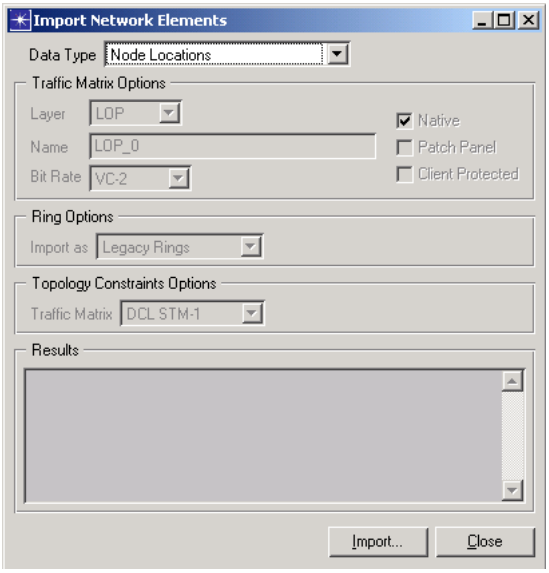
Procedure 5-1 describes how to import data from external text files. For information about available file types and formats, see Data File Formats on page TrP-5-4.

Procedure 5-1 Importing Network Data into a Project

1 In SP Guru Transport Planner, choose File > Import > Network Elements.

➥ The Import Network Elements dialog box appears.

Figure 5-2 Import Network Elements Dialog Box



2 Select the type of data you want to import in the Data Type pull-down menu.

3 You might need to specify additional options for some types of data:

- If you are importing connection or traffic data, specify the layer, name, bit rate, and other options.
- If you are importing rings, specify whether you want to import the rings as legacy, new, or candidate rings.
- If you are importing topology constraints, specify the traffic matrix to which they apply.

4 Click the Import button to open the file browser and select the data file you want to import, then click OK in the file browser to confirm the file selection.

5 If you want to import additional data, repeat step 2 through step 4. When you are finished, click Close.

End of Procedure 5-1

Export Procedure

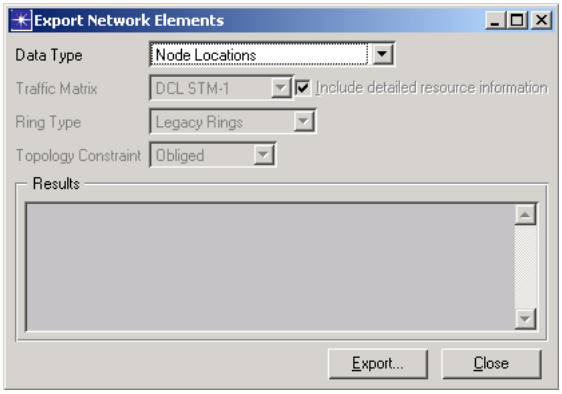
You can export data to external text files. For information about available file types and formats, see Data File Formats on page TrP-5-4.

Procedure 5-2 Exporting Network Data to a Text File

1 In SP Guru Transport Planner, choose File > Export > Network Elements.

➥ The Export Network Elements dialog box appears.

Figure 5-3 Export Network Elements Dialog Box



2 Select the type of data you want to export in the Data Type pull-down menu.

3 You might need to specify additional options for some types of data:

- If you are exporting a connection or traffic data, select the traffic matrix you want to export.
- If you are exporting rings, specify whether you want to export the legacy, new or candidate rings.
- If you are exporting topology constraints, specify the type of constraints you want to export.

4 Click the Export button to open the file browser, then specify the directory and file name.

5 Click OK in the file browser to confirm the file selection.

6 To export more data, repeat step 2 through step 4. When you are finished, click Close.

End of Procedure 5-2

Data File Formats

Table 5-1 lists the types of data that you can import and export using .csv text files, and provides references to further information.

Table 5-1 Data Text File Formats: References

Format	Format
Node Locations Data Files on page TrP-5-5	Node Settings Data Files on page TrP-5-6
OTS Link Data Files on page TrP-5-9	Optical Amplifier and Regenerator Locations Data Files on page TrP-5-10
OADM Data Files on page TrP-5-11	Equipped Fiber Pairs Data Files on page TrP-5-12
Cable Splitter Configuration Data Files on page TrP-5-13	Traffic Matrix Data Files on page TrP-5-14
Fiber Route Data Files on page TrP-5-15	Wavelengths Tables Data Files on page TrP-5-16
Connection List Data Files on page TrP-5-17	SONET/SDH Ring Data Files on page TrP-5-21
Topology Constraints Data Files on page TrP-5-22	Link User Costs Data Files on page TrP-5-8
Link Designations Data Files on page TrP-5-24	Link Subdesignations Data Files on page TrP-5-25
Link Usage Thresholds Data File on page TrP-5-26	
End of Table 5-1	

You can also import the following types of data in SP Guru Transport Planner:

- Equipment properties in text file format, as described in Importing and Exporting User Data Settings on page TrP-5-27
- WDMNetDesign data files, as described in Importing and Exporting WDMNetDesign Files on page TrP-5-28
- Route data files, as described in Importing and Exporting Route Data Files on page TrP-5-29

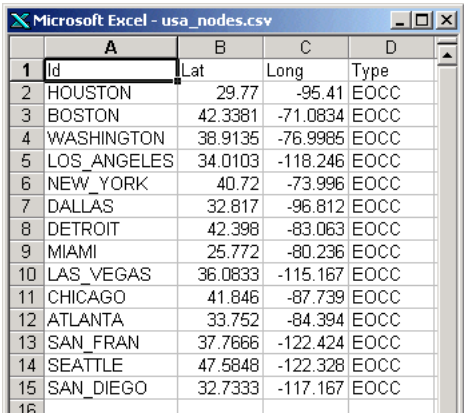
Node Locations Data Files

Node locations data files use the format shown in Figure 5-4 on page TrP-5-5. The first row contains four headers; each subsequent row describes one node.

Table 5-2 Node Locations Data File

Field	Description
Id	Node name
Lat or X	Latitude or X value
Long or Y	Longitude or Y value
Type	Node type, which can be ECC, EOCC, OCC, or CS
End of Table 5-2	

Figure 5-4 Node Locations Data File in .csv Format



	A	B	C	D
1	Id	Lat	Long	Type
2	HOUSTON	29.77	-95.41	EOCC
3	BOSTON	42.3381	-71.0834	EOCC
4	WASHINGTON	38.9135	-76.9985	EOCC
5	LOS_ANGELES	34.0103	-118.246	EOCC
6	NEW_YORK	40.72	-73.996	EOCC
7	DALLAS	32.817	-96.812	EOCC
8	DETROIT	42.398	-83.063	EOCC
9	MIAMI	25.772	-80.236	EOCC
10	LAS_VEGAS	36.0833	-115.167	EOCC
11	CHICAGO	41.846	-87.739	EOCC
12	ATLANTA	33.752	-84.394	EOCC
13	SAN_FRAN	37.7666	-122.424	EOCC
14	SEATTLE	47.5848	-122.328	EOCC
15	SAN_DIEGO	32.7333	-117.167	EOCC
16				

Node Settings Data Files

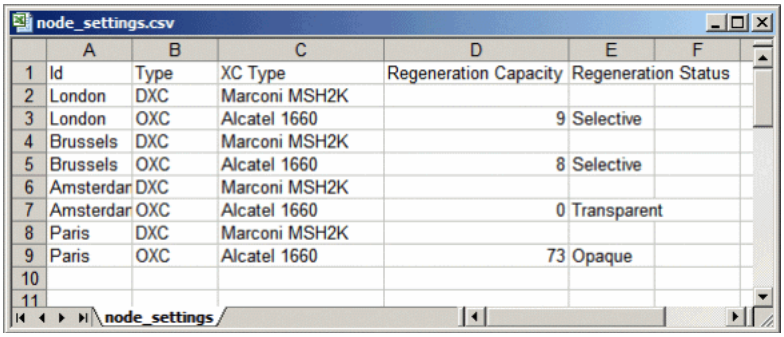
Node Settings data files use the format shown in Figure 5-5 on page TrP-5-7. The first row contains two to five headers, depending on the amount of data you want to import; each subsequent row describes settings for one OCH or DCL node. To generate a .csv file that contains a mix of DCL and OCH settings, choose File > Export > Network Elements.

Note—This operation does not create new nodes. If you want to create new nodes using an import file, see Node Locations Data Files on page TrP-5-5.

Table 5-3 Node Settings Data File

Field	Description
Id	Name of the node whose settings are specified in that row. If a node name in the "Id" column does not exist in the current scenario, the import engine skips that row. The same node ID can be listed more than once, typically to provide settings for nodes that contain both electrical and optical elements. To specify that a node contains a DXC and an OXC, you must include two entries. These entries do not need to be adjacent in the file.
Type	Node type name, which can be DXC, TM, IXC, OXC, WP-OXC, INT-OXC, OADM, INT-OADM, or PP. This field is mandatory because it is used to determine the layer (OCH or DCL) to which the information in that row applies. SP Guru Transport Planner automatically determines the layer based on this type. DXC and TM indicate DCL layer settings, IXC applies to both DCL and OCH, and all other types indicate OCH layer settings.
XC Type (*optional*)	Cross-connect type name, if applicable. "Continuous" specifies that a node contains a continuous XC; “Not Present” specifies that the node does not contain an XC. XC Type names should correspond to the node cost model currently in effect in your network. In the example shown in Figure 5-5, the network model should use a discrete DCL node model and a discrete OCH node model for this input file to be imported correctly. If an XC Type field does not correspond to the network's node cost model, the XC type of the node is not changed—it is set to the XC type it had before the import operation, or to the default XC type if the import file specifies a change to a different type. You must use the exact same spelling for XC type names as in the network settings (pay special care to the capitalization); otherwise SP Guru Transport Planner cannot find a match. If an XC type does not apply to the node type—in a TM and/or OADM node, for example—simply leave the XC Type field on that row blank.
Regeneration Capacity (*optional*)	Amount of regeneration capacity. This field is applicable for OCH nodes in transparent mode only. This field is ignored if the Regeneration Status is set to opaque.
Regeneration Status (*optional*)	The OCH transparency status; this value can be "Transparent", "Selective" or "Opaque". This field is applicable for OCH nodes in transparent mode only. If the Regeneration Capacity is greater than zero and the Regeneration Status is "transparent,” the Status field overrides the Capacity field and the node has no regeneration capacity.
End of Table 5-3	

Figure 5-5 Node Settings Data File



node_settings.csv

	A	B	C	D	E	F
1	Id	Type	XC Type	Regeneration Capacity	Regeneration Status	
2	London	DXC	Marconi MSH2K			
3	London	OXC	Alcatel 1660	9	Selective	
4	Brussels	DXC	Marconi MSH2K			
5	Brussels	OXC	Alcatel 1660	8	Selective	
6	Amsterdar	DXC	Marconi MSH2K			
7	Amsterdar	OXC	Alcatel 1660	0	Transparent	
8	Paris	DXC	Marconi MSH2K			
9	Paris	OXC	Alcatel 1660	73	Opaque	
10						
11						

node_settings

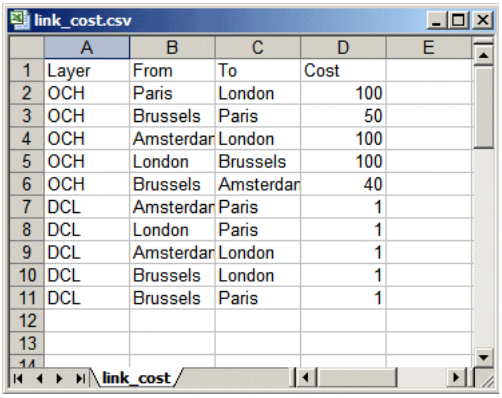
Link User Costs Data Files

Link user costs data files are used to import/export the user-specified cost of a link on a specific layer. The files use the format shown in Figure 5-6. The first row contains four headers; each subsequent row describes a link at a specific layer.

Table 5-4 Link User Costs Data Files

Field	Description
Layer	Layer of the link (OTS, OMS, OCH, or DCL)
From	Name of the source node
To	Name of the destination
Designation (Optional)	The user-defined designation of the link
Cost	User-specified cost of the link
End of Table 5-4	

Figure 5-6 Link User Costs Data File



OTS Link Data Files

OTS link data files use the format shown in Figure 5-7 on page TrP-5-9. The first row contains five headers; each subsequent row describes one link.

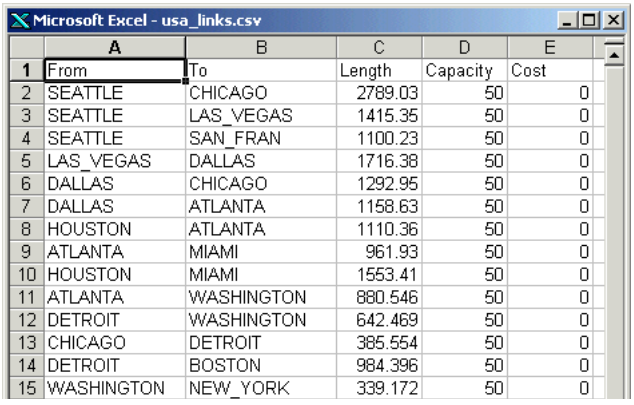
Table 5-5 OTS Link Data File Fields

Field	Description
From	Name of source node
To	Name of destination node
Length (*optional*)	Length of the link in kilometers or miles. The default value for this field is 200 for logical networks and the geographic distance between the end nodes for other networks.
Capacity (*optional*)	Link capacity, in number of fiber pairs. The default value for this field is 50.
Cost (*optional*)	User-defined cost of the link. The default value for this field is 1.
Designation (optional)	The user-defined designation of the OTS link.
End of Table 5-5	

A data file can define two or more links between the same two nodes. This creates parallel links between the nodes. Parallel links can have different length, capacity, and cost values.

If the imported data includes nodes that are not currently part of your network, SP Guru Transport Planner creates them. You can use this operation to import links and nodes into your network. Because the data file does not include node locations, SP Guru Transport Planner places the nodes at arbitrary locations in the network.

Figure 5-7 Link Data File in .csv Format



	A	B	C	D	E
1	From	To	Length	Capacity	Cost
2	SEATTLE	CHICAGO	2789.03	50	0
3	SEATTLE	LAS_VEGAS	1415.35	50	0
4	SEATTLE	SAN_FRAN	1100.23	50	0
5	LAS_VEGAS	DALLAS	1716.38	50	0
6	DALLAS	CHICAGO	1292.95	50	0
7	DALLAS	ATLANTA	1158.63	50	0
8	HOUSTON	ATLANTA	1110.36	50	0
9	ATLANTA	MIAMI	961.93	50	0
10	HOUSTON	MIAMI	1553.41	50	0
11	ATLANTA	WASHINGTON	880.546	50	0
12	DETROIT	WASHINGTON	642.469	50	0
13	CHICAGO	DETROIT	385.554	50	0
14	DETROIT	BOSTON	984.396	50	0
15	WASHINGTON	NEW_YORK	339.172	50	0

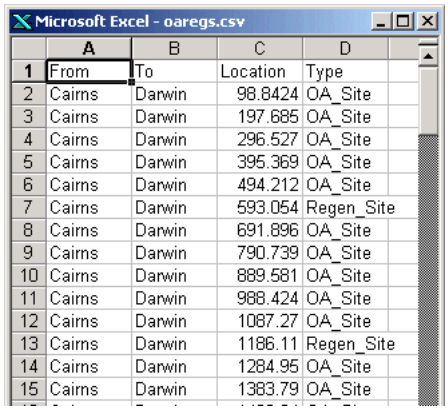
Optical Amplifier and Regenerator Locations Data Files

Optical amplifier and regenerator locations data files specify the locations of amplification/regeneration sites on OTS links. These files use the format shown in Figure 5-8.The first row contains four headers; each subsequent row describes one site.

Table 5-6 Optical Amplifier and Regenerator Locations Data File Fields

Field	Description
From	Source node of the OTS link to which the in-line location should be added
To	Destination node of the OTS link to which the in-line location should be added
Location	Location of this site, expressed as the distance (in miles or kilometers) from the source (“From”) node
Type	Type of site to add. This should be either “OA_Site” for an amplification site or “Regen_Site” for a regeneration site.
Designation (Optional)	The user-defined designation of the link
End of Table 5-6	

Figure 5-8 Optical Amplifier and Regenerator Locations File in .csv Format



	A	B	C	D
1	From	To	Location	Type
2	Cairns	Darwin	98.8424	OA_Site
3	Cairns	Darwin	197.685	OA_Site
4	Cairns	Darwin	296.527	OA_Site
5	Cairns	Darwin	395.369	OA_Site
6	Cairns	Darwin	494.212	OA_Site
7	Cairns	Darwin	593.054	Regen_Site
8	Cairns	Darwin	691.896	OA_Site
9	Cairns	Darwin	790.739	OA_Site
10	Cairns	Darwin	889.581	OA_Site
11	Cairns	Darwin	988.424	OA_Site
12	Cairns	Darwin	1087.27	OA_Site
13	Cairns	Darwin	1186.11	Regen_Site
14	Cairns	Darwin	1284.95	OA_Site
15	Cairns	Darwin	1383.79	OA_Site

OADM Data Files

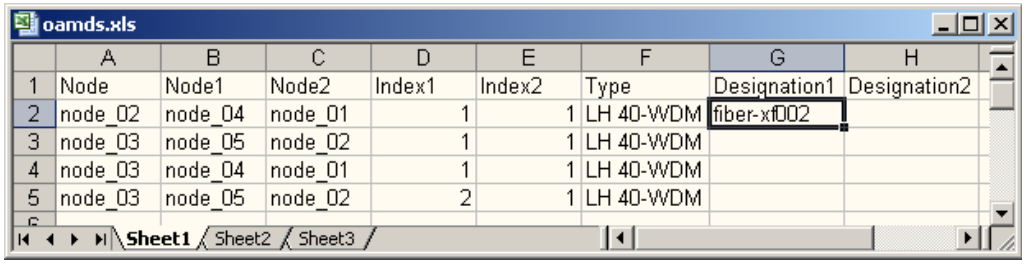
OADM data files use the format shown in Figure 5-9. The first row contains eight headers; each subsequent line corresponds to one OADM.

Note—You can import OADMs only if the network is in transparent mode.

Table 5-7 OADM Data File Fields

Field	Description
Node	The node in which the OADM is located
Node1 / Node2	The end nodes of the links between which the OADM should be added
Index1 / Index2	The indices of the fibers in the links between which the OADM should be added. If the fibers are not equipped yet, they will be equipped automatically as part of the import process.
Type	The Line System type of the OADM
Designation1/ Designation2	If two or more parallel links are present between Node and Node1 (or Node2), Designation1 (or Designation2) indicates which parallel link the specified OADM should use.
End of Table 5-7	

Figure 5-9 OADM Data File in .csv Format



Equipped Fiber Pairs Data Files

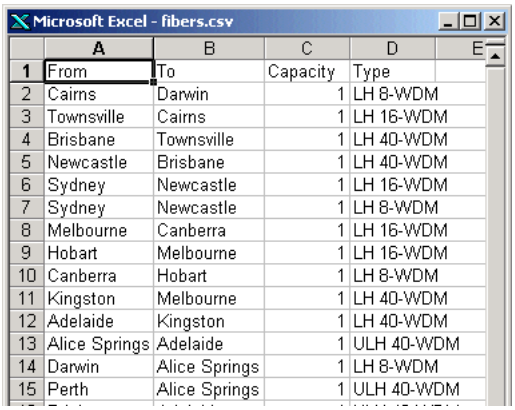
These files use the format shown in Figure 5-10. The first row contains four headers; each subsequent row describes one fiber.

Note—If a SONET link is considered, and there are not enough fibers lit (either currently in the network or specified in the current import operation) to accommodate all SONET trunks, SP Guru Transport Planner tries to equip extra fibers using the LS type listed in the Type field.

Table 5-8 Equipped Fiber Pairs Data File Fields

Field	Description
From	Source node of the link on which fibers will be lit
To	Destination node of the link on which fibers will be lit
Capacity (*optional*)	Number of fiber pairs to light on the specified link. The default value for this field is 1.
Type (*optional*)	Type of line system to deploy as specified in the WDM Link Equipment Properties dialog box. The default value for this field is the default LS Type for the link type (optical or SONET). For more information, see WDM Link Equipment Properties on page TrP-3-35.
Bit Rate (*optional*)	For SONET links where one or both of the end points is an ECC, the bit rate of the SONET trunk that results from lighting the fiber. The default value for this field is the network-wide default SONET bit rate.
Trunks (*optional*)	For SONET links where one or both of the end points is an ECC, the number of SONET trunks to create. The default value for this field is 1.
Designation (Optional)	The user-defined designation of the equipped fiber pair.
End of Table 5-8	

Figure 5-10 Equipped Fibers Data File in .csv Format

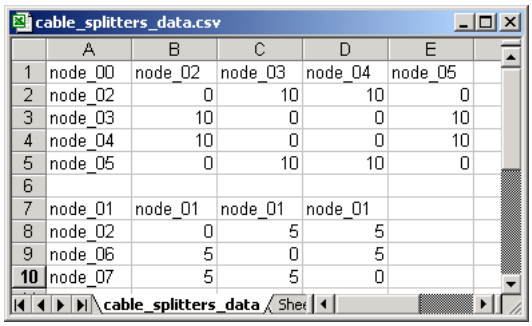


	A	B	C	D	E
1	From	To	Capacity	Type	
2	Cairns	Darwin	1	LH 8-WDM	
3	Townsville	Cairns	1	LH 16-WDM	
4	Brisbane	Townsville	1	LH 40-WDM	
5	Newcastle	Brisbane	1	LH 40-WDM	
6	Sydney	Newcastle	1	LH 16-WDM	
7	Sydney	Newcastle	1	LH 8-WDM	
8	Melbourne	Canberra	1	LH 16-WDM	
9	Hobart	Melbourne	1	LH 16-WDM	
10	Canberra	Hobart	1	LH 8-WDM	
11	Kingston	Melbourne	1	LH 40-WDM	
12	Adelaide	Kingston	1	LH 40-WDM	
13	Alice Springs	Adelaide	1	ULH 40-WDM	
14	Darwin	Alice Springs	1	LH 8-WDM	
15	Perth	Alice Springs	1	ULH 40-WDM	

Cable Splitter Configuration Data Files

Cable splitter configuration data files use the format shown in Figure 5-11. Each cable splitter is defined by a matrix. The first cell in each matrix specifies the node that contains the cable splitter. The rows and columns specify the nodes adjacent to the cable splitter. The intermediate fields specify the number of fiber pairs between the two nodes.

Figure 5-11 Cable Splitter Configuration Data File in .csv Format



	A	B	C	D	E
1	node_00	node_02	node_03	node_04	node_05
2	node_02	0	10	10	0
3	node_03	10	0	0	10
4	node_04	10	0	0	10
5	node_05	0	10	10	0
6					
7	node_01	node_01	node_01	node_01	
8	node_02	0	5	5	
9	node_06	5	0	5	
10	node_07	5	5	0	

Traffic Matrix Data Files

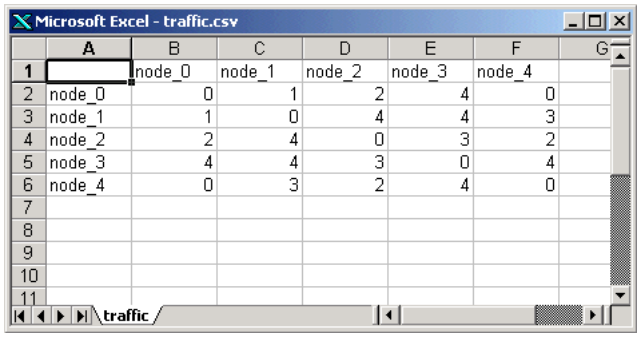
These files use the format shown in Figure 5-12. A traffic matrix file describes one symmetrical traffic matrix. The row and column headers specify the nodes in the network layer; the other values specify the amount of (symmetrical, bidirectional) traffic between each node pair.

Keep the following in mind:

- The node names in this file must match the node names at the network level into which you are importing the traffic
- A traffic data file is “generic,” in that it specifies traffic levels only. SP Guru Transport Planner prompts you for the following information when you import a traffic file:
  - The network layer of the traffic—that is, whether you are importing OCH, DCL, or LOP traffic. If you are importing OCH or DCL traffic, you can also set the Native option. If you are importing OCH traffic, you can also set the Patch Panel option.
  - The name and bit rate of the traffic matrix

For more information, see Creating Network Traffic on page TrP-3-26.

Figure 5-12 Traffic Matrix Data File in .csv Format



	A	B	C	D	E	F	G
1		node_0	node_1	node_2	node_3	node_4	
2	node_0	0	1	2	4	0	
3	node_1	1	0	4	4	3	
4	node_2	2	4	0	3	2	
5	node_3	4	4	3	0	4	
6	node_4	0	3	2	4	0	
7							
8							
9							
10							
11							

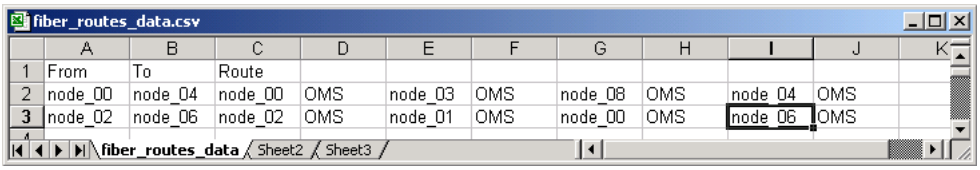
Fiber Route Data Files

Fiber route data files use the format shown in Figure 5-13. The first row contains three headers; each subsequent row describes one fiber route.

Table 5-9 Fiber Route Data File Fields

Field	Description
From	Name of source node
To	Name of destination node
Route	List of all nodes in the route, including the source node (first in list) and destination node (last in list). Every node is followed by a field that specifies the layer at which switching occurs for that node. Fiber routing always occurs at the OMS layer, so OMS is the typical value for these fields. However, if the fiber route passes through a cable splitter, that cable splitter node should also be included in the route and the layer field should say OTS.
End of Table 5-9	

Figure 5-13 Fiber Routes Data File in .csv Format



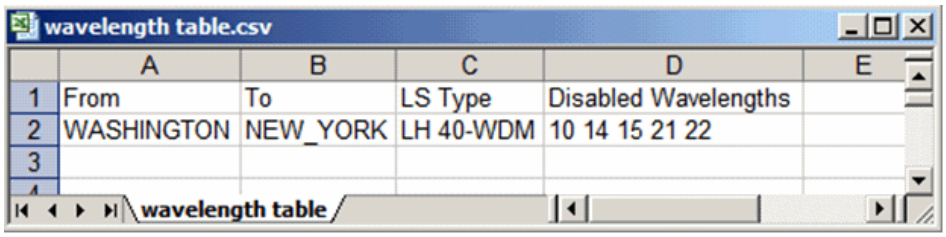
Wavelengths Tables Data Files

You can use wavelengths tables data files to disable certain wavelengths of a specific line system type on a link, as described in Wavelength Filtering on page TrP-4-10. Wavelengths tables data files use the format shown in Figure 5-14. The first row contains four headers; each subsequent row specifies a wavelength filter for a combination of a link and a line system type.

Table 5-10 Wavelengths Tables Data File

Statistic	Description
From	Source node of the affected optical link
To	Destination node of the affected optical link
LS Type	Line system type to which the filter applies
Disabled Wavelengths or Enabled Wavelengths	List of wavelength indices (separated by a space) to be disabled/enabled on the given link and line system type
End of Table 5-10	

Figure 5-14 Wavelengths Tables Data File



Connection List Data Files

Connection list data files use the format shown in Figure 5-15. The first row contains four or five headers; each subsequent row describes one connection.

Table 5-11 Connection List Data File Fields

Field	Description
From	Name of source node
To	Name of destination node
Service Designation (*optional*)	User identifier for the connection
Capacity	Capacity on the connection, in units
Route or Routes (*optional*)	Path along which an unprotected connection is routed (“Route”), or working and protection path of a protected connection (“Routes”). This field is optional.
Required Availability	The availability the connection should have, expressed as a number between 0 and 1.
End of Table 5-11	

Figure 5-15 Connection List Data File in .csv Format

	A	B	C	D	E	F	G	H	I	J
1	From	To	Capacity	Route						
2	node_00	node_01	1	node_00	OCH	node_01	OCH			
3	node_00	node_03	3	node_00	OCH	node_04	OCH	node_03	OCH	
4	node_00	node_04	2	node_00	OCH	node_04	OCH			
5	node_00	node_05	1	node_00	OCH	node_01	OCH	node_05	OCH	
6	node_00	node_06	4	node_00	OCH	node_04	OCH	node_03	OCH	node_06
7	node_01	node_02	1	node_01	OCH	node_02	OCH			
8	node_01	node_03	6	node_01	OCH	node_02	OCH	node_03	OCH	
9	node_01	node_04	2	node_01	OCH	node_00	OCH	node_04	OCH	
10	node_01	node_06	1	node_01	OCH	node_05	OCH	node_06	OCH	
11	node_01	node_06	1	node_01	OCH	node_05	OCH	node_06	OCH	
12	node_02	node_04	1	node_02	OCH	node_03	OCH	node_04	OCH	
13	node_02	node_05	5	node_02	OCH	node_06	OCH	node_05	OCH	
14	node_02	node_06	2	node_02	OCH	node_06	OCH			
15	node_03	node_05	1	node_03	OCH	node_06	OCH	node_05	OCH	
16	node_03	node_06	3	node_03	OCH	node_06	OCH			
17	node_04	node_05	2	node_04	OCH	node_03	OCH	node_06	OCH	node_05
18	node_04	node_06	5	node_04	OCH	node_03	OCH	node_06	OCH	
19	node_05	node_06	4	node_05	OCH	node_06	OCH			

connections

Keep in mind the following:

- You do not need to specify a route for a connection. If you do not specify a route, the connection appears as an unrouted connection.

- If you specify a route, you must specify it as a list of nodes traversed by the connection, starting with the From node and ending with the To node. Each field is followed by a field that specifies the layer at which the traffic is switched (“OTS”, “OMS”, “OCH”, “DCL”, or “LOP”). For 1+1 protected traffic, you must specify the working path first, a blank field—in CSV format, this means an extra comma as a delineator—and then the protection path.
- If you specify a route, SP Guru Transport Planner tries to set up the connection along this route within the existing network capacity. If there is no sufficient capacity along this route, the connection is not set up.
- You can import multiple connections (possibly with different routes) between the same node pair.
- Both nodes (From and To) must be specified in the network for the connection to be imported.
- When you import the connection file, you can specify the same properties as during a traffic matrix import in the Import Network Elements Dialog Box: network layer, bit rate, and so on (for more information, see Traffic Matrix Data Files on page TrP-5-14). You can also specify the Client Protected option.

Specifying Links Using Modifiers

You can insert certain modifiers within the regular route description to direct SP Guru Transport Planner to use certain links.

- "**`_Ring_`**"—This modifier narrows down the DCL link selection. If a DCL route has both mesh links and ring links, the `_Ring_` marker forces SP Guru Transport Planner to select a link on a ring instead of a mesh link. The marker should precede the node name of the end node of the link (for example: `Node_00,DCL,Node_01,OCH,_Ring_,Node_02,DCL`). With the marker placed near the end, SP Guru Transport Planner can derive the route from OTS up to DCL and then make the last selection.

  Suppose Node_00 and Node_02 are connected by an OCH connection that passes through Node_01, where it is switched optically. This OCH connection supports a DCL link from Node_00 to Node_02. These two nodes can have any number of connections between them, where each connection supports a DCL link. The _Ring_ marker directs SP Guru Transport Planner to use a DCL ring link (not a mesh link) to create the DCL route.

Specifying Routing Behavior Using Keywords

You can also specify additional information to further narrow down how the connection is routed. You must append this additional information immediately after the last field that contains the regular route information (nodes, layers and modifiers). If a working and protecting route are provided, you must append the detailed information to both routes separately.

- **`wavelengths`**—Use the keyword "`wavelengths`" to indicate that wavelength information follows. Then list each wavelength in a comma-separated field. The number of wavelengths provided should equal the number of OCH hops in the route—that is, the number of layer fields specifying "OCH" minus one.

- **`fibers`**—Use the keyword "`fibers`" to indicate that fiber information follows. Then list each fiber in a comma-separated field. The number of fibers should also equal the number of OCH hops, even if cable splitters or fiber routes are present. SP Guru Transport Planner selects the fiber specified by the index at the starting node of the current hop, and deduces other fiber information from the fiber routing and cable splitter configurations in the network.

- **`regenerations`** (*transparent network mode only*)—Use the keyword "`regenerations`" to indicate that regeneration information follows. For each intermediate OCH node in the route, specify in a comma-separated field either "YES" or "NO" to indicate whether regeneration occurs in the corresponding node.

- **`hardwired`**—Use the keyword "`hardwired`" to indicate that hardwiring status information follows. For each OCH node in the route, specify in a comma-separated field either "YES" or "NO" to indicate whether the connection is hardwired in the corresponding node.

- **`timeslots`**—Use the keyword "`timeslots`" to indicate that timeslot information follows, and then list each timeslot-set in a comma-separated field. A timeslot-set is a sequence of timeslot indices within a single CSV field, separated by spaces. The number of timeslot-sets provided should equal the number of DCL hops in the route, that is, the number of layer fields specifying "DCL" minus one.

- **`designations`**—Use the keyword "`designations`" to override the choice of specific resources (fibers, wavelengths, timeslots) the import engine would normally choose. The designations provided should correspond to links present in the network, and the number of designations should equal the number of hops in the route, on the layer on which the traffic is imported.

- **`subdesignations`**—Use the keyword "`subdesignations`" to override the choice of subresource (wavelengths or timeslots) on the route. These subdesignations apply to subresources on the route within the layer on which the traffic is imported. You cannot specify subresources on lower layers (that can be set using the "`designations`" keyword). The number of subdesignations provided should equal the number of hops in the route, on the layer on which the traffic is imported.

Figure 5-16 shows an example CSV file that uses the `wavelengths`, `fibers`, and `regenerations` keywords (these keywords are highlighted for clarity).

Figure 5-16 Keywords in a Connections Data File: Example

```
From,To,Capacity,Route
Kingston,Perth,1,Kingston,OCH,Adelaide,OCH,Alice
Springs,OCH,Perth,OCH,wavelengths,17,17,17,fibers,1,1,1,regenerations,NO,YES
```

Specifying Service Identifiers

You can also assign one or more service identifiers to a connection by using these keywords:

- **`service_identifiers_client`**—Use this keyword to start assigning client-level service identifiers to the connection. The contents of all fields following this keyword will be assigned as identifiers of the connection, until the end of the input line or another keyword is reached.
- **`service_identifiers_server`**—Use this keyword to start assigning server-level service identifiers to the connection. The contents of all fields following this keyword will be assigned as identifiers of the connection, until the end of the input line or another keyword is reached.

SONET/SDH Ring Data Files

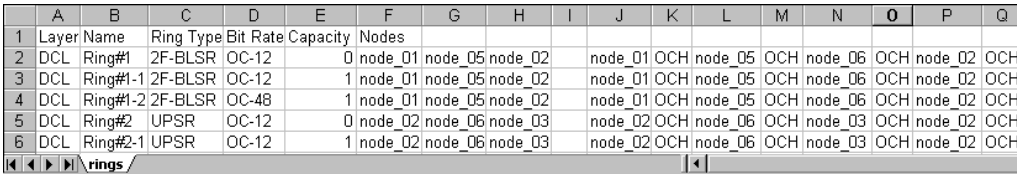
SONET/SDH ring data files use the format shown in Figure 5-17. The first row contains six headers; each subsequent row describes one ring.

Table 5-12 SONET/SDH Ring Data File Fields

Field	Description
Layer	Layer on which the rings are specified, currently only SONET/SDH rings are supported, thus the layer should be "DCL"
Name	A unique name for the ring. Note that each stacked ring must have a unique name.
Ring Type	UPSR, 2F-BLSR or 4F-BLSR in SONET mode SNCP, 2F-MSSPRing, 4F-MSSPRing in SDH mode
Bit Rate	A valid OCH bit rate that corresponds to the TDM nomenclature (SONET or SDH). For example: OC-12, OC-48 for SONET.
Capacity	The number of stacked rings to deploy. 0 means that only the ring footprint is created.
Nodes	List of DCL nodes that are part of the ring. You can also specify the OCH route of the ring (this information is optional). The route OCH route should be separated from the DCL node list by a blank field. The OCH route should be specified as a node list; each node field should be followed by a field that specifies the layer at which the route is switched (“OTS”, “OMS”, “OCH”, or “DCL”). If two OCH nodes in a route are connected by multiple parallel links, and you want SP Guru Transport Planner to use a certain parallel link, you can direct the importer by specifying designations. See Specifying Routing Behavior Using Keywords on page TrP-5-19 for details on how to do this.

End of Table 5-12

Figure 5-17 SONET/SDH Ring Data File in .csv Format



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1	Layer	Name	Ring Type	Bit Rate	Capacity	Nodes											
2	DCL	Ring#1	2F-BLSR	OC-12	0	node_01	node_05	node_02		node_01	OCH	node_05	OCH	node_06	OCH	node_02	OCH
3	DCL	Ring#1-1	2F-BLSR	OC-12	1	node_01	node_05	node_02		node_01	OCH	node_05	OCH	node_06	OCH	node_02	OCH
4	DCL	Ring#1-2	2F-BLSR	OC-48	1	node_01	node_05	node_02		node_01	OCH	node_05	OCH	node_06	OCH	node_02	OCH
5	DCL	Ring#2	UPSR	OC-12	0	node_02	node_06	node_03		node_02	OCH	node_06	OCH	node_03	OCH	node_02	OCH
6	DCL	Ring#2-1	UPSR	OC-12	1	node_02	node_06	node_03		node_02	OCH	node_06	OCH	node_03	OCH	node_02	OCH

rings

Topology Constraints Data Files

Topology Constraints data files are used to import/export the topology constraints for a specific traffic matrix. Topology restraints are useful when you want to force a design action (such as routing or dimensioning) route connections using specific paths, without having to specify an entire path. For more information about specifying topology constraints, see Topological Routing Constraints on page TrP-6-27.

A topology constraints file expresses constraints as nodes that should or should not be present in the route of a connection. The file format and other requirements are described in Table 5-13 and Topology Constraints Files: Additional Requirements on page TrP-5-23.

Figure 5-18 Topology Constraints Data File

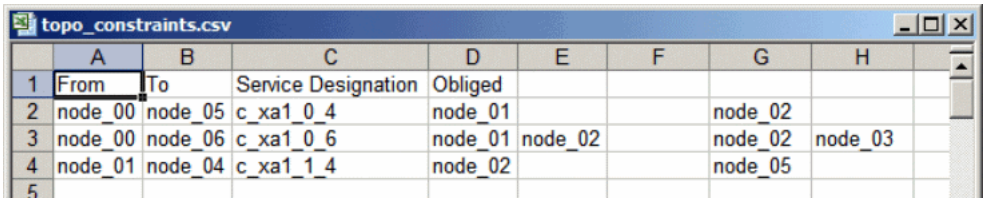


Table 5-13 Topology Constraints Data Files Format

Key word	Explanation
From	Source node of the connection. If the file includes a "To" column, the obliged or forbidden nodes are set for each connection between the "From" and "To" nodes. Otherwise, the obliged or forbidden nodes are set for each connection with the "From" node as an end point.
To (*optional*)	Destination node of the connection. If this column is defined in the header, you must specify a destination node every line. If a line does not include this value, it is skipped.
Service Designation (*optional*)	If this column is defined in the header, the obliged or forbidden nodes are set for a connection only if it has the specified service designation name. If a line does not include this field, the obliged or forbidden nodes are set for connections without a service designation name.
Obliged or Forbidden	The obliged (keyword "Obliged" in the header) or forbidden (keyword "Forbidden") nodes of a connection, specified as a comma-separated list of nodes. The obliged (or forbidden) nodes for the working path and protecting path must be filled in on the same line, separated by two commas (these separating commas appear as an empty cell in a spreadsheet). For information about additional requirements, see Topology Constraints Files: Additional Requirements on page TrP-5-23.
End of Table 5-13	

Topology Constraints Files: Additional Requirements

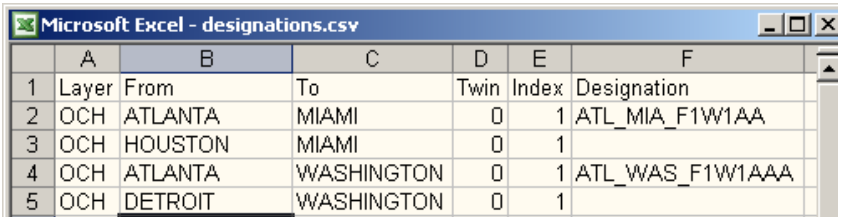
Note the following requirements for constraints files (in addition to the requirements list in Table 5-13 on page TrP-5-22):

- If a line does not include a "From", "To", "Obliged" or "Forbidden" field, the import engine skips that line.
- If the "To" column is defined in the header, you must specify a value for this column in at every line; if a line does not include this value, it is skipped.
- You do not need to fill in the "Obliged" or "Forbidden" columns for every connection.
- Obliged or forbidden node lists do not affect the protection type of connections. This means that you can import obliged or forbidden nodes for the protecting path of a connection, even if the protection type of the traffic matrix is set to no protection.
- You cannot change the obliged or forbidden node lists of a connection that is already groomed or accommodated in the network.
- You cannot specify a non-grooming node as an obliged node for a DCL connection.
- You cannot specify the same node as an obliged node and as a forbidden node for the same connection. For example, if a node is defined for the obliged nodes of a working path, but is already defined as a forbidden node for the same path, the node is not set as an obliged node.

Link Designations Data Files

Link designations data files allow you to attach designations (tags) to links on the DCL, OCH and OTS layer. These files use the format shown in Figure 5-19. The first row contains four to six headers; each subsequent row describes one link.

Figure 5-19 Link Designations Data File



	A	B	C	D	E	F
1	Layer	From	To	Twin	Index	Designation
2	OCH	ATLANTA	MIAMI	0	1	ATL_MIA_F1W1AA
3	OCH	HOUSTON	MIAMI	0	1	
4	OCH	ATLANTA	WASHINGTON	0	1	ATL_WAS_F1W1AAA
5	OCH	DETROIT	WASHINGTON	0	1	

Table 5-14 Link Designations Data File

Field	Description
Layer	Layer on which the link is specified. The layer should be “DCL”, “OCH”, or “OTS
From	Name of the source node
To	Name of the destination node
Twin (Optional)	If two links are present between From and To, putting the number 1 or 2 in this field specifies whether the first or the second twin link should be tagged
Index (Optional)	If two or more parallel links are present between From and To (different line systems or wavelengths), you can put the sequence number of the parallel link in this field to select a specific link to be tagged.
Designation	The designation (an alphanumeric identifier) added to the link.
End of Table 5-14	

Link Subdesignations Data Files

Link subdesignation data files allow you to attach designations to specific resources (fibers, wavelengths, timeslots) on links on the DCL, OCH, and OTS layer. These files use the format shown in Figure 5-20. The first row contains four headers; each subsequent row describes one link resource.

Figure 5-20 Link Subdesignations Data File

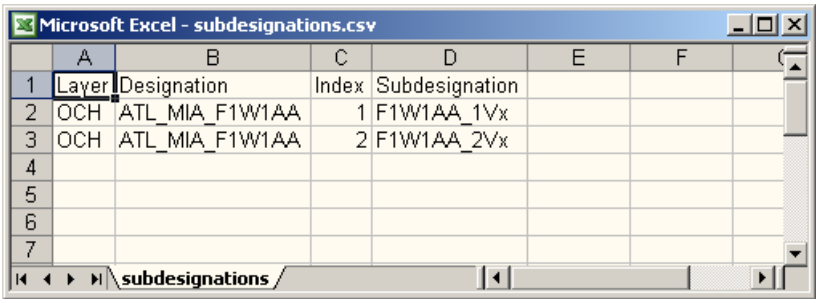


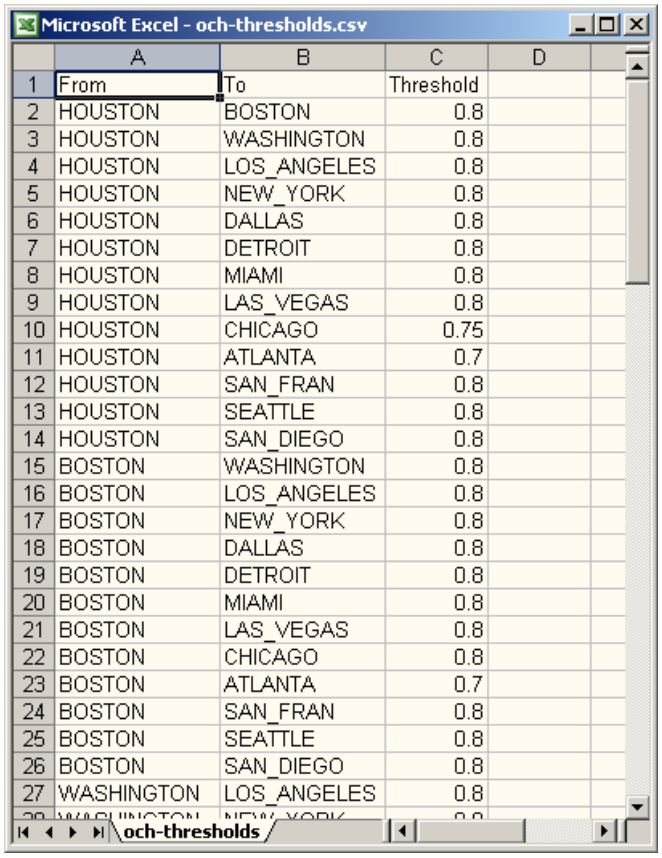
Table 5-15 Link Subdesignations Data File

Field	Description
Layer	Layer on which the link is specified The layer should be “DCL”, “OCH”, or “OTS”
Designation	The designation of the link for which a subdesignation is to be set. You can only add a subdesignation to a link that had already been assigned a designation.
Index	The index of the resource (timeslot, wavelength, fiber) to which the subdesignation must be attached
Subdesignation	The subdesignation (an alphanumeric identifier) added to the resource
End of Table 5-15	

Link Usage Thresholds Data File

Using link usage threshold data files, you can import a usage threshold for links on the DCL or the OCH layer. The files use the format shown in Figure 5-21. The first row contains three headers; each subsequent row describes one link. For more information, see Link Usage Threshold on page TrP-6-29 in the *Routing* chapter.

Figure 5-21 Link Usage Thresholds Data File



	A	B	C	D
1	From	To	Threshold	
2	HOUSTON	BOSTON	0.8	
3	HOUSTON	WASHINGTON	0.8	
4	HOUSTON	LOS_ANGELES	0.8	
5	HOUSTON	NEW_YORK	0.8	
6	HOUSTON	DALLAS	0.8	
7	HOUSTON	DETROIT	0.8	
8	HOUSTON	MIAMI	0.8	
9	HOUSTON	LAS_VEGAS	0.8	
10	HOUSTON	CHICAGO	0.75	
11	HOUSTON	ATLANTA	0.7	
12	HOUSTON	SAN_FRAN	0.8	
13	HOUSTON	SEATTLE	0.8	
14	HOUSTON	SAN_DIEGO	0.8	
15	BOSTON	WASHINGTON	0.8	
16	BOSTON	LOS_ANGELES	0.8	
17	BOSTON	NEW_YORK	0.8	
18	BOSTON	DALLAS	0.8	
19	BOSTON	DETROIT	0.8	
20	BOSTON	MIAMI	0.8	
21	BOSTON	LAS_VEGAS	0.8	
22	BOSTON	CHICAGO	0.8	
23	BOSTON	ATLANTA	0.7	
24	BOSTON	SAN_FRAN	0.8	
25	BOSTON	SEATTLE	0.8	
26	BOSTON	SAN_DIEGO	0.8	
27	WASHINGTON	LOS_ANGELES	0.8	

Table 5-16 Link Usage Thresholds Data File

Field	Description
From	Name of the source node
To	Name of the destination node
Threshold	The usage threshold (and number between 0 and 1) for the link
End of Table 5-16	

Importing and Exporting User Data Settings

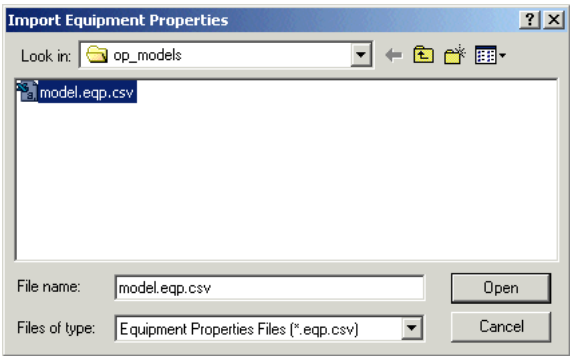
You can export the equipment properties and costs, and some network-wide settings such as delay and availability settings, and import them again in another scenario. This enables you to share the same models and cost data among different scenarios. The exported CSV file contains the following data:

- Concatenated bit rates
- Link costs
- Card costs
- Port costs
- Patch panel costs
- Ring costs
- Cross connect types (DXC, OXC, IXC, blocking OXC)
- Line system types
- Availability settings
- Delay settings

Note—You can import user data settings only if the network has no equipment installed.

To import or export user data settings, choose File > Import > User Data Settings or File > Export > User Data Settings.

Figure 5-22 Import Equipment Properties Dialog Box



Loading and Saving User Default Settings

The File > Import and File > Export submenus contain operations for loading and saving the Default User Data Settings file; you can use this file to specify the default settings to use when creating a new scenario.

Importing and Exporting WDMNetDesign Files

SP Guru Transport Planner can import files from WDMNetDesign v2.7. When you import a file:

- Imported nodes appear as EOCC nodes. You can change the node type in the OTS Node Browser.

  For more information, see OTS Node Browser on page TrP-4-14.

- All nodes have a continuous DXC + OXC. You can change this setting in the Network Properties dialog box.

  For more information, see Network Properties on page TrP-3-23.

- SP Guru Transport Planner creates a default WDM line system. The number of wavelengths is equal to the number of wavelengths in the WDMNetDesign file. You can change these settings in the WDM Link Equipment dialog box.

  For more information, see WDM Link Equipment Properties on page TrP-3-35.

To import a WDMNetDesign project, choose File > Import > WDMND File.

Importing and Exporting Route Data Files

You can use route data files so that SP Guru Transport Planner uses predefined routes during a routing or dimensioning run, instead of calculating the routes. For more information about importing routes, see Route DCL/OCH Traffic Dialog Box on page TrP-6-3, Dimension DCL/OCH Layer Dialog Box on page TrP-7-3, and Grooming DCL Traffic with Fixed Routes on page TrP-8-10.

Note—The route data files for Groom DCL to OCH Traffic > Fixed Routes should be specified entirely at the OTS layer (with the keyword OTS behind each layer). The grooming algorithm optimizes the layer at which to switch the traffic.

Unprotected Routes

Data files for unprotected routes use the definition shown in Figure 5-23. The file starts with the heading “Route” (singular) on its own row. Each subsequent row specifies one route. Each line specifies the nodes used by the route, from the starting node to the end node; each node is followed by a field that specifies the layer at which the traffic is switched (“OTS”, “OMS”, “OCH”, or “DCL”).

Figure 5-23 Routes (Unprotected) Data File in .csv Format

example_routes_unprotected.csv

	A	B	C	D	E	F
1	Route					
2	node_00	OCH	node_01	OCH		
3	node_00	OCH	node_01	OCH	node_02	OCH
4	node_01	OCH	node_02	OCH		
5	node_01	OCH	node_00	OMS	node_02	OCH
6	node_02	OCH	node_03	OCH		

example_routes_unprotected

Protected Routes

Data files for protected routes use the definition shown in Figure 5-24. The file starts with the heading “Routes” (plural) on its own row. Each subsequent row specifies two paths—the working path first and the protection path second—separated by one empty cell. Each path definition uses the same conventions as in the Unprotected routes data file: a list of nodes, from start to end node; each node is followed by the layer at which the traffic is switched (“OTS”, “OMS”, “OCH”, or “DCL”).

Figure 5-24 Routes (Protected) Data File in .csv Format

example_routes_protected.csv

	A	B	C	D	E	F	G	H	I	J	K
1	Routes										
2	node_00	OCH	node_01	OCH		node_00	OCH	node_01	OCH	node_02	OCH
3											
4	node_01	OCH	node_02	OCH		node_01	OCH	node_00	OMS	node_02	OCH
5											

example_routes_protected Sheet2 Sheet3