

# **TRP100**

## **SAP Transportation Resource Planning**

### **PARTICIPANT HANDBOOK INSTRUCTOR-LED TRAINING**

Course Version: 02  
Course Duration: 2 Day(s)  
Material Number: 50152806



# SAP Copyrights, Trademarks and Disclaimers

© 2022 SAP SE or an SAP affiliate company. All rights reserved.

No part of this publication may be reproduced or transmitted in any form or for any purpose without the express permission of SAP SE or an SAP affiliate company.

SAP and other SAP products and services mentioned herein as well as their respective logos are trademarks or registered trademarks of SAP SE (or an SAP affiliate company) in Germany and other countries. Please see <https://www.sap.com/corporate/en/legal/copyright.html> for additional trademark information and notices.

Some software products marketed by SAP SE and its distributors contain proprietary software components of other software vendors.

National product specifications may vary.

These materials may have been machine translated and may contain grammatical errors or inaccuracies.

These materials are provided by SAP SE or an SAP affiliate company for informational purposes only, without representation or warranty of any kind, and SAP SE or its affiliated companies shall not be liable for errors or omissions with respect to the materials. The only warranties for SAP SE or SAP affiliate company products and services are those that are set forth in the express warranty statements accompanying such products and services, if any. Nothing herein should be construed as constituting an additional warranty.

In particular, SAP SE or its affiliated companies have no obligation to pursue any course of business outlined in this document or any related presentation, or to develop or release any functionality mentioned therein. This document, or any related presentation, and SAP SE's or its affiliated companies' strategy and possible future developments, products, and/or platform directions and functionality are all subject to change and may be changed by SAP SE or its affiliated companies at any time for any reason without notice. The information in this document is not a commitment, promise, or legal obligation to deliver any material, code, or functionality. All forward-looking statements are subject to various risks and uncertainties that could cause actual results to differ materially from expectations. Readers are cautioned not to place undue reliance on these forward-looking statements, which speak only as of their dates, and they should not be relied upon in making purchasing decisions.

# Typographic Conventions

American English is the standard used in this handbook.

The following typographic conventions are also used.

This information is displayed in the instructor's presentation



Demonstration



Procedure



Warning or Caution



Hint



Related or Additional Information



Facilitated Discussion



User interface control

*Example text*

Window title

*Example text*

# Contents

vii	<b>Course Overview</b>
<b>1</b>	<b>Unit 1: SAP Transportation Resource Planning Overview</b>
3	Lesson: Understanding the Main Features and Benefits of SAP Transportation Resource Planning
7	Lesson: Outlining the Architecture and Landscape of SAP Transportation Resource Planning
<b>19</b>	<b>Unit 2: Administration and Master Data</b>
21	Lesson: Outlining System Administration
29	Lesson: Setting up Hierarchy, Location, and Resource
<b>45</b>	<b>Unit 3: Resource Visibility</b>
47	Lesson: Using Stock View, Resource View, and Change History
51	Lesson: Monitoring Lease Contracts, Moving Stock, and Transportation Demand
<b>59</b>	<b>Unit 4: Supply and Demand Planning</b>
61	Lesson: Understanding Plan Management
65	Lesson: Using a Supply and Demand Plan
<b>73</b>	<b>Unit 5: Resource Balancing</b>
75	Lesson: Creating Cost Models and Cost Datasets
83	Lesson: Outlining Network Setting Groups
87	Lesson: Creating a Simulation Plan
89	Lesson: Using a Balancing Simulation
<b>97</b>	<b>Unit 6: Pick-Up and Return Optimization</b>
99	Lesson: Creating Empty Pick-up and Empty Return Rulesets
105	Lesson: Suggesting Locations and Triangulation
111	Lesson: Integrating with the SAP TM System for Execution
<b>117</b>	<b>Unit 7: KPI and Home Dashboard Monitoring</b>
119	Lesson: Creating a KPI Plan
123	Lesson: Creating a Virtual KPI Plan
125	Lesson: Monitoring Data on the Home Dashboard



# Course Overview

## TARGET AUDIENCE

This course is intended for the following audiences:

- Project Manager
- Application Consultant
- Business Analyst
- Solution Architect



# UNIT 1

# SAP Transportation Resource Planning Overview

## Lesson 1

Understanding the Main Features and Benefits of SAP Transportation Resource Planning

3

## Lesson 2

Outlining the Architecture and Landscape of SAP Transportation Resource Planning

7

## UNIT OBJECTIVES

- Explain the main functions of SAP Transportation Resource Planning
- Describe general market requirements of SAP Transportation Resource Planning
- Describe the business challenges addressed by SAP Transportation Resource Planning
- Explain the SAP Transportation Resource Planning life cycle
- Describe the main process flow of SAP Transportation Resource Planning
- Understand the integration of SAP Transportation Resource Planning and SAP TM
- Outline the architecture of SAP Transportation Resource Planning
- Describe the available deployment models



## Unit 1

### Lesson 1

# Understanding the Main Features and Benefits of SAP Transportation Resource Planning



#### LESSON OBJECTIVES

After completing this lesson, you will be able to:

- Explain the main functions of SAP Transportation Resource Planning
- Describe general market requirements of SAP Transportation Resource Planning
- Describe the business challenges addressed by SAP Transportation Resource Planning
- Explain the SAP Transportation Resource Planning life cycle

#### Main Features and Benefits of SAP Transportation Resource Planning



**SAP Transportation Resource Planning** delivers support to provide the right resource at the right time and right location to fulfill the customer demand at a minimal cost.



Figure 1: Introduction to SAP Transportation Resource Planning



#### SAP Transportation Resource Planning Capabilities

- Increases the visibility of transportation resources
- Determines supply and demand of empty transportation resources, including forecasts
- Avoids or optimizes repositioning, based on calculated provisioning and return locations
- Supports and enables triangulation decisions
- Balances the stock of empty resources
- Integrates with SAP Transportation Management (SAP TM) for execution planning
- Monitors resource-related key performance indicators (KPIs)

## General Market Requirements



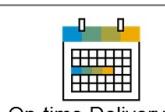
SAP Transportation Resource Planning addresses business needs that nowadays lead to a certain lack of visibility and control.



Figure 2: General Market Requirements

- Is a resource available?
- How can I monitor the supply of empty transportation resources?
- Is it always possible to determine an available to promise date?
- Which demand for empty resources do I have and can I allocate best the appropriate resource?
- How can I reliably forecast the supply and demand of resources?
- How to find triangulation options?
- How to avoid repositioning of empties and increase the utilization of my resources?
- How to reduce my costs per resource?
- Is it more economical to buy or lease new resources?
- How can I maintain and increase my service level?
- How to handle service recovery in exceptional cases?

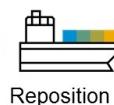
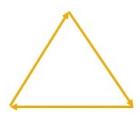
## Benefits of SAP Transportation Resource Planning



On-time Delivery



Available Empty Resources



Reposition



Visibility to various of Empty Resources  
Best proposal to reposition Empty Resources

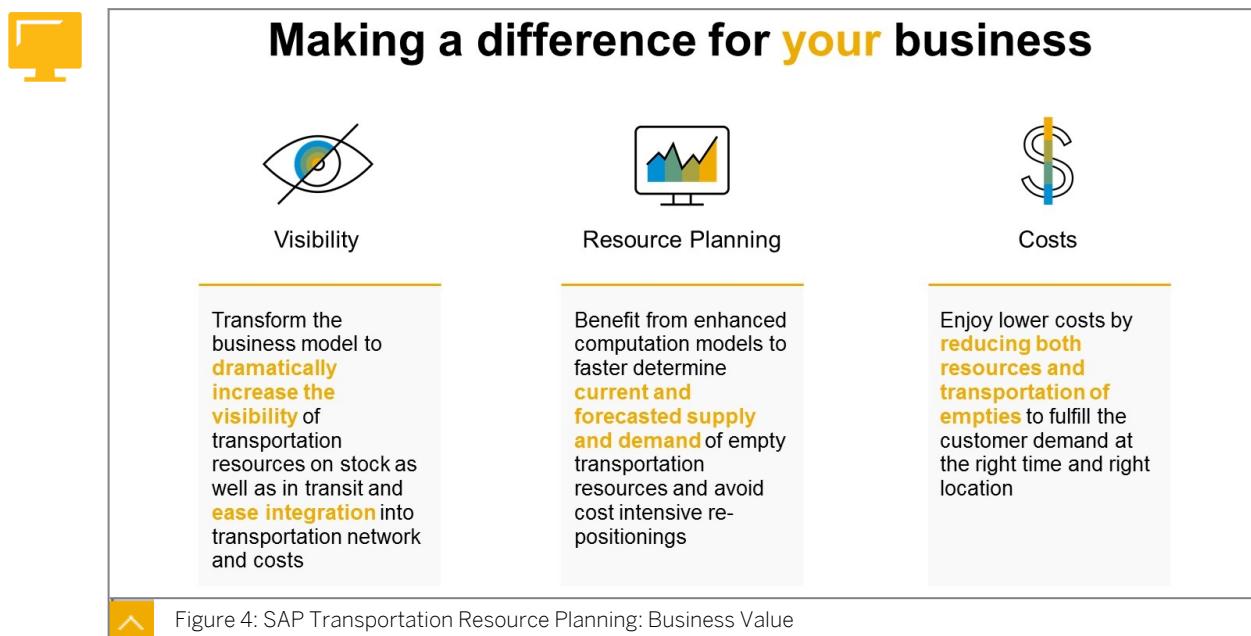
Figure 3: Key Business Needs Addressed by SAP Transportation Resource Planning

Transportation resource-related industries are capital intensive industries, therefore, there is a need to control costs and achieve competitive, though profitable, pricing.

SAP Transportation Resource Planning reduces costs related to resource movements. Imbalances between headhaul and backhaul can be reduced, as well as costs of service recoveries and inefficiencies in resource repositioning.

SAP Transportation Resource Planning overcomes inaccurate or outdated demand forecasts, which helps planners to be more precise and efficient. SAP Transportation Resource Planning sheds light on expected returns of used transportation resources, which helps to significantly reduce the unpredictability of returns at depots, terminals, or yards.

### SAP Transportation Resource Planning Life Cycle Overview



### LESSON SUMMARY

You should now be able to:

- Explain the main functions of SAP Transportation Resource Planning
- Describe general market requirements of SAP Transportation Resource Planning
- Describe the business challenges addressed by SAP Transportation Resource Planning
- Explain the SAP Transportation Resource Planning life cycle



# Unit 1

# Lesson 2

# Outlining the Architecture and Landscape of SAP Transportation Resource Planning

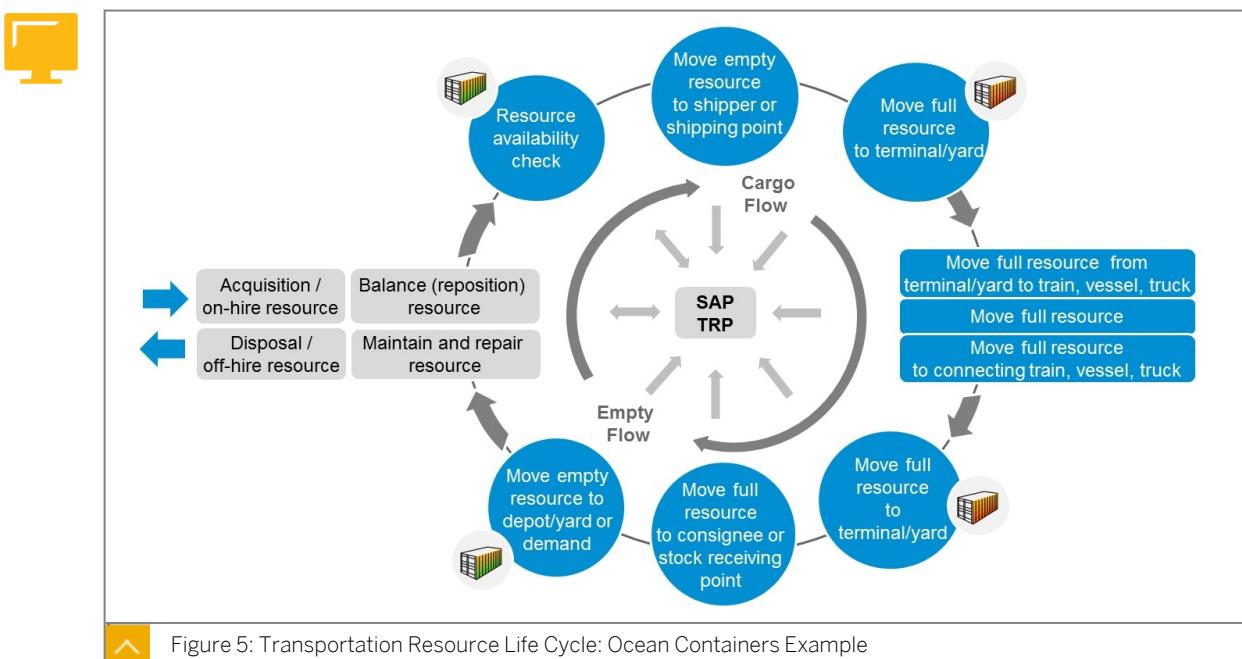


## LESSON OBJECTIVES

After completing this lesson, you will be able to:

- Describe the main process flow of SAP Transportation Resource Planning
  - Understand the integration of SAP Transportation Resource Planning and SAP TM
  - Outline the architecture of SAP Transportation Resource Planning
  - Describe the available deployment models

SAP Transportation Resource Planning Process Flow



SAP Transportation Management focuses on cargo flow planning and execution. SAP Transportation Resource Planning focuses on empty flow, however seamlessly it is integrated with SAP Transportation Management.

That is, SAP Transportation Management executes based on input coming from SAP Transportation Resource Planning.

The input from SAP Transportation Resource Planning can be any of the following:

- Resource availability checks



Note:

This feature is only available for SAP Transportation Management add-ons for container shipping liners for SAP S/4HANA.

- Updating the pick-up/return location and time for empty provisioning, an empty return, or in case of triangulation
- Deleting transportation orders, in case of a triangulation to be executed
- Creating transportation orders for empty repositioning

SAP Transportation Resource Planning supports multiple resource categories. The example in the figure shows the life cycle of ocean containers. Besides containers, other transportation units can be modelled too, such as railcars or trailers. SAP Transportation Resource Planning offers the possibility to use a generic resource category for other kinds of transportation units.

SAP Transportation Resource Planning can be used by manufacturing companies or shippers that manage a fleet of transportation resources as well as by any kind of carriers.



Figure 6: SAP Transportation Resource Planning Process Flows

Although SAP Transportation Resource Planning is a planning application, the flow chart in the figure demonstrates the logical sequence of steps that are supported by this application.

For prerequisites, see the following units, for example, Master Data and Administration and Resource Balancing (for costs and network).

### Visibility



- Resource
- Stock
- Moving stock
- Change history
- Lease contracts
- Movement demands

### Supply and Demand



- Flexible definition of supply and demand plan
- Supply and demand responds to transactional data from SAP Transportation Management System
- Granular forecast of supply and demand
- Availability check

- Business rule driven alerting
- Tactical resource inventory

### **Resource Planning**



- Scoring based planning algorithms
- Configurable planning scenarios
- Pickup location determination for resource provisioning
- Determination of return location
- Triangulation
- Manual and automated depot balancing
- Resource repositioning

### **Plan Execution**



- Integration into transactional data in SAP Transportation Management system: update location and time
- Creation of repositioning orders in SAP Transportation Management System
- Tracking of plan execution in supply and demand
- Respond to disruptions and changes

### **KPI Monitoring**



- Resource utilization
- Idle rate (by percentage)
- Import and export amount
- Stock levels

## SAP Transportation Resource Planning and SAP TM Integration

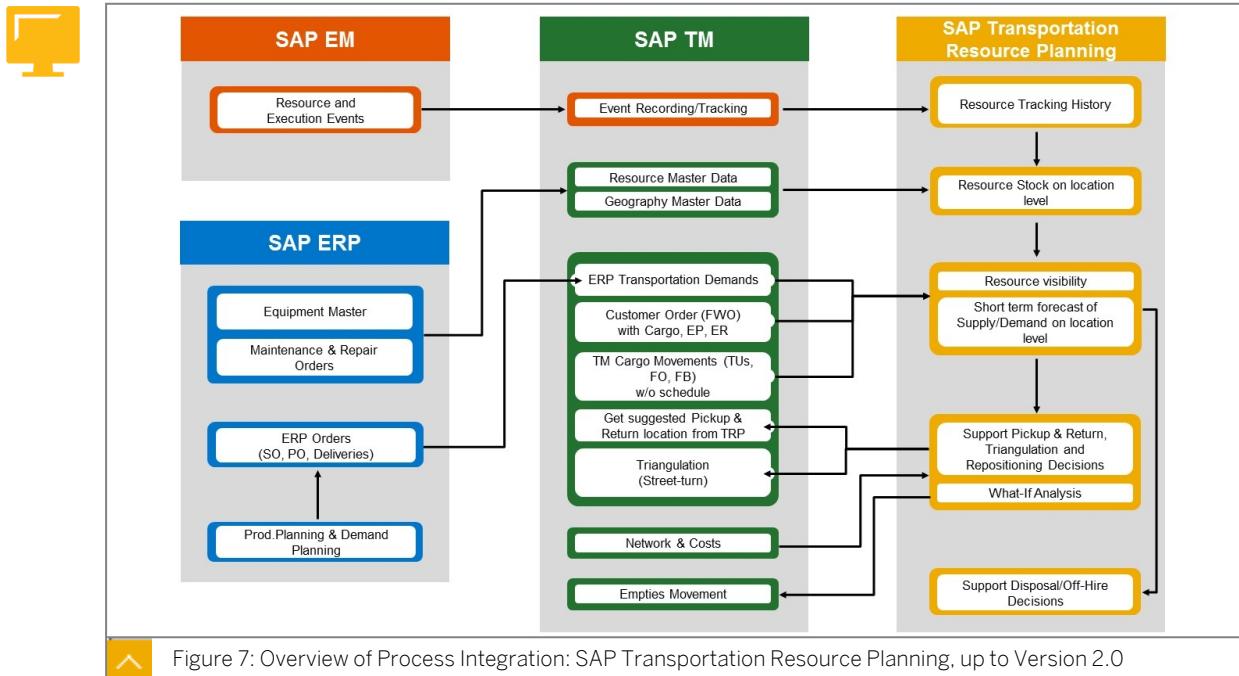


Figure 7: Overview of Process Integration: SAP Transportation Resource Planning, up to Version 2.0

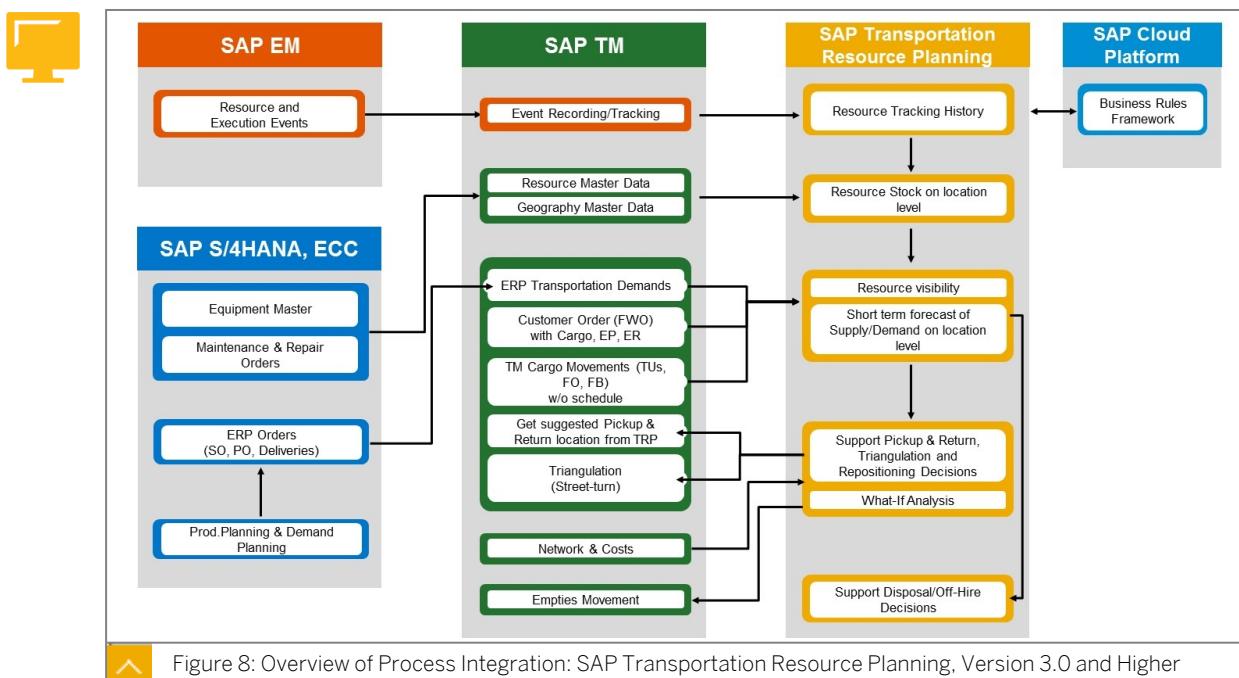


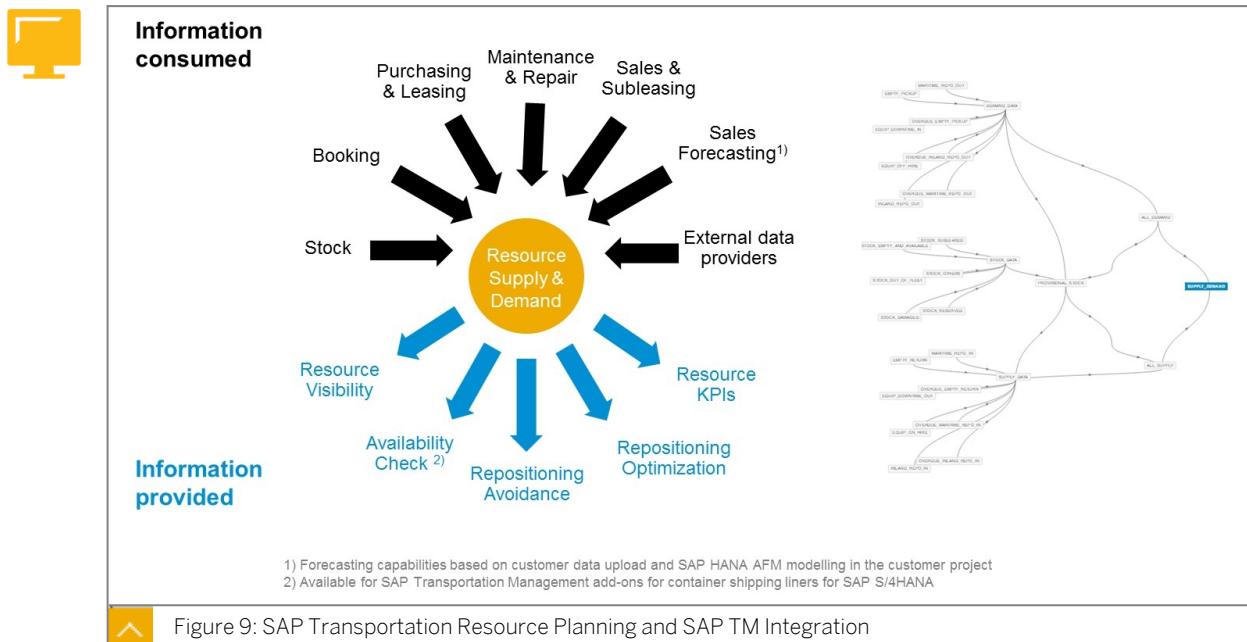
Figure 8: Overview of Process Integration: SAP Transportation Resource Planning, Version 3.0 and Higher

With the latest release of SAP Transportation Resource Planning, the SAP Cloud Platform-based Business Rules Framework can be consumed.

Business rules are relevant, for example, to configure alerts according to business requirements.

SAP Transportation Resource Planning 3.0 can retrieve relevant business rules SAP Cloud Platform. These can be stored in the SAP Transportation Resource Planning repository, where they can be assigned to configured alert rules.

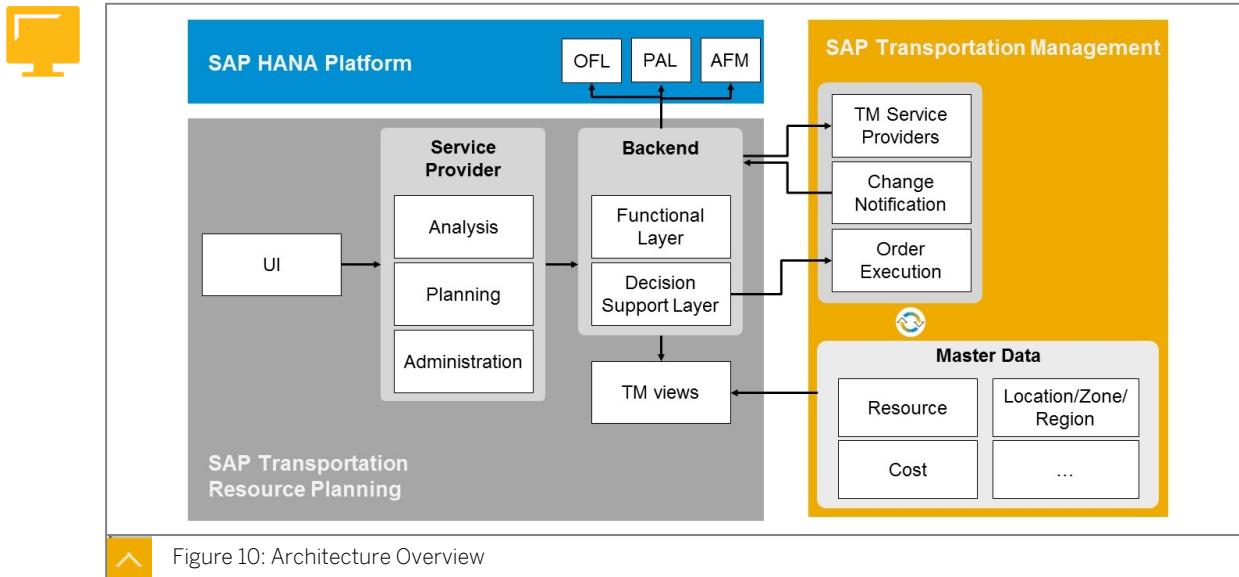
SAP Transportation Resource Planning 1.0 and 2.0 use the SAP HANA rules framework instead.



The transportation resources supply and demand model has the following capabilities:

- Supports shipper and carrier processes
  - Supports the possibility to plan multiple resource categories and types
  - Integrates with SAP Transportation Management
  - Supports flexible supply and demand plan modeling
  - Connects with various data providers to build up supply and demand
  - Supports business rule-based alerting
  - Provides detailed information of resource condition, state, and assignment
  - Allows for visibility of depot stock or moving stock
  - Supports supply and demand plan as the basis for planning the transportation resources
  - Repositions avoidance by strategies (flexible pick-up and return location determination, triangulation)
  - Supports cost-based repositioning optimization
  - Supports what-if scenarios, as well as simulation of multiple repositioning runs
  - Supports tactical fleet management decisions

## SAP Transportation Resource Planning Architecture Overview



The UI on SAP Transportation Resource Planning is organized into the main work centers: equipment visibility, supply and demand planning, and rebalancing planning.

The main back-end services of SAP Transportation Resource Planning can be grouped as follows:

- The functional layer:  
Consists of personalization and configuration, plan execution, evaluation of alerts, networks and costs
- Decision support:  
Consists of repositioning/depot balancing, pickup and return, triangulation/street turn
- TM views

SAP Transportation Resource Planning uses the following SAP HANA platform components:

- Application Function Modeler (AFM):  
An enhancement tool for creating planning models
- Optimization Function Library (OFL):  
Provider of the SAP HANA Linear Programming Solver
- Predictive Analysis Library (PAL):  
Statistical functions used in decision support and pre-delivered AFM nodes

In case of an integrated or side-car deployment model, SAP Transportation Resource Planning can consume the following set of SAP TM components:

- Master data:  
Locations, zones and hierarchies, resource master, resource change notifications, costs, network, that is, lanes and schedules, distance and duration

- Service providing objects:

Forwarding orders and bookings (carrier scenario), freight orders (shipper scenario), transportation units, for example, containers, railcars, and trailers

- Changes to service providing objects

In case of an integrated or side-car deployment model, SAP Transportation Resource Planning has an impact on the following order executions:

- Updating the location and time in an existing empty provisioning or return bookings
- Creating empty bookings for repositioning orders

## Deployment Models

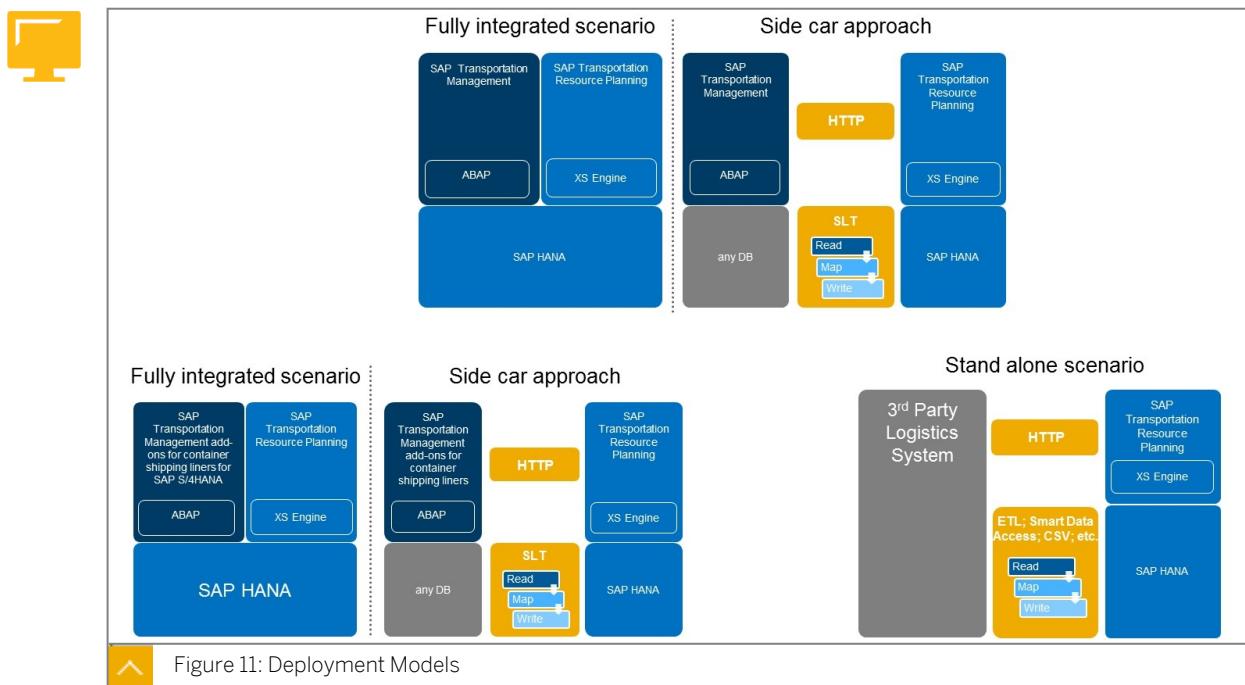


Figure 11: Deployment Models

The figure describes the various deployment models available.

	SAP TM 9.3	SAP TM 9.4 (or higher)				SAP S/4 eTM 1709	SAP S/4 eTM 1809	SAP S/4 eTM 1909	non SAP
	Any DB	Any DB	SAP HANA 1.0	SAP HANA 2.0	SAP HANA 2.0	SAP HANA 2.0	SAP HANA 2.0	(stand alone)	
SAP Transportation Resource Planning 2.0 SAP HANA 1.0 XS Classic	2	2	1, 2	1, 2	2	2	2	3	
SAP Transportation Resource Planning 3.0 SAP HANA 2.0 XS Advanced	2	2	2	1, 2	1, 2	1, 2	1, 2	3	

Figure 12: Deployment Models

The description of options outlined in the table Deployment Models are as follows:

1. Integrated
2. Side car via SLT
3. Stand alone

For further information, see the OSS note 2882531 - Deployment Options for SAP Transportation Resource Planning.



## LESSON SUMMARY

You should now be able to:

- Describe the main process flow of SAP Transportation Resource Planning
- Understand the integration of SAP Transportation Resource Planning and SAP TM
- Outline the architecture of SAP Transportation Resource Planning
- Describe the available deployment models

## Learning Assessment

1. Which of the following are capabilities of SAP Transportation Resource Planning?

*Choose the correct answers.*

- A Increases the visibility of transportation resources
- B Integrates with SAP Extended Warehouse Management (SAP EWM) for execution planning
- C Balances the stock of Loaded Resources
- D Integrates with SAP Transportation Management (SAP TM) for execution planning
- E Reduces the costs related to resource movements

2. Which of the following is not a logical step in the SAP Transportation Resource Management process flow?

*Choose the correct answer.*

- A Visibility
- B Plan Execution
- C Resource Check-in/Check-out
- D KPI Monitoring
- E Supply and Demand

3. Is the resource availability check feature available on SAP TM as input for SAP Transportation Resource Management?

*Choose the correct answer.*

- A Yes, it is available in all SAP TM versions
- B No, it is not available
- C Yes, it is available but only for SAP Transportation Management add-ons for container shipping liners for SAP S/4HANA

4. For what purpose could the SAP Cloud Platform be used in combination with the standard configuration of SAP Transportation Resource Planning 3.0?

*Choose the correct answers.*

- A To consume the Business Rules Framework
- B To provide resource position and additional information retrieved from IoT devices installed on board
- C To configure alerts according to business requirements

5. In SAP Transportation Resource Planning, version 3.0 and higher, is SAP Transportation Resource Planning directly integrated with SAP EM?

*Choose the correct answer.*

- A Yes, it is
- B Not directly, it is integrated via SAP TM
- C Not at all

6. Which deployment models are available for SAP Transportation Resource Planning?

*Choose the correct answers.*

- A Fully integrated scenario
- B Side car via SLT
- C Standalone scenario

7. In which SAP TM release is it possible to integrate SAP Transportation Resource Planning?

*Choose the correct answers.*

- A SAP TM for SAP S/4HANA
- B SAP TM 9.1
- C SAP TM 9.3 (of higher)

## Learning Assessment - Answers

1. Which of the following are capabilities of SAP Transportation Resource Planning?

*Choose the correct answers.*

- A Increases the visibility of transportation resources
- B Integrates with SAP Extended Warehouse Management (SAP EWM) for execution planning
- C Balances the stock of Loaded Resources
- D Integrates with SAP Transportation Management (SAP TM) for execution planning
- E Reduces the costs related to resource movements

2. Which of the following is not a logical step in the SAP Transportation Resource Management process flow?

*Choose the correct answer.*

- A Visibility
- B Plan Execution
- C Resource Check-in/Check-out
- D KPI Monitoring
- E Supply and Demand

3. Is the resource availability check feature available on SAP TM as input for SAP Transportation Resource Management?

*Choose the correct answer.*

- A Yes, it is available in all SAP TM versions
- B No, it is not available
- C Yes, it is available but only for SAP Transportation Management add-ons for container shipping liners for SAP S/4HANA

4. For what purpose could the SAP Cloud Platform be used in combination with the standard configuration of SAP Transportation Resource Planning 3.0?

*Choose the correct answers.*

- A To consume the Business Rules Framework
- B To provide resource position and additional information retrieved from IoT devices installed on board
- C To configure alerts according to business requirements

5. In SAP Transportation Resource Planning, version 3.0 and higher, is SAP Transportation Resource Planning directly integrated with SAP EM?

*Choose the correct answer.*

- A Yes, it is
- B Not directly, it is integrated via SAP TM
- C Not at all

6. Which deployment models are available for SAP Transportation Resource Planning?

*Choose the correct answers.*

- A Fully integrated scenario
- B Side car via SLT
- C Standalone scenario

7. In which SAP TM release is it possible to integrate SAP Transportation Resource Planning?

*Choose the correct answers.*

- A SAP TM for SAP S/4HANA
- B SAP TM 9.1
- C SAP TM 9.3 (of higher)

### Lesson 1

Outlining System Administration

21

### Lesson 2

Setting up Hierarchy, Location, and Resource

29

### UNIT OBJECTIVES

- Maintain general settings for SAP Transportation Resource Planning
- Register objects for SAP Transportation Resource Planning
- Describe resource categories
- Describe user authorization
- Describe the schedule integration between SAP TM, SAP Transportation Management add-ons for container shipping liners for SAP S/4HANA, and custom-developed schedules
- Extend columns for resource master and transportation demand
- Upload data using mass upload
- Create user roles
- Describe the basic functions of SAP Transportation Resource Planning objects
- Set up and update geographical hierarchy
- Set up location filters
- Set up resource filters
- Set up multi-attribute filters
- Set up time filters
- Set up stock settings
- Set up an alert rule group



## Outlining System Administration



### LESSON OBJECTIVES

After completing this lesson, you will be able to:

- Maintain general settings for SAP Transportation Resource Planning
- Register objects for SAP Transportation Resource Planning
- Describe resource categories
- Describe user authorization
- Describe the schedule integration between SAP TM, SAP Transportation Management add-ons for container shipping liners for SAP S/4HANA, and custom-developed schedules
- Extend columns for resource master and transportation demand
- Upload data using mass upload
- Create user roles

### General Settings

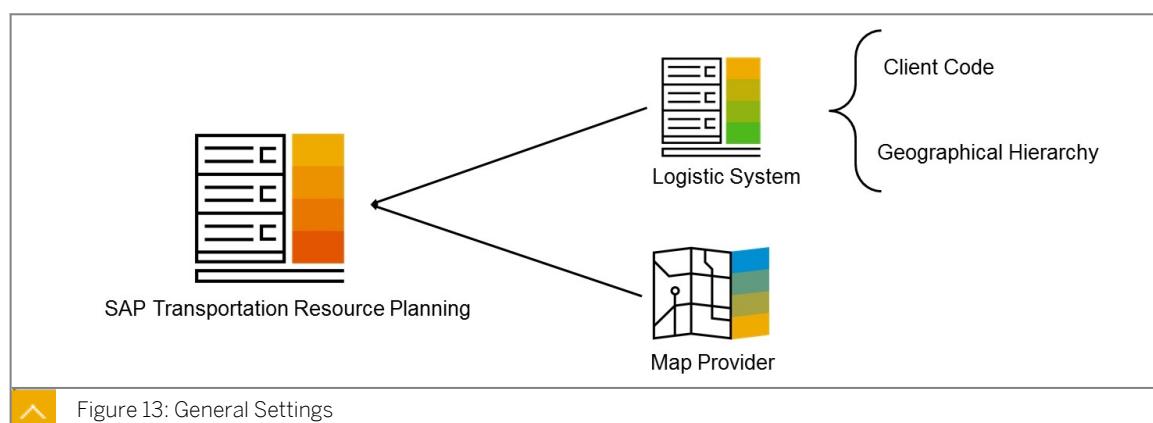


Figure 13: General Settings

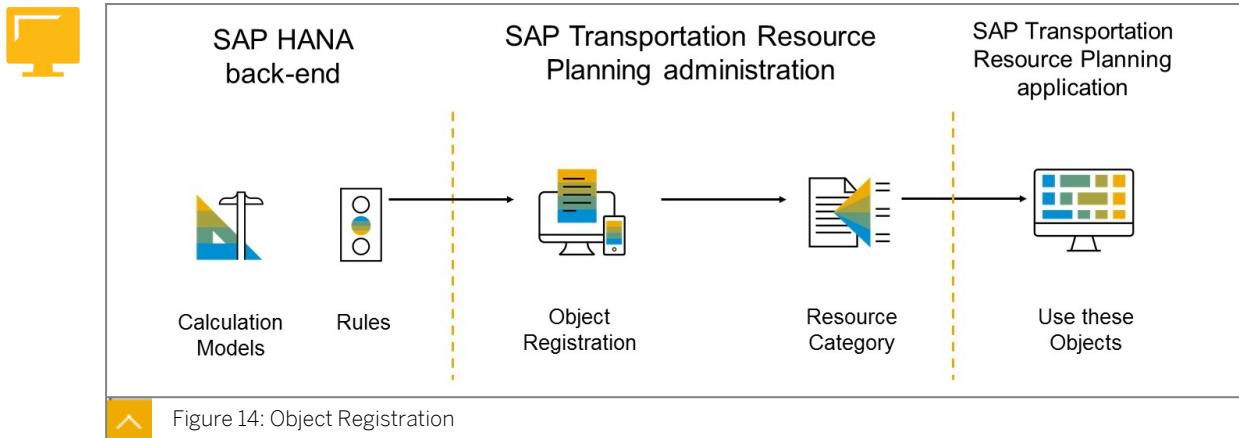
SAP Transportation Resource Planning reads logistics data from your logistics system. You must specify a client code to identify the server where your logistics system resides. SAP Transportation Resource Planning uses the client code to connect to the logistics system. Through the connection, logistics data can be synchronized between the two systems. The client code can be specified in the SAP HANA back-end system during the system configuration process.

SAP Transportation Resource Planning does not include a map service. When it displays a map view, the map image, which is independent from business data, is downloaded at runtime from a user-specified map provider. You must decide which map provider to use, and

obtain a license directly from the provider. The provider also supplies URLs for accessing map services.

To view general settings, choose *Administration* → *General Settings*.

## Object Registration



SAP Transportation Resource Planning delivers a set of business rules and calculation models to support resource visibility and optimization. These objects are delivered as runtime objects in the SAP HANA back-end system. You must register them into rules and models for SAP Transportation Resource Planning in order to use them.

In addition, you can define your own business rules and calculation models according to your business needs. User-defined objects also need to be registered before you can use them.

The following objects can be registered in the system:

- Calculation models
- Supply and demand alert rules
- KPI alert rules
- Location determination rules
- Exclusion rule
- Extended columns for pick-up
- Extended columns for return

The calculation models and rules that you want to register must be available in the SAP HANA back-end system.

To register objects, choose *Administration* → *Object Registration*.

## Resource Categories

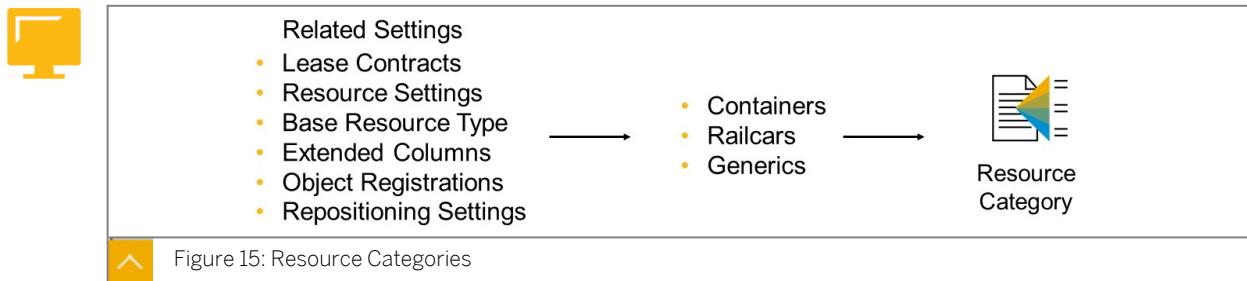


Figure 15: Resource Categories

A resource category distinguishes between the usage types of different classes of transportation resources. For example, if you have a resource category for containers, you can use this category to organize different container types at a higher level.

The following types of resource category are available:

- *Containers*, used to organize different types of containers.
- *Railcars*, used to organize different types of rail cars.
- *Generics*, used to organize other transportation resources, for example, trailers or air containers.

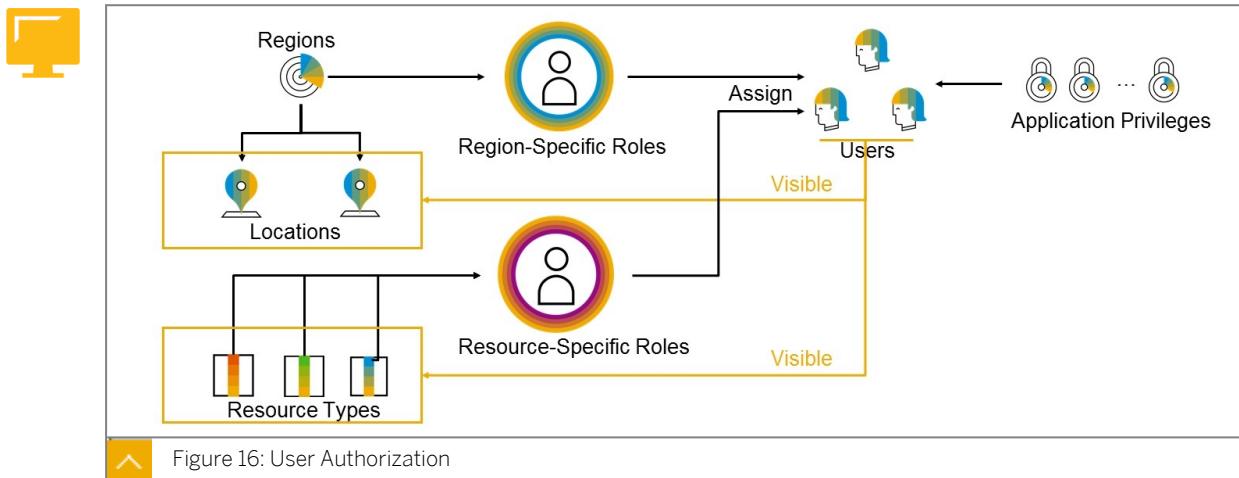
Different resource categories have different terminology on the related UI. For example, generic resource category types do not include pick up and return functions.

The following settings are available for resources:

- Lease contracts:  
This setting determines whether the *Resource Visibility* work center contains a *Lease Contracts* view, to show lease contracts information when the resource category is selected.
- Resource settings:  
This setting defines the specific resource types that are included in a resource category.
- Base resource type:  
This setting is used to calculate preliminary costs in network models. The real costs are then adjusted according to the specific resource types.
- Extended columns:  
This setting determines what extended columns are shown in the *Resources* and *Transportation Demand* views in the *Resource Visibility* work center when the resource category is selected.
- Object registrations:  
This setting specifies the registered objects that a user can use when the resource category is selected. Registered objects include rules and calculation models.
- Repositioning settings:  
This setting controls the repositioning activities for the resource category in resource balancing.

To view these settings for resources categories, choose *Administration → Resource Categories*.

## User Authorization



Roles allow you to tailor user privileges to correspond with their planning responsibilities. Each planner needs the following role types:

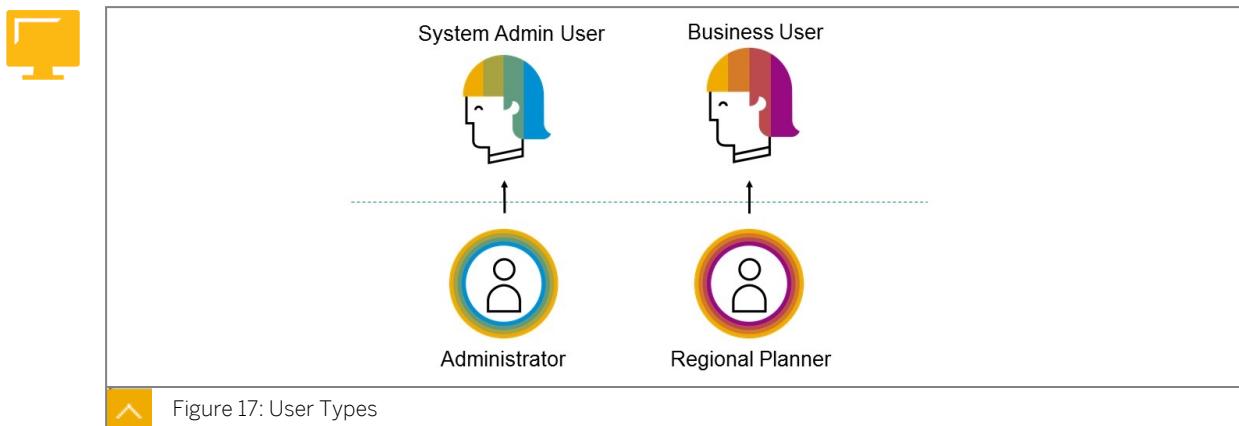
- Region-specific
- Resource-specific

Once the planner has these two role types assigned, they can see specific resource types at specific locations.

SAP Transportation Resource Planning provides basic and function-based application privileges to control user access to the application. These privileges can be granted to users of SAP Transportation Resource Planning in SAP HANA Studio, either directly or indirectly through roles that they have been granted.

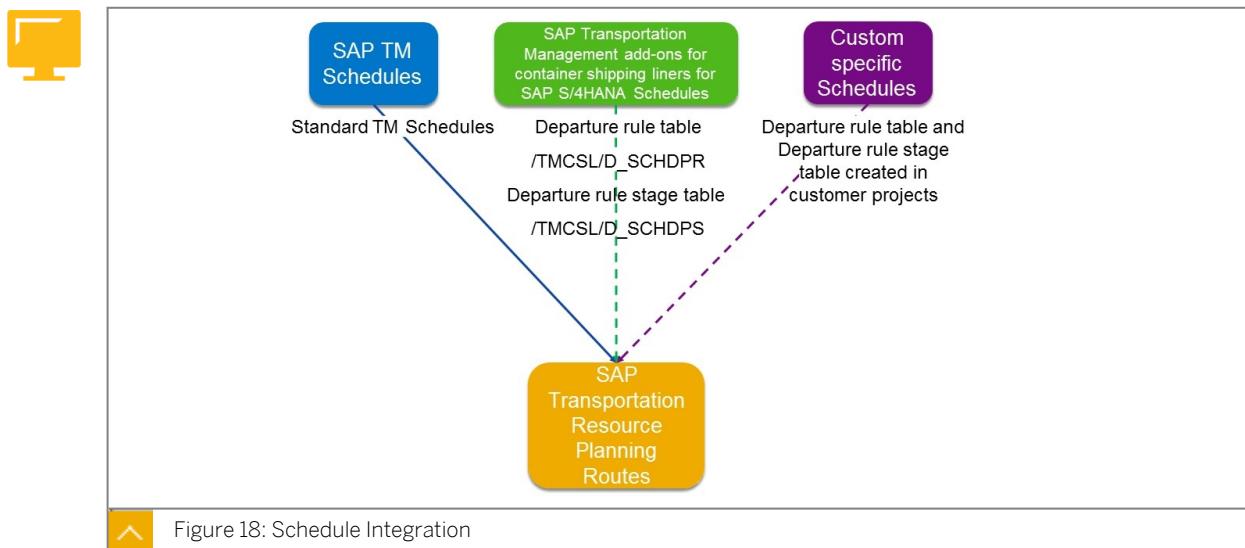
To view role settings, choose *Administration → Roles*.

To view user settings, choose *Administration → Users*.



The administrator user type has all of the privileges in SAP HANA, while the regional planner user type has limited authorization by location-specific role, resource-specific role, and privileges assigned to the user.

## Schedule Integration



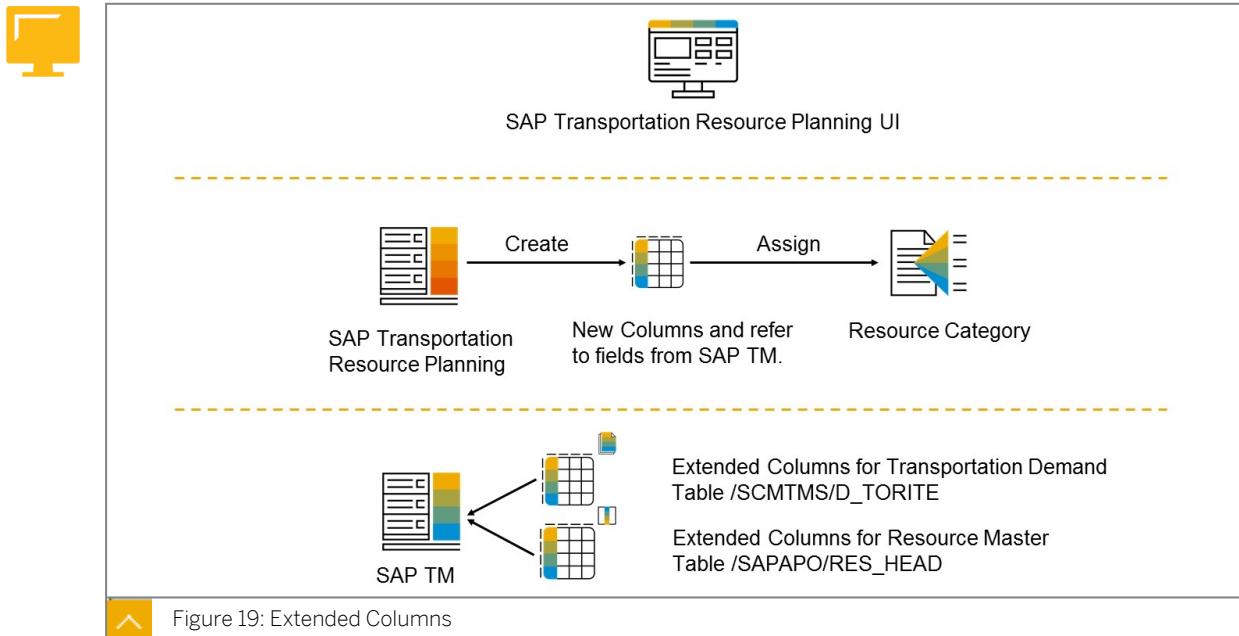
If there are SAP Transportation Management add-ons for container shipping liners for SAP S/4HANA, or a custom-specific scenario implemented in your target SAP TM, you need to integrate the SAP Transportation Management add-ons for container shipping liners for SAP S/4HANA, or the custom-specific schedule to SAP Transportation Resource Planning by specifying the enhanced schedule tables. After the schedule integration, SAP Transportation Resource Planning will use both the standard schedule and the SAP Transportation Management add-ons for container shipping liners for SAP S/4HANA, or a custom-specific schedule to generate routes.



### To Integrate a Schedule

1. Choose *Administration* → *Schedule Integration*.
2. To set up how the schedules will be integrated, use the following information:
  - Enter the departure rule table name **/TMCSL/D\_SCHDPR** and the departure rule stage table name **/TMCSL/D\_SCHDPS**. SAP Transportation Resource Planning will use the schedules from both SAP TM and SAP Transportation Management add-ons for container shipping liners for SAP S/4HANA to generate routes.
  - Without entering any information, SAP Transportation Resource Planning will use the SAP TM schedules as default to generate routes.
  - In a stand-alone scenario where neither of the above schedules can be used, ask the system administrator for the table names of external schedules on which SAP Transportation Resource Planning can generate routes.

## Extended Columns



If SAP Transportation Management is your underlying logistics system, the following types of extended columns are available to add:

- Transportation Demand

These fields are from SAP TM table /SCMTMS/D\_TORITE. They can be added to the *Transportation Demand* view of the *Resource Visibility* work center as extended columns.

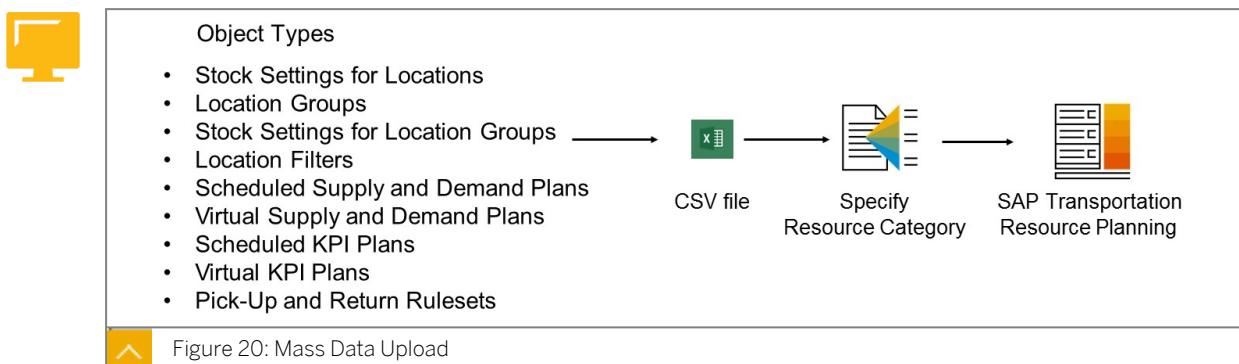
- Resources

These fields are from SAP TM table /SAPAPO/RES\_HEAD. They can be added to the *Resources* view of the *Resource Visibility* work center as additional attributes.

To extend columns for pick-up and return, choose *Administration* and choose the *Object Registration* tab to register the new column object first. Refer to the Object Registration part.

Choose *Administration* → *Extended Columns*.

## Mass Data Upload



Before you begin working with SAP Transportation Resource Planning, you need to set up various data, such as location groups, location filters, and scheduled supply and demand plans. Some of this data is high in volume and would be time consuming to enter one at a time.

To accelerate the data entry, you can use the mass data upload process to enter a high volume of data at once. You prepare the data in an application such as Microsoft Excel, and then save it as a comma-separated values (CSV) file for the upload process. Note that the data must be structured in a specific way. To do this, choose *Administration → Mass Data Upload*.



## LESSON SUMMARY

You should now be able to:

- Maintain general settings for SAP Transportation Resource Planning
- Register objects for SAP Transportation Resource Planning
- Describe resource categories
- Describe user authorization
- Describe the schedule integration between SAP TM, SAP Transportation Management add-ons for container shipping liners for SAP S/4HANA, and custom-developed schedules
- Extend columns for resource master and transportation demand
- Upload data using mass upload
- Create user roles



## Unit 2

### Lesson 2

# Setting up Hierarchy, Location, and Resource



#### LESSON OBJECTIVES

After completing this lesson, you will be able to:

- Describe the basic functions of SAP Transportation Resource Planning objects
- Set up and update geographical hierarchy
- Set up location filters
- Set up resource filters
- Set up multi-attribute filters
- Set up time filters
- Set up stock settings
- Set up an alert rule group

#### Objects Overview: Location and Region

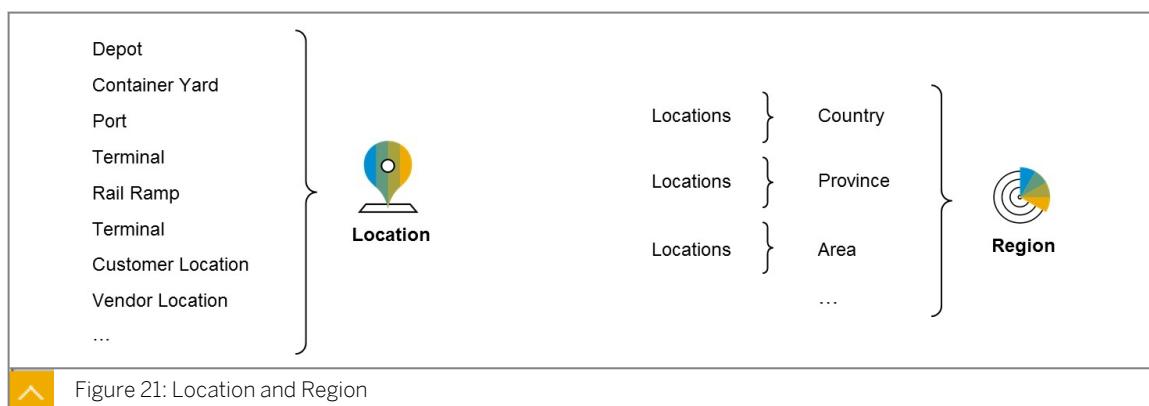


Figure 21: Location and Region

Location is the same as the object location which is synchronized from SAP TM.

Region is the same as the object zone which is synchronized from SAP TM. It is an area that contains a subset of locations under it.

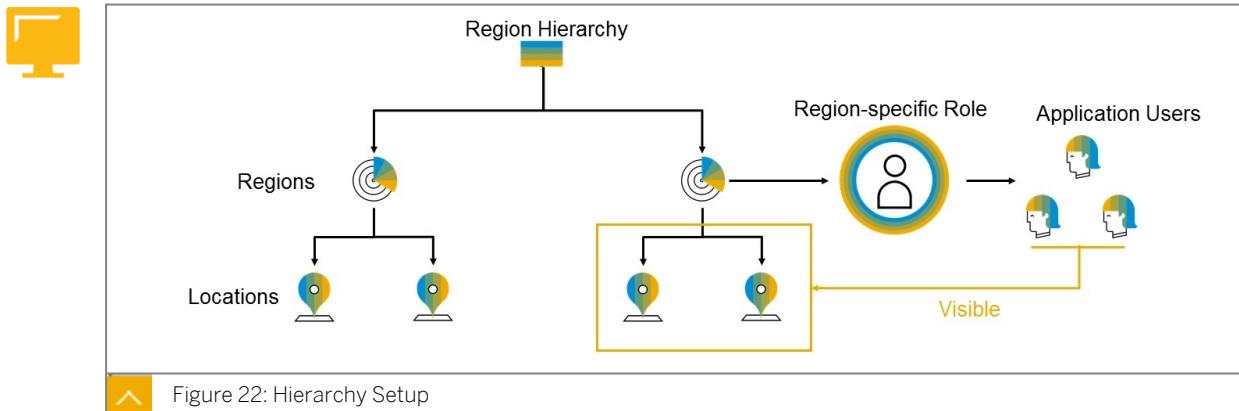


#### Note:

In the standalone scenario, this information needs to be imported into SAP Transportation Resource Planning from external sources. This course focuses on the integrated scenarios with SAP Transportation Management. Therefore, we will not repeat the specifics for a SAP Transportation Resource Planning system deployed in the standalone scenario.

To view the settings for these objects, choose *Location Settings → Regions*.

## Hierarchy Setup



To plan and manage your transportation resources, you need information about where your resources are located.

The geographic hierarchy is made up of the following elements:

- Location

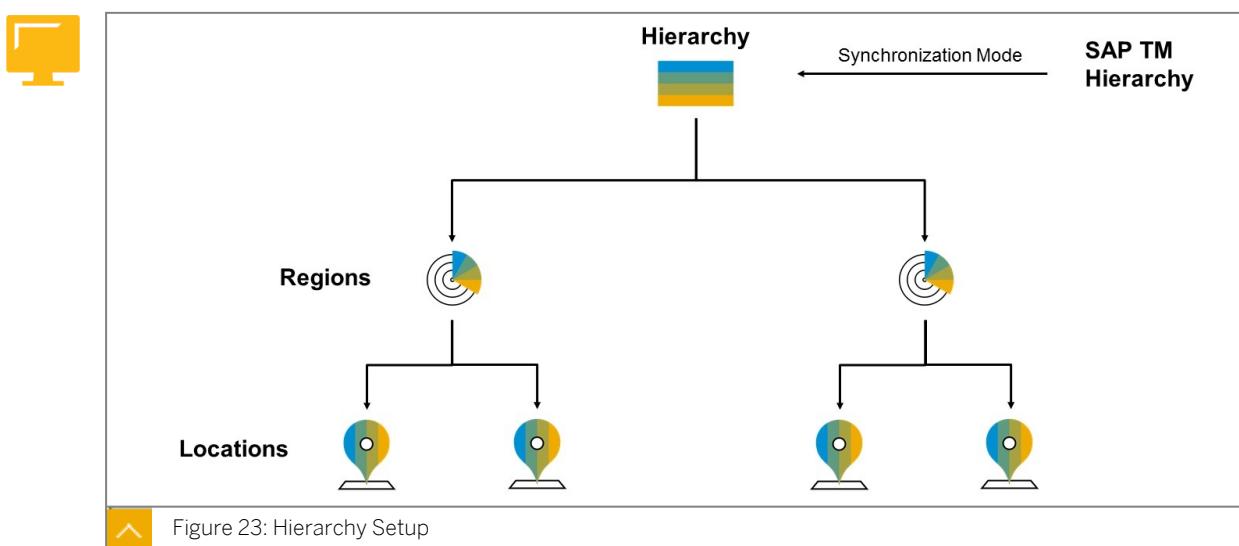
This is the location at which transportation resource stock is gathered, received, and redistributed. Location can be a depot, a port, or a container yard, for example.

- Region

Regions are used to structure locations hierarchically. A region consists of a parent region and its child locations.

Only the leaf node region can have its child locations.

These geographic structures correspond with the roles provided by SAP Transportation Resource Planning. System administrators can tailor the geographic structure to meet your administrative needs and assign roles to users accordingly.



The two possible options for handling the region hierarchy are as follows:

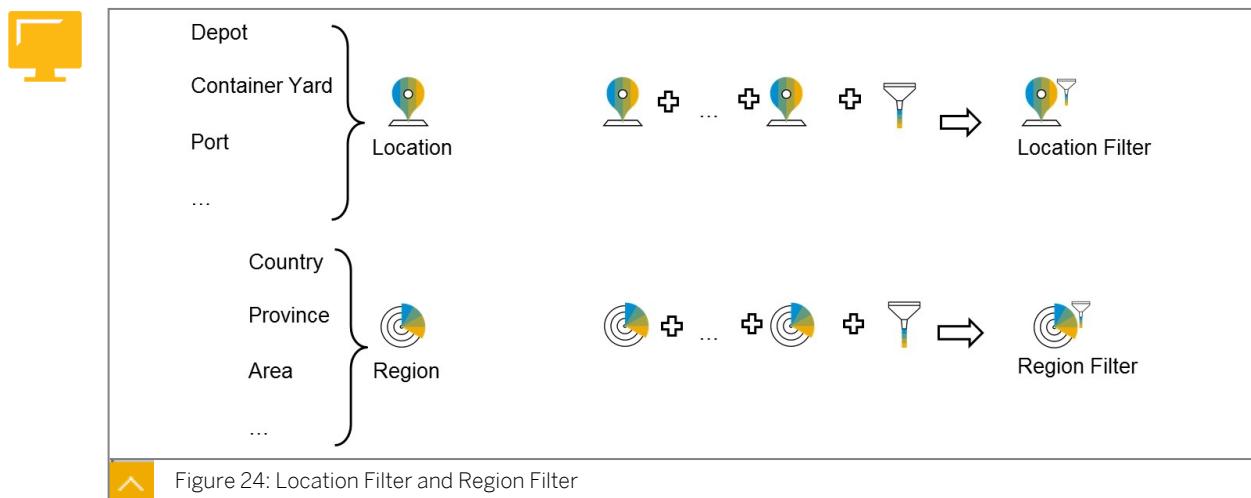
- Synchronization mode with SAP TM
- Independent mode

In synchronization mode, the SAP TM default hierarchy RELH\_ZONE synchronizes to the SAP Transportation Resource Planning hierarchy. In this case, you are not allowed to modify this hierarchy in SAP Transportation Resource Planning.

In independent mode, the SAP Transportation Resource Planning system uses a region hierarchy that is not the RELH\_ZONE hierarchy in SAP TM. In this case, you can modify the hierarchy in SAP Transportation Resource Planning.

To view the hierarchy settings, choose *Location Settings → Region Hierarchy*.

## Location Filters

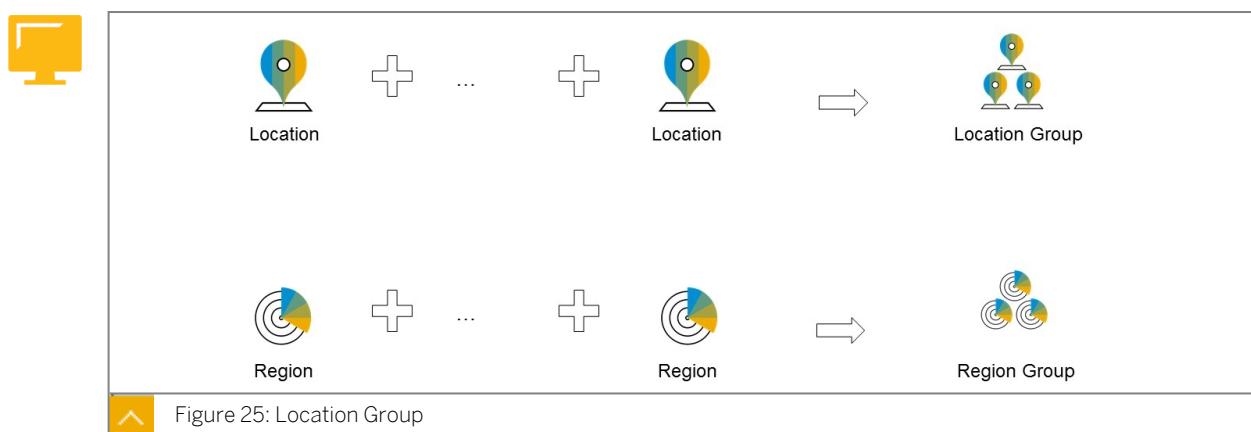


A location filter is a set of geographic objects or location groups. You can create a location filter to save your frequently used geographic objects or location groups as a single item for selection.

There are two types of filters, as follows:

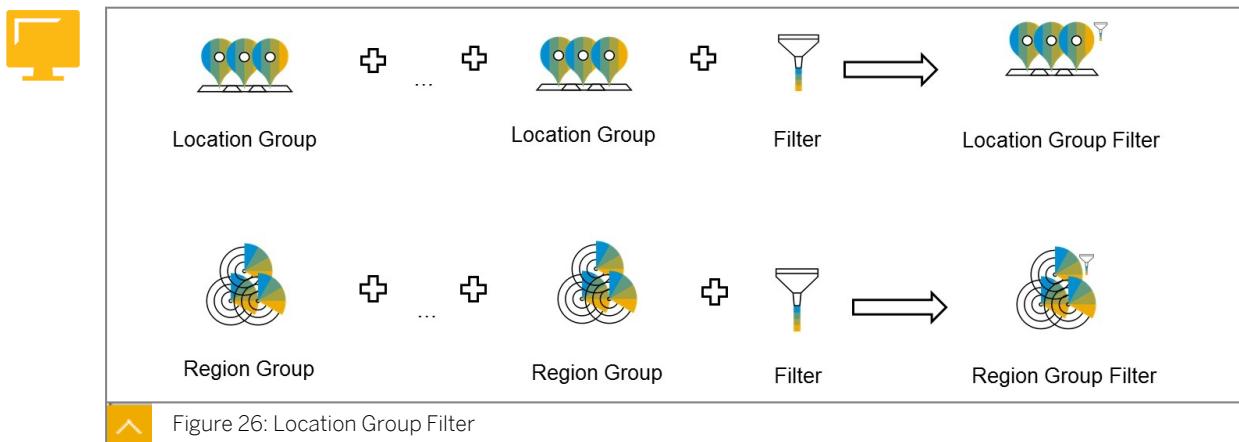
- Location filter
- Region filter

To view these settings, choose *Location Settings → Location Filters*.



A location group is a set of geographic objects, including locations or regions. Each location group contains only one type of geographic object. Each location group has a primary location. This determines the position of the location group when you access it in a map view.

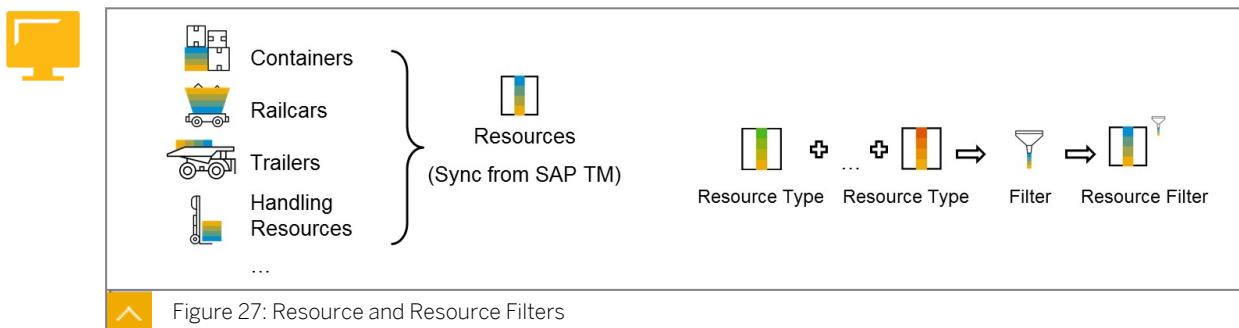
To view these settings, choose *Location Settings* → *Location Groups*.



Location group filters in SAP Transportation Resource Planning help you to organize and structure the query of geographical places and areas that you want to monitor for resource planning.

To view these settings, choose *Location Settings* → *Location Filters*.

## Resource Filters



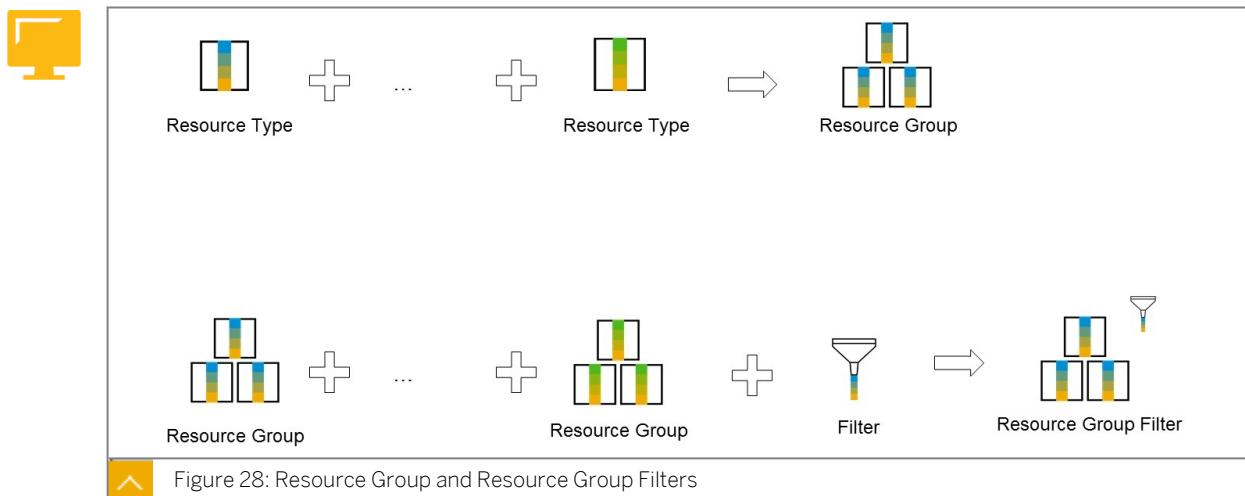
The object *resource* within SAP Transportation Resource Planning is the same object as the resource which is synchronized from SAP Transportation Management.

A resource filter is a set of resource types or resource groups. You can create a resource filter to save your frequently used resource types or groups as a single item for selection.

In SAP Transportation Resource Planning, resources mean passive transportation resources.

SAP Transportation Resource Planning provides resource visibility and optimization for passive transportation resources.

To view these settings, choose *Resource Settings* → *Resource Filters*.

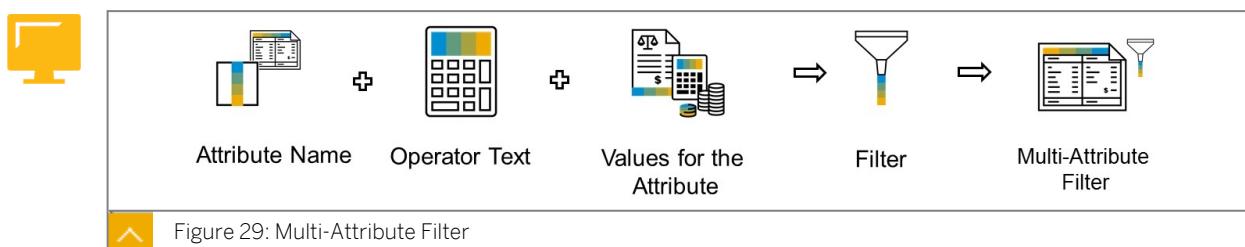


A resource group is a set of resource types.

To work with resource groups, choose *Resource Settings* → *Resource Groups*.

You can use resource groups to organize your transportation resources according to your business needs. For example, you can set up different groups according to resource size. Resource groups can then be used in resource filters.

### Multi-Attribute Filters



A multi-attribute filter is a set of attributes. Each attribute consists of the following:

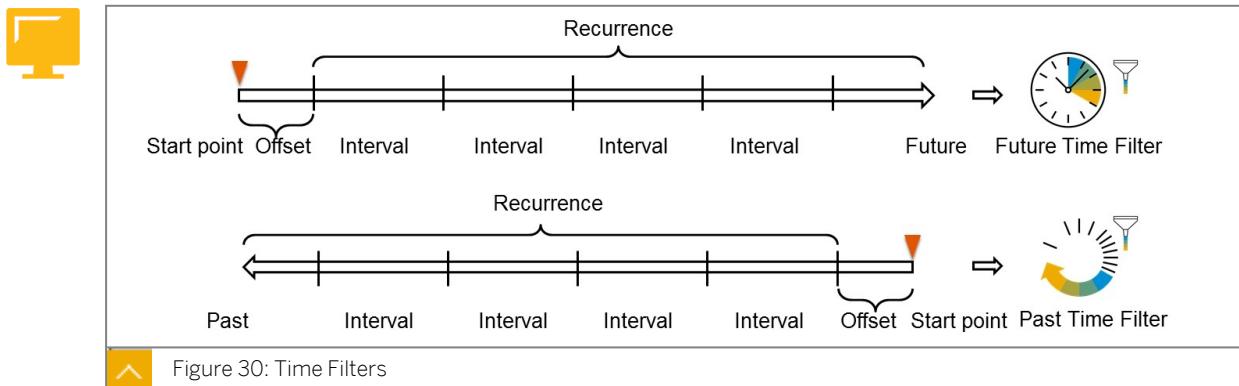
- The attribute name
- An operator text, such as **is** or **is not**
- One or more values per attribute

The filter finds all resources that meet the criteria that you have entered for the attributes and their values. Each attribute can be added once to a multi-attribute filter. If you enter more than one value for an attribute, the filter finds resources that have any one of the entered values.

Multi-attribute filters provide an additional means of filtering your transportation resources. In addition to filtering by resource type, with multi-attribute filters you can filter according to specific attributes and attribute values. You can group together resource attributes that you use frequently in a multi-attribute filter.

To work with these filters, choose *Resource Settings* → *Multi-Attribute Filters*.

## Time Filters



A time filter is a group of settings that determine the time horizon for the plans used to calculate and display planning data in SAP Transportation Resource Planning.

The following are the two types of time filters:

- Future time filter
- Past time filter

Future time filters are used in scheduled supply and demand plans and template supply and demand plans. These plans set out your planning horizon by making forecasts about the future supply and demand situation for locations, regions, and region groups.

Past time filters are used in scheduled KPI plans. You can use these plans to analyze the past performance history for locations, regions, and region groups.

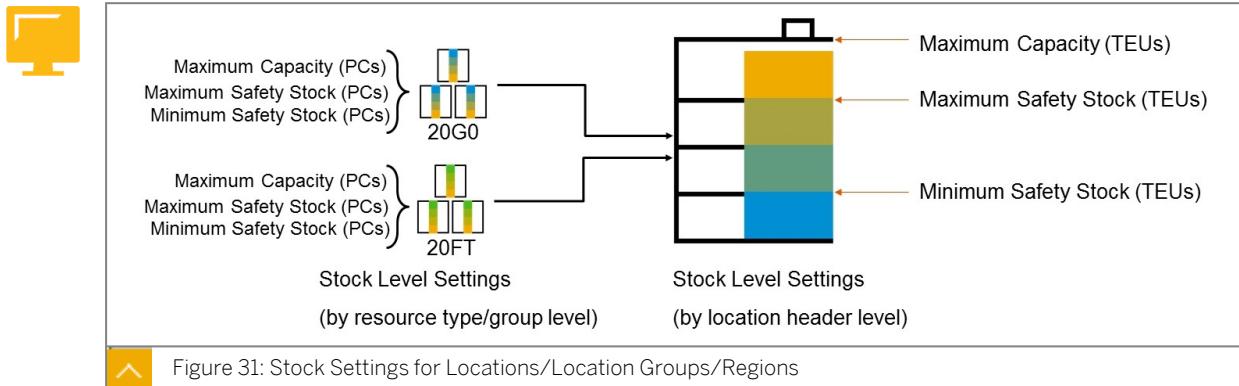
The time interval determines how long the time periods are. You can use hours, days, weeks, or months.

The number of recurrences determines how many individual time periods are marked out by the time filter, either in the past or in the future.

The time offset is to offset the start time of your time filter.

To work with these filters, choose *Plans* → *Time Filters*.

## Stock Settings



For each location, region, or location group in SAP Transportation Resource Planning, you can set the safety stock threshold by resource type or resource group. The specified thresholds

are used by the stock alert rule to determine whether the stock levels for resources are critical.

You can specify the following safety stock thresholds:

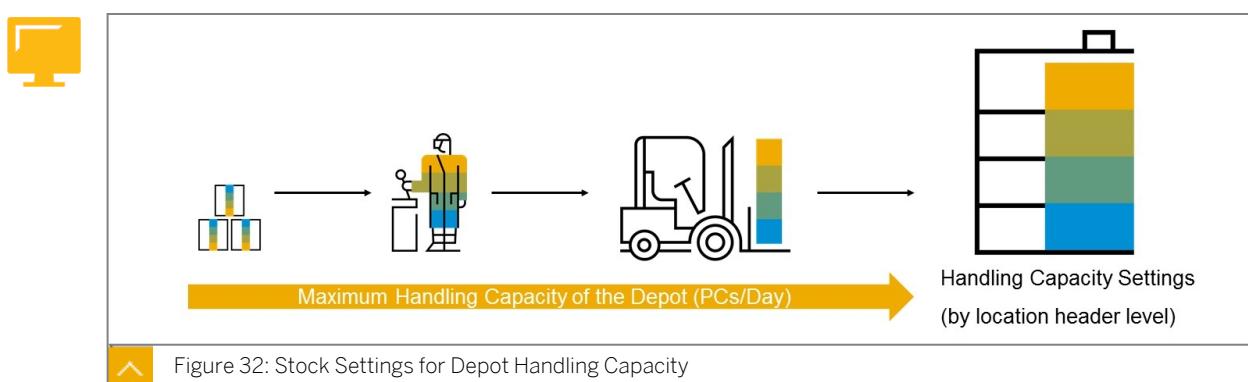
- Maximum and minimum safety stock

These two thresholds specify the safety stock range for a location, a region, or a location group.

- Maximum capacity

- This threshold specifies the maximum stock capacity for a location. This setting is not available for regions and location groups.
- You can set overall thresholds and thresholds for specific resource types and resource groups.
- For regions and location groups, there are no settings for maximum capacity.

To set the safety stock threshold, choose *Resource Settings → Stock Settings for Locations*.

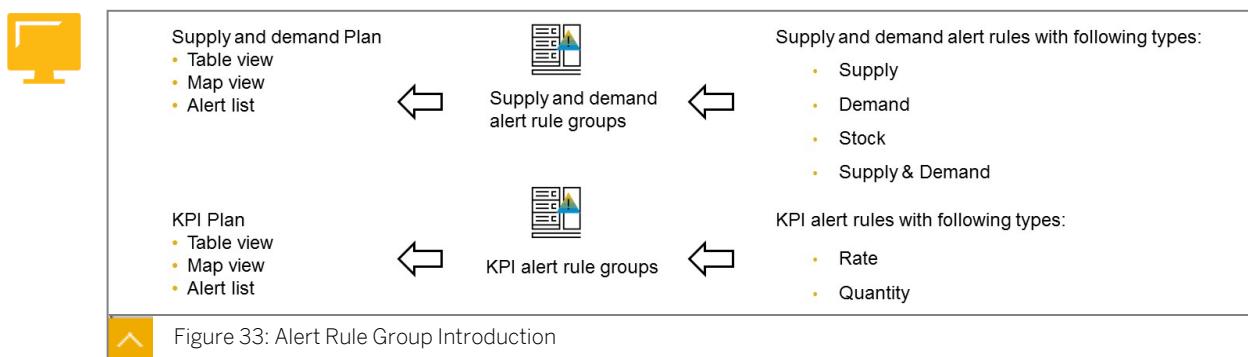


The defined handling capacity is used by the pick-up and return and the resource balancing optimization processes to ensure that the planned handling activities of the day do not exceed the maximum handling capacity.

You can set the depot handling capacity thresholds for locations under *Resource Settings → Stock Settings for Locations*.

In the network setting group, you can specify which activities can be managed in the handling capacity of the depot.

## Alert Rule Group



When monitoring the numbers for stock, supply, demand, and KPIs, it can be quite difficult to identify the risks behind each number. An alert rule group can determine and highlight alerts for each stock views, supply and demand views, and KPI views, with a combination of alert rules.

Alert rules can be grouped as one alert rule group, and the group can be assigned to each plan based on plan types. The following are the two types of alert rule groups:

- Supply and demand alert rule groups, for triggering alerts for resource surpluses and deficits.
- KPI alert rule groups, for triggering KPI alerts.

In a supply and demand alert rule group, you can assign multiple rules with the following types:

- Supply
- Demand
- Stock
- Supply and demand

In a KPI alert rule group, you can assign multiple rules with the following types:

- Rate
- Quantity

Alert rule groups are used to trigger warnings for critical situations of supply and demand plans and KPI plans. When looking at a plan, alert icons are shown beside numbers in the map view, and in the alert list view of the plan. By selecting the alert icon, a detail alert message displays, explaining the reason for the alert.

Whether for a supply and demand alert group, or a KPI alert group, alerts are built from HRF.

The IT administrator can register the new alerts from HRF. To set up an alert rule group, choose *Plans → Alert Rule Groups*.

### Alert Rule Group: Hit Policy



Rule	Conditions: LOCATION_NAME	Conditions: BALANCE_SUPPLY_DEMAND	Outputs: Message	Alert Reason
1	is not like 'null'	is less than 0	'Alert'	concatenate('Supply and demand balance for resource type ', SUPPLY_DEMAND.EQUIP_TYPE_NAME, ' at location ', SUPPLY_DEMAND.LOCATION_NAME, ' is ', SUPPLY_DEMAND.BALANCE_SUPPLY_DEMAND, ';SUPPLY_DEMAND.UNIT;'. It is below 0.)
2	is not like 'null'	is less than MIN_SAFETY_STOCK of the SUPPLY_DEMAND	'Alert'	concatenate('Supply and demand balance for resource type ', SUPPLY_DEMAND.EQUIP_TYPE_NAME, ' at location ', SUPPLY_DEMAND.LOCATION_NAME, ' is ', SUPPLY_DEMAND.BALANCE_SUPPLY_DEMAND, ';SUPPLY_DEMAND.UNIT;'. It is less than Min. Safety Stock ', MIN_SAFETY_STOCK, ' of the SUPPLY_DEMAND;')
3	is not like 'null'	is greater than MAX_SAFETY_STOCK of the SUPPLY_DEMAND	'Alert'	concatenate('Supply and demand balance for resource type ', SUPPLY_DEMAND.EQUIP_TYPE_NAME, ' at location ', SUPPLY_DEMAND.LOCATION_NAME, ' is ', SUPPLY_DEMAND.BALANCE_SUPPLY_DEMAND, ';SUPPLY_DEMAND.UNIT;'. It is greater than Max. Safety Stock ', MAX_SAFETY_STOCK, ' of the SUPPLY_DEMAND)

Figure 34: Alert Rule Group: Hit Policy Example

If your rule has more than one condition, you can specify a hit policy option, as follows:

- For pick-up/return location determination rules and exclusion rules, use *All Matches*.
- For other rules, use *First Match*.

You can add more condition columns from vocabulary into the alert rule table to build business conditions.

The alert reason concatenates parameters with words to display a message on the front-end UI.

In this case, once a location's first time interval, the supply minus demand quantity is less than 0, then the first rule match the condition. The user will see an alert icon with the message shown on the UI.

### Alert Rule Group: Example



		Day 1 16:40 - 23:59	Day 2 00:00 - Day 3 23:59	Day 4 00:00 - Day 7 23:59	...
All Selected Locations		180 250	86 191	92 190	
Location 1	Supply Demand	150 80	86 11	87 10	
20ST	Supply Demand	100 20	86 1	85 0	
20G0	Supply Demand	50 60	0 10	2 10	
Location 2	Supply Demand	30 170	0 180	5 180	
20ST	Supply Demand	20 80	0 100	0 100	
20G0	Supply Demand	10 90	0 80	5 80	

Figure 35: Alert Rule Group: Example

Alert icons are shown for each cell where the supply-demand quantity is less than 0.

When you select an alert icon, an error message displays for each cell, for example: **Supply and demand balance for resource type 20G0 at location Location1 is -10. It is below 0.**

The alerts are shown in the side panel *Alerts*, and on the *Alert* tab on the map view.



#### Note:

Alerts can be controlled based on business rules. The business rules can be configured in a flexible way.



### LESSON SUMMARY

You should now be able to:

- Describe the basic functions of SAP Transportation Resource Planning objects
- Set up and update geographical hierarchy
- Set up location filters
- Set up resource filters

- Set up multi-attribute filters
- Set up time filters
- Set up stock settings
- Set up an alert rule group

# Learning Assessment

1. SAP Transportation Resource Planning can read logistics data from which systems?

*Choose the correct answers.*

- A SAP TM
- B SAP Yard Logistics
- C Other logistics systems, including non-SAP TM

2. Logistics data can be synchronized with SAP Transportation Resource Planning. What kind of logistics data does this include?

*Choose the correct answer.*

- A Master data and orders
- B Only master data
- C Master data (excluding schedules) and orders

3. Does SAP Transportation Resource Planning include map services?

*Choose the correct answer.*

- A Yes, it is embedded
- B No, the customer has to decide which map provider to use

4. Which resource categories are managed by SAP Transportation Resource Planning?

*Choose the correct answer.*

- A Only containers
- B Containers and trailers
- C Containers, railcars, and generics

5. Which role types are needed by a planner?

*Choose the correct answer.*

- A Region-specific only
- B Region-specific and resource-specific
- C Region-specific, resource-specific, and MTr-specific (means of transport)

6. If SAP TM is the underlying logistics system, which of the following types of extended columns are available to add?

*Choose the correct answer.*

- A Transportation Demand and Locations
- B Transportation Demand and Resources
- C Resources and Locations

7. Geographic hierarchy includes which of the following?

*Choose the correct answer.*

- A Regions and locations
- B Regions, locations, and roles
- C Locations and countries

8. With regards to resource types and groups in SAP Transportation Resource Planning, is there any correspondence with equipment types and groups in SAP TM?

*Choose the correct answer.*

- A Yes, the Resource group in SAP Transportation Resource Planning = the Equipment group in SAP TM, and the Resource type in SAP Transportation Resource Planning = the Equipment type in SAP TM
- B Yes, the Resource type in SAP Transportation Resource Planning = the Equipment Type in SAP TM, but the Resource group is defined in SAP Transportation Resource Planning directly
- C No, there is no correspondence

9. Which types of filters are possible to create in SAP Transportation Resource Planning?

*Choose the correct answer.*

- A Region, resource, multi-attribute, and time filters
- B Location, resource, multi-attribute, and time filters
- C Location, resource, multi-attribute, and empty order filters

10. Is it possible to set a safety stock threshold by resource type or resource group?

*Choose the correct answer.*

- A Yes, for each location, region, or location group
- B Yes, for each location and location group
- C It is not possible to set a safety stock for resource group - only for resource type

# Learning Assessment - Answers

- SAP Transportation Resource Planning can read logistics data from which systems?

*Choose the correct answers.*

- A SAP TM
- B SAP Yard Logistics
- C Other logistics systems, including non-SAP TM

- Logistics data can be synchronized with SAP Transportation Resource Planning. What kind of logistics data does this include?

*Choose the correct answer.*

- A Master data and orders
- B Only master data
- C Master data (excluding schedules) and orders

- Does SAP Transportation Resource Planning include map services?

*Choose the correct answer.*

- A Yes, it is embedded
- B No, the customer has to decide which map provider to use

- Which resource categories are managed by SAP Transportation Resource Planning?

*Choose the correct answer.*

- A Only containers
- B Containers and trailers
- C Containers, railcars, and generics

5. Which role types are needed by a planner?

*Choose the correct answer.*

- A Region-specific only
- B Region-specific and resource-specific
- C Region-specific, resource-specific, and MTr-specific (means of transport)

6. If SAP TM is the underlying logistics system, which of the following types of extended columns are available to add?

*Choose the correct answer.*

- A Transportation Demand and Locations
- B Transportation Demand and Resources
- C Resources and Locations

7. Geographic hierarchy includes which of the following?

*Choose the correct answer.*

- A Regions and locations
- B Regions, locations, and roles
- C Locations and countries

8. With regards to resource types and groups in SAP Transportation Resource Planning, is there any correspondence with equipment types and groups in SAP TM?

*Choose the correct answer.*

- A Yes, the Resource group in SAP Transportation Resource Planning = the Equipment group in SAP TM, and the Resource type in SAP Transportation Resource Planning = the Equipment type in SAP TM
- B Yes, the Resource type in SAP Transportation Resource Planning = the Equipment Type in SAP TM, but the Resource group is defined in SAP Transportation Resource Planning directly
- C No, there is no correspondence

9. Which types of filters are possible to create in SAP Transportation Resource Planning?

*Choose the correct answer.*

- A Region, resource, multi-attribute, and time filters
- B Location, resource, multi-attribute, and time filters
- C Location, resource, multi-attribute, and empty order filters

10. Is it possible to set a safety stock threshold by resource type or resource group?

*Choose the correct answer.*

- A Yes, for each location, region, or location group
- B Yes, for each location and location group
- C It is not possible to set a safety stock for resource group - only for resource type

## Lesson 1

Using Stock View, Resource View, and Change History

47

## Lesson 2

Monitoring Lease Contracts, Moving Stock, and Transportation Demand

51

## UNIT OBJECTIVES

- Understand the different visibility scenarios in SAP Transportation Resource Planning
- Monitor stock
- Explain the functions in the resource visibility view
- Monitor resource change history
- Monitor lease contracts
- Calculate a lease contract
- Monitor moving stock
- Search transportation units



# Unit 3

## Lesson 1

# Using Stock View, Resource View, and Change History



### LESSON OBJECTIVES

After completing this lesson, you will be able to:

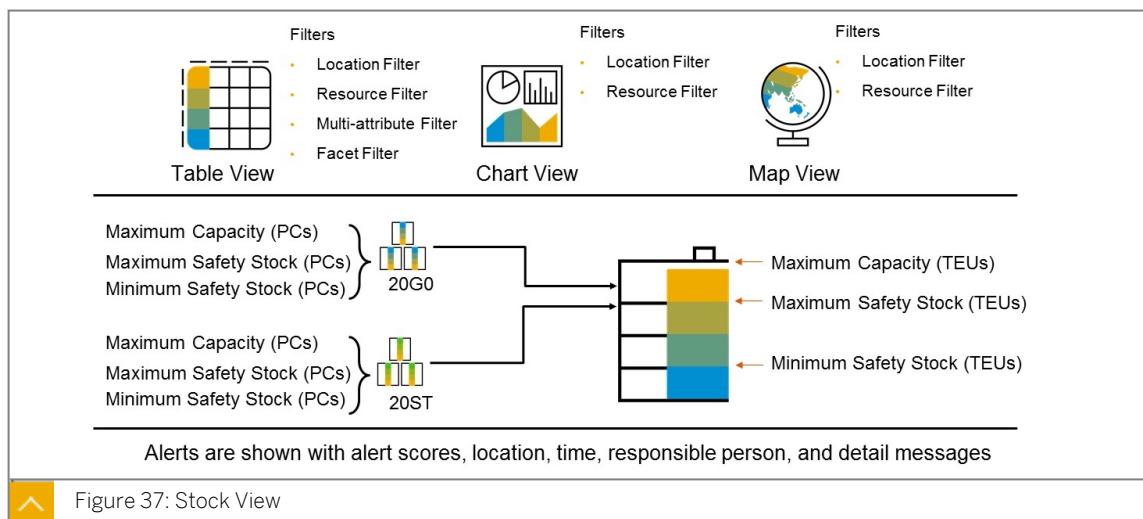
- Understand the different visibility scenarios in SAP Transportation Resource Planning
- Monitor stock
- Explain the functions in the resource visibility view
- Monitor resource change history

### Visibility Introduction



The *Resource Visibility* work center is the starting point for detailed information about resources. This work center provides real-time data about the status and location of your resources and allows you to check the corresponding stock levels and safety thresholds for specific locations. You can also use this work center to obtain an overview of current lease contracts and empty resources that have not yet been booked.

### The Stock View



The Stock view provides detailed information about the current stock levels for resource types in specific locations. You can use this view to keep track of safety stock thresholds and the maximum storage capacity for locations, also according to resource type.

The following views are the three different ways of looking at your stock data:

- Table view:

You can monitor your stock of transportation resources in table form.

- Chart view:

You can monitor your stock of transportation resources in bar chart form.

- Map view:

You can monitor your stock of transportation resources in a map view.

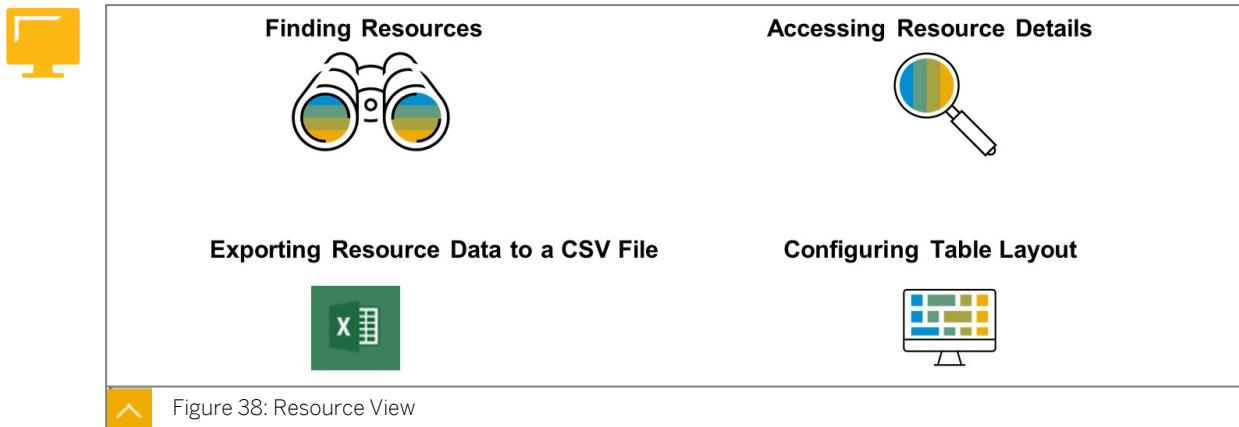
You can also access information about any alerts that have been triggered for the stock situation in the locations included in the selected location filter. To view alerts for a particular location, select the warning symbol in the *Alerts* column. You can also open the *Alerts* panel at the right of the view. This panel shows you all alerts for the selected locations, and allows you to sort notifications and search.

If you want to export your stock data to a CSV file, you can choose *Export to CSV*. This generates a file containing the data shown in the table.

The numbers of stock quantity listed in table view and chart view can help you navigate to the resource list view. It provides a more detailed insight into current stock.

To use the *Stock* view, choose *Resource Visibility* → *Stock*.

## The Resource View



Use the *Resource* view to track and monitor your transportation resources.

You can find resources in the following ways:

- Use filters
- Use the search option
- Use the facet filter
- Sort and filter each individual column in the list

You can access resource details in the following ways:

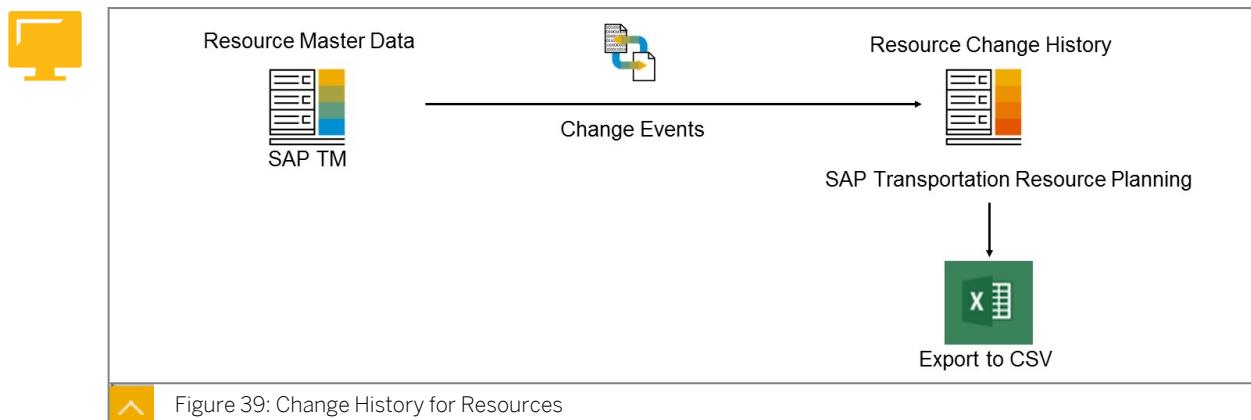
- Dynamic attributes:  
Attributes which might be updated according to business transactions.
- Static attributes:  
Attributes which are not related to business transactions.
- Additional attributes:  
Fields extended in SAP TM can be added as additional attributes.
- Reefer information:  
Specific information for reefer containers.
- Change history:  
A view that provides tracking information about events that have affected your transportation resources.

If you want to export your resource data to a CSV file, you can choose *Export to CSV*. This generates a file containing the data shown in the table.

You can configure the layout of this table to show only the columns that you are interested in. To do this, choose at the left of the main search field. This opens a dialog in which you can select the columns to be shown or hidden in the *Resources* view.

To use the *Resources* view, choose *Resource Visibility* → *Resources*.

## Change History for Resources



*Change History* keeps an overview of important status changes for your transportation resources. This view provides tracking information about events that have affected your transportation resources.

You can search using the following criteria:

- Location filter
- Resource filter
- Time range
- Resource name

In *Change History*, you can view the following content:

- Resource name
- Location
- Time of change
- Changed field
- Old value
- New value

If you want to export your change history data to a CSV file, you can choose *Export to CSV*. This generates a file containing the data shown in the table.

To use the *Change History* view, choose *Resource Visibility → Change History*.



### LESSON SUMMARY

You should now be able to:

- Understand the different visibility scenarios in SAP Transportation Resource Planning
- Monitor stock
- Explain the functions in the resource visibility view
- Monitor resource change history

## Unit 3

### Lesson 2

# Monitoring Lease Contracts, Moving Stock, and Transportation Demand



#### LESSON OBJECTIVES

After completing this lesson, you will be able to:

- Monitor lease contracts
- Calculate a lease contract
- Monitor moving stock
- Search transportation units

#### Lease Contracts

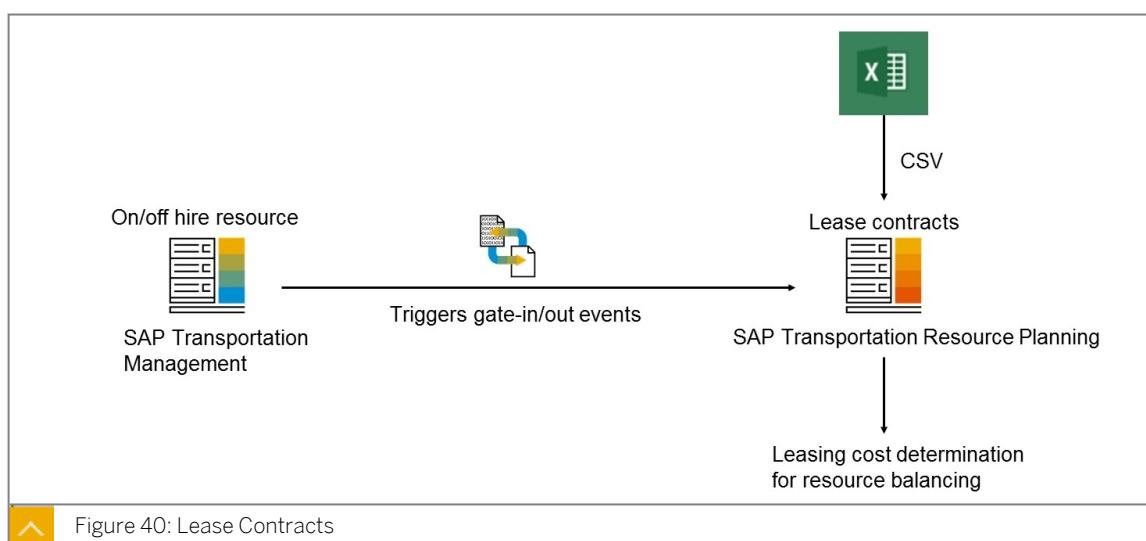


Figure 40: Lease Contracts

SAP Transportation Resource Planning has a *Lease Contract* view under the *Resource Visibility* work center, which shows a list with detailed contract terms and on-hired and off-hired container statistics.

Lease contracts are uploaded to SAP Transportation Resource Planning using CSV files, like other mass upload objects to the SAP Transportation Resource Planning system.

Each entry in the list of lease contracts includes a link to detailed information. When choosing the identifier for a lease contract, you can access the following details:

- Additional information about terms and statistics for each resource type included in the lease
- Details about the on-hire and off-hire terms specified in the lease contract

- Detailed statistics about individual transportation resources

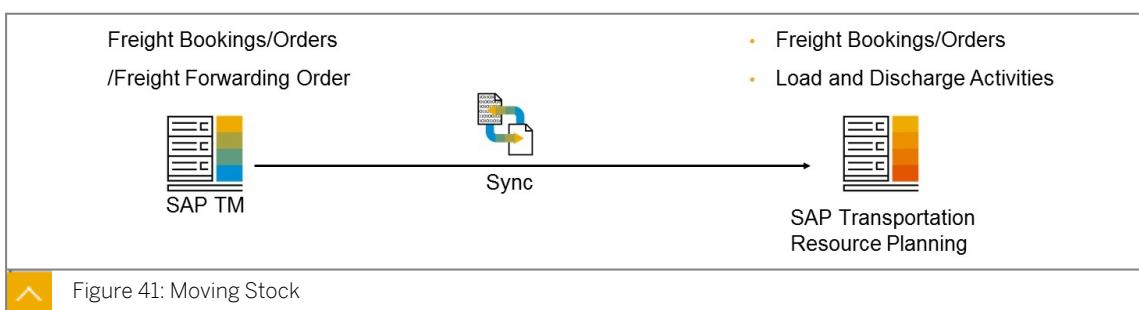
Gate-in or gate-out events at the depot change the status of an empty resource in SAP Transportation Resource Planning. Usually, this information flows from SAP TM to SAP Transportation Resource Planning.

In a simulation of depot balancing options, the leasing costs of on-hired resources are considered. Balancing means providing empty resources to a depot with a deficit situation. The process of depot balancing, that is repositioning, will be explained in later lesson.

When specifying on/off hire activities in *Resource Balancing* with lease contract ID, leasing costs will be calculated based on the terms of the lease contract.

To view lease contracts, choose *Resource Visibility* → *Lease Contracts*.

## The Moving Stock View



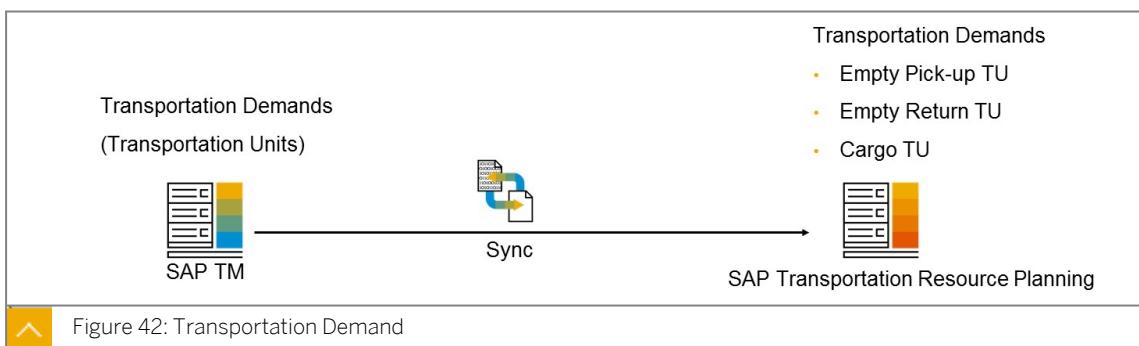
When working with your transportation resources, you need to keep track of the current stock levels at fixed locations. In addition, you must be able to track the current location of transportation resources that are moving from one location to another on board transportation vehicles.

The *Moving Stock* view provides two tabs, one for freight bookings and freight orders, and one for planned loading and discharging activities. The *Freight Bookings/Orders* tab gives you an overview of freight bookings and freight orders, filtered by location and resource type.

The *Load and Discharge* tab provides a different view of this data, according to the loading and discharging activities for each location and resource type. The information shown here is based on freight bookings from your logistics system.

To view information on your moving stock, choose *Resource Visibility* → *Moving Stock*.

## Transportation Demand



The *Transportation Demand* view monitors booking orders for transportation resources. These bookings are shown as transportation units.

When you open the view, you must first select a location filter and a resource filter. Location filters are used to group together locations or regions. A resource filter can consist of certain resource types or resource groups. You must also use the *From* and *To* fields to set a time period.

You can configure the layout of this table to show only those columns that you are interested in. To do this, choose the *Configuration* button in the toolbar. This opens a dialog in which you can select the columns to be shown or hidden in the *Transportation Demand* view.

To use the *Transportation Demand* view, choose *Resource Visibility* → *Transportation Demand*.



## LESSON SUMMARY

You should now be able to:

- Monitor lease contracts
- Calculate a lease contract
- Monitor moving stock
- Search transportation units



## Learning Assessment

1. In the Stock view of *Resource Visibility*, how many views are provided to check the current stock?

*Choose the correct answer.*

- A 2 views
- B 3 views
- C 4 views

2. On which criteria are Alerts Scores for stock based?

*Choose the correct answer.*

- A Below minimum safety stock and above maximum safety stock defined at each location in SAP Transportation Resource Planning
- B Below minimum safety stock, above maximum safety stock and above max capacity defined at each location in SAP Transportation Resource Planning
- C Only above maximum capacity defined at each location in SAP Transportation Resource Planning

3. Can a user find the current location of a resource on the *Resources* view?

*Choose the correct answer.*

- A Yes, it is possible
- B No, this is only possible using filters, using the search option, and sorting and filtering each individual column in the list

4. Where are lease contracts visible in SAP Transportation Resource Planning?

*Choose the correct answer.*

- A Under *Resource Visibility*
- B Under *Resource Settings*
- C Under *KPI*

5. Is SAP Transportation Resource Planning able to calculate cost, based on the lease contract in case of an on-hire/off-hire activity?

*Choose the correct answer.*

- A No, this is not possible according to standard SAP Transportation Resource Planning available functionalities
- B Yes, in *Resource Balancing*

6. Which tabs are available in the *Moving Stock* view?

*Choose the correct answer.*

- A *Forwarding Orders, Load and Discharge*
- B *Freight Bookings/Orders, Load and Discharge*
- C *Forwarding Orders, Freight Bookings/Orders*

## Learning Assessment - Answers

1. In the Stock view of Resource Visibility, how many views are provided to check the current stock?

*Choose the correct answer.*

- A 2 views
- B 3 views
- C 4 views

2. On which criteria are Alerts Scores for stock based?

*Choose the correct answer.*

- A Below minimum safety stock and above maximum safety stock defined at each location in SAP Transportation Resource Planning
- B Below minimum safety stock, above maximum safety stock and above max capacity defined at each location in SAP Transportation Resource Planning
- C Only above maximum capacity defined at each location in SAP Transportation Resource Planning

3. Can a user find the current location of a resource on the Resources view?

*Choose the correct answer.*

- A Yes, it is possible
- B No, this is only possible using filters, using the search option, and sorting and filtering each individual column in the list

4. Where are lease contracts visible in SAP Transportation Resource Planning?

*Choose the correct answer.*

- A Under Resource Visibility
- B Under Resource Settings
- C Under KPI

5. Is SAP Transportation Resource Planning able to calculate cost, based on the lease contract in case of an on-hire/off-hire activity?

*Choose the correct answer.*

- A No, this is not possible according to standard SAP Transportation Resource Planning available functionalities
- B Yes, in *Resource Balancing*

6. Which tabs are available in the *Moving Stock* view?

*Choose the correct answer.*

- A *Forwarding Orders, Load and Discharge*
- B *Freight Bookings/Orders, Load and Discharge*
- C *Forwarding Orders, Freight Bookings/Orders*

### Lesson 1

Understanding Plan Management

61

### Lesson 2

Using a Supply and Demand Plan

65

### UNIT OBJECTIVES

- Explain a supply and demand plan
- Describe the three types of supply and demand plans
- Create a virtual supply and demand plan
- Describe supply and demand plan views
- Describe the calculation model
- Describe supply and demand plan usage for user privileges
- Create a scheduled supply and demand plan



# Unit 4

## Lesson 1

# Understanding Plan Management



## LESSON OBJECTIVES

After completing this lesson, you will be able to:

- Explain a supply and demand plan
- Describe the three types of supply and demand plans
- Create a virtual supply and demand plan

## Supply and Demand Introduction



Figure 43: Supply and Demand Planning Introduction

In the *Supply and Demand* work center, you can calculate and forecast the supply and demand quantities of transportation resources based on a supply and demand plan.

Once you have obtained the calculation results for a plan, you can display them in a table view or a map view. The supply information about transportation resources includes the actual stock and the planned activities that will increase the stock in the future. The demand information about transportation resources includes the quantity of unavailable resources in the future.

## Supply and Demand Plans



		Time Intervals				}
		Day 1 16:40 - 23:59	Day 2 00:00 - Day 3 23:59	Day 4 00:00 - Day 7 23:59	...	
Location	All Selected Locations	180 250	86 191	92 190		Summary for all locations
	Location1	Supply Demand 150 80	86 11	87 10		Summary for single location
Resource Types	20ST	Supply Demand 100 20	86 1	85 0		Summary by resource type per location
	20G0	Supply Demand 50 60	0 10	2 10		
	Location2	Supply Demand 30 170	0 180	5 180		
	20ST	Supply Demand 20 80	0 100	0 100		
	20G0	Supply Demand 10 90	0 80	5 80		

Figure 44: Supply and Demand Plan

A supply and demand plan is a dataset of forecasted data about the supply and demand situation in a location or set of locations for a resource type, or a set of resource types, over a specific period of time.

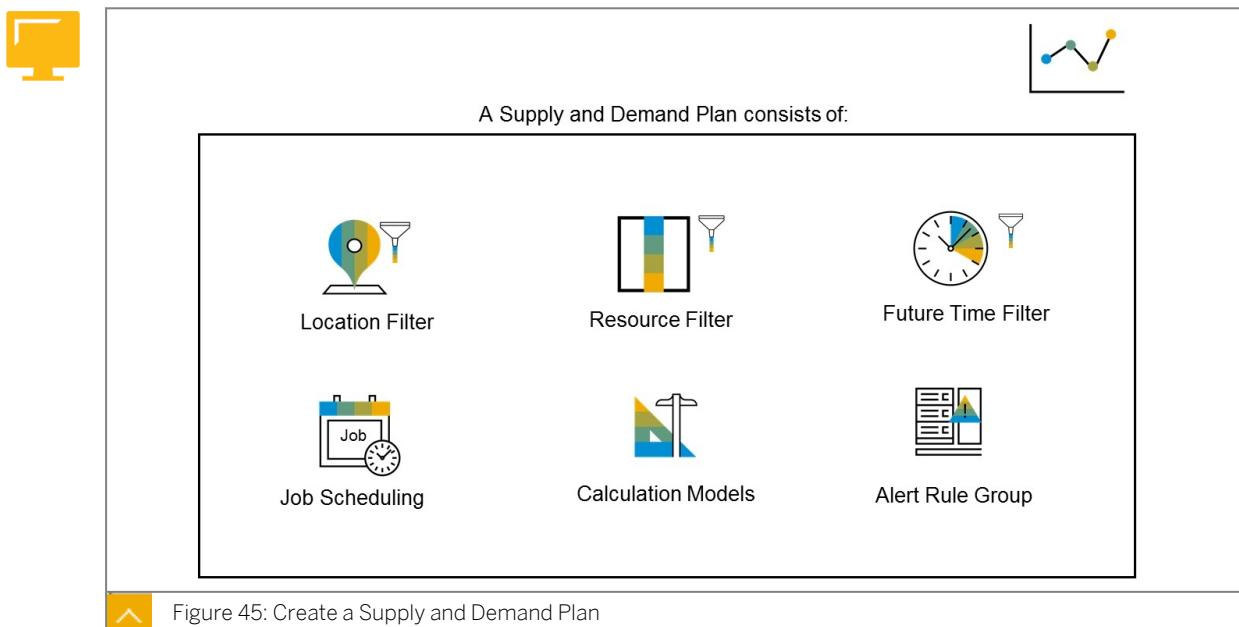
It tells you in which future time period which location has how many supply or demand quantities for a certain resource type. A business user could learn from the supply and demand plan whether the future supply is sufficient or not.

To view your supply and demand plan, choose *Supply and Demand*.

### Supply and Demand View

The *Supply and Demand* view can be sorted using the following types:

- Resource types per location, as shown in the figure Supply and Demand Plan
- Locations per resource type



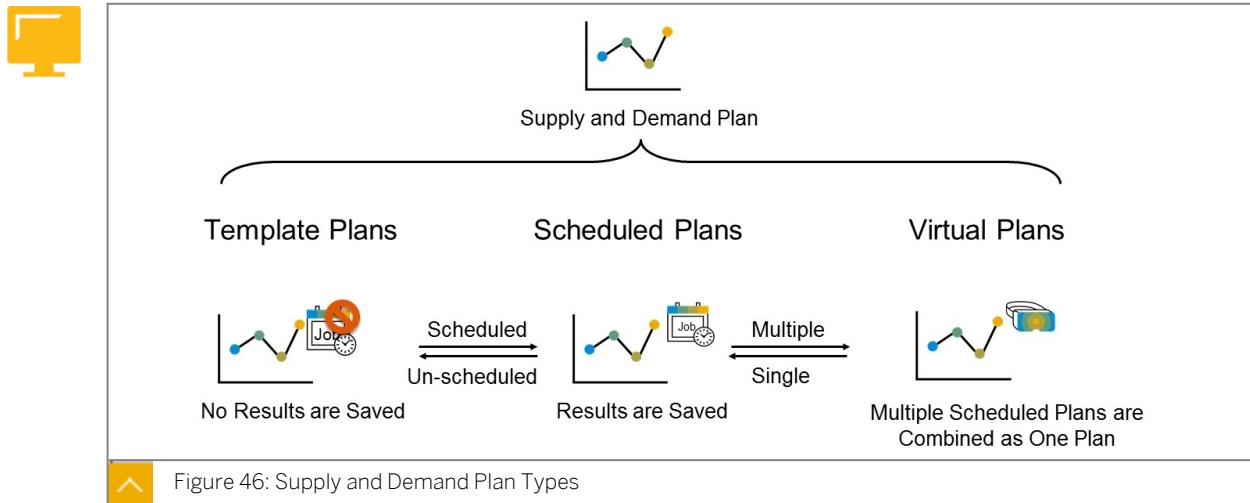
SAP Transportation Resource Planning uses plans to calculate the data that you use to make your planning decisions. Whether you are monitoring supply and demand data, or stock data, the data you see comes from a calculation that is based on a plan.

A plan consists of the following elements:

- One or more locations, specified in a location filter.
- One or more resource types, specified in a resource filter for resource types or resource groups.
- A time filter for a time period in the future or in the past, such as the next seven days or the last three months. Future time filters are used in supply and demand plans.
- A calculation model that provides the algorithm for calculating the current stock or supply and demand quantities for the locations and resource types.
- Supply and demand alert rule groups for triggering alerts.

To configure your supply and demand plan, choose *Plans* → *Plan Configuration*.

## Supply and Demand Plan Types



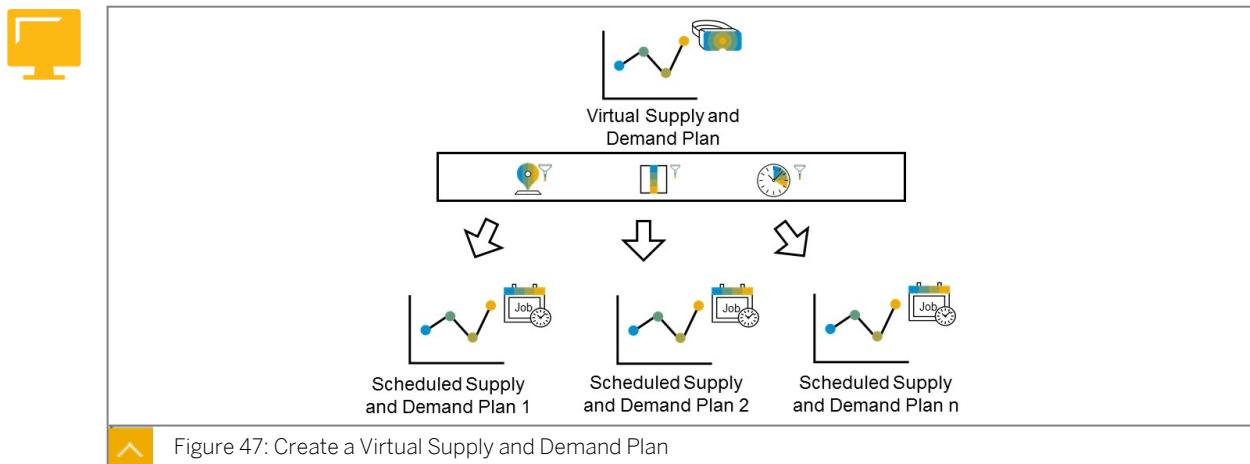
Template plans allow you to change the planning parameters and execute a plan whenever you want. You can create your own template plans to meet your resource planning needs. After working with your template plan, you can decide to schedule it for automatic execution. The plan is then changed into a scheduled supply and demand plan.

Scheduled plans are executed automatically to generate forecasted data about the supply and demand situation in a location or set of locations for a resource type or set of resource types over a specific period of time. Once a plan has been executed, you can see the results in the *Supply and Demand* work center.

Virtual plans allow you to group together a set of scheduled supply and demand plans. You can then work with and compare their data in one view in the *Supply and Demand* work center.

If there are duplicate results in more than one scheduled plan, but they are combined together, the virtual plan will compare and use the data from the most recent result.

## Virtual Supply and Demand Plans



Virtual plans allow you to group together scheduled plans and see their results in a consolidated view. The plans grouped in a virtual plan all have the same time filter. Their

location filters and resource filters must also overlap with the virtual plan's location filter and resource filter.

If multiple scheduled supply and demand plans contain the same data element, the virtual plan will always compare and display the data from the most recently executed scheduled plan.



### LESSON SUMMARY

You should now be able to:

- Explain a supply and demand plan
- Describe the three types of supply and demand plans
- Create a virtual supply and demand plan

# Unit 4

## Lesson 2

# Using a Supply and Demand Plan



## LESSON OBJECTIVES

After completing this lesson, you will be able to:

- Describe supply and demand plan views
- Describe the calculation model
- Describe supply and demand plan usage for user privileges
- Create a scheduled supply and demand plan

## Supply and Demand Plan Views

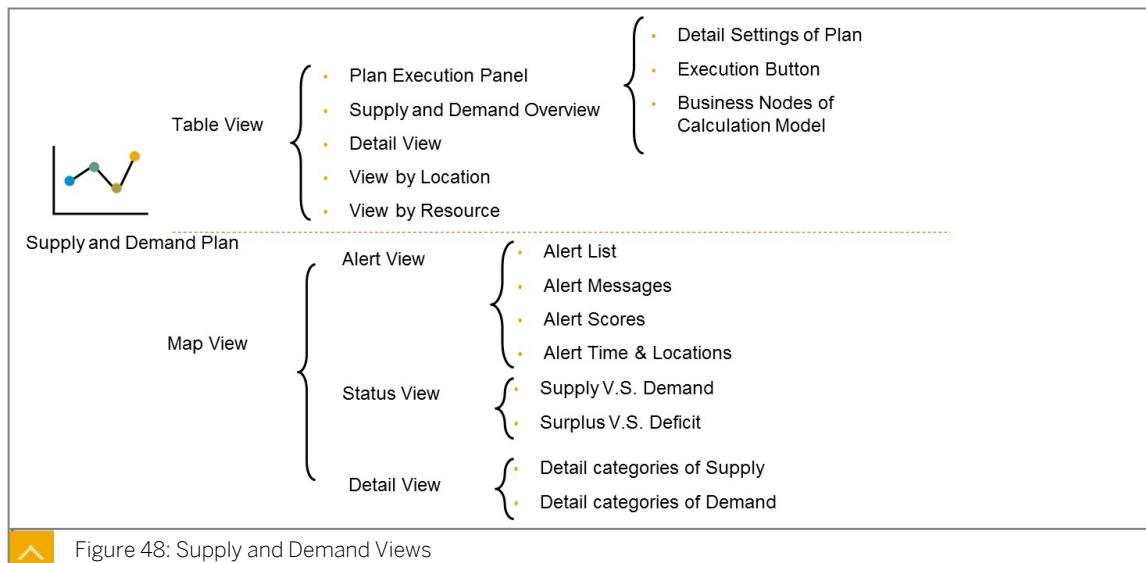


Figure 48: Supply and Demand Views

When a plan is displayed, you can view the forecasted supply and demand information by location, resource type, and time, based on the plan's location filter, resource filter, and time filter.

When you choose the number or bubble chart, a detailed status of the supply and demand quantities displays. When you choose the empty pick-up or empty return on the pie chart, the *Transportation Demand* tab displays, showing a detailed transportation unit list.

To display supply and demand plan views, choose *Supply and Demand*.

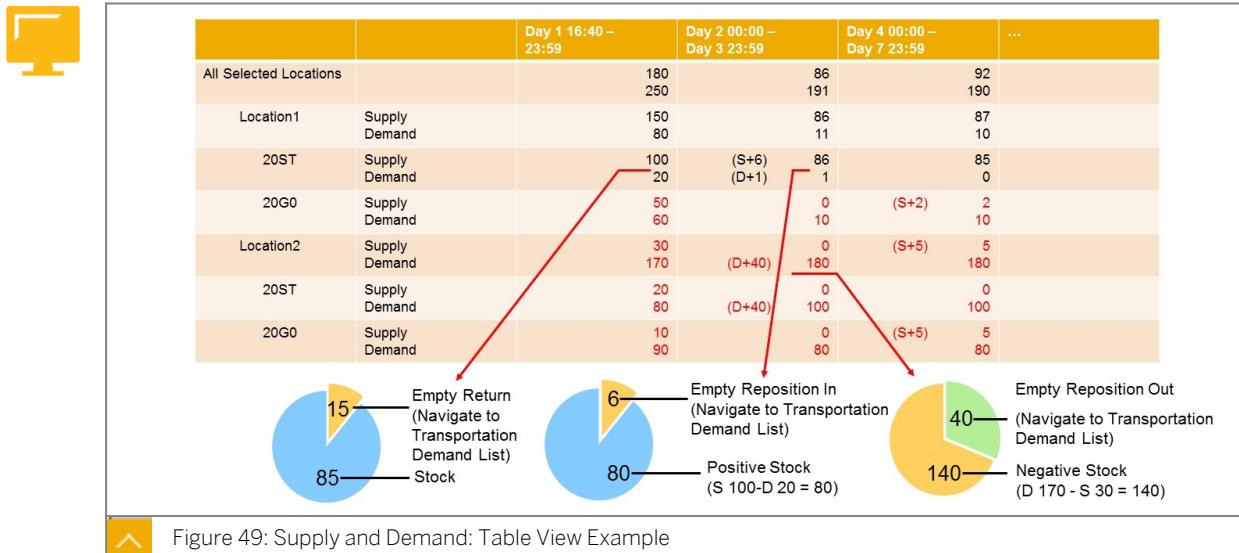


Figure 49: Supply and Demand: Table View Example

The figure shows an example of presenting the supply and demand evolution in a user-defined time interval using the *Table view*.

For containers of 20ST at Location1, there are 85 pieces of stock at the location, and 15 empty return containers will arrive at Location1 as planned. Therefore, during the first time interval, the supply is 100 pieces. As demand in the first time interval is 20 pieces, so in the second time interval, 20ST at Location1 has a positive stock of 80, which is derived from the previous stock,  $100-20=80$ .

At Location2, the first time interval supply is less than the demand. The negative stock ( $170-30=140$ ) is carried to the second time interval and that's why we see 140 as negative stock in the pie chart.

Empty return belongs to the *Supply* category, while the *Stock* category shows the current stock quantity of the type of container at the current location.

## The Calculation Model

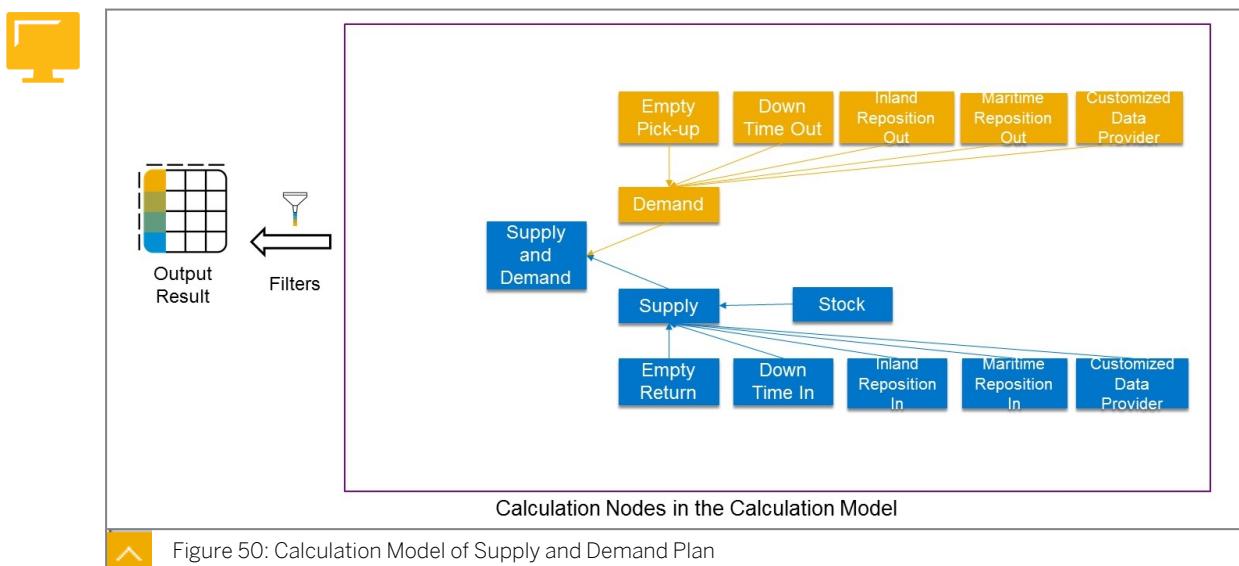


Figure 50: Calculation Model of Supply and Demand Plan

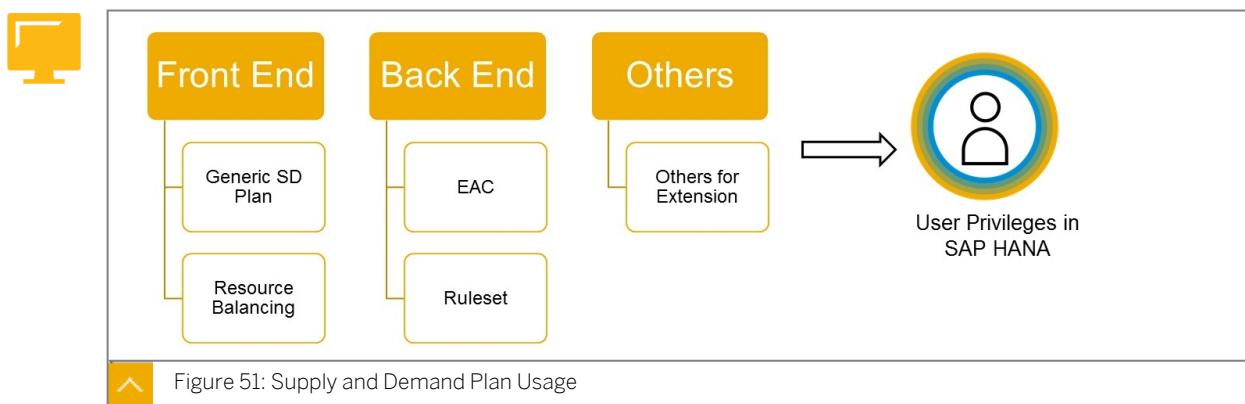
The calculation model is a mathematical model used to calculate supply and demand quantities. SAP Transportation Resource Planning provides pre-defined calculation models

and alert rules for supply and demand. It is possible to create your own calculation models and alert rules in order to support your specific business requirements.

Each calculation model consists of a set of calculation nodes that are used to collect or calculate sets of data. The *Calculation Output* column in the table view for the *Supply and Demand* work center shows the current result type.

To access the underlying calculation model in *Supply and Demand* work center, choose the *Plan Execution* tab on the right. This opens a panel showing detailed information about both the plan and its calculation model. In the *Calculation Model* area, each node defined for the model is shown in diagram form. You can use these nodes to filter supply and demand result types. For example, if you interested in only empty return information, you can use the calculation model to show only a single type.

## Supply and Demand Plan Usages



When you create a supply and demand plan, you must select the usage type to indicate whether the supply and demand plan is for a generic supply and demand plan or used for resource balancing, or whether the supply and demand plan is used for back-end like equipment availability check (EAC), or empty pick-up or empty return rulesets. If the usage is for none of these usages, or for special usage, you can set the usage as *Others for Extension*.

The usage of supply and demand plan is for user's authorization control.

When a user is granted with the privilege of a generic supply and demand plan, the user can display the supply and demand plans with usage of a generic supply and demand plan in the front-end UI. If the user is not granted with a privilege of EAC or ruleset usage, the user cannot display all of the supply and demand plans which usages are EAC or ruleset.

To select the supply and demand usage type, choose to *Plans → Plan Configuration*.



## LESSON SUMMARY

You should now be able to:

- Describe supply and demand plan views
- Describe the calculation model
- Describe supply and demand plan usage for user privileges
- Create a scheduled supply and demand plan



## Learning Assessment

1. What is a supply and demand plan?

*Choose the correct answers.*

- A It is a dataset of forecasted data about the supply and demand situation in a location, for a resource type, over a specific period of time
- B It is a dataset of data about the supply and demand situation, available only on regional level, for a resource type, over a specific period of time
- C It tells us in which future time period which location has how many supply and demand quantities, for a certain resource type

2. In *Supply and Demand*, in the case of a template plan, are the results saved?

*Choose the correct answer.*

- A Yes, they are saved and can be reused
- B No, results are not saved for this type of plan

3. Is it possible to automatically execute a plan?

*Choose the correct answer.*

- A Yes, but only for scheduled plans
- B Yes, it is possible to automatically execute template, scheduled, and virtual plans

4. Is it possible to create your own calculation models and alert rules?

*Choose the correct answer.*

- A Yes, it is possible to develop calculation models and alert rules in the SAP HANA Studio
- B No, only pre-defined calculation models and alert rules for supply and demand can be used

5. What is needed in order to be able to use the different usage types, such Generic SD, Resource Balancing, and EAC?

*Choose the correct answer.*

- A User privileges in SAP HANA
- B Nothing specific - all users are able to see all usage types by default

## Learning Assessment - Answers

1. What is a supply and demand plan?

*Choose the correct answers.*

- A It is a dataset of forecasted data about the supply and demand situation in a location, for a resource type, over a specific period of time
- B It is a dataset of data about the supply and demand situation, available only on regional level, for a resource type, over a specific period of time
- C It tells us in which future time period which location has how many supply and demand quantities, for a certain resource type

2. In *Supply and Demand*, in the case of a template plan, are the results saved?

*Choose the correct answer.*

- A Yes, they are saved and can be reused
- B No, results are not saved for this type of plan

3. Is it possible to automatically execute a plan?

*Choose the correct answer.*

- A Yes, but only for scheduled plans
- B Yes, it is possible to automatically execute template, scheduled, and virtual plans

4. Is it possible to create your own calculation models and alert rules?

*Choose the correct answer.*

- A Yes, it is possible to develop calculation models and alert rules in the SAP HANA Studio
- B No, only pre-defined calculation models and alert rules for supply and demand can be used

5. What is needed in order to be able to use the different usage types, such Generic SD, Resource Balancing, and EAC?

*Choose the correct answer.*

A User privileges in SAP HANA

B Nothing specific - all users are able to see all usage types by default

## Lesson 1

Creating Cost Models and Cost Datasets

75

## Lesson 2

Outlining Network Setting Groups

83

## Lesson 3

Creating a Simulation Plan

87

## Lesson 4

Using a Balancing Simulation

89

## UNIT OBJECTIVES

- Describe resource planning
- Describe cost models and cost datasets
- Create cost datasets and cost models
- Determine transportation costs with transportation cost datasets
- Determine storage costs with storage cost datasets
- Determine handling costs with handling cost datasets
- Describe the network setting group and its usage
- Create a network setting group
- Describe network models
- Describe a simulation plan
- Create a simulation plan
- Describe how a simulation plan balances resources in transportation networks
- Run automatic balancing



## Creating Cost Models and Cost Datasets



### LESSON OBJECTIVES

After completing this lesson, you will be able to:

- Describe resource planning
- Describe cost models and cost datasets
- Create cost datasets and cost models
- Determine transportation costs with transportation cost datasets
- Determine storage costs with storage cost datasets
- Determine handling costs with handling cost datasets

### Resource Planning Introduction

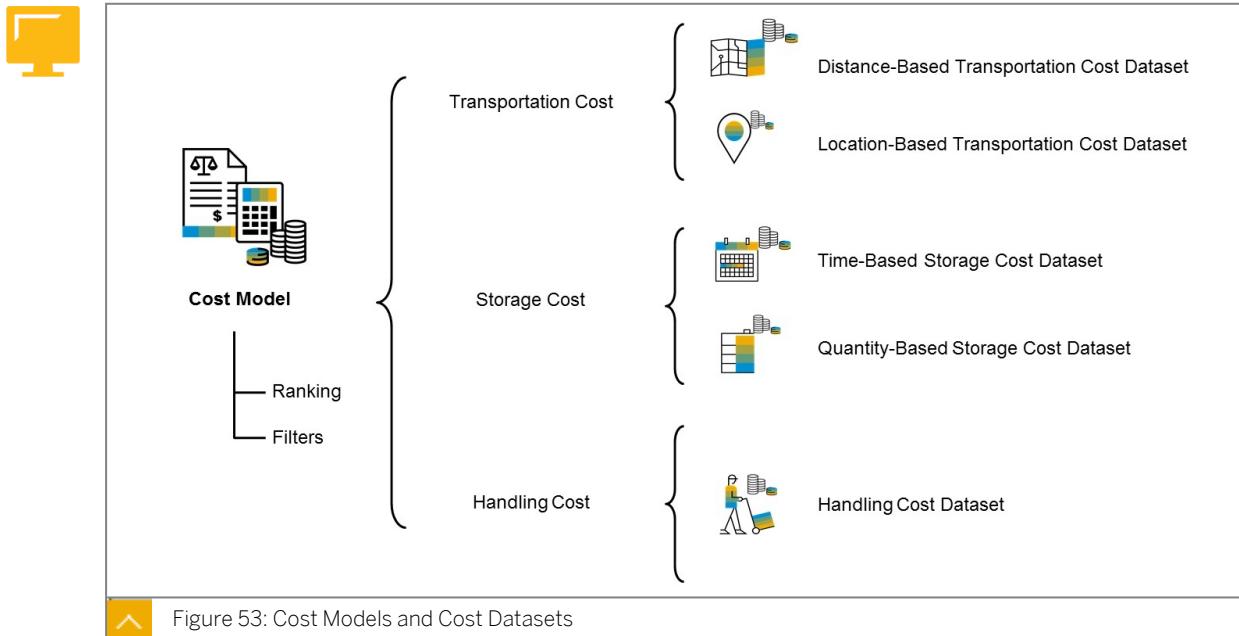


Planning of resources can follow two main strategies: avoid repositioning of empties or optimize repositioning of empties.

Repositioning avoidance is fuelled by optimizing the pick-up and return moves of empty transportation resources.

Repositioning optimization considers the depot situations, network settings, and cost models in order to move empty transportation resources to where they need to be from a rather tactical perspective.

## Cost Models and Cost Datasets



A cost model consists of one or more cost datasets with the same currency. Cost datasets are arranged in an ordered list. When the cost model is used for cost calculation, the datasets in the list are queried in order until the cost data is found, or the end of the list is reached.

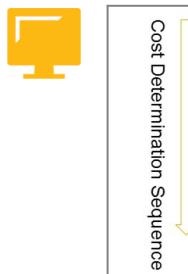
A cost model is used to support empty pick-up, empty return, and repositioning cost calculation.

A cost model determines related costs, based on transportation costs, storage costs, and handling costs.

A planner can assign more than one cost dataset, even if they are the same type. Ranking and filters are used to determine the first match result for related cost query and calculation.

To view cost models, choose *Plans* → *Cost Models*.

## Cost Model Example



Cost Model: COST_TRPDEMO						
Rank	Name	Description	Type	Means of Transport	Carrier Filter	
1	C01_LOCATION_TCOST	C01 Location Based Transportation Cost	Location-Based Cost	Truck, Rail	0000000101, 0000000102	
2	C01_DISTANCE_TCOST	C01 Distance Based Transportation Cost	Distance-Based Cost			
3	C01_HANDLING_HCOST	C01 Handling Cost Dataset	Handling-Based Cost			
4	C01_TIME_SCOST	C01 Time Based Storage Cost	Time-Based Storage Cost			
5	C01_QUANTITY_SCOST	C01 Quantity Based Storage Cost	Quantity-Based Storage Cost			

Location-Based Transportation Cost: C01_LOCATION_TCOST						
From Location	To Location	Means of Transportation	Resource Type	Carrier	UoM	Amount
Location_A	Location_B	Truck	20ST	*	PCs	1
Location_C	Location_D	Rail	20ST	*	PCs	0.5

Distance-Based Transportation Cost: C01_DISTANCE_TCOST					
Means of Transportation	Resource Type	Carrier	UoM	Amount	
Truck	20ST	*	PCs	0.20	
Rail	*	*	TEU	0.30	

Figure 54: Cost Model Example

If there are more than one of the same type of cost dataset in a cost model, SAP Transportation Resource Planning determines the related cost by rank sequence. The figure shows an example of how to determine the transportation cost from Location A to Location B. As there are two transportation cost datasets in the cost model, SAP Transportation Resource Planning checks the location-based cost first. Once any record maps the query, SAP Transportation Resource Planning does not go to next transportation cost dataset for transportation cost determination.

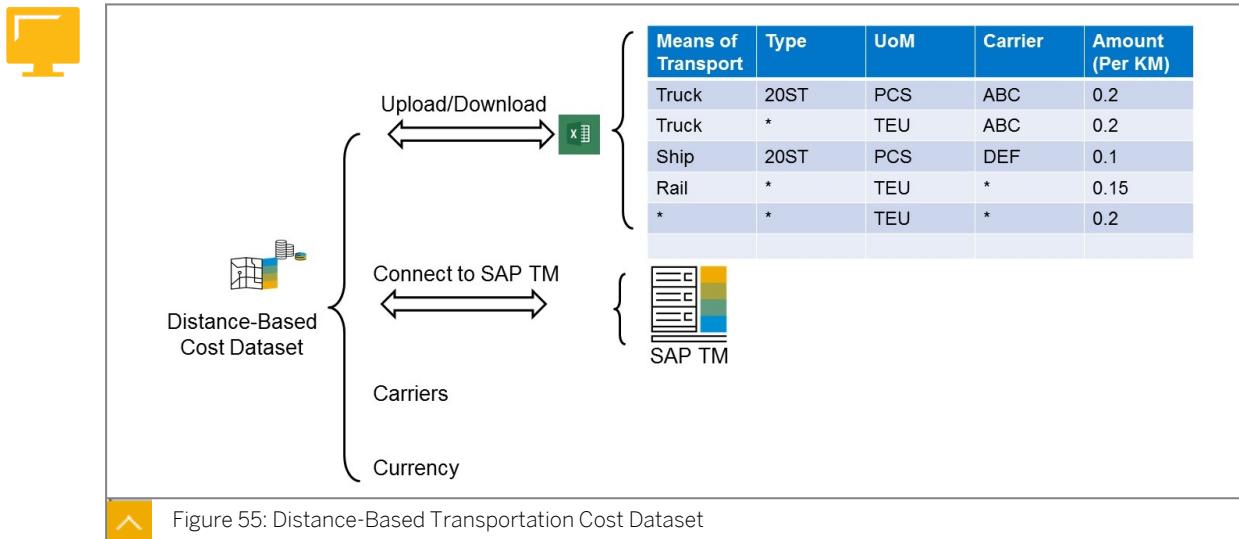
In this example, if a query determines the transportation cost for 20ST by truck from Location A to Location B by carrier 0000000101, the cost model determines from C01\_LOCATION\_TCOST, as it has a higher ranking than C01\_DISTANCE\_TCOST and it matches the query.

 Note:

In the cost model, if any cost dataset specifies *Means of Transport* or *Carrier*, it means that only the query for *Means of Transport* and *Carrier* is valid. Otherwise, it goes to the next transportation cost dataset.

To view the cost model, choose *Plans* → *Cost Model*.

## Transportation Cost Datasets



A distance-based transportation cost dataset is used to calculate transportation costs based on distance (every 1 kilometer), means of transport, resource type, and carrier. It reads cost data from your logistics system or a prepared cost file in CSV format, or both, by connector type in the cost dataset detail settings.

A cost dataset based on distance (kilometers) for different means of transport.

Choose the following settings:

- **Currency:**

Specify the currency used for cost calculation.

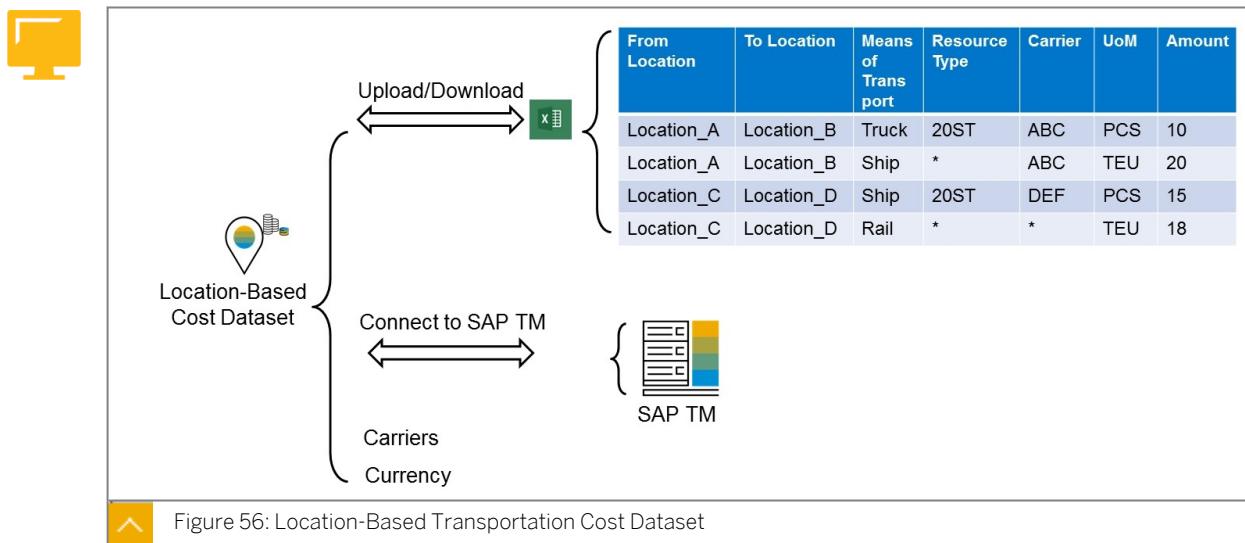
- **Connector type:**

Choose *None* if you do not want the dataset to retrieve cost data from your logistics system. Choose *Cost Profile*, *Custom*, or *Purchase Organization and Freight Agreement* if you want the dataset to retrieve cost data from SAP Transportation Management.

- **Carriers:**

Specify the business partners for which the costs are applicable.

Choose *Plans* → *Cost Datasets*.



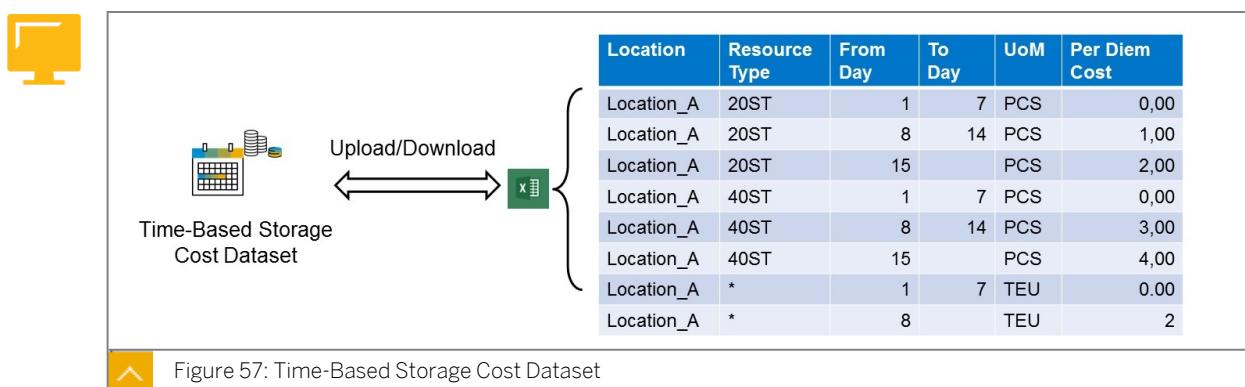
A location-based transportation cost dataset is used to calculate transportation costs based on location pairs, means of transport, resource type, and carrier. It reads cost data from your logistics system or a prepared cost file in CSV format, or both.

Choose the following settings:

- **Currency:**  
Specify the currency used for cost calculation.
- **Connector type:**  
Choose *None* if you do not want the dataset to retrieve cost data from your logistics system. Choose *Cost Profile*, *Custom*, or *Purchase Organization and Freight Agreement* if you want the dataset to retrieve cost data from SAP Transportation Management.
- **Carriers:**  
Specify the business partners for which the costs are applicable.

To view location-based transportation cost datasets, choose *Plans* → *Cost Datasets*.

## Storage Cost Datasets



A time-based storage cost dataset is used to calculate storage costs based on resource type, storage location, and the days that the resources are stored. It can only read cost data from a prepared cost file in CSV format. Upload a CSV file with time-based storage costs for different resource types at different locations.

Specify the currency used for cost calculation.

To view time-based storage cost datasets, choose *Plans → Cost Datasets*.

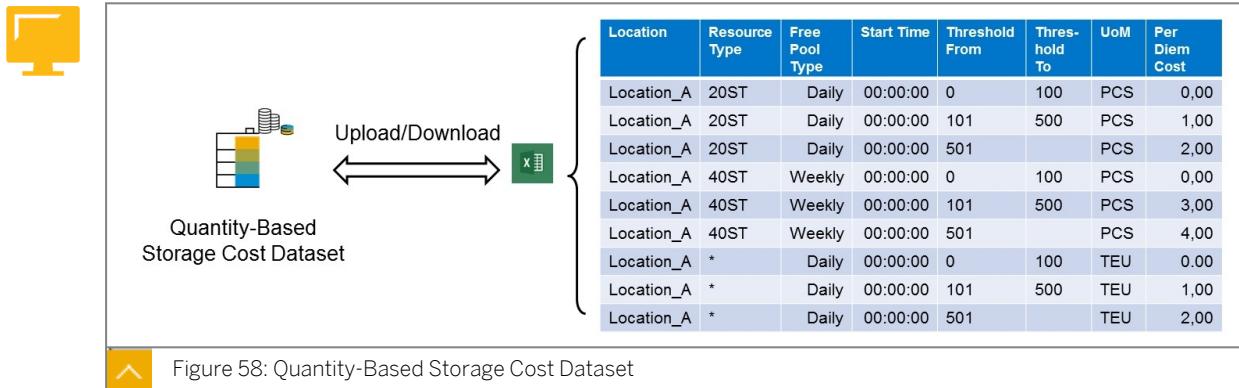


Figure 58: Quantity-Based Storage Cost Dataset

A quantity-based storage cost dataset is used to calculate storage costs based on resource type, storage location, and the quantity of the resources. The cost data is read from a prepared cost file in CSV format. Upload a CSV file with the quantity-based storage costs for different resource types at different locations.

Specify the currency used for cost calculation.

*Free Pool Type* represents the time granularity based on which per diem costs per resource type will be calculated. The per diem costs of resources on stock are required to determine how expensive it is to keep certain resources at the depot. Factoring in such costs into the *quantity-based storage cost data set* helps to use the most expensive resources first, instead of letting them accumulate higher per diem costs on stock.

To view quantity-based storage cost datasets, choose *Plans → Cost Datasets*.

## Handling Cost Datasets

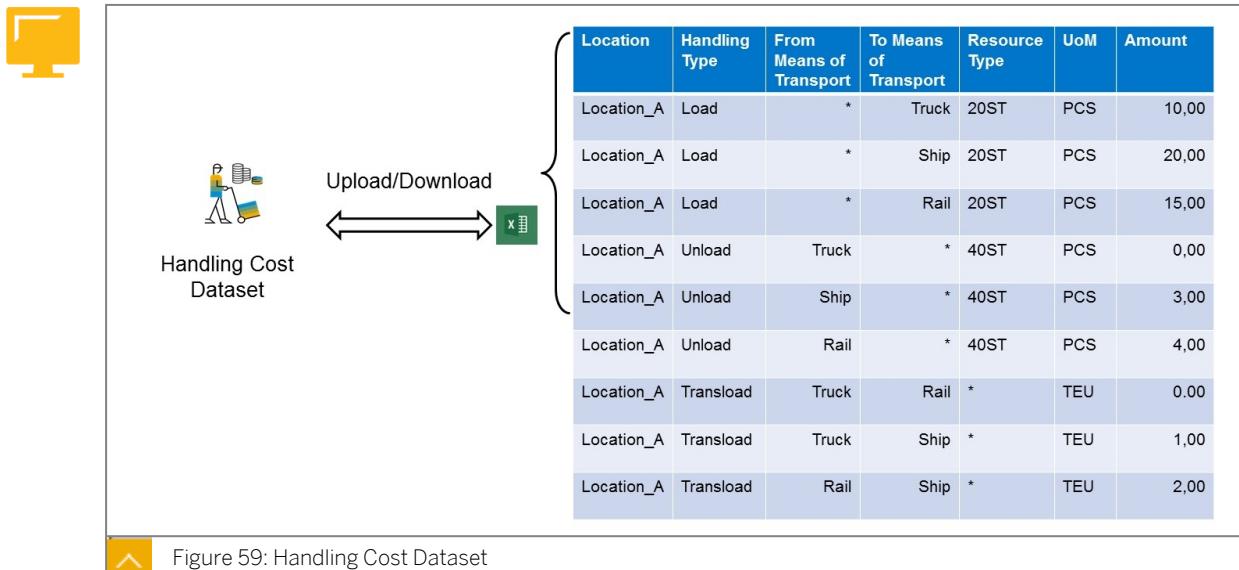


Figure 59: Handling Cost Dataset

A handling cost dataset is used to calculate handling costs based on location, resource type, handling type, and the means of transport involved. The cost data is read from a prepared cost file in CSV format. Upload a CSV file with the costs for gate-in or gate-out charges at storage locations between means of transport.

Specify the currency used for cost calculation.

To view handling cost datasets, choose *Plans* → *Cost Datasets*.



### LESSON SUMMARY

You should now be able to:

- Describe resource planning
- Describe cost models and cost datasets
- Create cost datasets and cost models
- Determine transportation costs with transportation cost datasets
- Determine storage costs with storage cost datasets
- Determine handling costs with handling cost datasets



# Outlining Network Setting Groups

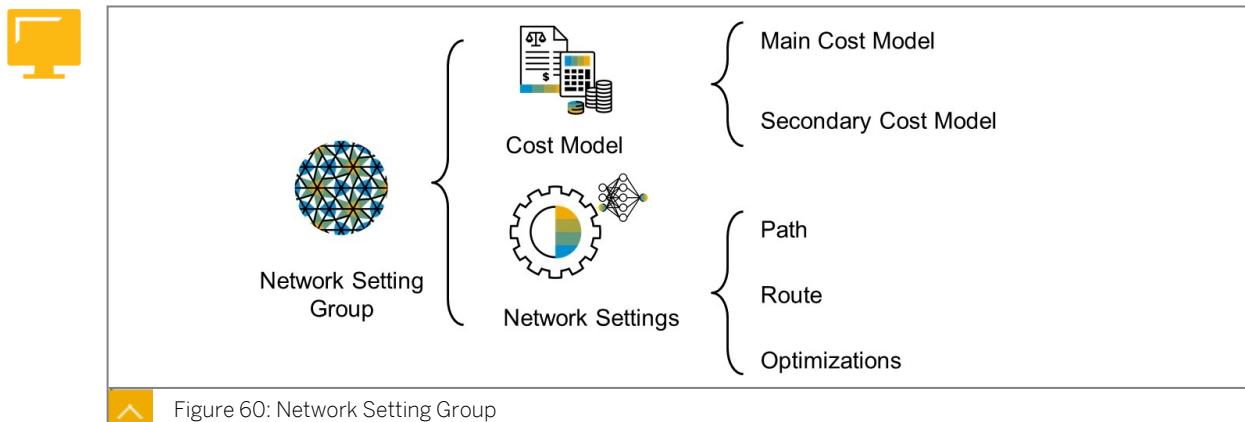


## LESSON OBJECTIVES

After completing this lesson, you will be able to:

- Describe the network setting group and its usage
- Create a network setting group
- Describe network models

## Network Setting Group



A network setting group consists of one or two cost models and a set of network settings that can be assigned as a whole to a balancing simulation or a pick-up or return ruleset.

The main cost model in a network setting group must contain the distance-based cost information, which specifies the cost for a certain length of distance. This is currently limited to the unit of measurement kilometers.

Before creating a network setting group, you need at least one cost model with at least one cost dataset.

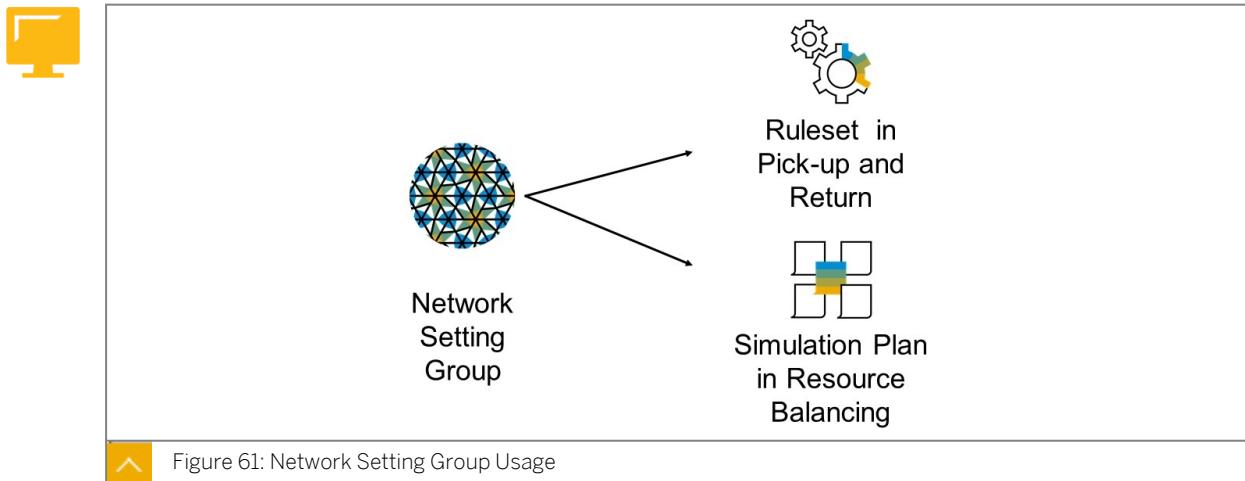
Network settings include parameters for the following aspects:

- Path:  
This setting is used for generating multi-stage paths in a network model.
- Route:  
This setting is used for generating routes.
- Optimization:

This setting is used for automatic resource balancing, such as proposing empty repositioning activities.

For further parameter setting descriptions, see [help.sap.com/trp](http://help.sap.com/trp) → Application Help for SAP Transportation Resource Planning → Preparing for Resource Planning > Network Setting Groups → Network Settings.

To view network setting groups, choose *Plans* → *Network Setting Groups*.

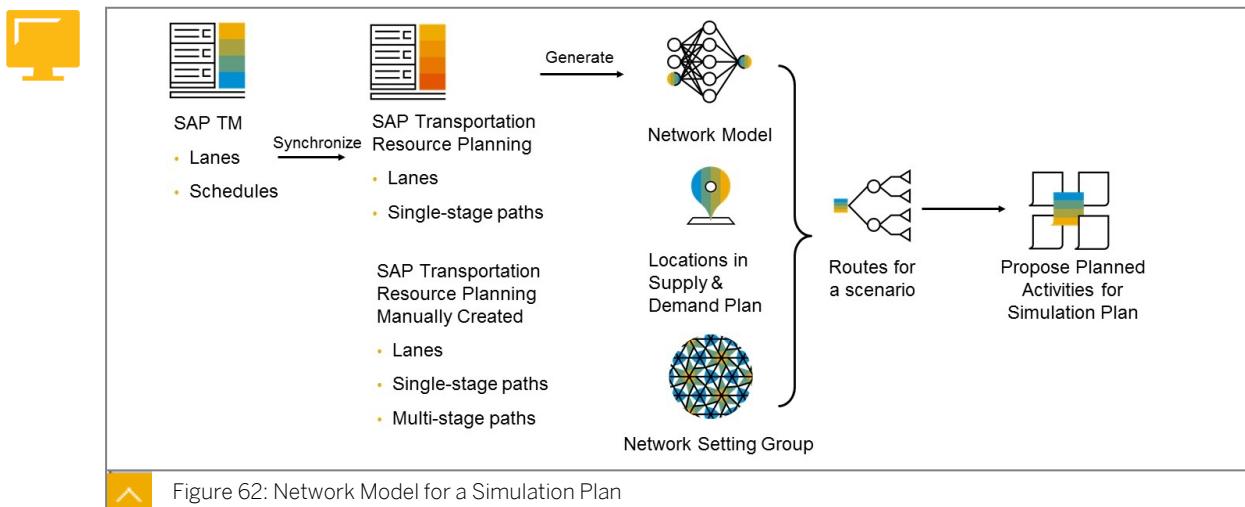


Use network setting groups in pick-up or return rulesets and balancing simulations for running resource balancing.

When a network setting group is used in a pick-up or return ruleset, only the main cost model in the network setting group is used. The secondary cost model and network settings are not used.

When a network setting group is used in a balancing simulation, the simulation uses the distance-based cost data in the main cost model to calculate the costs for multi-stage paths, and uses both the main model and the secondary model to calculate the costs for routes.

## Network Models



A network model represents the current transportation network that can be used in resource balancing. A network model consists of the following:

- Lanes:

A lane defines a direct transport capability between two locations without any planned intermediate transport activities, such as stops for loading and uploading.

- Single-stage paths:

A single-stage path is a sequence of lanes with start and end locations and a common means of transport. This type of path represents a transportation capability for the sequence of locations with potential loads and unloads at any of the locations. However, there is no requirement for transshipment in between.

- Multi-stage paths:

A multi-stage path is a transportation path with a set of sequential and contiguous single-stage path or lanes for transporting resources from a source location to a destination location.

You can use a network model to generate routes. Routes can be used in repositioning activities to determine scheduled departures, stop sequences, vehicle capacity, distance, duration, costs, and so on.

In a network model, lanes and single-stage paths are initially retrieved from your logistics system. You can create new lanes and single-stage paths or modify the existing ones according to your own business needs.

The multi-stage paths in a network model are automatically generated based on the lanes and single-stage paths. You can also create your own multi-stage paths.

To view your network model, choose *Resource Balancing*.



## LESSON SUMMARY

You should now be able to:

- Describe the network setting group and its usage
- Create a network setting group
- Describe network models



# Unit 5

## Lesson 3

# Creating a Simulation Plan



## LESSON OBJECTIVES

After completing this lesson, you will be able to:

- Describe a simulation plan
- Create a simulation plan

## Introduction to Simulation Plans

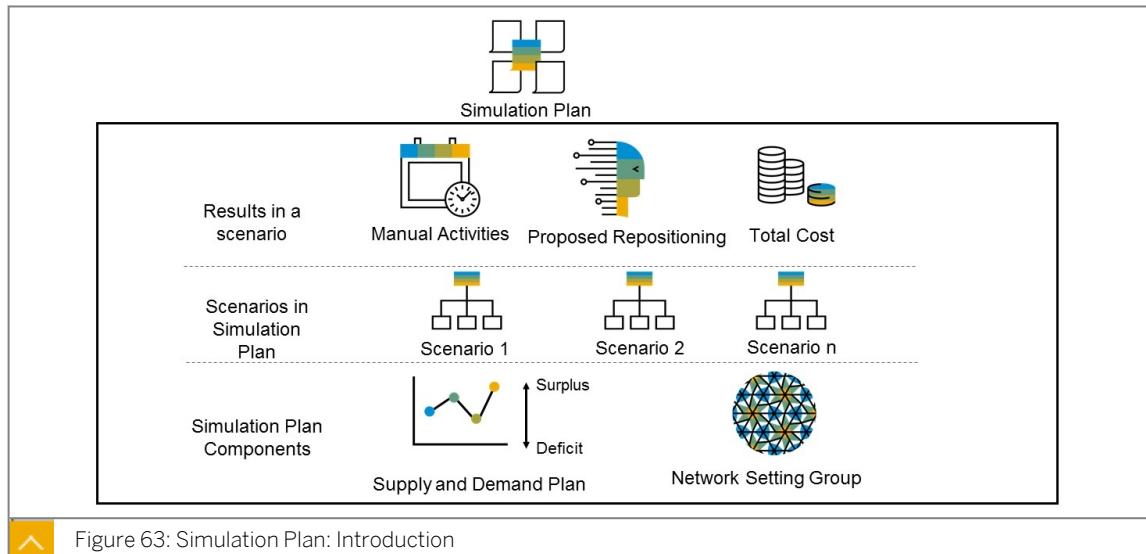


Figure 63: Simulation Plan: Introduction

SAP Transportation Resource Planning helps you to both detect approaching critical supply and demand situations, and correct these imbalances before they occur. Resource balancing uses a simulation plan to propose optimum reposition activities to logistic system for execution.

A simulation plan allows you to compare its different scenarios of network models and combination of manual and automatically proposed repositioning activities to resolve imbalanced situations by optimization.

Based on the supply and demand results, the transportation resource planner can identify and manage forecasted issues. By using resource balancing in SAP Transportation Resource Planning, the transportation resource planner can reposition on and off-hire empty transportation resources by creating transportation requests in SAP Transportation Management or simulate the repositioning without creating transportation requests in SAP Transportation Management.

The proposed activities of a simulation plan are based on the following:

- Supply and demand plan

- Network setting group

Planned activities include manual activities and proposed activities.

The planner can create or modify the following manual activities:

- Repositioning
- Planned repositioning
- On-hire
- Off-hire
- Maintenance and repair
- Load and discharge

Together with manual activities, the planner can get optimized repositioning activities from the solver.

The simulation plan provides a cost summary for the following costs:

- Activity cost
- Storage cost
- Balancing cost

To view simulation plans, choose *Resource Balancing*.



## LESSON SUMMARY

You should now be able to:

- Describe a simulation plan
- Create a simulation plan

## Unit 5

### Lesson 4

# Using a Balancing Simulation

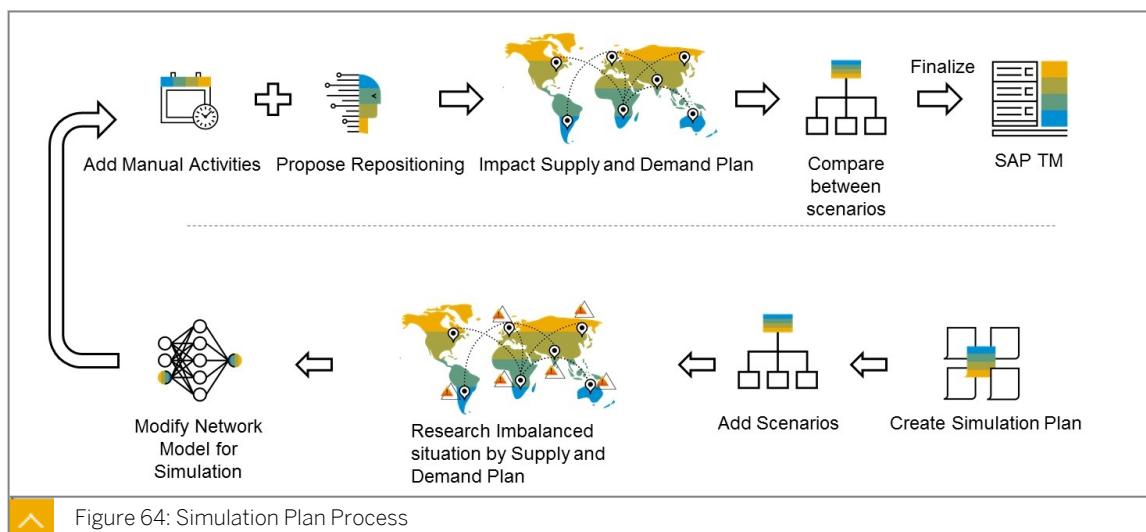


### LESSON OBJECTIVES

After completing this lesson, you will be able to:

- Describe how a simulation plan balances resources in transportation networks
- Run automatic balancing

### Simulation Plan Process



The following prerequisites are required in the SAP TM system for a simulation plan:

- Transportation requests (forwarding orders), which results in a deficit or surplus for a depot location.

The following prerequisites are required in the SAP Transportation Resource Planning System for a simulation plan:

- Safety stock settings:  
Maintain safety stock settings for depot locations within the area of responsibility. This can be done in the *Resource Settings* work center.
- Supply and demand plan:  
The execution result of the supply and demand is the basis for creating a resource balancing simulation.
- Network setting group:

A network model represents the transportation network in SAP Transportation Resource Planning that can be used in resource balancing. A network model can consist of lanes, single-stage paths, and multi-stage paths. Costs can be determined based on the network model.

### Simulation Plan: Process Overview

1. Create a balancing simulation plan.

In the *Resource Balancing* work center, you must first create a balancing simulation. When you do this, you choose a supply and demand plan and a network setting group. At this point, a network model is also generated for the simulation.

2. Add scenarios and activities.

Create different scenarios for correcting an imbalanced supply and demand situation in a location or set of locations. Each scenario consists of different activities that can be performed to correct the imbalance. If necessary, the planner can create or disable existing lanes, a single-stage path, and multiple-stage path for each scenario in the network model for resource balancing activity simulation.

3. Compare scenario results.

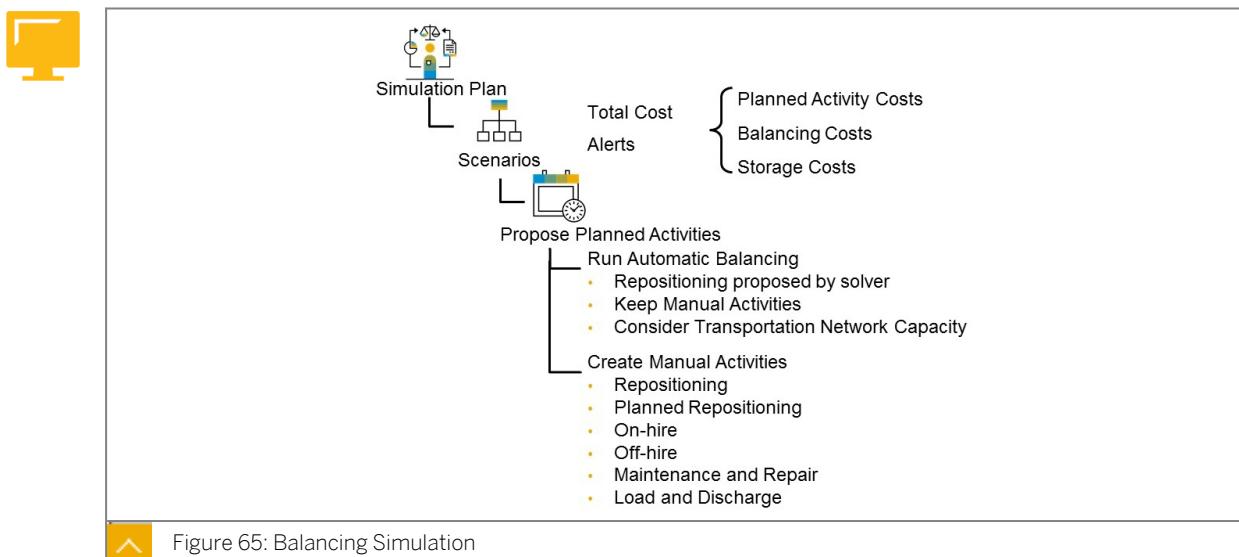
The left area of the work center shows the simulated supply and demand status and any alerts. Initially, this area shows the results from the last execution run of the supply and demand plan that is being used in the balancing simulation. Then, for each scenario and after any change in the included activities, you can check the effect on the supply and demand situation here. You can also display this information in the map view.

4. Finalize a scenario.

Once you have decided on the optimal scenario, you finalize it, and the activities are sent to your logistics system to be carried out. Repositioning activities will be generated in SAP TM with parameters defined in repositioning of resource category settings.

When you finalize a scenario, this also finalizes the status of the balancing simulation itself. Then, the supply and demand plan can be used again in a new balancing simulation.

### Balancing Simulations



A balancing simulation allows you to compare different scenarios for optimizing the rebalancing activities.

A scenario goes through a life cycle. Until a scenario has been finalized, it has a *Draft* status. This means that the activities in the scenario have not yet been sent to your logistics system. You can change a scenario as long as all scenarios in the balancing simulation have the status *Draft*.

When you are satisfied with a scenario and its effects on your imbalanced situation, you can finalize the scenario. The activities are sent to your logistics system and are carried out there, and the status of the scenario changes to *Finalized*. The balancing simulation can then no longer be changed.

Choose *Run Automatic Balancing* to generate suggested repositioning activities for balancing the situation. You can manually create or change the suggested activities and these activities will be kept in next run automatic balancing. For activities that are proposed by the solver and haven't been changed manually, they will be removed automatically when the planner chooses *Run Automatic Balancing*.

The costs of a scenario are as follows:

- *Planned Activity Costs* is the total cost of the activities included in the scenario. These costs are calculated based on the cost model.
- *Balancing Costs* is for imbalanced situations. This field shows how much it would cost to balance the situation. If the situation in the current scenario is already balanced, with no alerts in the simulated results, then the balancing cost is zero.
- *Storage Costs* is the summary of the storage cost all the containers during the whole period of the supply and demand plan in the simulation plan.
- *Total Cost* is the *Planned Activity Costs* + *Balancing Costs* + *Storage Costs*.

Alerts in a scenario are the total numbers of alerts of the supply and demand plan. After you choose *Update Simulation Plan with newly proposed activities*, the alert number refreshes.

You can manually create the following types of activities for a scenario:

- Repositioning:  
Triggers the movement of empty resources from a location that has a surplus to a location that has a deficit.
- Planned repositioning:  
Assumes the movement of empty resources to simulate a planned repositioning event that is known to happen in the future. Unlike a repositioning activity, a planned repositioning activity will not be implemented in your logistics system when the scenario is finalized.
- On-hire:  
Initiates leasing of additional transportation resources.
- Off-hire:  
Ends leasing of transportation resources.
- Maintenance and repair:  
Define an activity to repair damaged transportation resources and make them available for use again.
- Load and discharge:

Adjusts the number of empty resources to be loaded or discharged at specific locations in a voyage.



### LESSON SUMMARY

You should now be able to:

- Describe how a simulation plan balances resources in transportation networks
- Run automatic balancing

## Learning Assessment

1. How are cost datasets considered by SAP Transportation Resource Planning when a cost model is used for cost calculation?

*Choose the correct answer.*

- A The cost datasets in the list are queried in order, until the cost data is found, or the end of the list is reached
- B The cost datasets in the list are queried in transportation, storage, and handling costs order, until the cost data is found, or the end of the list is reached
- C The cost datasets with the same type cannot be assigned in one cost model together, the query will end if there is no matching result from the cost dataset

2. Transportation costs datasets are which of the following?

*Choose the correct answer.*

- A Distance-based, location-based, quantity-based
- B Distance-based, location-based
- C Distance-based, quantity-based

3. Is it possible to read a storage cost dataset from a logistics system?

*Choose the correct answer.*

- A Yes, similar to transportation cost datasets
- B No, it is only possible to read data from a prepared cost file in CSV format
- C Yes, it is possible to read data from a logistics system or from a prepared cost file in CSV format

4. Where can a network setting group be used?

*Choose the correct answer.*

- A Only in pick-up or return rulesets
- B Only in balancing simulations for running resource balancing
- C In both

5. Can a user create new lanes and paths for a network model in SAP Transportation Resource Planning?

*Choose the correct answer.*

- A No, lanes and single-stage paths are only retrieved from the logistics system
- B Yes, it is possible to create new lanes and paths directly in SAP Transportation Resource Planning
- C No, it is only possible to modify the existing ones retrieved from the logistics system

6. Which of the following statements about simulation plans are correct?

*Choose the correct answers.*

- A A simulation plan allows you to compare its different scenarios to resolve imbalanced situations by optimization.
- B A simulation plan is used by resource balancing to propose optimum reposition activities to the logistics system for execution.
- C A simulation plan includes proposed activities but not manual activities.

7. Which of the following are prerequisites for a simulation plan in SAP Transportation Resource Planning?

*Choose the correct answer.*

- A Supply and demand plan, network setting group, safety stock settings (optional)
- B Transportation requests, safety stock settings, supply and demand plan, network setting group
- C Transportation requests, safety stock settings, network setting group

## Learning Assessment - Answers

1. How are cost datasets considered by SAP Transportation Resource Planning when a cost model is used for cost calculation?

*Choose the correct answer.*

- A The cost datasets in the list are queried in order, until the cost data is found, or the end of the list is reached
- B The cost datasets in the list are queried in transportation, storage, and handling costs order, until the cost data is found, or the end of the list is reached
- C The cost datasets with the same type cannot be assigned in one cost model together, the query will end if there is no matching result from the cost dataset

2. Transportation costs datasets are which of the following?

*Choose the correct answer.*

- A Distance-based, location-based, quantity-based
- B Distance-based, location-based
- C Distance-based, quantity-based

3. Is it possible to read a storage cost dataset from a logistics system?

*Choose the correct answer.*

- A Yes, similar to transportation cost datasets
- B No, it is only possible to read data from a prepared cost file in CSV format
- C Yes, it is possible to read data from a logistics system or from a prepared cost file in CSV format

4. Where can a network setting group be used?

*Choose the correct answer.*

- A Only in pick-up or return rulesets
- B Only in balancing simulations for running resource balancing
- C In both

5. Can a user create new lanes and paths for a network model in SAP Transportation Resource Planning?

*Choose the correct answer.*

- A No, lanes and single-stage paths are only retrieved from the logistics system
- B Yes, it is possible to create new lanes and paths directly in SAP Transportation Resource Planning
- C No, it is only possible to modify the existing ones retrieved from the logistics system

6. Which of the following statements about simulation plans are correct?

*Choose the correct answers.*

- A A simulation plan allows you to compare its different scenarios to resolve imbalanced situations by optimization.
- B A simulation plan is used by resource balancing to propose optimum reposition activities to the logistics system for execution.
- C A simulation plan includes proposed activities but not manual activities.

7. Which of the following are prerequisites for a simulation plan in SAP Transportation Resource Planning?

*Choose the correct answer.*

- A Supply and demand plan, network setting group, safety stock settings (optional)
- B Transportation requests, safety stock settings, supply and demand plan, network setting group
- C Transportation requests, safety stock settings, network setting group

# UNIT 6

# Pick-Up and Return Optimization

## Lesson 1

Creating Empty Pick-up and Empty Return Rulesets

99

## Lesson 2

Suggesting Locations and Triangulation

105

## Lesson 3

Integrating with the SAP TM System for Execution

111

## UNIT OBJECTIVES

- Explain the concept of empty pick-up and empty return rulesets
- Create an empty pick-up ruleset
- Describe the empty pick-up and return scenario
- Understand how locations are suggested to each empty pick-up or return transportation units
- Explain how triangulation saves on transportation costs
- Integrate with the SAP TM system for execution



# Unit 6

## Lesson 1

# Creating Empty Pick-up and Empty Return Rulesets



## LESSON OBJECTIVES

After completing this lesson, you will be able to:

- Explain the concept of empty pick-up and empty return rulesets
- Create an empty pick-up ruleset

## Empty Pick-up and Empty Return Rulesets

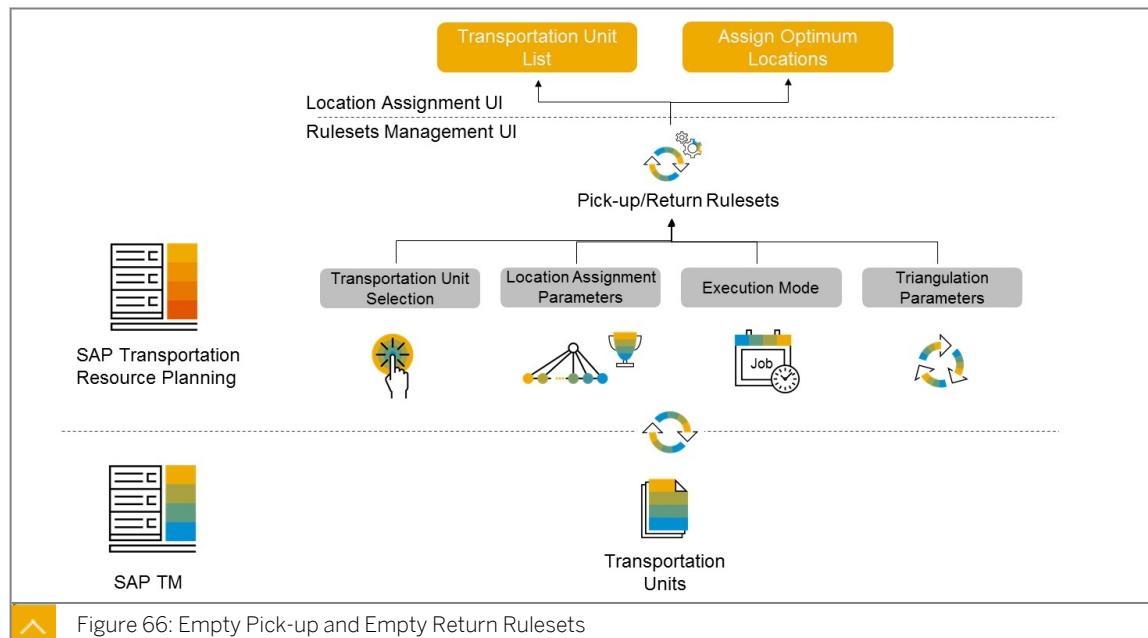


Figure 66: Empty Pick-up and Empty Return Rulesets

The transportation planner is responsible for providing the right transportation resources, for example, empty containers, at the right time, to the right location, in order to meet the demand. Typically, companies face the challenge of fulfilling their customer requirements but saving on costs for empty moves. Thus, a resource planner needs to find the optimal and less costly pick-up and return location assignments for cargo movements.

In the integrated carrier scenario, the shipper's forwarding order is created in SAP TM, and the customer's forwarding order is created in SAP TM. This generates an empty pick-up transportation unit (TU) and an empty return TU, to tell the customer where to pick-up the empty containers before usage, and where to return after the goods transportation. In the case of the carrier's haulage, these movements will be carried out by the carrier. In this case, internal release orders will be generated for either the pick-up leg or the return leg, or both the pick-up and return leg. These TUs will be selected by the parameters of the transportation unit selection in rulesets.

Pick-up and return rulesets have the following aims:

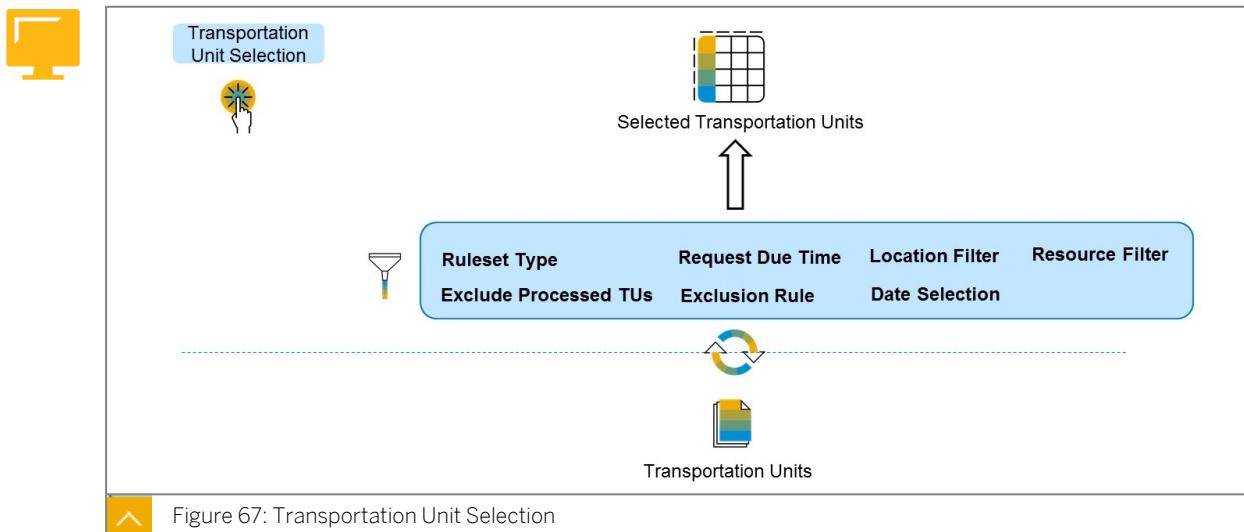
- To determine which transportation units should be selected for optimization, according to location, status, when they are due for pick-up or return, and optionally, resource type.
- To set the parameters for how optimization should take place, whether using location determination rules, automatic optimization, or a combination of both.

The following parameters are required for an empty pick-up or empty return ruleset:

- Transportation unit selection
- Location assignment parameters
- Execution mode
- Triangulation parameters

To view pick-up and return rulesets, choose *Pick-up and Return* → *Pick-up/Return Rulesets*.

## Transportation Unit Selection



### Transportation Unit Selection Settings

- *Ruleset Type*:

Shows whether the ruleset is used for pick-up or return of transportation resources.

When you use the ruleset in the *Location Assignment* view, the pick-up rulesets filter for transportation units (TUs) of the *Empty Provisioning* type. Return rulesets filter for TUs of the *Empty Return* type.

- *Due for Pick-Up/Return In*:

Shows in how many hours, days, or weeks a transportation resource is due for pick-up or return.

- *Location Filter*:

Specifies the location filter used to filter transportation units in the *Location Assignment* view.

When you use a ruleset to select pick-up or return TUs, the ruleset finds TUs with source locations or destination locations that are included in this location filter.

- *Resource Filter:*

Specifies the resource filter used to filter transportation units in the *Location Assignment* view.

- *Exclude Processed TUs:*

Determines whether or not already processed transportation units should be excluded.

If you choose Yes, then transportation units that have already been processed by a ruleset are not selected again and therefore will not be replanned.

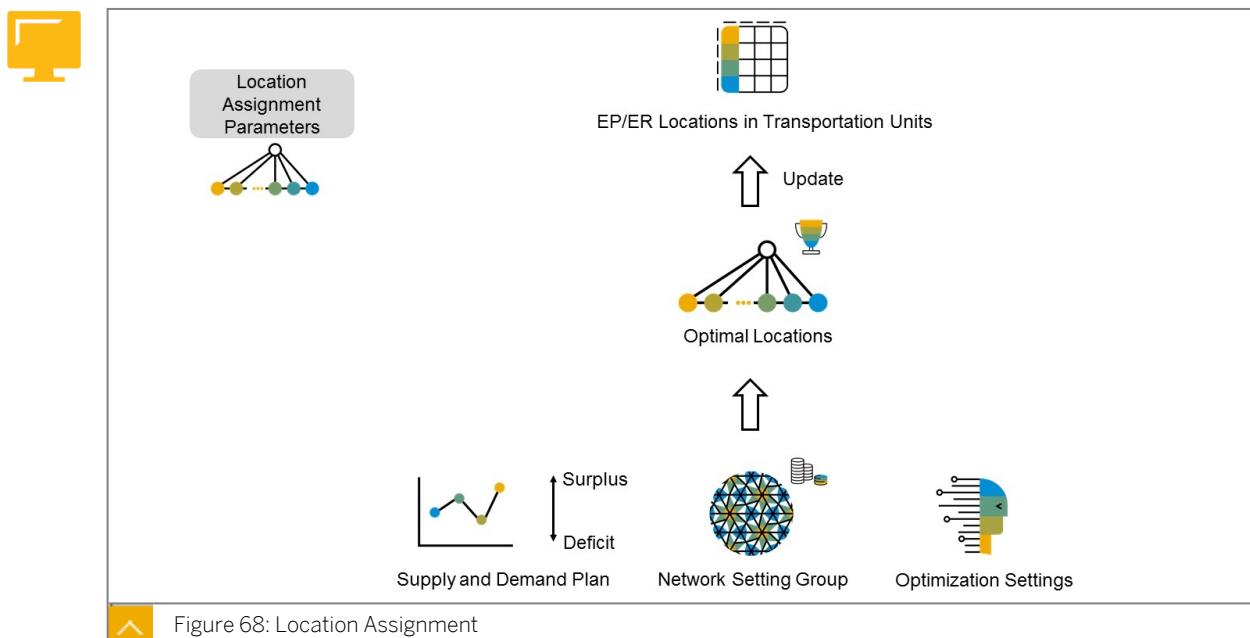
- *Exclusion Rule:*

Specifies a rule that allows you to exclude certain transportation units from the *Location Assignment* view. These TUs are not shown.

- *Date Selection:*

Specifies the date used to filter the TUs. By default, the TUs are filtered by the planned departure time in the pick-up scenario and by the vessel arrival date in the return scenario.

## Location Assignment



## Location Assignment Parameters

- *Supply and Demand Plan*

Specifies a supply and demand plan used for forecasting the surplus and deficit situation for certain resources types in a set of locations over a period of time. You can specify a scheduled supply and demand plan or a virtual supply and demand plan.

- *Network Setting Group*

The network setting group that you select provides the main cost model used for pick-up or return.

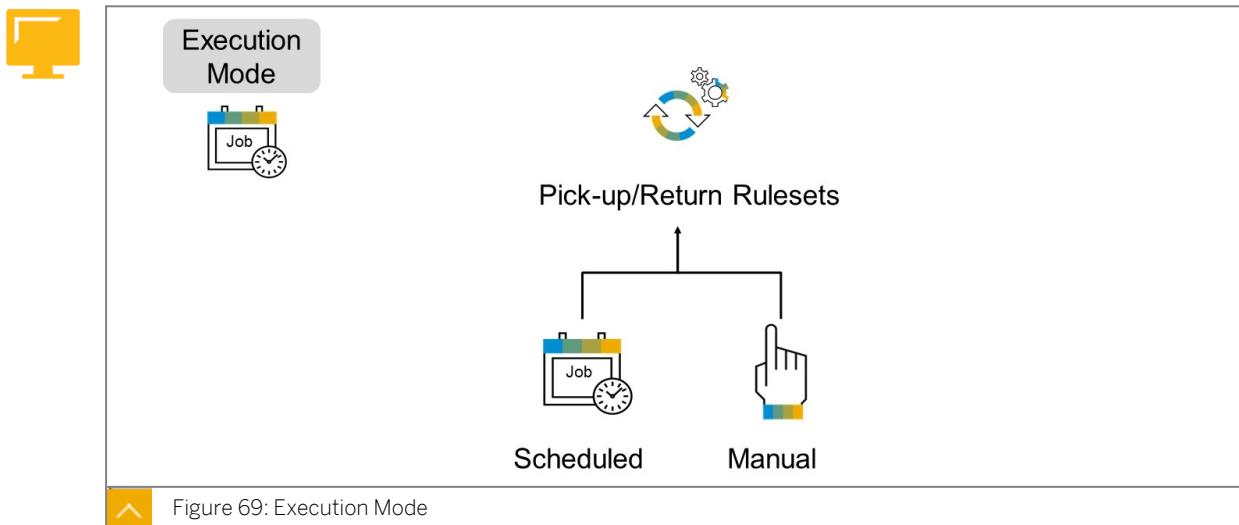
The cost model consists of a currency and any number of cost datasets used to calculate different types of costs.

- *Optimization Setting*

Specifies how optimization is performed using the ruleset. The following options are available for optimization settings:

- *Location Determination Rule*: Only location determination rules are used to optimize locations.
- *Automatic Optimization*: Optimization is performed using additional aspects such as costs and balancing. You can decide whether you want to focus on only costs or both costs and balancing.
- *Location Determination Rule and Automatic Optimization*: Uses both approaches, including the option to focus on costs or both costs and balancing.
- *None*: No location determination rule is used and no automatic optimization is performed.

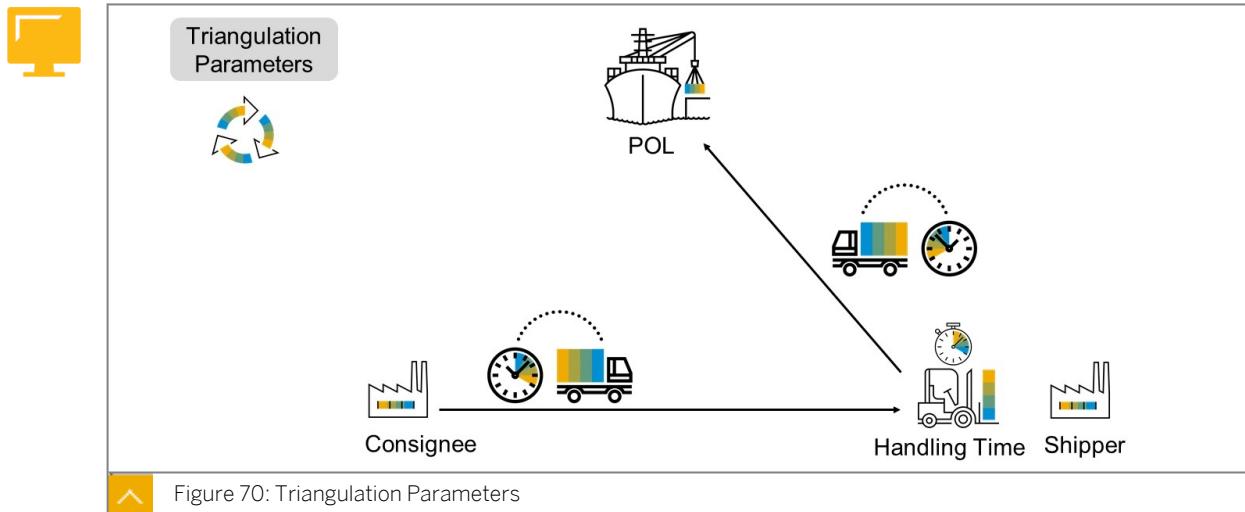
## Execution Mode



Execution mode specifies whether the execution of a ruleset is manual or scheduled in the back-end at a certain frequency.

The ruleset job scheduling supports additional settings to be executed only in working hours, once frequency is by hours or minutes.

## Triangulation Parameters



### Triangulation Parameters

- *Handling Time Buffer:*

Specifies the time buffer required for handling a triangulation.

When SAP Transportation Resource Planning suggests triangulations for a specific TU, it considers the handling time buffer. For example, if the pick-up time for an empty-provisioning TU is 10 a.m. on a specific day, and the handling time buffer is set to 4 hours, then only the triangulation TUs whose return time is earlier than 6 a.m. on that day will be suggested.

- *Maximum Hits:*

Specifies the maximum number of triangulations to be suggested in the *Suggested Triangulations* list.



### LESSON SUMMARY

You should now be able to:

- Explain the concept of empty pick-up and empty return rulesets
- Create an empty pick-up ruleset



## Suggesting Locations and Triangulation

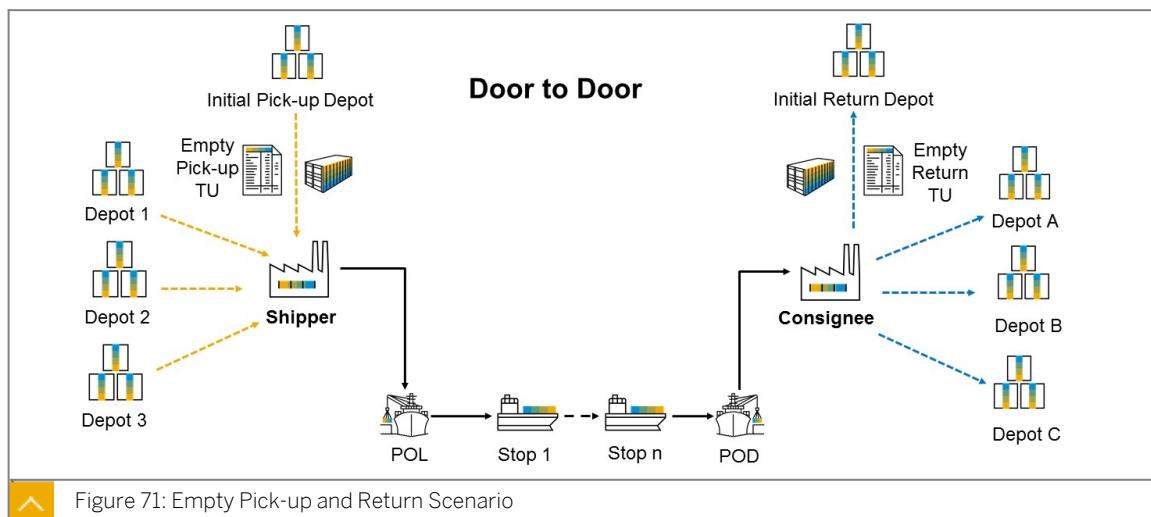


### LESSON OBJECTIVES

After completing this lesson, you will be able to:

- Describe the empty pick-up and return scenario
- Understand how locations are suggested to each empty pick-up or return transportation units
- Explain how triangulation saves on transportation costs

### Empty Pick-up and Return: Example



The figure depicts a door to door carrier haulage scenario. This example describes the empty pick-up and empty return process in SAP Transportation Resource Planning.

A shipper wants to deliver goods to a consignee. Besides the cargo move, the shipper requests an ocean carrier to provide an empty container at their own premises, and to return the empty container from the consignee's premises after unloading. An agent creates a forwarding order in the logistic system SAP TM and generates the following transportation units:

- Empty pick-up transportation unit, to send an empty container to shipper.
- Cargo transportation unit, to transport laden container to consignee.
- Empty return transportation unit, to return the empty container to a depot nearby.

In the empty pick-up TU, the agent will specify the initial pick-up depot as the source location in the empty pick-up TU. When the planner executes an empty pick-up ruleset, the TU will be

selected for further empty pick-up location suggestion, if it meets all the criteria in the transportation unit selection of the ruleset.

The empty pick-up ruleset will calculate and give suggested empty pick-up locations based on the location assignment parameters of the empty pick-up ruleset.

If the ruleset is selected from the *Location Assignment* tab, the planner can see the rankings and decide which location is the best for the selected TU in front-end UI.

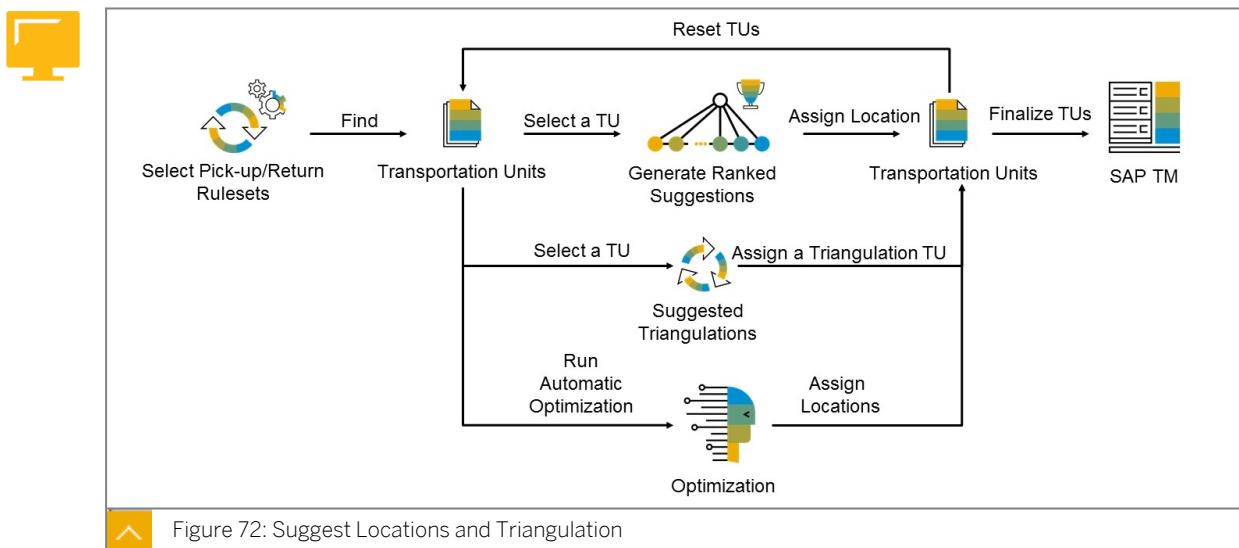
If the planner chooses the *Run Automatic Optimization* button, or executes the ruleset by scheduling job, SAP Transportation Resource Planning solver will assign the most optimum locations for all these TUs.

When working in the front-end UI, the planner needs to choose the *Update in Logistic System* button to update the new suggested empty pick-up location to SAP TM.

It is a similar process for the empty return scenario.

Choose *Pick-up and Return* → *Location Assignment*.

## Pick-up and Return: Location Suggestions



Before you can begin working in the *Location Assignment* view, you need rulesets for pick-up and return. These rulesets determine which transportation units are displayed in the view for making assignments.

Choose *Pick-up and Return* → *Location Assignment*.

### 1. Find transportation units.

To select transportation units, you must select a ruleset in the *Location Assignment* view. The list then displays transportation units that are eligible for the assignment of a new location and date for pick-up or return of empty resources.

The ruleset filters the transportation units shown according to the following criteria:

- The due date for pick-up or return, for example, the next 7 days.
- The location filter selected for the ruleset. The ruleset finds TUs with source locations or destination locations that are included in this location filter. If the TU's source

location or destination location is empty in your logistics system, then the ruleset uses the location of the port of loading (for pick-up) or port of discharge (for return). If this location is included in this location filter, the TU is also selected.

- The exclusion rule that is in effect for the ruleset.

## 2. Generate ranked suggestions.

Once you have obtained a list of transportation units, you can generate a ranked list of suggested locations and triangulations.

- To get a list of suggested locations, select one or more transportation units in the list.
- To get a list of suggested triangulations, select only one transportation unit in the list.

The system executes the ruleset and shows the results below the list of transportation units in two separate tabs, one for locations and the other for triangulations. The system ranks the suggested locations according to the optimization settings in the ruleset, and ranks the suggested triangulations according to estimated cost. Costs are displayed in the currency unit specified in the ruleset's network setting group.

## 3. Make assignments.

Once you have obtained a list of transportation units, you can assign pick-up or return locations or triangulations.

You have the following options to make location assignments:

- You can make manual changes in individual transportation units. You can make these changes directly in the list or use *Assign* shown in the list of suggested locations to accept the suggestion. Note that you can also use the *Assign* option to assign a location to more than one transportation unit if you have selected more than one in the list above.
- To assign a new pick-up or return location to all transportation units that have been obtained using the applied ruleset, use *Assign to All*.
- To obtain new suggested dates and locations for all of the listed transportation units at once, choose *Run Automatic Optimization*.
- You can use a combination of both manual adjustment and automatic optimization. The automatic optimization process does not overwrite any manual changes of the date or location that you have made in the list of transportation units.

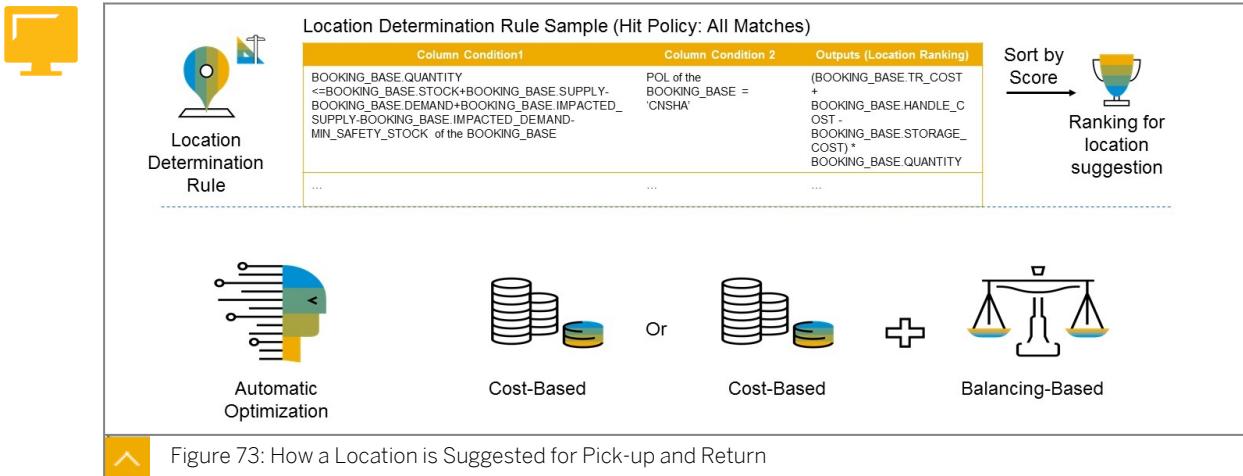
To assign a triangulation, use *Assign* shown in the list of suggested triangulations to accept the suggestion.

To see whether the location or triangulation assignment was successful, you can check the *Assignment Status* field.

If you want to clear all entries that you have made so far, either manually or automatically, choose *Reset*.

## 4. Finalize your changes.

When you are satisfied with the changes that you have made in the *Transportation Unit* list, choose *Update in Logistics System*. This sends your changes to your logistics system.



Use the *Pick-Up and Return* work center in SAP Transportation Resource Planning to find the optimal pick-up and return location assignments for your transportation resources. This helps prevent imbalances and ensures that your resources are available where they are needed.

For each empty-repositioning or empty-return transportation unit, you can either directly assign new pick-up or return locations for them, or use triangulation to optimize the assignments. Triangulation combines a request for empty provisioning and a request for empty return to save transportation charges.

Rulesets are used as the basis for evaluating and determining pick-up or return locations or triangulation assignments. As part of a ruleset, you can use both location determination rules and automatic optimization to support decisions concerning location or triangulation assignments. In addition, when using automatic optimization, you can decide whether aspects of costs or balancing or a combination of both are more important for your decisions.

### Location Determination Rule

The location determination rule is flexible, and allows the planner to define conditions together with the formula to determine which locations are suitable for certain TUs, and defines a formula for calculating the score of these locations. The location will be listed in the suggested location, with ranking.

### Automatic Optimization

Optimization has the following two options:

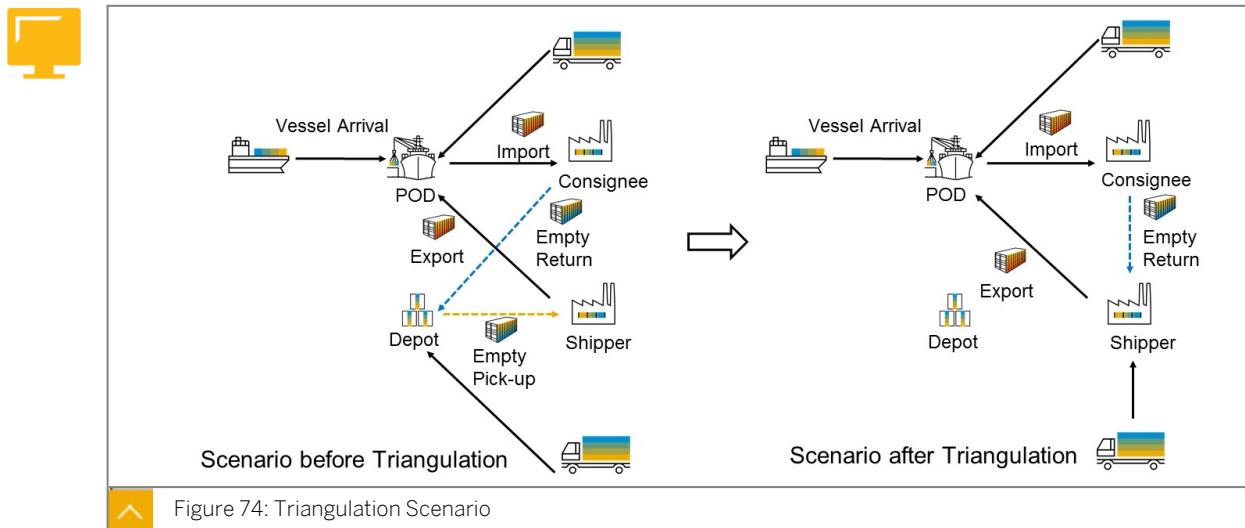
- Cost-based: Cost is used as the sole factor for optimizing the pick-up and return of transportation resources.
- Cost and balancing-based: Both cost and the surplus and deficit situation is taken into account for automatic optimization. The balancing situation is forecasted by the selected supply and demand plan for the ruleset.

The cost calculation is a summary of the transportation cost, handling cost and storage cost, based on the calculation model in the network setting group.

### Location Determination Rule and Automatic Optimization

SAP Transportation Resource Planning supports optimization with both the location determination rule and automatic optimization.

## Triangulation



The purpose of triangulation is to reduce unnecessary empty containers or railcar moves.

The process for a normal scenario can be summarized as follows:

1. The truck or train drives to the port or rail station to pick up an import transportation resource.
2. The transportation resource is moved from the port dock or the rail station to the unloading facility.
3. The transportation resource is moved from the unloading facility to a storage facility.
4. The truck returns to pick up the transportation resource from the storage facility.
5. The empty transportation resource is sent to an export load facility.
6. The transportation resource is moved from the load facility to the port or rail station.

The process for a triangulation scenario can be summarized as follows:

1. The truck drives to the port to pick up an import transportation resource.
2. The transportation resource is moved from the port dock or rail station to the unloading facility.
3. The empty transportation resource is transported to a load facility.
4. The transportation resource is moved from the load facility to the port or rail station.

Triangulation starts based on a return TU. Empty return and empty pick-up TUs are combined together.

After the suggestion has been updated to SAP TM, the empty pick-up TU will be deleted, while the empty return TU will be updated to send the container to next shipper.

Choose *Pick-up and Return → Location Assignment*.



## LESSON SUMMARY

You should now be able to:

- Describe the empty pick-up and return scenario
- Understand how locations are suggested to each empty pick-up or return transportation units
- Explain how triangulation saves on transportation costs

## Unit 6

### Lesson 3

# Integrating with the SAP TM System for Execution



#### LESSON OBJECTIVES

After completing this lesson, you will be able to:

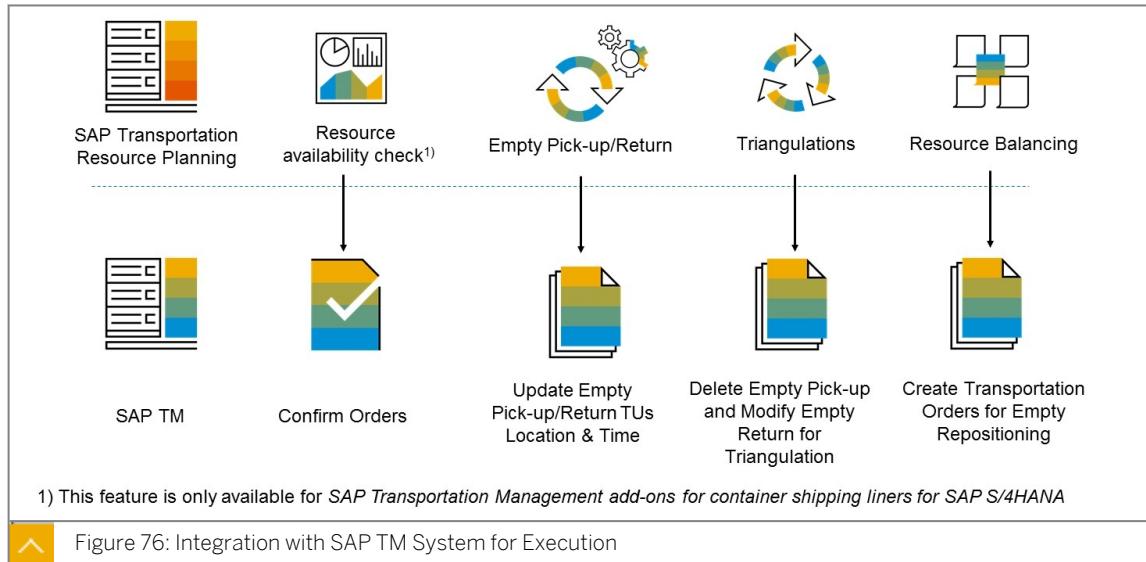
- Integrate with the SAP TM system for execution

#### Plan Execution Introduction



Plans coming from repositioning avoidance or repositioning optimization strategies can be executed, i.e. transferred to the connected logistics system.

#### SAP TM System Integration



In an integrated scenario, SAP Transportation Resource Planning can provide SAP TM with data. This includes the following types of data:

- Resource availability check.



Note:

This feature is only available for SAP Transportation Management add-ons for container shipping liners for SAP S/4HANA.

- Update to a pick-up/return location and time for empty provisioning, empty return or in case of triangulation.
- Deletion of transportation orders, in case of a triangulation to be executed.
- Creation of transportation orders for empty repositioning.



### LESSON SUMMARY

You should now be able to:

- Integrate with the SAP TM system for execution

## Learning Assessment

1. In an integrated scenario, which transportations units (TUs) created in SAP TM are selected by the parameters of the transportation unit selection in rulesets in SAP Transportation Resource Planning?

*Choose the correct answer.*

- A Empty provisioning TU, cargo TU, empty return TU
- B Only empty provisioning TU and empty return TU
- C Only cargo TU

2. Which parameters are required for an empty pick-up or empty return ruleset?

*Choose the correct answers.*

- A Transportation unit selection
- B Location assignment parameters
- C Optimization settings

3. Is SAP Transportation Resource Planning able to suggest triangulations?

*Choose the correct answer.*

- A Yes, triangulation is one of the parameters required by empty rulesets
- B No, this is out of scope for the current SAP Transportation Resource Planning release

4. In an integrated scenario, is SAP Transportation Resource Planning capable of assigning the most optimum empty pick-up location?

*Choose the correct answers.*

- A Yes, but this can only be done manually by the planner, who can see the rankings and decide which location is the best for the selected TU in front-end UI
- B Yes, SAP Transportation Resource Planning can assign it automatically if the planner chooses the *Run Automatic Optimization* button
- C Yes, SAP Transportation Resource Planning can assign it automatically if the planner executes the ruleset by scheduling job

5. After the suggestion about triangulation has been updated to SAP TM from SAP Transportation Resource Planning, what happens on the SAP TM side?

*Choose the correct answer.*

- A The empty pick-up TU will be deleted, while the empty return TU will be updated to send the container to the next shipper
- B The empty pick-up TU will be updated to send the container to the next shipper, while the empty return TU will be deleted
- C Both empty pick-up TU and the empty return TU will be updated

6. In an integrated scenario, SAP Transportation Resource Planning can provide SAP TM with which of the following types of data?

*Choose the correct answers.*

- A Resource availability check
- B Creation of transportation orders for empty repositioning
- C Deletion of transportation orders, in case of a triangulation to be executed
- D Update to a pick-up/return location and time for empty provisioning, empty return, or in case of triangulation

## Learning Assessment - Answers

1. In an integrated scenario, which transportations units (TUs) created in SAP TM are selected by the parameters of the transportation unit selection in rulesets in SAP Transportation Resource Planning?

*Choose the correct answer.*

- A Empty provisioning TU, cargo TU, empty return TU
- B Only empty provisioning TU and empty return TU
- C Only cargo TU

2. Which parameters are required for an empty pick-up or empty return ruleset?

*Choose the correct answers.*

- A Transportation unit selection
- B Location assignment parameters
- C Optimization settings

3. Is SAP Transportation Resource Planning able to suggest triangulations?

*Choose the correct answer.*

- A Yes, triangulation is one of the parameters required by empty rulesets
- B No, this is out of scope for the current SAP Transportation Resource Planning release

4. In an integrated scenario, is SAP Transportation Resource Planning capable of assigning the most optimum empty pick-up location?

*Choose the correct answers.*

- A Yes, but this can only be done manually by the planner, who can see the rankings and decide which location is the best for the selected TU in front-end UI
- B Yes, SAP Transportation Resource Planning can assign it automatically if the planner chooses the *Run Automatic Optimization* button
- C Yes, SAP Transportation Resource Planning can assign it automatically if the planner executes the ruleset by scheduling job

5. After the suggestion about triangulation has been updated to SAP TM from SAP Transportation Resource Planning, what happens on the SAP TM side?

*Choose the correct answer.*

- A The empty pick-up TU will be deleted, while the empty return TU will be updated to send the container to the next shipper
- B The empty pick-up TU will be updated to send the container to the next shipper, while the empty return TU will be deleted
- C Both empty pick-up TU and the empty return TU will be updated

6. In an integrated scenario, SAP Transportation Resource Planning can provide SAP TM with which of the following types of data?

*Choose the correct answers.*

- A Resource availability check
- B Creation of transportation orders for empty repositioning
- C Deletion of transportation orders, in case of a triangulation to be executed
- D Update to a pick-up/return location and time for empty provisioning, empty return, or in case of triangulation

## UNIT 7

# KPI and Home Dashboard Monitoring

### Lesson 1

Creating a KPI Plan

119

### Lesson 2

Creating a Virtual KPI Plan

123

### Lesson 3

Monitoring Data on the Home Dashboard

125

### UNIT OBJECTIVES

- Describe a KPI plan
- Create a scheduled KPI plan
- Display KPI plans
- Create a virtual KPI plan
- Monitor data on the home dashboard
- Adjust tiles on the home dashboard



# Unit 7

## Lesson 1

# Creating a KPI Plan



## LESSON OBJECTIVES

After completing this lesson, you will be able to:

- Describe a KPI plan
- Create a scheduled KPI plan
- Display KPI plans

## KPI Monitoring Introduction

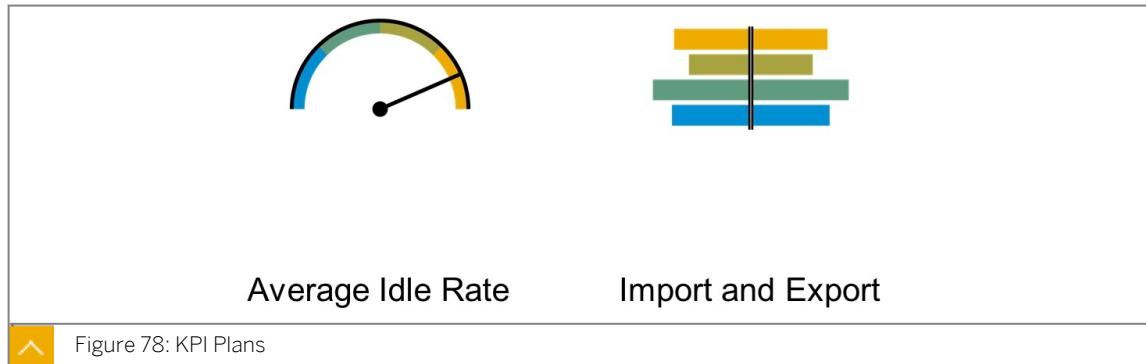


You use the *KPI* work center to monitor and analyze the performance history of a location or set of locations according to a key performance indicator. The results shown in the work center are calculated based on a scheduled KPI plan, meaning that the results are calculated regularly according to the execution schedule for the plan.

KPI plans are always executed for a specific location or set of locations, resource type, or group of resource types, and for a specific time period in the past. You can also use a virtual KPI plan to group together the KPI results for several scheduled KPI plans.

Once you have obtained the calculation results for a KPI plan, you can display them in table form, as a bar chart, or on a map in the *KPI* work center.

## KPI Plans



SAP Transportation Resource Planning provides the following KPI types:

- *Average idle rate*

This is the average amount of days that a transportation resource has spent in a location between two customer orders during a specific time period. You can see the overall average idle time for all resources in a location or set of locations and also according to resource type.



**Note:**

Time that a transportation resource spends in maintenance and repair is not considered idle time.

- *Import/export balance*

For a specific location or set of locations, this number represents the difference between the number of transportation resources of a specific type that have come in and the number of resources that have left the location during a specific time period.



**Note:**

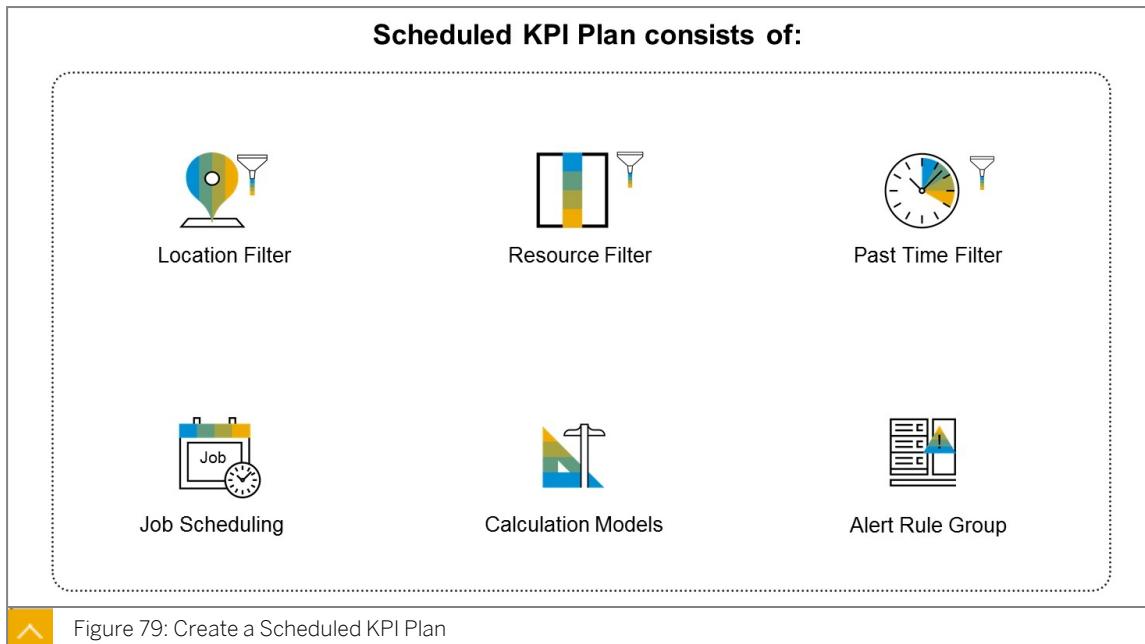
This KPI statistic only takes movements of laden resources into account. It does not consider the return, pick-up, and repositioning of empty transportation resources.



**Note:**

SAP Transportation Resource Planning provides a sample of KPI plans. If a customer has their own logic to calculate resource idle rates or imports and exports, the customer is able to create their own KPI calculation model.

To view KPI plans, choose *Plans* → *Plan Configuration*.

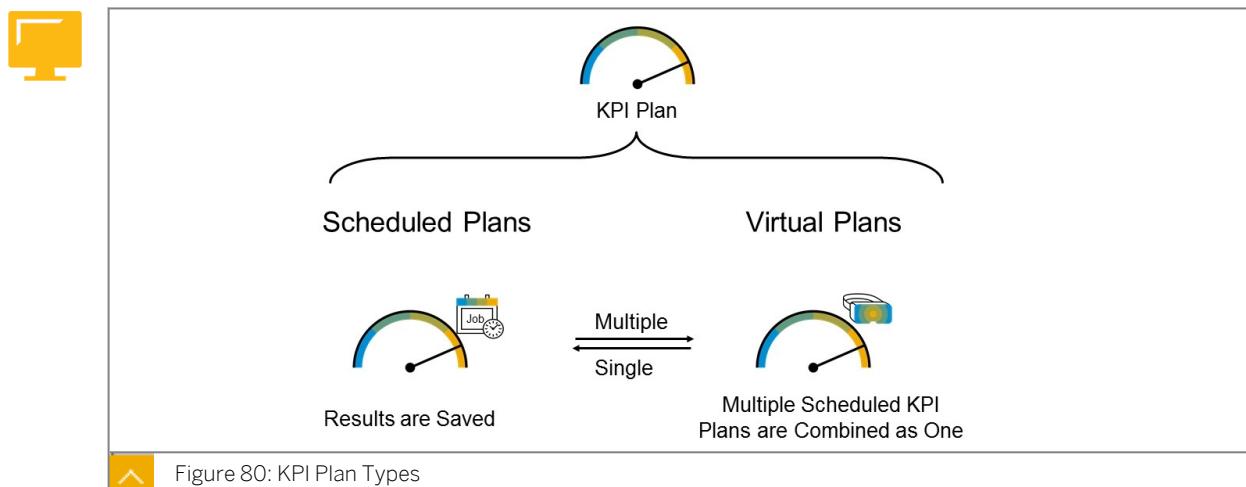


Use the *KPI* work center to monitor and analyze the performance history of a location or set of locations, according to a key performance indicator. The results shown in the work center

are calculated based on a scheduled KPI plan, meaning that the results are calculated regularly according to the execution schedule for the plan. KPI plans are always executed for a specific location or set of locations, resource type, or group of resource types, and for a specific time period in the past.

A plan always consists of the following components:

- One or more locations, specified in a location filter.
- One or more resource types, specified in a resource filter for resource types or resource groups.
- A time filter for a time period in the past, such as the last seven days or the last three months. Past time filters are used in KPI plans.
- A calculation model that provides the algorithm for calculating the KPI for the locations and resource types.
- KPI plan's alert rule groups are for triggering alerts.



Scheduled plans are executed automatically to generate forecasted data about the supply and demand situation in a location or set of locations for a resource type, or set of resource types over a specific period of time. Once a plan has been executed, you can see the results in the *KPI* work center.

Virtual KPI plans allow you to group together a set of scheduled KPI plans. You can then work with and compare their data in one view in the *KPI* work center.

If there are duplicated results in more than one scheduled plan, but they are combined together, the virtual plan will compare and use the data from the newest plan execution result.

## KPI Plan Views

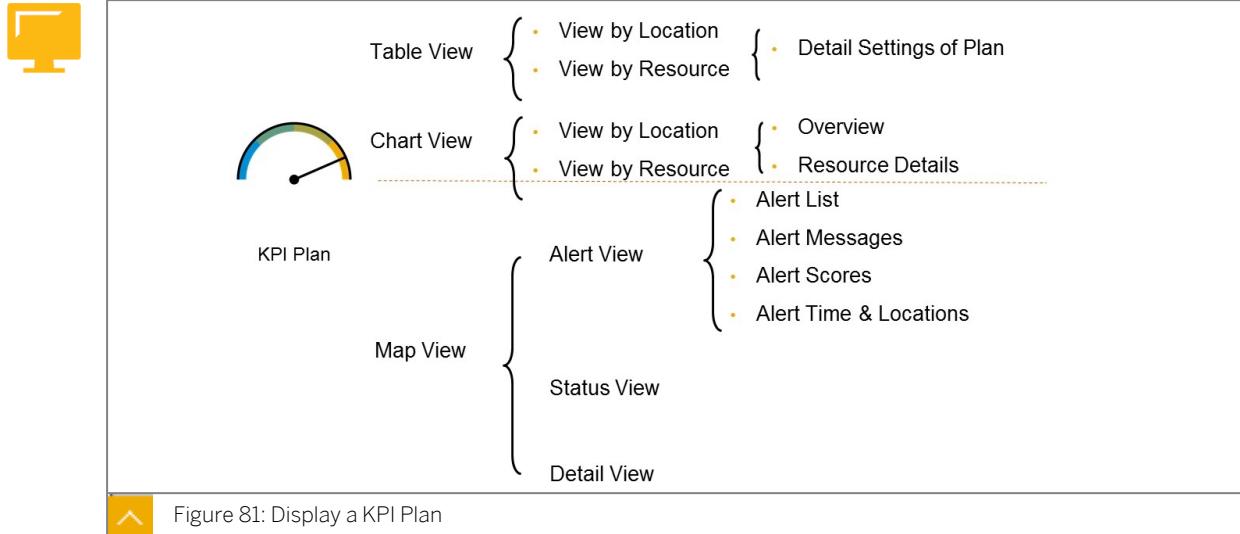


Figure 81: Display a KPI Plan

Use KPI plans to monitor and analyze the performance history of a location, or set of locations, according to a key performance indicator. These plans are executed periodically based on the scheduling settings made as part of the plan configuration.

When a plan is displayed, you can view the history KPI information by location, resource type, and time, based on the plan's location filter, resource filter, and time filter.

To display a KPI plan, choose *KPI*.



## LESSON SUMMARY

You should now be able to:

- Describe a KPI plan
- Create a scheduled KPI plan
- Display KPI plans

# Unit 7

## Lesson 2

### Creating a Virtual KPI Plan



#### LESSON OBJECTIVES

After completing this lesson, you will be able to:

- Create a virtual KPI plan

#### Virtual KPI Plans

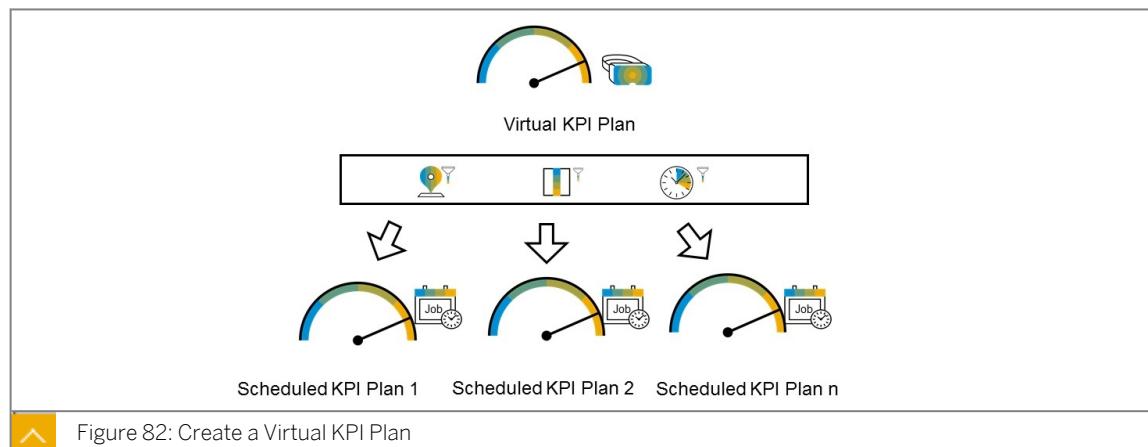


Figure 82: Create a Virtual KPI Plan

You can also use virtual KPI plans in the *KPI* work center. Virtual KPI plans allow you to group together scheduled KPI plans and see their results in a consolidated view. The plans grouped in a virtual plan all have the same past time filter. Their location filters and resource filters must also overlap.

To use virtual KPI plans, choose *Plans → Plan Configuration*.



#### LESSON SUMMARY

You should now be able to:

- Create a virtual KPI plan



## Unit 7

### Lesson 3

# Monitoring Data on the Home Dashboard



#### LESSON OBJECTIVES

After completing this lesson, you will be able to:

- Monitor data on the home dashboard
- Adjust tiles on the home dashboard

#### The Home Dashboard

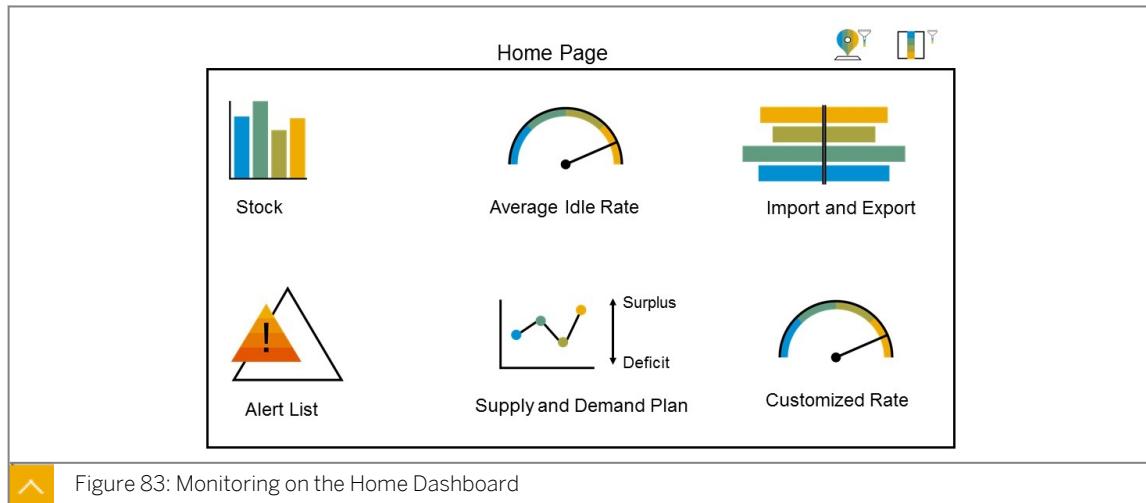


Figure 83: Monitoring on the Home Dashboard

The *Home* dashboard opens when you log on to SAP Transportation Resource Planning. This central dashboard gives you an overview of current information about your transportation resources.

You can configure tiles in the dashboard to show the information that you want to monitor.

You can show the following types of information here:

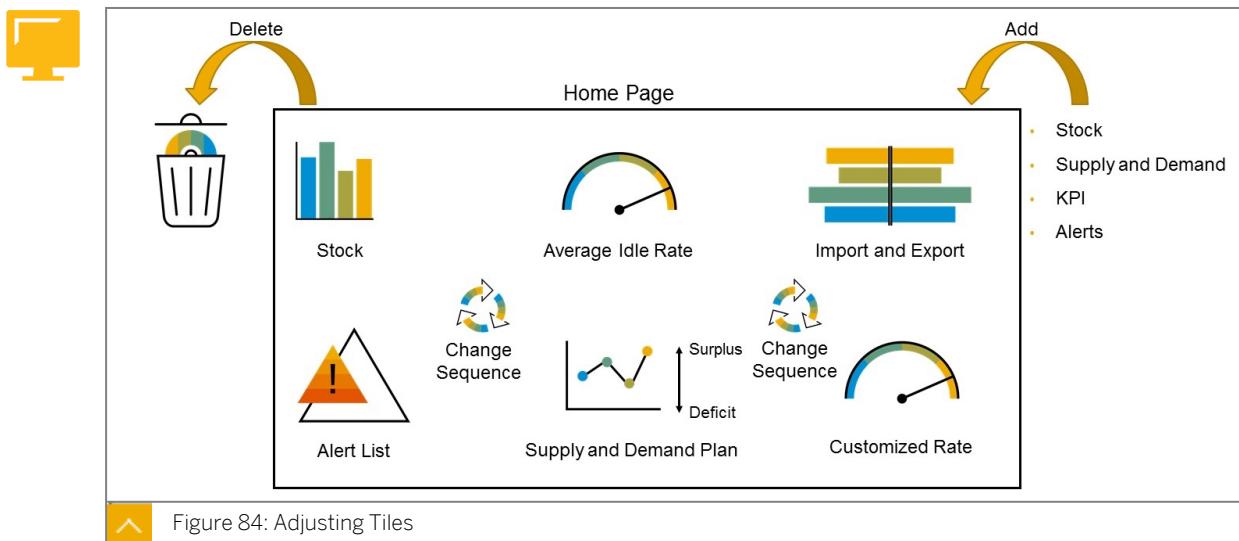
- *Stock:*  
Shows the current stock situation for a selected location and set of resource types.
- *Supply and demand:*  
Shows the forecasted supply and demand situation based on the selected scheduled supply and demand plan. This gives you an overview of the supply-demand balance for the locations and resource types for which you are responsible.
- *Alerts:*  
Allows you to monitor alerts related to selected scheduled supply and demand and KPI plans.

- *KPIs:*

Shows the current trend for key performance indicators such as idle rate and import/export balance.

To view the *Home* dashboard, choose *Home*.

## Tile Adjustment



When you log on to the *Home* dashboard for the first time, there are no tiles displayed. You can choose what kind of information you want displayed here.

You can add or remove tiles from the *Home* dashboard. You can also decide how many tiles you want to see in each row, and in what order they should appear on the dashboard.

You can also decide how many tiles you want to see in each row and in what order they should appear in the dashboard.



### To Add a Tile to the Home Dashboard

To add a tile to the dashboard, complete the following steps:

1. Choose *Add a Tile* and select the type of tile that you want to display.
2. Depending on the type of tile you add, you must choose different settings to configure the tile.
3. Continue to add additional tiles as necessary.
4. Save your entries.

The tile appears on your *Home* dashboard.



### To Remove a Tile from the Home Dashboard

To remove a tile from the *Home* dashboard, complete the following steps:

1. Select the upper-right corner of the tile that you want to delete.
2. Choose *Delete*.

**3. Confirm your deletion.**

The tile is removed from your *Home* dashboard.



**LESSON SUMMARY**

You should now be able to:

- Monitor data on the home dashboard
- Adjust tiles on the home dashboard



## Learning Assessment

1. Which of the following KPI types are provided by SAP Transportation Resource Planning?

*Choose the correct answers.*

- A Average idle rate
- B Import/export balance
- C Any KPI calculation model needed by the customer

2. What type of plan can be used in order to maximize the usage of existing KPI plans and lower the system load?

*Choose the correct answer.*

- A Several scheduled KPI plans can be consolidated in one single virtual KPI plan
- B There is no way to reduce existing KPI plans

3. Can the user add or remove tiles from the *Home* dashboard?

*Choose the correct answer.*

- A It is possible to add a new tile but it is not possible to delete standard tiles, which are fixed
- B Yes, it is possible to add or remove tiles
- C No, it is only possible to change the sequence of the tiles

## Learning Assessment - Answers

1. Which of the following KPI types are provided by SAP Transportation Resource Planning?

*Choose the correct answers.*

- A Average idle rate
- B Import/export balance
- C Any KPI calculation model needed by the customer

2. What type of plan can be used in order to maximize the usage of existing KPI plans and lower the system load?

*Choose the correct answer.*

- A Several scheduled KPI plans can be consolidated in one single virtual KPI plan
- B There is no way to reduce existing KPI plans

3. Can the user add or remove tiles from the *Home* dashboard?

*Choose the correct answer.*

- A It is possible to add a new tile but it is not possible to delete standard tiles, which are fixed
- B Yes, it is possible to add or remove tiles
- C No, it is only possible to change the sequence of the tiles