TRAFIKVERKET

REPORT

Samgods 1.2.3 - Technical Documentation

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Dokumentdatum: 2026-05-04
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1 Introduction

This technical document is written for Trafikverket to help users perform analysis with the Samgods GUI. It contains a technical description of each model element in terms of input data, procedures, and methods applied.

The Samgods GUI forms an integrated interface for several external programs developed over the years. They are related to the Standard Logistics Module and Rail Capacity Management Module. For details on the external programs, their control files and their usage and meaning of input and output, we refer to their technical documentation listed in the references chapter. The documentation is not written for programmers in the first place but for users of the model.

The document has the following structure:

Chapter 2: The file structure

Chapter 3: Input and output files reference

Chapter 4: Description of the model structure

Chapter 5: Description of the application structure

Chapter 5.12: Methods applied in the model

Chapter 7: Programs and licenses required

Chapter 8: References

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1.1. Glossary

Below are some important glossaries used in this manual. Observe that the explanations for some glossaries are specific to this context.

BuildChain - Build Chain procedure associated with BuildChain.exe program

ChainChoi - Chain Choi procedure associated with the ChainChoi.exe program

ConsolidRateMode – Consolid Rate Mode procedure associated with ConsolidRateMode.jar

consol - consolidation

Extract - extraction procedure of tonnes, empty and loaded vehicle matrices associated with extract.exe program

LogMod or STD - Standard Logistics Module

MAT - extension for matrix file produced in Cube (binary format), also referred as Voyager Matrix.

MergeRep is a procedure to merge all .rep files that ChainChoi produces into a unique .rep file. Associate to Mergerep.exe program

Mode - aggregate mode used in chains. See section 14 Appendices in Samgods 1.2.3 User manual for further details

MSA algorithm - Method of Successive Averages algorithm

ORIGCAP - Initial capacity in rail links provided with input capacity table

PWC matrices - Production Warehouse Consumption matrices

S/A user - Standard User / Advance User

RCM - Rail Capacity Management Module

Submode - submode (vehicle type) used in mode. See section 14 Appendices in Samgods 1.2.3 User manual for further details.

V/C is the flow volume over capacity ratio for rail flows.

NORIG - the node number in Emme numbering format.

SCBSTANN - region code for Swedish zones and univocal number for the other countries.

Vessel or **Vessel Type** - vehicle type for sea mode

Vehicle type - type of vehicle described in the model. 5 types for road mode, 8 types for rail mode, 21 types for sea mode and one for air.

VY - Voyager

Warm start - start the model from a defined LP solution instead of ng from nothing.

.314 - extension for matrix file in Emme numbering format, e.g. format derived by EMME software

{CATALOG_DIR} - the directory where the .cat file is located

{SCENARIO_DIR} - the directory where the scenario folder is located

{SCENARIO_CODE} - the code associated with a specific scenario and specified during the creation under the scenario window

{SCENARIO_SHORTNAME} - the scenario name under the scenario tree present in the scenario window

2 The file structure

The file structure for the model is shown in Table 1.

Table 1 - Folder structure of the model.

Catalog Folder	First Level	Second Level	Third Level	Fourth Level	Description
{CATALOG_DIR}	SamGods_v123.cat Outputs_Calibration_Template_rev11.xlsm				Catalog file: main file to access to the entire model Excel file with a template for statistics in calibration
{CATALOG_DIR}	01_Programs				Folder for the external programs (LOGMOD and RCM). At this level, Samgods_Parallelization_Module.jar and its input files are present. The other external programs reside in subfolders. For a full list of files and an understanding of structure and programs, please refer to the documentation for each program, for example, reference 1, reference 2 on section 6.10.
{CATALOG_DIR}	01_Programs	LogMod			Folder and subfolders with executables for different programs. Executables are placed in respective subfolders together with control files. The files in the LogMod folder are: • execution_times_logmod.txt - run time associated to each commodity. Used in parallelize LogMod run • Samgods_Parallelization_Module.jar - program to parallelize LogMod and extract procedure
{CATALOG_DIR}	01_Programs	LogMod	BUILDCHAIN		Folder containing executable files: • BuildChain.exe - First program of Standard Logistics Module or RCM and control files: • select.dat • logselect.dat

Catalog Folder	First Level	Second Level	Third Level	Fourth Level	Description
					for selection of detailed cost and volume output. The following control files: • BuildChain_Common.ctl • BuildChain_Special.ctl • BUILDCHAINNN.ctl are produced by the model and saved under the scenario folder (NN being the commodity group number). Therefore, they are not present in the general folder.
{CATALOG_DIR}	01_Programs	LogMod	ChainChoi		Folder containing executable files: • ChainChoi.exe - Second program of Standard Logistics Module or RCM • LP2CC.exe - Last program in RCM to derive the final solution in Standard Logistics module format • ConsolidRateMode.jar - third program of Standard Logistics Module and a control file: • Select.dat for the selection of detailed cost and volume output. The following control files: • ChainChoi_Common.ctl • ChainChoi_Special.ctl • CHAINCHOINN.ctl are produced by the model and saved under the scenario folder (NN being the commodity group number). Therefore, they are not present in the general folder
{CATALOG_DIR}	01_Programs	LogMod	EXTRACT		The model produces a folder containing the executable file extract.exe to extract OD vehicles, empty vehicles, and tonnes in EMME format. These are saved under the

Catalog Folder	First Level	Second Level	Third Level	Fourth Level	Description
					scenario folder. Therefore, they are absent in the general folder.
{CATALOG_DIR}	01_Programs	LogMod	Input		The main folder for all the relevant inputs
{CATALOG_DIR}	01_Programs	LogMod	Input	PWC\2019\VY_F PWC\2045\VY_F PWC\2045_S0\VY_F	PWC matrices in Voyager format. Files present if "PWC matrices" application has been run
{CATALOG_DIR}	01_Programs	LogMod	LOG		The folder can be found in the scenario folder and contains report files from the Logistics Module and RCM. These are saved under the scenario folder. Therefore, they are absent in the general folder.
{CATALOG_DIR}	01_Programs	LogMod	MERGEREP		Folder containing the executable for Mergerep procedure mergerep.exe. These are saved under the scenario folder. Therefore, they are absent in the general folder.
{CATALOG_DIR}	01_Programs	LogMod	RCM		Folder containing the executable files: • clp64.exe - free software for linear programming problem • MPS.jar - executable to prepare inputs for lp_solve.exe and to extract results from the output • SelectDirect.jar – executable used to perform select link analysis
{CATALOG_DIR}	02_Applications				The main folder for all the applications defined in the model
{CATALOG_DIR}	02_Applications	1_Editing			Folder for "Create the editable files" and "Edit the data" applications
{CATALOG_DIR}	02_Applications	1_Editing	Capacity		Folder for the subgroup "Rail Capacity Checks" in the "Edit the data" application

Catalog Folder	First Level	Second Level	Third Level	Fourth Level	Description
{CATALOG_DIR}	02_Applications	1_Editing	Comparison		Folder for the subgroup “Compare Nodes and Node_terminals” in the “Edit the data” application
{CATALOG_DIR}	02_Applications	1_Editing	Numbering		Folder for the subgroup “Numbering System” in the “Edit the data” application
{CATALOG_DIR}	02_Applications	1_Editing	Regions		Folder for the subgroup “Regions for links” in the “Edit the data” application
{CATALOG_DIR}	02_Applications	2_Run			Folder for the main application, “Samgods Model.”
{CATALOG_DIR}	02_Applications	2_Run	Ass_VY		Folder for the subgroup “Assignment” in the “Samgods Model” and other subgroups for this application: • Conversion from LogMod to VY • Road Assignment • Rail Assignment • Sea Assignment • Air Assignment
{CATALOG_DIR}	02_Applications	2_Run	Calibr		Folder for the subgroup “Parameters Calculation” in the “Samgods Model” application
{CATALOG_DIR}	02_Applications	2_Run	Costs_VY		Folder for the subgroup “LOS Calculation” in the “Samgods Model” and other subgroups for this application: • Data preparation • Tax Calculation • Road • Rail • Sea • Air • Conversion from VY-matrices to LogMod-matrices in emme format
{CATALOG_DIR}	02_Applications	2_Run	Ini		Folder for the subgroup “Initialization” in the “Samgods Model” application

The file structure

Catalog Folder	First Level	Second Level	Third Level	Fourth Level	Description
{CATALOG_DIR}	02_Applications	2_Run	LogisticModVY		Folder for the subgroup “Logistic Module” in the “Samgods Model” and other subgroups for this application: • Prepare data • Prepare data second part • Prepare data third part • Run the logistic model • Save reports
{CATALOG_DIR}	02_Applications	2_Run	Results		Folder for the subgroup “Results” in the “Samgods Model” and other subgroups for the application: • Results 1.0 • Port Areas • GIS maps by commodity group • Öresund Kiel and Jylland • Reports per geographical aggregation
{CATALOG_DIR}	02_Applications	3_Compare			Folder for the “Compare” application and subgroups: • LOS matrices • Assignment
{CATALOG_DIR}	02_Applications	3_Compare	OD_matrices		Folder for the subgroup “OD matrices” inside “Compare” in the “Samgods Model”
{CATALOG_DIR}	02_Applications	4_Handling			Folder for the main application “Handling Scenario” and subgroups: • Delete • Compact • Scenario export • Model Export • General tables • Create the new base • Create new scenario specific tables • Scenario import

Catalog Folder	First Level	Second Level	Third Level	Fourth Level	Description
{CATALOG_DIR}	02_Applications	4_Handling	Original		Folder with the empty catalog used as a template during the creation of a new model
{CATALOG_DIR}	02_Applications	4_Handling	Scenario_tables		Folder with scenario tables used in comparison with the new base. File produced during "Handling Scenario" application and saved under the scenario folder. Therefore, they are absent in the general folder.
{CATALOG_DIR}	02_Applications	5_Installation			Folder for the “Installation” application
{CATALOG_DIR}	02_Applications	6_PWC_matrices			Folder for the “PWC_Matrices” application
{CATALOG_DIR}	02_Applications	7_Matrix_form			Folder for the “Change matrix format” application
{CATALOG_DIR}	02_Applications	09_RCM1			Folder for the subgroup “Rail Capacity Management” in the “Samgods Model” and other subgroups for this application: • Warm start
{CATALOG_DIR}	02_Applications	09_RCM1	Ass_VY		Folder for the subgroup “RCM Assignment” in the “Samgods Model” and other subgroups for this application: • Conversion from LogMod matrices to VY matrices • Road Assignment RCM • Rail Assignment RCM • Sea Assignment RCM • Air Assignment RCM
{CATALOG_DIR}	02_Applications	09_RCM1	Dataprep_LP		This is the folder for the subgroup “Data Preparation LP” inside “Rail Capacity Management” in the “Samgods Model.”
{CATALOG_DIR}	02_Applications	09_RCM1	Final		Folder for the subgroup “Run Final Process” inside “Rail Capacity Management” in the “Samgods Model” and other subgroups for this application: • Prepare control files

The file structure

Catalog Folder	First Level	Second Level	Third Level	Fourth Level	Description
					• Run the final process • Save Reports
{CATALOG_DIR}	02_Applications	09_RCM1	LP		This is the folder for the subgroup “LP Loop” inside “Rail Capacity Management” in the “Samgods Model.”
{CATALOG_DIR}	02_Applications	09_RCM1	LP	LP0	Folder for the subgroup “LP0 step” inside “LP Loop” in the “Samgods Model” and other subgroups for this application: • Prepare CTL files - Extract procedure
{CATALOG_DIR}	02_Applications	09_RCM1	LP	LP1	Folder for subgroup “LP1+ step” inside “LP Loop” in the “Samgods Model” and other subgroups for this application: • Prepare CTL files • Run BuildChain4RCM and ChainChoi4RCM • Run MPS, LP and Extract • Check convergence
{CATALOG_DIR}	02_Applications	09_RCM1	Results		Folder for subgroup “Results RCM” in the “Samgods Model” and other subgroups for the application: • Report 1.0 • Port Areas • GIS maps by commodity group • Öresund Kiel and Jylland • Rail Capacity • Reports per geographical aggregation
{CATALOG_DIR}	02_Applications	10_SelectLink			Folder with application and intermediate files for the " Select Link Analysis " application
{CATALOG_DIR}	02_Applications	11_CBA			Folder for application “Cost Benefit Analysis – ASEK values”
{CATALOG_DIR}	02_Applications	11_CBA	LP2CC		Folder for subgroup “CBA Analysis.”

Catalog Folder	First Level	Second Level	Third Level	Fourth Level	Description
{CATALOG_DIR}	02_Applications	12_Elasticity			Folder for application “Elasticity module”
{CATALOG_DIR}	02_Applications	12_Elasticity	1_Run		LOS calculation and STD logmod stages for “Elasticity module”
{CATALOG_DIR}	02_Applications	12_Elasticity	1_Run	1_Ini	Analogous to 02_Apllications\2_Run\Ini
{CATALOG_DIR}	02_Applications	12_Elasticity	1_Run	2_Costs	Analogous to 02_Apllications\2_Run\Costs_VY
{CATALOG_DIR}	02_Applications	12_Elasticity	1_Run	3_LogisticMod	Analogous to 02_Apllications\2_Run\LogisticModVY
{CATALOG_DIR}	02_Applications	12_Elasticity	1_Run	4_AssSTD	Analogous to 02_Apllications\2_Run\Ass_VY
{CATALOG_DIR}	02_Applications	12_Elasticity	1_Run	5_Results STD	Analogous to 02_Apllications\2_Run\Results
{CATALOG_DIR}	02_Applications	12_Elasticity	2_RCM		RCM stage for “Elasticity module”
{CATALOG_DIR}	02_Applications	12_Elasticity	2_RCM	1_DataPrepar_LP	Analogous to 02_Apllications\9_RCM1\Dataprep_LP
{CATALOG_DIR}	02_Applications	12_Elasticity	2_RCM	2_LP_steps	Analogous to 02_Apllications\9_RCM1\Dataprep_LP
{CATALOG_DIR}	02_Applications	12_Elasticity	2_RCM	3_Final	Analogous to 02_Apllications\9_RCM1\Dataprep_LP
{CATALOG_DIR}	02_Applications	12_Elasticity	2_RCM	4_AssRCM	Analogous to 02_Apllications\9_RCM1\Ass_VY
{CATALOG_DIR}	02_Applications	12_Elasticity	2_RCM	5_Results RCM	Analogous to 02_Apllications\9_RCM1\Results
{CATALOG_DIR}	02_Applications	12_Elasticity	3_Elasticities		Elasticity calculation for STD and RCM stages
{CATALOG_DIR}	03_Gis_Data				Folder for shape files, geodatabase gdb Mxd files, Empty and layer file (.lyr)
{CATALOG_DIR}	04_Media				Folder for banners used in the interface
{CATALOG_DIR}	05_Input_Data				Folder for the main geodatabase, containing all the input data (networks, tables and scenario specific tables)

The file structure

Catalog Folder	First Level	Second Level	Third Level	Fourth Level	Description
{CATALOG_DIR}	05_Input_Data	Calibration			The folder contains calibration databases for Base2019 and MainSc2045.
{CATALOG_DIR}	06_Reports				This is a folder containing Rtf files with the model operating instructions and report files (.rep) shown in the data panel Scenario Reports section.
{CATALOG_DIR}	07_Python				Folder with Python scripts
{CATALOG_DIR}	08_Standalone				Folder with script for translation of maps to Arc GIS Pro.
{CATALOG_DIR}	Scenario_Tree				Folder for results from the model; it contains several subfolders specific by scenario

3 Input and output file reference

Here, we describe the input and output structure in Samgods.

3.1. File summary

The file list is organised per location. There is a main folder for the input data and an output folder for each scenario.

Under the folder {CATALOG_DIR}\05_Input_data\ there is the main geodatabase with all the input data, named Input_Data.mdb. The input data could be classified into the following classes:

1. General tables to define lookup values and calibration parameters.
2. Tables that represent the base values used in the model.
3. Tables representing the values differ from the base values and are related to a specific scenario. These are denoted scenario specific tables.
4. Tables to manage database version information.
5. Structural tables to manage the geographical information (managed by Cube).

Table 2 lists the content in the input data geodatabase and specifies the class for each object.

Table 2 - Input data in geodatabase.

Input name	Format	Class
A_CountyName	Table	1
A_default_frequencies	Table	
A_F2FTypes	Table	
A_LinkCategories	Table	
A_MainModeStatistics	Table	
A_Mode_Type	Table	
A_NodeClass	Table	
A_Par_Class	Table	
A_Port_areas	Table	
A_TrakBandel	Table	
A_Transfer_Type	Table	
A_Vessel_Type	Table	
A_Zoning_System	Table	
BuildChain_CONSOL	Table	
BuildChain_MODES	Table	
Chain_List_2019	Table	
Chain_List_2045	Table	
ChainChoice_MODES	Table	

Input name	Format	Class
CSTVARI	Table	
Direct_Access	Table	
Extract_parameters	Table	
Inzone_Distance	Table	
LBD_Ratio	Table	
Macros_EMME	Table	
MaxCapAndConsolExcept	Table	
Modes	Table	
Other_statistics	Table	
Port_statistics	Table	
SamGods_zones (and SamGods_zones_Shape_Index)	Stand-alone Feature class polygons	
V101_SpeedFlowCurves	Table	
V102_SpeedFlowCurves	Table	
Base2019	Five Tables (Network: Base2019_Link, Base2019_Link_SHAPE_Index, Base2019_Node, Base2019_Node_SHAPE_Index, Base2019_SpdCap)	
Frequency_Data_Base2019	Five Tables (Network: Frequency_Data_Base2019_Link, Frequency_Data_Base2019_Link_SHAPE_Index, Frequency_Data_Base2019_Node, Frequency_Data_Base2019_Node_SHAPE_Index, Frequency_Data_Base2019_SpdCap	
Cargo_Base2019	Table	
Node_terminals_Base2019	Table	
Nodes_Base2019	Table	
Nodes_Commodities_Base2019	Table	2
PropLink_Base2019	Table	
Rail_Capacity_Base2019	Table	
Scenarios_List	Table	
Tax_Category_Base2019	Table	
Tax_Country_Base2019	Table	
Tax_Link_Base2019	Table	
Toll_Link_Base2019	Table	
Vehicles_parameters_partA_Base2019	Table	
Vehicles_parameters_partB_Base2019	Table	
General_Base2019	Table	3

Input name	Format	Class
LogMod_Base2019	Table	
Sc_Base2019_Cargo	Table	
SC_Base2019_Frequency_Data_Link	Table	
SC_Base2019_Frequency_Data_Node	Table	
SC_Base2019_Link	Table	
SC_Base2019_Node	Table	
SC_Base2019_Node_Terminals	Table	
SC_Base2019_Nodes	Table	
SC_Base2019_Nodes_commodities	Table	
Sc_Base2019_PropLink	Table	
Sc_Base2019_Rail_Capacity	Table	
Sc_Base2019_Tax_Category	Table	
Sc_Base2019_Tax_Country	Table	
Sc_Base2019_Tax_Link	Table	
Sc_Base2019_Toll_Link	Table	
SC_Base2019_Vehicles_parameters_PartA	Table	
SC_Base2019_Vehicles_parameters_PartB	Table	
History	Table	4
Model_description	Table	
CITILABS_NETWORKS	Table	5
CITILABS_TRANSITGROUPS	Table	
GDB_ColumnInfo	Table	
GDB_DatabaseLocks	Table	
GDB_GeomColumns	Table	
GDB_ItemRelationships	Table	
GDB_ItemRelationshipTypes	Table	
GDB_Items	Table	
GDB_Items_Shape_Index	Table	
GDB_ItemTypes	Table	
GDB_ReplicaLog	Table	
GDB_SpatialRefs	Table	

Under the folder {CATALOG_DIR}\05_Input_data\Calibration two geodatabase files:

- Input_Data_Calibration_Base2019.mdb and
- Input_Data_Calibration_Base2045.mdb

Section 6.8 describes the calibration process, and section 3.3 describes the structure of each table.

Table 3 lists the content in the input data calibration geodatabases.

Table 3 - Input data calibration geodatabases.

Input name	Format	Notes
Base2019_Link, MainSc2045_Link	Table	Same table as the one present in Input_data.mdb
KielCanal_Parameter_Base2019, KielCanal_Parameter_MainSc2045	Table	Values 2.2 and 3.2 respectively
Locked_2019, Locked_2045 and Locked_2045_Xore	Table	Different entries for each scenario
Nodes_Base2019, Nodes_MainSc2045	Table	Same table
Parameters_Kielcalibration	Table	Present only in Input_Data_Calibration_Base2019.mdb
Parameters_portcalibration	Table	Present only in Input_Data_Calibration_Base2019.mdb
PortAreaParams_16_Comm_Base2019, PortAreaParams_16_Comm_MainSc2045	Table	Same table
Rail_Capacity_Base2019, Rail_Capacity_MainSc2045	Table	66 entries in Base2019 and no entries in MainSc2045. NB- the two entries in MainSc2045 have no effects (see section 6.9 for details)
Tax_Country_Base2019, Tax_Country_MainSc2045	Table	The same table with empty entries (see section 6.9 for details)
Tax_Link_Base2019, Tax_Link_MainSc2045	Table	36 entries in MainSc2045 and no entries in Base2019
Toll_Link_Base2019, Toll_Link_MainSc2045	Table	146 entries in Base2019 and 176 in MainSc2045
Vehicles_parameters_PartA_Base2019, Vehicles_parameters_PartA_MainSc2045	Table	Same table as the one present in Input_data.mdb
Vehicles_parameters_PartB_Base2019, Vehicles_parameters_PartB_MainSc2045	Table	Same table as the one present in Input_data.mdb

Under each scenario folder, for instance {CATALOG_DIR}\Scenario_Tree\Year_2019\Base2019, the following content will be present:

- one or more LogMod_Y folders, where Y refers to the cycling process for calibration (or scenario ID in elasticity test). For a standard user, this will always be LogMod_1. This folder contains all the standard outputs from the Logistics and Rail Capacity Management modules. Chapter 2 describes the file system and structure.
- one folder ABS_GIS{SCENARIO_SHORTNAME}. Inside the folder will be present personal geodatabase (gdb format) and related map document mxd that could be used in ArcGIS (without a Cube licence) (see section 3.4.8.7 for file list)

- one folder DIFF_GIS2045_2019 with personal geodatabase (gdb format) and related map document mxd that could be used in ArcGIS (without a Cube licence) on differences between scenarios (see section 3.4.8.7 for file list)
- one folder SelectLink with several subfolders depending on the number of Select link analysis performed by the user (see section 3.4.8.6 for file list)
- the output files (the ones produced depending on user choices) are listed in Table 4. In this example, the scenario is Base2019. A different scenario will have the same output files with the scenario name included in the file name; for instance, Output0_Base2019.mdb will be Output0_Base2019R62.mdb if the scenario is Base2019R62. In the next table and the rest of the document, we will refer to {SCENARIO_SHORTNAME} to highlight this concept.

Table 4 - List of outputs under the scenario folder. Note that in the table below, X represents the commodity group number.

File name	Output name	Format
Outputo_{SCENARIO_SHORTNAME}.mdb	Model_description	Table
	outputs	Table
	Node_labels	Table
	ProprLink_{SCENARIO_SHORTNAME}	Table
	LOAD_NET_ROAD_0	Network (5 Tables)
	LOAD_NET_RAIL_0	Network (5 Tables)
	LOAD_NET_SEA_0	Network (5 Tables)
	LOAD_NET_AIR_0	Network (5 Tables)
	Loaded_Net_0	Network (5 Tables)
	Loaded_Bid_0	Network (5 Tables)
	CHAIN_OD_COV_{SCENARIO_SHORTNAME}_0_1	Table
	COM_L_D_{SCENARIO_SHORTNAME}_0_1	Table
	VHCL_OD_COV_{SCENARIO_SHORTNAME}_0_1	Table
	COM_{Select_commodity}_{Scenario_ShortName}_{ScenarioC_name}	Network
	Report_1_{SCENARIO_SHORTNAME}_0	Table
	Report_3_TonKM_perMode_0	Table
	Report_4_{SCENARIO_SHORTNAME}_0	Table
	Report_5_{SCENARIO_SHORTNAME}_0	Table
	Report_6_{SCENARIO_SHORTNAME}_0	Table
	Report_6b_{SCENARIO_SHORTNAME}_0	Table
	Report_7_{SCENARIO_SHORTNAME}_0	Table
	Report_8_{SCENARIO_SHORTNAME}_0	Table
	Report_9_{SCENARIO_SHORTNAME}_0	Table
	Report_10_{SCENARIO_SHORTNAME}_0	Table
	Report_11_{SCENARIO_SHORTNAME}_0	Table
	Report_12_{SCENARIO_SHORTNAME}_0	Table
	Report_13_Portarea_0_STD	Table
	Report_14_Oresund_Kiel_0_STD	Table
	Report_16_{SCENARIO_SHORTNAME}_0	Table

File name	Output name	Format
	Report_17_{SCENARIO_SHORTNAME}_0	Table
	Report_18_{SCENARIO_SHORTNAME}_0	Table
	Report_19_{SCENARIO_SHORTNAME}_0	Table
	LOAD_NET_ROAD_RCM	Network (5 Tables)
	LOAD_NET_RAIL_RCM	Network (5 Tables)
	LOAD_NET__SEA_RCM	Network (5 Tables)
	LOAD_NET__AIR_RCM	Network (5 Tables)
	Loaded_Net_RCM	Network (5 Tables)
	Rail_BiDir	Network (5 Tables)
	Compare_Bid	Network (5 Tables)
	GBD	10 Tables
	Loaded_Bid_RCM	Network (5 Tables)
	CHAIN_OD_COV_{SCENARIO_SHORTNAME}_RCM_1	Table
	COM_L_D_{SCENARIO_SHORTNAME}_RCM_1	Table
	VHCL_OD_COV_{SCENARIO_SHORTNAME}_RCM_1	Table
	COMR_{Scenario_ShortName}_{ScenarioC_name}	Network
	Report_1_{SCENARIO_SHORTNAME}_RCM	Table
	Report_3_TonKM_perModeRCM	Table
	Report_4_{SCENARIO_SHORTNAME}_RCM	Table
	Report_5_{SCENARIO_SHORTNAME}_RCM	Table
	Report_6_{SCENARIO_SHORTNAME}_RCM	Table
	Report_6b_{SCENARIO_SHORTNAME}_RCM	Table
	Report_7_{SCENARIO_SHORTNAME}_RCM	Table
	Report_8_{SCENARIO_SHORTNAME}_RCM	Table
	Report_9_{SCENARIO_SHORTNAME}_RCM	Table
	Report_10_{SCENARIO_SHORTNAME}_RCM	Table
	Report_11_{SCENARIO_SHORTNAME}_RCM	Table
	Report_12_{SCENARIO_SHORTNAME}_RCM	Table
	Report_13_Portarea_RCM	Table
	Report_14_Oresund_Kiel_RCM	Table

Input and output file reference

File name	Output name	Format
	Report_15_RailLinksRMC	Table
	Report_16_{SCENARIO_SHORTNAME}_RCM	Table
	Report_17_{SCENARIO_SHORTNAME}_RCM	Table
	Report_18_{SCENARIO_SHORTNAME}_RCM	Table
	Report_19_{SCENARIO_SHORTNAME}_RCM	Table
	Report_21_{SCENARIO_SHORTNAME}_RCM	Table
	CHAIN_OD_COV_{SCENARIO_SHORTNAME}_CBA_1	Table
	COM_L_D_{SCENARIO_SHORTNAME}_CBA_1	Table
	VHCL_OD_COV_{SCENARIO_SHORTNAME}_CBA_1	Table
	Report_5_{SCENARIO_SHORTNAME}_CBA	Table
	Report_6_{SCENARIO_SHORTNAME}_CBA	Table
	Report_6b_{SCENARIO_SHORTNAME}_CBA	Table
	Report_7_{SCENARIO_SHORTNAME}_CBA	Table
	Report_8_{SCENARIO_SHORTNAME}_CBA	Table
	Report_10_{SCENARIO_SHORTNAME}_CBA	Table
	Report_11_{SCENARIO_SHORTNAME}_CBA	Table
	Report_12_{SCENARIO_SHORTNAME}_CBA	Table
	Report_19_{SCENARIO_SHORTNAME}_CBA	Table
	Report_20_{SCENARIO_SHORTNAME}_CBA	Table
	Vehicles_loaded_and_empty_witin_Swedish_territory_CBA	Table
	Costs_D_I_X_T_{SCENARIO_SHORTNAME}_CBA	Table
	CITILABS_NETWORKS	Table
	CITILABS_TRANSITGROUPS	Table
	COMMODITYFLows	Network
	COMMODITYFLowsSTD	Table
COST_ROAD_{SCENARIO_SHORTNAME}.MAT		Voyager Matrix
COST_RAIL_{SCENARIO_SHORTNAME}.MAT		Voyager Matrix
COST_SEA_{SCENARIO_SHORTNAME}.MAT		Voyager Matrix
COST_AIR_{SCENARIO_SHORTNAME}.MAT		Voyager Matrix
ROAD_VHCLFLOWo_{SCENARIO_SHORTNAME}.MAT		Voyager Matrix

File name	Output name	Format
RAIL_VHCLFLOWo_{SCENARIO_SHORTNAME}.MAT		Voyager Matrix
SEA_VHCLFLOWo_{SCENARIO_SHORTNAME}.MAT		Voyager Matrix
AIR_VHCLFLOWo_{SCENARIO_SHORTNAME}.MAT		Voyager Matrix
ROAD_TONo_{SCENARIO_SHORTNAME}.MAT		Voyager Matrix
RAIL_TONo_{SCENARIO_SHORTNAME}.MAT		Voyager Matrix
SEA_TONo_{SCENARIO_SHORTNAME}.MAT		Voyager Matrix
AIR_TONo_{SCENARIO_SHORTNAME}.MAT		Voyager Matrix
ROAD_EMPo_{SCENARIO_SHORTNAME}.MAT		Voyager Matrix
RAIL_EMPo_{SCENARIO_SHORTNAME}.MAT		Voyager Matrix
SEA_EMPo_{SCENARIO_SHORTNAME}.MAT		Voyager Matrix
AIR_EMPo_{SCENARIO_SHORTNAME}.MAT		Voyager Matrix
ROAD_VHCLFLOW_FIN_{SCENARIO_SHORTNAME}.MAT		Voyager Matrix
RAIL_VHCLFLOW_FIN_{SCENARIO_SHORTNAME}.MAT		Voyager Matrix
SEA_VHCLFLOW_FIN_{SCENARIO_SHORTNAME}.MAT		Voyager Matrix
AIR_VHCLFLOW_FIN_{SCENARIO_SHORTNAME}.MAT		Voyager Matrix
ROAD_TON_FIN_{SCENARIO_SHORTNAME}.MAT		Voyager Matrix
RAIL_TON_FIN_{SCENARIO_SHORTNAME}.MAT		Voyager Matrix
SEA_TON_FIN_{SCENARIO_SHORTNAME}.MAT		Voyager Matrix
AIR_TON_FIN_{SCENARIO_SHORTNAME}.MAT		Voyager Matrix
ROAD_EMP_FIN_{SCENARIO_SHORTNAME}.MAT		Voyager Matrix
RAIL_EMP_FIN_{SCENARIO_SHORTNAME}.MAT		Voyager Matrix
SEA_EMP_FIN_{SCENARIO_SHORTNAME}.MAT		Voyager Matrix
AIR_EMP_FIN_{SCENARIO_SHORTNAME}.MAT		Voyager Matrix
Scenario_Data.mdb		Database
Scenario_Data.vpr		Visual project file (GRAPHICS)
Input_data.mxd		Visual project map file (GIS)
Input_data.mxr		File index
CalParameter_Loop_1.txt		Text File
CalParameter_Loop_2.txt		Text File
CalParameterNextLoop.txt		Text File

Input and output file reference

File name	Output name	Format
FINAL_NETWORK_{SCENARIO_SHORTNAME}.NET		Binary Network
ParKiel_ini.txt		Text File
ParKiel_{SCENARIO_SHORTNAME}.txt		Text File
REPORT_ED_{SCENARIO_SHORTNAME}.txt		Text File
REPORT_SG_{SCENARIO_SHORTNAME}.txt		Text File
Differences_{SCENARIO_SHORTNAME}.csv		CSV File
PortAreaParams_16_Comm.txt		CSV File
EMME_NET_{SCENARIO_SHORTNAME}.211		Emme file
V101_102_LINK_SPEEDS.DAT		DAT File
General_Table_{SCENARIO_SHORTNAME}.DBF		Dbase File
Capacity_table_{SCENARIO_SHORTNAME}.DBF		Dbase File
Nodes.DBF		Dbase File
Parameters_Kielcalibration.dbf		Dbase File
Parameters_portcalibration.dbf		Dbase File
Rail_capacities_STD_{SCENARIO_SHORTNAME}.DBF		Dbase File
RENUM_NODES.DBF		Dbase File
Scaling_Nodes. DBF		Dbase File
Scaling_PartA. DBF		Dbase File
Scaling_PartB. DBF		Dbase File
Scaling_Rail_Capacity. DBF		Dbase File
Scaling_speed_network.dbf		Dbase File
Scaling_Tax_country. DBF		Dbase File
Scaling_Tax_Link. DBF		Dbase File
Scaling_Toll_link. DBF		Dbase File
Tax_by_Link_{SCENARIO_SHORTNAME}.DBF		Dbase File
Tax_Category_{SCENARIO_SHORTNAME}.DBF		Dbase File
Tax_Country_{SCENARIO_SHORTNAME}.DBF		Dbase File
Toll_by_link_{SCENARIO_SHORTNAME}.DBF		Dbase File
Vh_par_fin_1_8_{SCENARIO_SHORTNAME}.DBF		Dbase File
Vh_par_fin_9_16_{SCENARIO_SHORTNAME}.DBF		Dbase File

File name	Output name	Format
Vh_par_tot.DBF		Dbase File
Vhl_par_PartA.DBF		Dbase File
ChainChoio_{SCENARIO_SHORTNAME}.rep		Report File
ChainChoio_{SCENARIO_SHORTNAME}FIN.rep		Report File
Calibration_1.txt		Text File
CBA_Final_report_{SCENARIO_SHORTNAME}.txt		Text File
Check_overcapacity_{SCENARIO_SHORTNAME}.txt		Text File
chainchoiCBAo_{SCENARIO_SHORTNAME}.rep		Text File
Output_CMD_STD_GIS_TON.mxd		Visual project map file (GIS)
Output_CMD_STD_GIS_VHCL.mxd		Visual project map file (GIS)
Output_CMD_RCM_GIS_TON.mxd		Visual project map file (GIS)
Output_CMD_RCM_GIS_VHCL.mxd		Visual project map file (GIS)
{SCENARIO_SHORTNAME}_Catalogkeys.CSV		Report File
KielNextValue.txt		Text File
Locked_{SCENARIO_SHORTNAME}.dat		Table
Log_file_1.log		Text File
logfile_scenario.dat		Text File
PortArea_report_{SCENARIO_SHORTNAME}_Loop1 .csv		Table
PortArea_report_RCM_{SCENARIO_SHORTNAME}_Loop1.csv		Table
RMSE_loops.txt		Text File
Scaling		7 Dbase Files
V101_SpeedFlowCurves.DBF		Dbase File
V102_SpeedFlowCurves.DBF		Dbase File

3.2. Input data

We can categorise the input data into three categories.

- Lookup tables
- Base data
- Scenario specific data

There exists one and only one reference scenario described by the base data, and every other scenario refers to this scenario, showing their differences as scenario-specific data. The relation is explained in section 3.2.2.

3.2.1. Lookup tables

Here, the lookup tables are listed, including

- the content of the table,
- software requirements,
- the description of use in the model,
- editing options for the user and
- which part of the model is acting on the table?

3.2.1.1. A_CountyName

05_Input_data\Input_data.mdb\A_CountyName

The content of the table is listed in Table 5.

Table 5 - Format of "A_CountyName" table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
COUNTY	Numerical identifier of county	Integer	1
NAME	County name	String	Stockholm

Software Required: Microsoft Access, Cube Database Window (see Help -> Cube Base -> Database window), ArcMap, ArcCatalog.

Description of Use: Used in reporting phase to associate the county description to reports.

Editing Options: This does not need to be updated. (Only a new definition of county classification will require changes.)

Used by: "Reports per geographical aggregation" subgroup under "Samgods Model > Results > Results 1.0" and under "Samgods Model > Results RCM > Reports 1.0".

3.2.1.2. A_default_frequencies

05_Input_data\Input_data.mdb\A_default_frequencies

The content of the table is listed in Table 6.

Table 6 - Format of "A_default_frequencies" table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
ID_REL	Counter	Integer	1

Field	Description	Data Format	Example
TER_TYPE_O	Terminal code for origin	Integer	0
TER_TYPE_D	Terminal code for the destination	Integer	0
SYSTEM	Frequency System	Double	0
LORRY	Frequency Lorry	Double	84
WAGONLOAD	Frequency WaggonLoad	Double	0
RAILFERRY	Frequency RailFerry	Double	0
ROADFERRY	Frequency RoadFerry	Double	0
CON_VESSEL	Frequency ContainerVessel	Double	0
OTH_VESSEL	Frequency Other Vessels	Double	0.5
RORO_VESS	Frequency RororVessel	Double	0.2
COMBI	Frequency Combi	Double	0
AIR	Frequency Air	Double	5.0

Software Required: Microsoft Access, Cube Database Window (see Help -> Cube Base -> Database window), ArcMap, ArcCatalog.

Description of Use: Define the default frequencies for the frequency matrices based on the terminal type (road, rail, sea, ferry or air) per week.

Editing Options: Only needs to be updated in case of changes in the default frequencies.

Used by: "Frequency matrices" subgroup under "Edit the data > Create the tables specific of scenario" and "General tables" subgroup under "Handling scenario > Scenario Export".

3.2.1.3. A_F2FTypes

05_Input_data\Input_data.mdb\A_F2FTypes

The content of the table is listed in Table 7.

Table 7 - Format of "A_F2FTypes" table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
ID_F2F	ID for the firm to firm relationship	Integer	0
DESCRIPTIO	Description of the firm to firm relation	String	singular or transit

Software Required: Microsoft Access, Cube Database Window (see Help -> Cube Base -> Database window), ArcMap, ArcCatalog.

Description of Use: Define the type of relations between firm to firm in the PWC matrices.

Editing Options: No need to be updated.

Used by: "General tables" subgroup under "Handling scenario > Scenario Export".

3.2.1.4. A_LinkCategories

05_Input_data\Input_data.mdb\A_LinkCategories

The content of the table is listed in Table 8.

Table 8 - Format of "A_LinkCategories" table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
CATEGORY	Link category code	Integer	11
MODE_T	Description of the mode	String	Road
MODE	Code for allowed modes . Same coding is used in other tables with slightly a different labelling (MODE_L and MODE_N). _L and _N refer to type of element which MODE refers to, specifically _L is a link table and _N is a node table	Integer	1
ID_COUNTRY	Country code	Integer	1
GENERAL_MO	Description of the general mode as per table A_Mode_Type	String	Road
DESCRIPTIO	Description of infrastructure	String	Oresund Bridge
AREA	Description of geographical covered area	String	Baltic Sea

Software Required: Microsoft Access, Cube Database Window (see Help -> Cube Base -> Database window), ArcMap, ArcCatalog.

Description of Use: List of categories defined in the network and the associated country code. The main use is to derive the ID_COUNTRY code for each link in the network, e.g. geographical classification. Second use is to derive statistics at various levels in the reporting stage, such as vehiclekms and tonnekms per E10 roads (CATEGORY=11).

Editing Options: Add a new line for each new category defined in the network.

Used by: "Editable map data" and "Editable tables" subgroups under "Create the editable files", "Emme Edits" subgroup under "Edit the data > Create the tables specific of scenario", "Tax calculation" subgroup under "Samgods Model > LOS calculation > Data Preparation" and "General tables" subgroup under "Handling scenario > Scenario Export".

3.2.1.5. A_MainModeStatistics

05_Input_data\Input_data.mdb\A_MainModeStatistics

The content of the table is listed in Table 9.

Table 9 - Format of "A_MainModeStatistics" table.

Field	Description	Data Format	Example
ID	Counter	Integer	1
ROAD	Millions of domestic tonkm on road mode	Single	52.02
RAIL	Millions of domestic tonkm on rail mode	Single	22.72
SEA	Millions of domestic tonkm on sea mode	Single	29.61
REFYEAR	Year of statistics	Integer	2019

Software Required: Microsoft Access, Cube Database Window (see Help -> Cube Base -> Database window), ArcMap, ArcCatalog.

Description of Use: Official Statistics on domestic million tonkm by mode in Sweden. The values are used in creating the output tables “Report_3_TonKM_perMode_0” and “Report_3_TonKM_perMode_RCM”.

Editing Options: No need to be updated.

Used by: “Numbering System Voyager” subgroup under “under “Samgods Model > Results > Results 1.0” and under “Samgods Model > Results RCM > Results1.0”.

3.2.1.6. A_Mode_Type

05_Input_data\Input_data.mdb\A_Mode_Type

The content of the table is listed in Table 10.

Table 10 - Format of “A_Mode_Type” table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	5
MODE	Code for allowed modes	Integer	4
DESCRIPTIO	Description of mode	String	Ferry
GEN_MODE	General mode code	Integer	3
DESCR_GEN	Description of general mode	String	Sea

Software Required: Microsoft Access, Cube Database Window (see Help -> Cube Base -> Database window), ArcMap, ArcCatalog.

Description of Use: List of modes defined in the network and related MODE_L, MODE_N attributes in node and link tables.

Editing Options: No need to be updated. (Only the introduction of new general will require changes on this. This will impact all the model structure and require several amendments).

Used by: “Editable map data” subgroup under “Create the editable data”, “General tables” subgroup under “Handling scenario > Scenario Export” and graphical editor during the editing of the network. Is one of the codes mandatory to edit properly the network (other two are the country code and the region code).

3.2.1.7. A_NodeClass

05_Input_data\Input_data.mdb\A_NodeClass

The content of the table is listed in Table 11.

Table 11 - Format of “A_NodeClass” table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	10
ID	ID of node class	Integer	10
DESCRIPTIO	Description of node class	String	Road - regional system
RULE	Rule to define node number	String	From 20000 to 259999
MIN_V	Lower limit for node number	Double	20000

Field	Description	Data Format	Example
MAX_V	Upper limit for node number	Double	260000
MODE	Code for allowed modes	Integer	1
DES_MODE	Description of mode	String	Road – Domestic

Software Required: Microsoft Access, Cube Database Window (see Help -> Cube Base -> Database window), ArcMap, ArcCatalog.

Description of Use: List of node classes defined in the network. The initial network used has been developed in EMME with a list of rules for numbering. Those rules are described in this table. To derive new EMME numbers when the network is modified in Cube GIS window, those rules are applied.

Editing Options: No need to be updated. (Only the introduction of new general will require changes on this. This will impact all the model structure and require several amendments).

Used by: "Numbering System Voyager" subgroup under "Edit the data > Create the tables specific of scenario", "Tax calculation" subgroup under "Samgods Model > LOS calculation > Data Preparation" and "General tables" subgroup under "Handling scenario > Scenario Export".

3.2.1.8. A_Par_Class

05_Input_data\Input_data.mdb\A_Par_Class

The content of the table is listed in Table 12.

Table 12 - Format of "A_Par_Class" table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
CLASS	ID of node class	Integer	12
MIN_R	Minimum value for zones	Integer	1
MAX_R	Maximum value for zones	Integer	399

Software Required: Microsoft Access, Cube Database Window (see Help -> Cube Base -> Database window), ArcMap, ArcCatalog.

Description of Use: The hierarchic rule in EMME numbering has in the first three digits the region code. In this table are represented the minimum and maximum country code associated to the class of nodes present in A_NodeClass.

Editing Options: No need to be updated. (Only the introduction of new numbering system will require changes on this. This will impact all the model structure and require several amendments).

Used by: Not used in the system. Illustration purposes.

3.2.1.9. A_Port_areas

05_Input_data\Input_data.mdb\A_Port_areas

The content of the table is listed in Table 13.

Table 13 - Format of "A_Port_areas" table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	9
PortNodes_PortAreaNbr	Port area number	Integer	8
Description	Description of port area	String	Visby (Gotland)

Software Required: Microsoft Access, Cube Database Window (see Help -> Cube Base -> Database window), ArcMap, ArcCatalog

Description of Use: List of defined domestic port areas. The calibration of the model conducted, requires as input a table with scaling factors by port area and commodity group, respectively. Each domestic port belongs to a specific port area. This table defines them.

Editing Options: No need to be updated. (Only a new definition of port area classification will require changes on this).

Used by: "Port Areas" subgroup under "Samgods Model > Results > Results 1.0" and under "Samgods Model > Results RCM > Reports 1.0" and "General tables" subgroup under "Handling scenario > Scenario Export".

3.2.1.10. A_TrakBandel

05_Input_data\Input_data.mdb\A_TrakBandel

The content of the table is listed in Table 14.

Table 14 - Format of "A_TrakBandel" table.

Field	Description	Data Format	Example
OBJECTID	Record identifier	Integer	1
TrakBandel	Trak Bandel code	Integer	1110
Section_	Description of the section	String	Kiruna-Vassijaure
Corridor	Description of the corridors	String	Malmbanan
Tracks	Number of tracks	Integer	1
DaysPerYr	Operational days in a year	Double	365
Cap2040Öresund	Number of trains per day (bidirectional)	Double	99
Cap2012Öresund	Number of trains per day (bidirectional)	Double	56

Software Required: Microsoft Access, Cube Database Window (see Help -> Cube Base -> Database window), ArcMap, ArcCatalog.

Description of Use: List of trak bandel codes used in later reporting (COMMODITYFLows and maps "GIS map with Ktons per commodity group" and "GIS map with vhcl per commodity group").

Editing Options: No need to be updated. (Only a new definition of trakbandel will require changes on this).

Used by: Editable map data" subgroup under "Create the editable files" and "General tables" subgroup under "Handling scenario > Scenario Export".

3.2.1.11. A_Transfer_Type

05_Input_data\Input_data.mdb\A_Transfer_type

The content of the table is listed in Table 15.

Table 15 - Format of "A_Transfer_Type" table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
TRANSF_TYP	Transfer type code	Integer	1
DESCRIPTION	Description of transfer type	String	TransferRoadRoad

Software Required: Microsoft Access, Cube Database Window (see Help -> Cube Base -> Database window), ArcMap, ArcCatalog.

Description of Use: List of defined transfer types used in Nodes_Commodities_Base2019 table.

Editing Options: No need to be updated. (Only a new definition of transfer type will require changes on this).

Used by: Editable map data" subgroup under "Create the editable files" and "General tables" subgroup under "Handling scenario > Scenario Export".

3.2.1.12. A_Vessel_type

05_Input_data\Input_data.mdb\A_Vessel_type

The content of the table is listed in Table 16.

Table 16 - Format of "A_Vessel_type" table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
VES_TYPE	Vessel type code	Integer	1
DESCRIPTIO	Description of vessel type	String	containers

Software required: Microsoft Access, Cube Database Window (see Help -> Cube Base -> Database window), ArcMap, ArcCatalog.

Description of Use: List of vehicle types defined in the logistic chains (container and non-container).

Editing Options: No need to be updated. (Only a new definition of special vehicle type will require changes on this).

Used by: "General tables" subgroup under "Handling scenario > Scenario Export".

3.2.1.13. A_Zoning_System

05_Input_data\Input_data.mdb\A_Zoning_System

The content of the table is listed in Table 17.

Table 17 - Format of "A_Zoning_System" table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	2
COUNTRY_CO	Country code, later referred as ID_COUNTRY	Integer	1
REGION_COD	Region code later referred as ID_REGION	Integer	115
COUNTRY	Country description	String	Sweden

Field	Description	Data Format	Example
REGION	Region description	String	Vallentuna
CENTROID_C	Centroid code in Emme format	Integer	711500
SCBSTANN	Scbstann code	Integer	115
SWEDEN	Boolean variable indicating if the zone is in Sweden	Integer	1

Software required: Microsoft Access, Cube Database Window (see Help -> Cube Base -> Database window), ArcMap, ArcCatalog.

Description of Use: List of zones and related country, region and scbstann codes.

Editing Options: No need to be updated (a revision of zoning system would impact all the model, therefore for normal usage of the model is not recommended to change this).

Used by: "Editable tables" subgroup under "Create the editable files", "Numbering System Voyager" subgroup under "Edit the data > Create the tables specific of scenario", "Tax calculation" subgroup under "Samgods Model > LOS calculation > Data Preparation", "Reports per geographical aggregation" subgroup under "Samgods Model > Results > Results 1.0" and under "Samgods Model > Results RCM > Reports 1.0" and "General tables" subgroup under "Handling scenario > Scenario Export".

3.2.1.14. BuildChain_CONSOL

05_Input_data\Input_data.mdb\BuildChain_CONSOL

The content of the table is listed in Table 18.

Table 18 - Format of "BuildChain_CONSOL" table.

Field	Description	Data Format	Example
ID	Counter	Integer	1
MODE_C	Sub-mode[1]	String	A
CONSOL_L	default lower bound	Double	0.4
CONSOL_U	default upper bound	Double	0.6
Mode	Description	String	Road
ID_MODE	Associated number to mode	Integer	1
CONSOL_L01	lower bound for Commodity group 1	Double	-1
CONSOL_U01	upper bound for Commodity group 1	Double	-1
CONSOL_L02	lower bound for Commodity group 2	Double	-1
CONSOL_U02	upper bound for Commodity group 2	Double	-1
CONSOL_L03	lower bound for Commodity group 3	Double	-1
CONSOL_U03	upper bound for Commodity group 3	Double	-1
CONSOL_L04	lower bound for Commodity group 4	Double	-1
CONSOL_U04	upper bound for Commodity group 4	Double	-1

[1] See Table A-2 in the User manual for full list of sub-modes and vehicle types

Field	Description	Data Format	Example
CONSOL_L05	lower bound for Commodity group 5	Double	-1
CONSOL_U05	upper bound for Commodity group 5	Double	-1
CONSOL_L06	lower bound for Commodity group 6	Double	-1
CONSOL_U06	upper bound for Commodity group 6	Double	-1
CONSOL_L07	lower bound for Commodity group 7	Double	-1
CONSOL_U07	upper bound for Commodity group 7	Double	-1
CONSOL_L08	lower bound for Commodity group 8	Double	-1
CONSOL_U08	upper bound for Commodity group 8	Double	-1
CONSOL_L09	lower bound for Commodity group 9	Double	-1
CONSOL_U09	upper bound for Commodity group 9	Double	-1
CONSOL_L10	lower bound for Commodity group 10	Double	-1
CONSOL_U10	upper bound for Commodity group 10	Double	-1
CONSOL_L11	lower bound for Commodity group 11	Double	-1
CONSOL_U11	upper bound for Commodity group 11	Double	-1
CONSOL_L12	lower bound for Commodity group 12	Double	-1
CONSOL_U12	upper bound for Commodity group 12	Double	-1
CONSOL_L13	lower bound for Commodity group 13	Double	-1
CONSOL_U13	upper bound for Commodity group 13	Double	-1
CONSOL_L14	lower bound for Commodity group 14	Double	-1
CONSOL_U14	upper bound for Commodity group 14	Double	-1
CONSOL_L15	lower bound for Commodity group 15	Double	-1
CONSOL_U15	upper bound for Commodity group 15	Double	-1
CONSOL_L16	lower bound for Commodity group 16	Double	-1
CONSOL_U16	upper bound for Commodity group 16	Double	-1

Software Required: Microsoft Access, Cube Database Window (see Help -> Cube Base -> Database window), ArcMap, ArcCatalog.

Description of Use: The consolidation factors, specified as two values representing an allowed range, in this table are specified for all the commodities (CONSOL_L and CONSOL_U) and for each commodity groups. If under each commodity group is placed a “-1” value, the proper number will be derived from default values (CONSOL_L and CONSOL_U). A mechanism within the model will pull together the appropriated combination of values under each BuildChainXX.ctl file.

Editing Options: Instructions on setting up different values for different scenarios has been explained in User Manual 6.1. The table could be copied via Data Manager and opened in dbf window in GUI interface. Its reference is controlled by catalog key "Consolidation factors table".

Used by: “Prepare Data third part” subgroup under “Samgods Model > Logistics Module” and “General tables” subgroup under “Handling scenario > Scenario Export”.

3.2.1.15. BuildChain_MODES

05_Input_data\Input_data.mdb\BuildChain_MODES

The content of the table is listed in Table 19.

Table 19 - Format of "BuildChain_MODES" table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
ID_COMM	Commodity group	Integer	1
A	Main vehicle type for chain type A	Integer	104
B	Main vehicle type for chain type B	Integer	102
C	Main vehicle type for chain type C	Integer	104
D	Main vehicle type for chain type D	Integer	201
E	Main vehicle type for chain type E	Integer	202
F	Main vehicle type for chain type F	Integer	208
G	Main vehicle type for chain type G	Integer	202
H	Main vehicle type for chain type H	Integer	208
I	Main vehicle type for chain type I	Integer	204
J	Main vehicle type for chain type J	Integer	0
K	Main vehicle type for chain type K	Integer	0
L	Main vehicle type for chain type L	Integer	0
M	Main vehicle type for chain type M	Integer	310
N	Main vehicle type for chain type N	Integer	315
O	Main vehicle type for chain type O	Integer	317
P	Main vehicle type for chain type P	Integer	319
Q	Main vehicle type for chain type Q	Integer	322
R	Main vehicle type for chain type R	Integer	401
T	Main vehicle type for chain type T	Integer	205
U	Main vehicle type for chain type U	Integer	206
c_1	Main vehicle type for chain type c	Integer	106
d_1	Main vehicle type for chain type d	Integer	210
h_1	Main vehicle type for chain type h	Integer	212
i_1	Main vehicle type for chain type i	Integer	211
V	Main vehicle type for chain type V	Integer	322
W	Main vehicle type for chain type W	Integer	322
f_1	Main vehicle type for chain type f	Integer	212

Field	Description	Data Format	Example
X	Main vehicle type for chain type X	Integer	106

Software Required: Microsoft Access, Cube Database Window (see Help -> Cube Base -> Database window), ArcMap, ArcCatalog.

Description of Use: Main vehicle type used in the BuildChain process for each logistic chain and commodity group. It is the translation in access table of information present in reference 1 (Table 5).

Editing Options: No need to be updated.

Used by: "Prepare Data third part" subgroup under "Samgods Model > Logistics Module" and "General tables" subgroup under "Handling scenario > Scenario Export".

3.2.1.16. Chain_List_2019 and Chain_List_2045

05_Input_data\Input_data.mdb\Chain_List_2019

05_Input_data\Input_data.mdb\Chain_List_2045

The content of the table is listed in Table 20.

Table 20 - Format of "Chain_List_2019" and "Chain_List_2045" tables.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	2
ID_C	Logistic chain code	Integer	2
CHAIN_TYPES	Transport chain	String	ADA
SEL_SEA	Flag for chain containing sea mode	Integer	0

Software Required: Microsoft Access, Cube Database Window (see Help -> Cube Base -> Database window), ArcMap, ArcCatalog.

Description of Use: Specifies the possible chains in the model. Each letter represents a specific submode and vehicle type. It is the translation in the access table with information present in references 1 (Table 4a and Table 4b). The new vehicle types have imposed the creation of several new chain types. The SEL_SEA attribute is for report purposes during the creation of outputs.

Editing Options: Needs to be updated when the chain types are revised. If sensitivity tests are required, create a copy and link the new table in "*Samgods"* application via catalog key.

Used by: "Prepare Data third part" and "Save Reports" subgroups under "Samgods Model > Logistics Module" and "General tables" subgroup under "Handling scenario > Scenario Export".

3.2.1.17. ChainChoice_MODES

05_Input_data\Input_data.mdb\ChainChoice_MODES

The content of the table is listed in Table 21.

Table 21 - Format of "ChainChoice_MODES" table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
MODE_C	Chain type	String	A

Field	Description	Data Format	Example
VHCL_NR	Vehicle type, 3 digit format (as per Vehicles_parameters_PartA_Base2019 table)	Integer	104
VES_TYPE	Container/non container	Integer	1

Software Required: Microsoft Access, Cube Database Window (see Help -> Cube Base -> Database window), ArcMap, ArcCatalog.

Description of use: Specifies the vehicle type and vessel type (specified in A_Vessel_type) associated to each mode present in Chain_List_2019 and Chain_List_2045. It is the translation in access table of information present in reference 1 (Table 3).

This table is used in building the ChainChoixx.ctl files (xx being the commodity group number) for parameters VHCLA through VHCLR, (see reference 2, Figure 5-3). An example using values the example data in Table 22, results in(ChainChoi01.ctl):

VHCLA=104,105

VHCLD=201

Editing Options: Needs to be updated when chain types and associated vehicle and vessel types are revised.

Used by: "Prepare Data third part" and "Save Reports" subgroups under "Samgods Model > Logistics Module" and "General tables" subgroup under "Handling scenario > Scenario Export".

Table 22 - Example of rows in the access table.

MODE_C	VHCL_NR	VES_TYPE
A	104	1
A	105	1
D	201	1

3.2.1.18. CSTVARI

05_Input_data\Input_data.mdb\CSTVARI

The content of the table is listed in Table 23.

Table 23 - Format of "CSTVARI" table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
ID_COM	Commodity Group number	Integer	1
F2F_0	VAR parameter (lambda value in logit formulation) for flow to flow class 0	Double	0.1
F2F_1	VAR parameter (lambda value in logit formulation) for flow to flow class 1	Double	0.1
F2F_2	VAR parameter (lambda value in logit formulation) for flow to flow class 2	Double	0.1
F2F_3	VAR parameter (lambda value in logit formulation) for flow to flow class 3	Double	0.1
F2F_4	VAR parameter (lambda value in logit formulation) for flow to flow class 4	Double	0.1
F2F_5	VAR parameter (lambda value in logit formulation) for flow to flow class 5	Double	0.1
F2F_6	VAR parameter (lambda value in logit formulation) for flow to flow class 6	Double	0.1
F2F_7	VAR parameter (lambda value in logit formulation) for flow to flow class 7	Double	0.1
F2F_8	VAR parameter (lambda value in logit formulation) for flow to flow class 8	Double	0.1
F2F_9	VAR parameter (lambda value in logit formulation) for flow to flow class 9	Double	0.1

Software Required: Microsoft Access, Cube Database Window (see Help -> Cube Base -> Database window), ArcMap, ArcCatalog.

Description of Use: Specifies the lambda value for logit formulation of probabilities across solutions (first, second, etc.) for each commodity group and flow to flow class.

Editing Options: Needs to be updated when calibrating the model.

Used by: "Samgods Model > Logistics Module".

3.2.1.19. Direct_Access

05_Input_data\Input_data.mdb\Direct_Access

The content of the table is listed in Table 24.

Table 24 - Format of "Direct_Access" table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
ID_COM	Code of Commodity group	Integer	1
F2F_0	Flag to enable or disable direct access	Integer	1
F2F_1	Flag to direct access for F2F type 1	Integer	0
F2F_2	Flag to direct access for F2F type 2	Integer	0
F2F_3	Flag to direct access for F2F type 3	Integer	1
F2F_4	Flag to direct access for F2F type 4	Integer	0
F2F_5	Flag to direct access for F2F type 5	Integer	0
F2F_6	Flag to direct access for F2F type 6	Integer	1
F2F_7	Flag to direct access for F2F type 7	Integer	1
F2F_8	Flag to direct access for F2F type 8	Integer	1
F2F_9	Flag to direct access for F2F type 9	Integer	1

Software Required: Microsoft Access, Cube Database Window (see Help -> Cube Base -> Database window), ArcMap, ArcCatalog.

Description of Use: Define per each type of f2f flow (the types are described in table A_F2FTypes) and commodity group if direct access is allowed.

This table is used when building the ChainChoixx.ctl files for the parameter DIRACC (xx is commodity group number). For more information please see reference 2. Each row has been translated from an access table given in Table 25. Inside the control file it looks like:

```
DIRACC=1,0,0,1,0,0,1,1,1,1
```

Editing Options: Needs to be updated when direct access for a specific f2f category and product group is revised.

Used by: "Prepare Data third part" subgroup under "Samgods Model > Logistics Module" and "General tables" subgroup under "Handling scenario > Scenario Export".

Table 25 - Example of row with values from the access table.

ID_COM	F2F_0	F2F_1	F2F_2	F2F_3	F2F_4	F2F_5	F2F_6	F2F_7	F2F_8	F2F_9
1	1	0	0	1	0	0	1	1	1	1

3.2.1.20. Extract_parameters

05_Input_data\Input_data.mdb\Extract_parameters

The content of the table is listed in Table 26.

Table 26 - Format of "Extract_parameters" table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
ID	Id of vehicle type extract parameters	Integer	1
VEH_NR	Vehicle type	Integer	101
DIST1	First threshold distance	Double	50
EMPFAC1	Add-on factor applied up to DIST1 determining the proportion of empty vehicle flows to loaded vehicle flows. Between DIST1 and DIST2 a linear interpolation is conducted between EMPFAC1 and EMPFAC2	Double	1
DIST2	Second threshold distance	Double	300
EMPFAC2	Add-on factor applied above DIST2 determining the proportion of empty vehicle flows to loaded vehicle flows	Double	0.52
ASYM	Threshold distance above which asymmetric loaded vehicle flows will generate the same empty vehicle flow	Double	99888

Software Required: Microsoft Access, Cube Database Window (see Help -> Cube Base -> Database window), ArcMap, ArcCatalog.

Description of Use: The table provides, for each vehicle type, the function that will be applied in the extract procedure. The extract procedure reads the emptyfrac.dat placed under EXTRACT folder and applies the values specified in this table (DIST1, EMPFAC1, DIST2, EMPFAC2 etc. for specification of a piecewise linear function). The ASYM control parameter present in each extractXXX.ctl file is filed out with values from this table.

Editing Options: Needs to be updated when specifying different curves.

An example to understand the parameters in this table, using the curve in Figure 1 is:

DIST1=50 km

EMPFAC1=1

DIST2=300 km

EMPFAC2=0.52

Used by: "prepare Data second part" and "Prepare Data third part" subgroups under "Samgods Model > Logistics Module" and "Prepare CTL Files" subgroup under "Samgods Model > Rail Capacity Management > LP Loop > LP0 step", "Samgods Model > Rail Capacity Management > LP Loop > LP1+ step", "Samgods Model > Rail Capacity Management > LP1 Adjust Capacities > LP Adjust Capacity Loop > LP1b step" and "Samgods Model > Rail Capacity Management > Run Final Process".

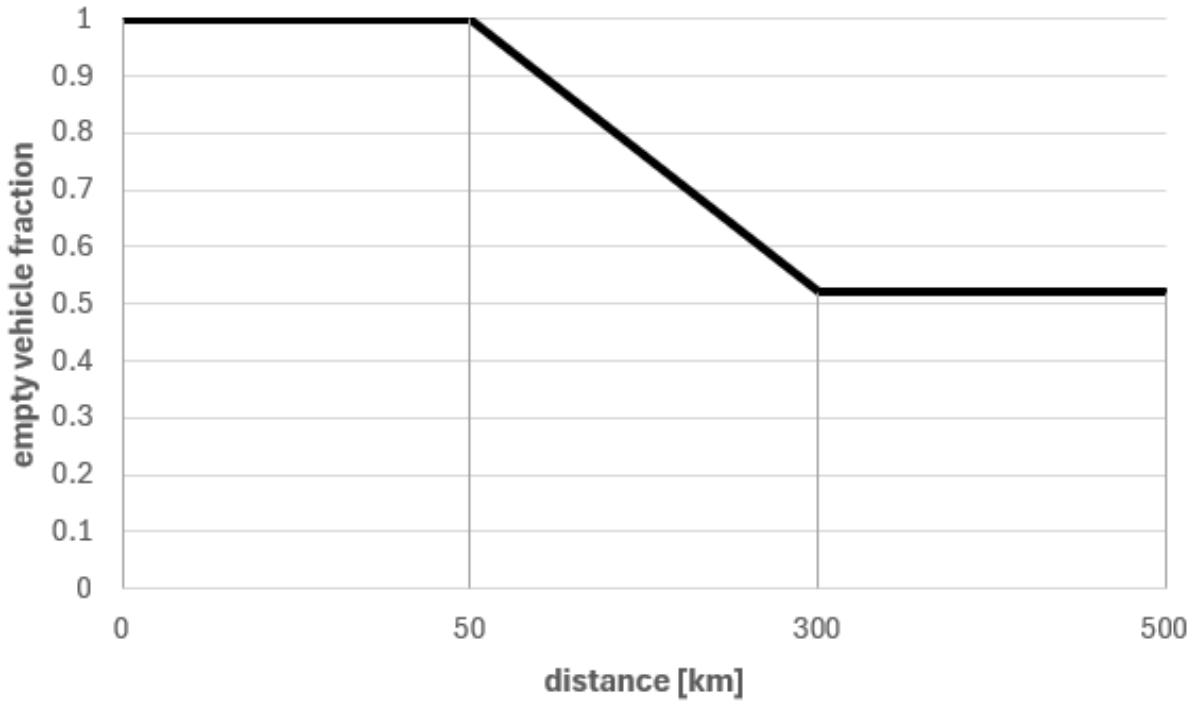


Figure 1 - The curve for empty vehicle fraction.

3.2.1.21. Inzone_Distance
05_Input_data\Input_data.mdb\Inzone_Distance

The content of the table is listed in Table 27.

Table 27 - Format of "Inzone_Distance" table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	2
ZONEID	Zone code (NORIG value)	Integer	711500
DISTANCE	Intrazonal distance [km]	Double	5.53

Software Required: Microsoft Access, Cube Database Window (see Help -> Cube Base -> Database window), ArcMap, ArcCatalog.

Description of Use: Inzone_Distance represents the default values for the intrazonal distances on domestic zones. This value will be added both for the distance, domestic distance and time skims during the cost calculation phases.

Editing Options: No edits to be updated (the revision of this is connected to the revision of zoning system. therefore in the normal usage of the model is not recommended to change this).

Used by: "Data Preparation" subgroup under "Samgods Model > LOS calculation" and "General tables" subgroup under "Handling scenario > Scenario Export".

3.2.1.22. Macros_EMME
05_Input_data\Input_data.mdb\Macros_EMME

The content of the table is listed in Table 28.

Table 28 - Format of "Macros_EMME" table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
ID	Table identifier	Integer	1
VEH_NR	Vehicle type	Integer	101
DESCRIPTIO	Vehicle description	String	Lorry light LGV.< 3.5 ton
EMME2_C	Name of the macro in EMME for cost calculation	String	~<v100.mac
MATIN	Name of the macro in EMME for load the OD matrix	String	~<veh_matin_100.mac
EMME2_A	Name of the macro in EMME for assignment	String	~<asg100.mac
ODMATRIX	Name of OD matrix in EMME format	String	od_vhcl101.314
ODEMME	Matrix number in emme2bank	String	mf11

Software Required: Microsoft Access, Cube Database Window (see Help -> Cube Base -> Database window), ArcMap, ArcCatalog.

Description of Use: The table is used to specify the matrix label printed out in OD matrices when extracted from the transport chain solutions. Values in ODEMME column will specified the value for control parameter ID in the extract control file. For instance for Vehicle type 101 in control file we have ID=mf11, and this value comes from ODEMME attribute in Table 29.

Editing Options: If user wishes to change the matrix label, the values could be updated.

Used by: "Prepare Data third part" subgroup under "Samgods Model > Logistics Module", "Prepare CTL Files" subgroup under "Samgods Model > Rail Capacity Management > LP Loop > LP0 step", "Samgods Model > Rail Capacity Management > LP Loop > LP1+ step", "Samgods Model > Rail Capacity Management > LP1 Adjust Capacity Loop > LP1b step" and "Samgods Model > Rail Capacity Management > Run Final Process", "General tables" subgroup under "Handling scenario > Scenario Export".

Table 29 - Example from the access table.

ID	VEH_NR	DESCRIPTIO	EMME2_C	MATIN	EMME2_A	ODMATRIX	ODEMME
1	101	Lorry light LGV <3.5	~<v100.mac	~<veh_matin._	~<asg100.mac	od_vhcl101.314	mf11

3.2.1.23. MaxCapAndConsolExcept

05_Input_data\Input_data.mdb\MaxCapConsolExcept

The content of the table is listed in Table 30.

Table 30 - Format of "MaxCapConsolExcep" table.

Field	Description	Data Format	Example
ID	Identified	Integer	1
OBJECTID	Count	Integer	1
ORIG	Zone origin	Integer	971211
DEST	Zone destination	Integer	970621
MODE_C	Mode associated	String	H

Field	Description	Data Format	Example
CMD_SLCT	String with 0/1 – position of the digit represent the commodity group. In the example the constrain is applied to the second commodity	String	0100000000000000
VEHCAP	Fixed capacity	Integer	2000
CONSOLRATE	Fixed consolidate rate	Double	0.98

Software Required: Microsoft Access, Cube Database Window (see Help -> Cube Base -> Database window).

Description of Use: Define for each commodity group, origin and destination and submode, the maximum vehicle capacity and consolidation rate. The values will overide the consolidation rate calculation in the logistic module.

Editing Options: Update with new codes if need to add a different origin destination pair.

Used by: “Samgods model> Logistic Module> Prepare data” and the Elasticity application.

3.2.1.24. Modes

05_Input_data\Input_data.mdb\Modes

The content of the table is listed in Table 31.

Table 31 - Format of “Modes” table.

Field	Description	Data Format	Example
OBJECTID	Count	Integer	1
CODE	Code for each mode	String	x
DESCR_MODE	Description of the vehicle type associated to mode	String	All_m
VAL1	Code 1: code used in Voyager process to sort properly some tables during the run	Double	1
VAL2	Code 2: code used in Voyager process to sort properly some tables during the run	Double	1

Software Required: Microsoft Access, Cube Database Window (see Help -> Cube Base -> Database window), ArcMap, ArcCatalog.

Description of Use: Define the modes in the network and some codes used in the Voyager application to properly sort records in intermediate files.

Editing Options: Update with new codes if need to add a different vehicle type.

Used by: “Editable map data” subgroup under “Create the editable files”, “Numbering System Voyager” subgroup under “Edit the data > Create the tables specific of scenario”, and “General tables” subgroup under “Handling scenario > Scenario Export”.

3.2.1.25. Other_statistics

05_Input_data\Input_data.mdb\Other_statistics

The content of the table is listed in Table 32.

Table 32 - Format of “Other_statistics” table.

Field	Description	Data Format	Example
ID	Counter	Integer	1
A	Start node of the link in VY Numbering	Integer	11964
B	End node of the link in VY Numbering	Integer	11969
DES	Description of statistics	String	OresundRoad
Statistics	Unit used for statistics (number of vehicles or tons per year)	String	Vehicles
ID_S	Identification number for unit in statistics (1 - number of vehicles, 2 - tons)	Integer	1
Value	Tons or vehicles per year	Double	377662.6

Software Required: Microsoft Access, Cube Database Window (see Help -> Cube Base -> Database window), ArcMap, ArcCatalog.

Description of Use: This table contains statistics on Oresund Bridge (both for rail and road components) and Kiel Canal and Jylland region. The values refer to base year 2019. The table also contains the links (A and B nodes) that represent those infrastructures or services. This table is used in setting up the comparisons between Base2019 scenario and statistics reported in Report #3.

Editing Options: Since these are the reference numbers for comparisons, no edits are required.

Used by: "Oresund Kiel and Jylland" subgroup under "Samgods Model > Results > Results 1.0" and "Oresund Kiel and Jylland" under "Samgods Model > Results RCM > Reports 1.0".

3.2.1.26. Port_statistics

05_Input_data\Input_data.mdb\Port_statistics

The content of the table is listed in Table 33.

Table 33 - Format of "Port_statistics" table.

Field	Description	Data Format	Example
PortAreaNbr	Port area code	Integer	1
COM01	Tonnes/1000 through port area of commodity group 1	Double	1.964
COM02	Tons/1000 on port area and COMMODITY group 2	Double	1536.803
COM03	Tons/1000 on port area and COMMODITY group 3	Double	5770.829
COM04	Tons/1000 on port area and COMMODITY group 4	Double	0.154
COM05	Tons/1000 on port area and COMMODITY group 5	Double	0
COM06	Tons/1000 on port area and COMMODITY group 6	Double	1155.889
COM07	Tons/1000 on port area and COMMODITY group 7	Double	876.687
COM08	Tons/1000 on port area and COMMODITY group 8	Double	580.82
COM09	Tons/1000 on port area and COMMODITY group 9	Double	351.737
COM10	Tons/1000 on port area and COMMODITY group 10	Double	182.252
COM11	Tons/1000 on port area and COMMODITY group 11	Double	0.254
COM12	Tons/1000 on port area and COMMODITY group 12	Double	6.204

Field	Description	Data Format	Example
COM13	Tons/1000 on port area and COMMODITY group 13	Double	0.163
COM14	Tons/1000 on port area and COMMODITY group 14	Double	69.408
COM15	Tons/1000 on port area and COMMODITY group 15	Double	400.604
COM16	Tons/1000 on port area and COMMODITY group 16	Double	0

Software Required: Microsoft Access, Cube Database Window (see Help -> Cube Base -> Database window), ArcMap, ArcCatalog.

Description of Use: This table contains statistics on port areas divided by commodity group. The values refer to base year 2019. This table is used in setting up the comparisons between Base2019 scenario and statistics reported in Report #13.

Editing Options: Since these are the reference numbers for comparisons, no edits are required.

Used by: "Port Areas" subgroup under "Samgods Model > Results > Results 1.0", "Port Areas" under "Samgods Model > Results RCM > Reports 1.0" and "General tables" subgroup under "Handling scenario > Scenario Export".

3.2.1.27. SamGods_zones

05_Input_data\Input_data.mdb\SamGods_zones

The content of the table is listed in Table 34.

Table 34 - Format of "SamGods_zones" table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	33
Shape	Feature class type	OLE Object	Long Binary Data
COUNTRY_CO	Country code	Integer	518
REGION_COD	Region code	Integer	201
COUNTRY	Description of country	String	Norway
REGION	Description of region	String	Akershus
CENTROID_C	Centroid code in Emme format	Integer	960100
SCBSTANN	SCBSTANN code	Integer	2601
Shape_Length	Length of perimeter in meters	Double	393316.015
Shape_Area	Area of shape in square meters	Double	5030650696.500

Software Required: Cube GIS Window (see Help>Cube Base>GIS window) Or ArcMap

Description of Use: Defines the zoning system in the model. It is used during the editing to assist the user in the definition of COUNTRY_CO and REGION_CO. It is also used to classify links on boundaries per SCBSTANN. The table "A_Zoning_System" contains the actual coding present in PWC matrices, while the feature class "SamGods_zones" is its translation in a visualizable layer.

Editing Options: No need to be updated (a revision of zoning system would impact all the model, therefore for normal usage of the model is not recommended to change this).

Used by: “Prepare temporary data” subgroup under “Create the editable files”, “Regions for links” subgroup under “Edit the data > Save changes in the main gdb” and GIS window to select the country and region codes during the edit of the network.

3.2.1.28. V101_SpeedFlowCurves and V102_SpeedFlowCurves

05_Input_data\Input_data.mdb\V101_SpeedFlowCurves

05_Input_data\Input_data.mdb\V102_SpeedFlowCurves

The content of the tables is listed in Table 35.

Table 35 - Format of “V101_SpeedFlowCurves” and “V101_SpeedFlowCurves” tables.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
NUM_CURVE	ID function when coding speed-flow curves relationships under Cube scripting	Integer	1
SPEEDBASE1	Base speed for first part of equation	Double	111
A1	A parameter for first part of equation	Double	4.211003
B1	B parameter for first part of equation	Double	107.2412
C1	C parameter for first part of equation	Double	0.009474
D1	D parameter for first part of equation	Double	0.00007
G1	G parameter for first part of equation	Double	0.001405
SPEEDBASE2	Base speed for second part of equation	Double	0
A2	A parameter for second part of equation	Double	0
B2	B parameter for second part of equation	Double	0
C2	C parameter for second part of equation	Double	0
D2	D parameter for second part of equation	Double	0
G2	G parameter for second part of equation	Double	0

Software Required: Microsoft Access, Cube Database Window (see Help -> Cube Base -> Database window), ArcMap, ArcCatalog.

Description of Use: Define the delay functions based on the category of the link for vehicle type 101 and vehicle type 102-106 respectively.

Editing Options : No need to be updated.

Used by: “Road” subgroup under “Samgods Model > LOS calculation”, “Road Assignment” subgroup under “Samgods Model > Assignment”, “Road Assignment” subgroup under “Samgods Model > RCM Assignment” and “General tables” subgroup under “Handling scenario > Scenario Export”.

NOTE: This table represents the coefficients used in delay curves defined for each category. This table will be used if there will be no speed values for the road mode in Sweden. Their formats in the programs are discussed below. There are two different structures for the delay functions, depending on the number of lanes on a link:

First structure:

*TC[NUM_CURVE]=LI.UL2 / MIN (SPEEDBASE1, (A1+(B1+(C1*exp(D1*(v/0.88)))/(1+G1*exp(D1*(v/0.88)))*

Second structure:

*TC[40]=CmpNumRetNum(LI.NLANES,'>',1.5,(LI.UL2/ (MIN(SPEEDBASE1,A1 + (B1 + C1 * exp(D1 *(V/0.12))) /(1 + G1 * exp(D1 *(V/0.12)))))), (LI.UL2/ (MIN(SPEEDBASE2,A2 + (B2 + C2 * exp(D2 *(V/0.12))) / (1 + G2 * exp(D2 *(V/0.12)))))))*

where:

- LI.UL2 – Distance in km
- V – Volume of vehicle flow (per hour or units per day)
- LI. NLANES – Number of lanes.

3.2.2. Interaction between Base data and Scenario specific data

Base data works in pair with scenario specific data to form a specific scenario.

The concept is that all the input data connected to a specific scenario is stored in the database as the differences between the current scenario and the base scenario (i.e., the reference scenario), as shown in Figure 2. The benefits of this approach are:

- A smaller amount of data is stored, that is, only the differences between the base scenario and the alternative scenario(s)
- It makes different alternative scenarios independent of each other, by letting the alternative scenarios having only the base scenario as a reference. The only redundancy of the system occurs when children are added to an alternative scenario since all scenarios (including child and parent scenarios) are independent of each other and only have the base scenario as a reference
- When changes are made to the base scenario, there is no need to change all the other scenarios. This facilitates the handling of the overall scenarios. Furthermore, the changes and edits will be done only once, in the base scenario, avoiding risk of mistake when updating the correlated scenarios

To create the editable files for a specific scenario and the scenario specific tables, two applications work in conjunction:

- the *Create the editable files* application, which merges the base scenario with the scenario specific tables to view and edit a scenario, and
- the *Edit the data* application, which stores the scenario-specific tables into the database after any edits have been made

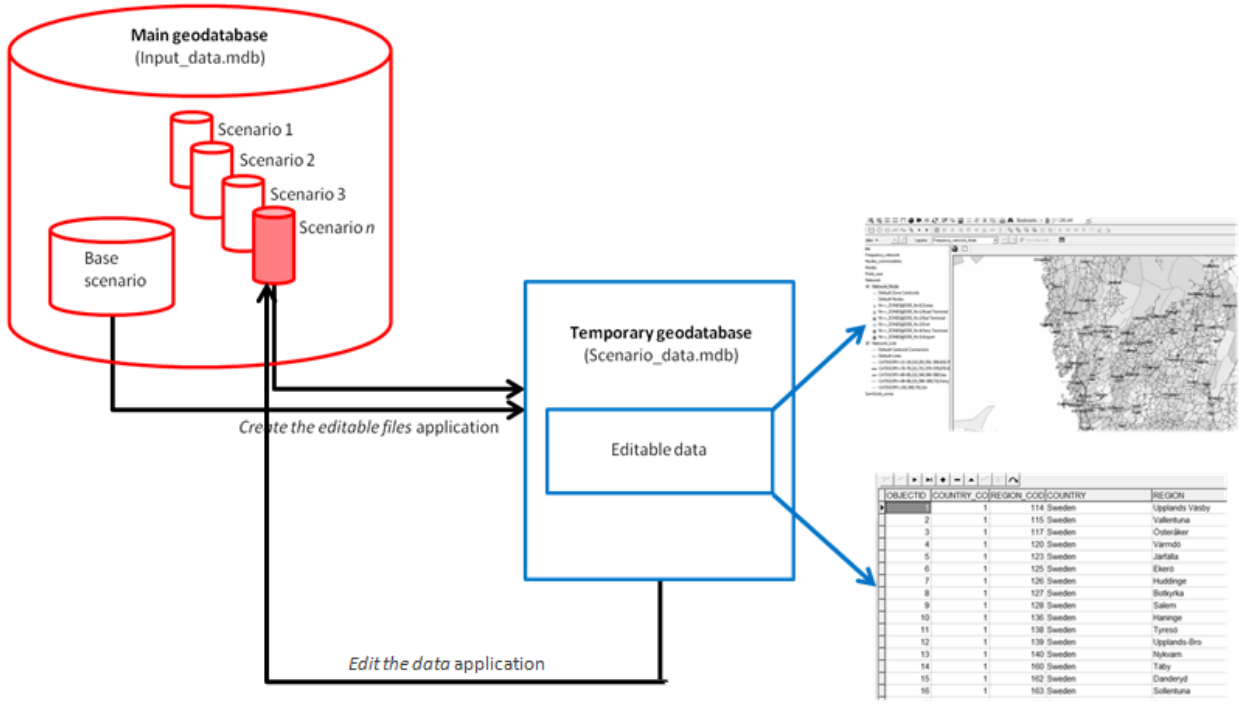


Figure 2 - Database structure and scenario data of the Samgods GUI.

To create the editable file for a specific scenario and vice versa, create the scenario specific tables, two applications work in conjunction, the first one is "Create the editable files" with the purpose to merge the base scenario with the scenario specific table to consolidate a scenario, and "Edit the data" application, that after the edits stores the scenario specific table into the database.

The main database is always present in the model, under 05_Input_data folder; the temporary database is created in each run under the scenario folder and deleted on request by the user.

Here, we will discuss the tables and networks that form the base data, e.g. the reference scenario. In the scenario folder, all the base data and scenario data (e.g. differences with Base Scenario) are merged forming a new set of input data editable from interface. In Table 36 the correspondences among each feature class or table present in Input_data.mdb and Scenario_data.mdb are presented.

Table 36 - Correspondence between Input_data.mdb and Scenario_data.mdb.

Input_Data.mdb		**Scenario_data.mdb**	
Name	**Type**	**Name**	**Type**
Cargo_Base2019	Table	Cargo_{SCENARIO_SHORTNAME}	Table
Sc_{SCENARIO_SHORTNAME}_Cargo	Table		
Frequency_Data_Base2019	Network	Frequency_network	Network
Sc_{SCENARIO_SHORTNAME}_Frequency_Data_Link	Node Table		
Sc_{SCENARIO_SHORTNAME}_Frequency_Data_Node	Link Table		
General_Base2019	Table	General_{SCENARIO_SHORTNAME}	Table
LogMod_Base2019	Table	LogMod_{SCENARIO_SHORTNAME}	Table

Input_Data.mdb		**Scenario_data.mdb**	
Name	**Type**	**Name**	**Type**
Base2019	Network	Network	Network
Sc_{SCENARIO_SHORTNAME}_Link	Node Table		
Sc_{SCENARIO_SHORTNAME}_Node	Link Table		
Model_description	Table	Model_description	
Nodes_Base2019	Table	Nodes	Stand-alone Feature class points
Sc_{SCENARIO_SHORTNAME}_Nodes	Node Table		
Nodes_Commodities_Base2019	Table	Nodes_Commodities	Stand-alone Feature class points
Sc_{SCENARIO_SHORTNAME}_Nodes_commodities	Table		
Node_terminals_Base2019	Table	Ports_Swe	Stand-alone Feature class points
Sc_{SCENARIO_SHORTNAME}_Node_Terminals	Table		
Rail_Capacity_Base2019	Table	Rail_Capacity_{SCENARIO_SHORTNAME}	Table
Sc_{SCENARIO_SHORTNAME}_Rail_Capacity	Table		
SamGods_zones	Stand-alone Feature class polygons	SamGods_zones	Stand-alone Feature class polygons
Tax_Category_Base2019	Table	Tax_Category_{SCENARIO_SHORTNAME}	Table
Sc_{SCENARIO_SHORTNAME}_Tax_Category	Table		
Tax_Country_Base2019	Table	Tax_Country_{SCENARIO_SHORTNAME}	Table
Sc_{SCENARIO_SHORTNAME}_Tax_Country	Table		
Tax_Link_Base2019	Table	Tax_Link_{SCENARIO_SHORTNAME}	Table
Sc_{SCENARIO_SHORTNAME}_Tax_Link	Table		
Toll_Link_Base2019	Table	Toll_Link_{SCENARIO_SHORTNAME}	Table
Sc_{SCENARIO_SHORTNAME}_Toll_Link	Table		
Vehicles_parameters_PartA_Base2019	Table	Vehicles_parameters_ Sc_{SCENARIO_SHORTNAME}_PartA	Table
Sc_{SCENARIO_SHORTNAME}_Vehicles_parameters_PartA	Table		
Vehicles_parameters_PartB_Base2019	Table	Vehicles_parameters_ Sc_{SCENARIO_SHORTNAME}_PartB	Table
Sc_{SCENARIO_SHORTNAME}_Vehicles_parameters_PartB	Table		

The structure for each table is identical to the structure in Input_data.mdb with some exceptions:

- MODESTR, attribute present in the link table of the network, is converted into a set of attributes per link where the particular vehicle type is allowed/not allowed depending on the flag. For instance ' xc' is converted in two attributes ALL_M=1 and CAR=1. The correspondence is hold in Vehicle Parameters table under MODE_1 and MODE_2. Per each letter specified under MODESTR, a different attribute has specified.
- Some new attributes are added to make the information more readable. For instance under Nodes_commodities a new field TRANSFER gives the information of which type of transfer the TRANSFER_TYPE number refers to. For instance TRANSFER_TYPE=1 means that TRANSFER= TransferRoadRoad.

Please see reference 6 for further details on the structure and rules for editing.

3.2.3. Base Data

In this section all tables related to reference scenario are listed.

3.2.3.1. Base2019

05_Input_data\Input_data.mdb\Base2019

The tables represent the network for the cost calculation and assignment processes. Physically it is constructed from two tables, the node and the link table in the geodatabase, presented in Table 37 and Table 38 respectively.

Table 37 - Format of "Base2019_Node" table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
SHAPE	Feature class type (point)	OLE Object	Long Binary Data
N	Node number in VY Numbering	Integer	1
X	Coordinate x (SWEREF99_TM)	Double	1620000
Y	Coordinate y (SWEREF99_TM)	Double	6601000
NORIG	Original node number in EMME numbering based on the combination of ID_Country, ID_region and MODE_N values	Integer	711400
SCBSTANN	SCBSTANN code	Integer	114
ID_COUNTRY	Country code	Integer	1
ID_REGION	Region code	Integer	114
MODE_N	Mode code for node	Integer	0
UI4	User field (not used in the current model)	Double	0
CENTRALL	Node description in terms of location	String	Upplands-Väsby
GEOMETRYSOURCE	Structural code representing source of node. In Base 2019 always 1	Double	1

Table 38 - Format of "Base2019_Link" table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
SHAPE	Feature class type (lane)	OLE Object	Long Binary Data
A	Start node in VY Numbering	Integer	1

Field	Description	Data Format	Example
B	End node in VY Numbering	Integer	2659
Shape_Length	Length based on distance between coordinates in meters	Double	230.86792762
MODESTR	String with all the allowed modes	String	Xabc
SPEED_1	Speed in kms per hour for all modes except v102-106 in Sweden	Double	50
SPEED_2	Speed in kms per hour for vehicle types v102-106 in Sweden	Double	50
CATEGORY	Link category	Integer	110
FUNCTION	Index for vdf function	Double	61
NLANES	Number of lanes (may be a decimal number)	Double	1
UL2	Distance in kms. User link data in emme used to enable holding link lengths longer than 999 kms.	Double	1.36
UL3	Capacity for vessels on sea (dwell tons)	Double	0
GEOMETRYSOURCE	Structural code representing source of node. In Base 2019 always 1	Double	1

Software required: Microsoft Access, Cube GIS Window (see Help>Cube Base>GIS window), ArcMap.

Description of Use: Define the base network.

Editing Options: No edits; all the changes will be allowed only in the export phase merging the scenario specific tables and the base tables.

Used by: All the applications.

3.2.3.2. Frequency_data_Base2019

05_Input_data\Input_data.mdb\Frequency_data_Base2019

Frequency_data_Base2019 represents the frequency matrices for specific modes. Physically it is constructed from tables, the node and the link table in the geodatabase, presented in Table 42 and Table 43. The use of a network instead of a set of matrices is to save hard disk space (the network format is more compressed than the matrix format) and access time during the read/write phases.

Each relation between zones is represented by:

- a link if the connection is between two different zones
- a node if the connection is between the same zone (origin coincides with destination)

For instance in the link table the following link in Table 39, this will be translated into 3 rows in each file representing different frequencies. In the example:

- FREQCONTAINERVESSEL.314 will take the value 0.1 from CONTAINERV and origin 711400 from ZONEORIG and destination 730521 from ZONEDEST
- FREQOTHERVESSEL.314 will take the value 0.5 from OTHER and origin 711400 from ZONEORIG and destination 730521 from ZONEDEST

- FREQRORVESSEL.314 will take the value 0.5 from OTHER and origin 711400 from ZONEORIG and destination 730521 from ZONEDEST

In each .314-file we will find the corresponding record in Table 40. A similar process is conducted for the node table, where all the intrazonal frequencies are saved, i.e. values where origin is identical with destination. Values in node table with 0 in ZONEORIG_N and ZONEDEST_N represent that the intrazonal values are not available for that specific zone. The correspondence between .314-files and attributes in the network is shown in Table 41.

Table 39 - Example showing a row from the access table.

A	B	ZONEORIG	ZONEDEST	SYSTEM	COMBI	CONTAINERV	LORRY	OTHER	ROROVES
1	1100	711400	730521	0	0	0.1	0	0.5	0.2

Table 40 - Example of content of the .314-files.

File	Record
FREQCONTAINERVESSEL.314	711400 730521:0.1
FREQOTHERVESSEL.314	711400 730521:0.5
FREQROROVESSEL.314	711400 730521:0.2

Table 41 - Correspondence between information in Frequency_network and LOS files under Input folder for logistics module.

Attribute in node table	Attribute in link table	File under Input\LOS
SYSTEM_N	SYSTEM	FREQSYSTEM.314
AIR_N	AIR	FREQAIR.314
COMBI_N	COMBI	FREQCOMBI.314
CONTAINE_N	CONTAINERV	FREQCONTAINERVESSEL.314
LORRY_N	LORRY	FREQLORRY.314
OTHER_N	OTHER	FREQOTHERVESSEL.314
ROROVES_N	ROROVES	FREQROROVESSEL.314
WAGONL_N	WAGONL	FREQWAGGONLOAD.314
RAILFERR_N	RAILFERRY	FREQRAILFERRY.314
ROADFERR_N	ROADFERRY	FREQROADFERRY.314
INWW_N	INWW	FREQIWW.314

Table 42 - Format of "Frequency_data_Base2019_Node" table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	25
SHAPE	Feature class type (point)	OLE Object	Long Binary Data
N	Node number in VY Numbering	Integer	25

Field	Description	Data Format	Example
X	Coordinate x (SWEREF99_TM)	Double	1593100
Y	Coordinate y (SWEREF99_TM)	Double	6562900
ZONEORIG_N	Original node number in EMME Numbering for the origin	Integer	714000
ZONEDEST_N	Original node number in EMME Numbering for the destination	Integer	714000
SYSTEM_N	Frequency System	Double	0
AIR_N	Frequency air	Double	0
COMBI_N	Frequency Combi	Double	0
CONTAINE_N	Frequency ContainerVessel	Double	0
LORRY_N	Frequency Lorry	Double	84
OTHER_N	Frequency Other Vessels	Double	0
ROROVES_N	Frequency RororVessel	Double	0
WAGONL_N	Frequency WaggonLoad	Double	0
RAILFERR_N	Frequency Railferry	Double	0
ROADFERR_N	Frequency RoadFerry	Double	0
INWW_N	Frequency Inland water	Double	0
GEOMETRYSOURCE	Number representing to which network the node belongs (1-Road 2-Rail 3_sea 4-Air)	Double	4

Table 43 - Format of "Frequency_data_Base2019_Link" table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
SHAPE	Feature class type (lane)	OLE Object	Long Binary Data
A	Start node in VY Numbering	Integer	1
B	End node in VY Numbering	Integer	1100
Shape_Length	Length based on distance between coordinates in meters	Double	6796881.71149
ZONEORIG	Original node number in EMME Numbering for the origin	Integer	711400
ZONEDEST	Original node number in EMME Numbering for the destination	Integer	730521
SYSTEM	Frequency System	Double	0
AIR	Frequency air	Double	0
COMBI	Frequency Combi	Double	0
CONTAINERV	Frequency ContainerVessel	Double	0.1

Field	Description	Data Format	Example
LORRY	Frequency Lorry	Double	0
OTHER	Frequency Other Vessels	Double	0.5
ROROVES	Frequency RororVessel	Double	0.2
WAGONL	Frequency WaggonLoad	Double	0
RAILFERRY	Frequency Railferry	Double	0
ROADFERRY	Frequency RoadFerry	Double	0
INWW	Frequency Inland water	Double	0.0

Software required: Microsoft Access, Cube GIS Window (see Help>Cube Base>GIS window), ArcMap.

Description of Use: Define the base network.

Editing Options: No edits; all the changes will be allowed only in the export phase merging the scenario specific tables and the base tables.

Used by: All the applications.

3.2.3.3. Cargo_Base2019

05_Input_data\Input_data.mdb\Cargo_Base2019

The table, Table 44, represents the default values for the commodities, with all the parameters used in the logistics module.

Table 44 - Format of "Cargo_Base2019" table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
ID_COM	Commodity code	Integer	1
DESC_COMM	Description of commodity	String	Cereals
VALUE_SEKT	Value in SEK per ton	Integer	1350
INV_COST	Inventory cost	Integer	466
ORD_COST	Order cost	Double	1829
NSTR_NR	NSTR code	Integer	10
AGGR_NUM	Class used in reporting, if set from 1 to 16 is just commodity group number.	Integer	1
AGGR_COM	Commodity aggregation (three classes Dry bulk, General cargo, Liquid bulk)	String	Dry bulk
COM_TYPE	Code for the commodity aggregation (1 Dry bulk, 2 Liquid bulk, 3 general cargo)	Integer	1
PRORCOST	ProportionalOrderCosts Parameter used for the calculation of the annual demand dependent order costs. The annual demand dependent order costs are calculated as: OrderCosts = FixedOrderCosts + ProportionalOrderCosts x AnnualDemand^Alpha	Double	2.19109

Field	Description	Data Format	Example
ALPHA	Parameter used in the order cost calculation	Single	0.5
SHIP_SIZE	Typical shipment size for this commodity. This parameter is used to determine the shipment size q [tonnes per shipment] and calculate the logistic costs for the chains in the BuildChain phase. This parameter can be either a number or DYNAMIC_MAX, DYNAMIC_AVERAGE or DYNAMIC_GEOMEAN. See Program_Documentation_Sweden_November_2019. Pg. 34 for details	String	41
OPTIP	Code for including all costs or only transport costs for producers 0=include all costs 1=include only transport costs	Integer	0
OPTIW	Code for including all costs or only transport costs for wholesale. 0=include all costs 1=include only transport costs	Integer	0
MFREQ	Minimum frequency that is used when the default frequency is not available in the vehicle cost file	Integer	1
SELECT_BC	Manage the existence of the select.dat file for BuildChain (0- no, 1 –yes)	Integer	0
SELECT_CC	Manage the existence of the select.dat file for ChainChoi (0- no, 1 –yes)	Integer	0

Software Required: Microsoft Access, Cube Database Window (see Help -> Cube Base -> Database window), ArcCatalog.

Description of Use: Defines the values in INPUT\COST\CARGO.TXT and some control parameters (SELECT_BC and SELECT_CC) in BuildChain.ctl and ChainChoi.ctl control files. See reference 2 for more details.

Editing Options: No edits; Changes will be allowed only in the export phase merging the scenario specific tables and the base tables.

Used by: "Editable tables" subgroup under "Create the editable files", "Create the tables specific of scenario" subgroup under "Edit the data", "Data Preparation" subgroup under "Samgods Model > LOS calculation" and "Create the new base" subgroup under "Handling scenario > Scenario Export".

3.2.3.4. Node_terminals_Base2019

05_Input_data\Input_data.mdb\Node_terminals_Base2019

The table, Table 45, holds the information of pilot fees for each port and vehicle type.

Table 45 - Format of "Node_terminals_Base2019" table.

Field	Description	Data Format	Example
OBJECTID	Count	Integer	9
N	Node number in VY Numbering	Integer	211
TERMINAL_N	Code number in EMME Numbering for port	Integer	808322
PILOT_V301	Pilot fee for vehicle type 301 [SEK]	Double	4932
PILOT_V302	Pilot fee for vehicle type 302 [SEK]	Double	7054
PILOT_V303	Pilot fee for vehicle type 303 [SEK]	Double	8240
PILOT_V304	Pilot fee for vehicle type 304 [SEK]	Double	11757

PILOT_V305	Pilot fee for vehicle type 305 [SEK]	Double	2393
PILOT_V306	Pilot fee for vehicle type 306 [SEK]	Double	3412
PILOT_V307	Pilot fee for vehicle type 307 [SEK]	Double	3766
PILOT_V308	Pilot fee for vehicle type 308 [SEK]	Double	4224
PILOT_V309	Pilot fee for vehicle type 309 [SEK]	Double	5639
PILOT_V310	Pilot fee for vehicle type 310 [SEK]	Double	7054
PILOT_V311	Pilot fee for vehicle type 311 [SEK]	Double	8240
PILOT_V312	Pilot fee for vehicle type 312 [SEK]	Double	10692
PILOT_V313	Pilot fee for vehicle type 313 [SEK]	Double	10692
PILOT_V314	Pilot fee for vehicle type 314 [SEK]	Double	11757
PILOT_V315	Pilot fee for vehicle type 315 [SEK]	Double	7054
PILOT_V316	Pilot fee for vehicle type 316 [SEK]	Double	8240
PILOT_V317	Pilot fee for vehicle type 317 [SEK]	Double	9406

Software Required: Microsoft Access or Cube Database window (see Help>Cube Base>Database window), ArcCatalog.

Description of Use: Pilot fees for Swedish ports per vehicle type. Values are exported to INPUT\COST\PILOTFEES.TXT.

Editing Options: No edits; Changes will be allowed only in the export phase merging the scenario specific tables and the base tables.

Used by: “Editable map data” subgroup under “Create the editable file”, “Compare Nodes and Node_terminals” subgroup under “Edit the data > Create the tables specific of scenario”, “Prepare data” subgroup under “Samgods Model > Logistics Module", and “Create the new base” subgroup under “Handling scenario > Scenario Export”.

3.2.3.5. Nodes_Base2019

05_Input_data\Input_data.mdb\Nodes_Base2019

The table contains information about the zones and terminals, the format is shown in Table 46.

Table 46 - Format of “Nodes_Base2019” table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	10
N	Zone number in VY Numbering	Integer	10
ZONEID	Code number in EMME Numbering for zone	Integer	712500
NAME	Description of the zone/terminal	String	Zone: Ekerö
ZONET	Zone code for node location if direct access, 0 other cases	Integer	712500
DOMESTIC	Dummy for domestic location (1=domestic, 0=non domestic)	Integer	1
C_TECH_FAC	Cost efficiency factor in terminals	Double	1

Field	Description	Data Format	Example
T_TECH_FAC	Time efficiency factor in terminals	Double	1
MAXDWTCONT	Load constraint for container vessels that the port can manage [tonnes]	Double	0
MAXDWTRORO	Load constraint for RoRo vessels that the port can manage [tonnes]	Double	0
MAXDWOTHE	Load constraint for other vessels that the port can manage [tonnes]	Double	0
SEAOUTPUT	Yearly sea output[tonne]. Used for consolidation determination.	Double	0
SEACONTO	Yearly container output [tonne] Used for consolidation determination.	Double	0
AIROUTPUT	Yearly air output [tonne] Used for consolidation determination.	Double	0
TranOceFac	Penalty factor applied during the LOS calculation for TIME. The final time will penalized by a factor in the following manner: TIME (from the network)* (1+OrigFactor)*(1+DestFactor) where OrigFactor is TranOceFac for the origin and DestFactor is TranOceFac for the destination	Double	0
PORTAREANR	Port area number for the specific port. Values from A_Port_areas table	Integer	0
VANERNCAN	Capacity associated to a port in Vänern Lake. Value represents dwell units allowed in the particular port. See section 6.6.2 for further details.	Double	0

Software Required: Microsoft Access or Cube Database window (see Help>Cube Base>Database window), ArcCatalog.

Description of Use: definition for each zone and terminal of different parameters representing capacities and location in .\Input\Nodes\NODES.TXT file. TranOceFac is explicitly used in the Samgods application generating the impedance factors per each origin and destination in LOS calculation (Matrix step #3 and HIGHWAY step #7) applied to TIME skim.

Editing Options: No edits; Changes will be allowed only in the export phase merging the scenario specific tables and the base tables.

Used by: “Editable map data” subgroup under “Create the editable files”, “Compare Nodes and Node_terminals” subgroup under “Edit the data > Create the tables specific of scenario”, “Data Preparation” subgroup under “Samgods Model > LOS calculation”, “Prepare Data second” subgroup under “Samgods Model > Logistics Module” and “Create the new base” subgroup under “Handling scenario > Scenario Export”.

3.2.3.6. Nodes_Commodities_Base2019

05_Input_data\Input_data.mdb\Nodes_Commodities_Base2019

The table contains information about the possibility of transfer in every zone and terminal by commodity, with format as shown in Table 47. In Table 50 the correspondence between Transfer Type and related input file in the logistics module.

Table 47 - Format of "Nodes_Commodities_Base2019" table.

Field	Description	Data Format	Example
OBJECTID	Count	Integer	21
N	Zone number in VY Numbering	Integer	21
ZONEID	Code number in EMME Numbering for zone or terminal	Integer	713611
TRANSF_TYP	Transfer type code (referred to A_Transfer_type table)	Integer	14
COM_1	Dummy representing whether a transfer of a certain type is allowed for listed terminals etc for commodity group 1	Integer	1
COM_2	As above for commodity group 2	Integer	2
COM_3	As above for commodity group 3	Integer	3
COM_4	As above for commodity group 4	Integer	4
COM_5	As above for commodity group 5	Integer	5
COM_6	As above for commodity group 6	Integer	6
COM_7	As above for commodity group 7	Integer	7
COM_8	As above for commodity group 8	Integer	8
COM_9	As above for commodity group 9	Integer	9
COM_10	As above for commodity group 10	Integer	10
COM_11	As above for commodity group 11	Integer	11
COM_12	As above for commodity group 12	Integer	12
COM_13	As above for commodity group 13	Integer	13
COM_14	As above for commodity group 14	Integer	14
COM_15	As above for commodity group 15	Integer	15
COM_16	As above for commodity group 16	Integer	16

Software Required: Microsoft Access or Cube Database window (see Help>Cube Base>Database window), ArcCatalog.

Description of Use: Define per transfer type the list of terminals where at least one commodity may be subject to transfer. It is the source to produce files under Input\Nodes. Based on each transfer type.

For instance, the following records in Table 48 will be translated into 3 rows in each file representing different transfer types, as shown in Table 49. Thus,

- TRANSFERROADTRAIN.TXT (TRANSF_TYPE=3) will be given the commodity group number for all the commodities where COM_X<>0 and ZONEID=713611
- DIRECTFEEDERTRAIN.TXT (TRANSF_TYPE=14) will be given the commodity group number for all the commodities where COM_X<>0 and ZONEID=713611

- DIRECTFEEDERTRAIN.TXT (TRANSF_TYPE=16) will be given the commodity group number for all the commodities where COM_X<>0 and ZONEID=713611

Table 48 - Example of rows in the access table.

N	ZONEID	TRANSF_TYP	COM_1	COM_2	COM_3	COM_4	COM_5	COM_6	COM_7
21	713611	3	1	2	3	4	5	6	7
21	713611	14	1	2	3	4	5	6	7
21	713611	16	0	0	0	0	0	0	0

Table 49 - Example of output.

File	Record					
TRANSFERROADTRAIN.TXT	713611	Rail: Jordbro	1	2	3	4
		5	6	7		
FREQOTHERVESSEL.314	713611	Rail: Jordbro	1	2	3	4
		5	6	7		
DIRECTFEEDERTRAIN.TXT	713611	Rail: Jordbro	0	0	0	0
		0	0	0		

Table 50 - Correspondence between file system and Nodes_commodities table.

TRANSF_TYP	DESCRIPTIO	File under Input\Nodes
1	TransferRoadRoad	TRANSFERROADROAD.TXT
2	TransferRoadCombi	TRANSFERROADCOMBI.TXT
3	TransferRoadTrain	TRANSFERROADTRAIN.TXT
4	TransferRoadSea	TRANSFERROADSEA.TXT
5	TransferRoadRoadFerry	TRANSFERROADROADFERRY.TXT
6	TransferRoadAir	TRANSFERROADAIR.TXT
7	TransferCombiSea	TRANSFERCOMBISEA.TXT
8	TransferFeederTrainWagonload	TRANSFERFEEDERTRAINWAGONLOAD.TXT
9	TransferWagonloadSea	TRANSFERWAGONLOADSEA.TXT
10	TransferWagonloadRailFerry	TRANSFERWAGONLOADRAILFERRY.TXT
11	TransferSystemTrainSea	TRANSFERSYSTEMTRAINSEA.TXT
12	TransferSeaSea	TRANSFERSEASEA.TXT
13	ContainerHandling	CONTAINERHANDLING.TXT

TRANSF_TYP	DESCRIPTIO	File under Input\Nodes
14	DirectFeederTrain	DIRECTFEEDERTRAIN.TXT
15	DirectSea	DIRECTSEA.TXT
16	DirectSystemTrain	DIRECTSYSTEMTRAIN.TXT
17	DirectWagonLoad	DIRECTWAGONLOAD.TXT

Editing Options: No edits; Changes will be allowed only in the export phase merging the scenario specific tables and the base tables

Used by: "Editable map data" subgroup under "Create the editable files", "Compare other tables" subgroup under "Edit the data", "Prepare Data second part" subgroup under "Samgods Model > Logistics Module" and "Create the new base" subgroup under "Handling scenario > Scenario Export"

3.2.3.7. PropLink_Base2019

05_Input_data\Input_data.mdb\PropLink_Base2019

This table, Table 51, provides information about the proportion WEIGHT of a link A-B that resides in a zone REGION. The proportion is given in percent (0-100).

Table 51 - Format of "PropLink_Base2019" table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	696
A	Start node in VY Numbering	Integer	2793
B	End node in VY Numbering	Integer	2794
REGION	SCBSTANN code	Integer	136
WEIGHT	Weight proportional to the part of the link residing in the zone.	Double	100

Software Required: Microsoft Access or Cube Database window (see Help>Cube Base>Database window), ArcCatalog.

Description of Use: Table with all road and rail links that share a different SCBSTANN area. Each record provides the proportion of the link length belonging to the listed SCBSTANN area. The proportion is used to classify tonneskm and vehicleskm statistics per region and county. (See reports #9, 16, 17 and 18).

Editing Options: No edits; Changes will be allowed only in the export phase merging the scenario specific tables and the base tables.

Used by: "Reports per geographical aggregation" subgroup under "Samgods Model > Results > Results 1.0", "Samgods Model > Results RCM > Results1.0", "Create the new base" subgroup under "Handling scenario > Scenario Export" and "Create the scenario tables" subgroup under "Handling scenario > Scenario Export > Create the new scenario specific tables".

3.2.3.8. Rail_Capacity_Base2019

05_Input_data\Input_data.mdb\Rail_Capacity_Base2019

This table, Table 52, provides the capacity ORIGCAP for a link A-B having the trakbandel category TRAKBANDEL.

Table 52 - Format of "Rail_Capacity_Base2019" table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
ID_LINK	Link identified for rail link. Two links in opposite direction share the same ID_LINK.	Integer	25
A	Start voyager node	Integer	2000
B	End voyager node	Integer	2001
TRAKBANDEL	Trakbandel code for link	Integer	4333
ORIGCAP	Original value for capacity in bidirectional trains per day	Double	418

Software Required: Microsoft Access or Cube Database window (see Help>Cube Base>Database window), ArcCatalog.

Description of Use: This table represents the main input for Rail Capacity Management module, since the number of total vehicles on rail links is compared with the ORIGCAP value. The links with ratio V/C equals or greater than the value in catalog key " Cut off criteria for RCM process (will consider links with V/C > XX% where XX is given in percentage)" will be selected as part of the linear programming problem. For details on edits of this table, please see reference 6. It is also a mandatory input for the Rail Assignment under "Samgods Model > RCM Assignment > Rail Assignment RCM" since in this case the assignment is based on capacity constraints, e.g. the delay functions are related to the ratio V/C.

Editing Options: No edits; Changes will be allowed only in the export phase merging the scenario specific tables and the base tables.

Used by: "Editable tables" subgroup under "Create the editable files", "Rail Capacity Checks" subgroup under "Edit the data > Create the tables specific of scenario", "Data Preparation" subgroup under "Samgods Model > LOS calculation", "Create the new base" subgroup under "Handling scenario > Scenario Export" and "Create the scenario tables" subgroup under "Handling scenario > Scenario Export > Create the new scenario specific tables".

3.2.3.9. Tax_Category_Base2019

05_Input_data\Input_data.mdb\Tax_Category_Base2019

This table, Table 53, provides information about the tax SEK per link category LINKTYPE and vehicle type ID_VEHICLE.

Table 53 - Format of "Tax_Category_Base2019" table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	17
LINKTYPE	Link category	Integer	580
ID_VEHICLE	Vehicle type	Integer	317
SEK	Track fee or tax [SEK]	Double	104218

Software Required: Microsoft Access or Cube Database window (see Help>Cube Base>Database window), ArcCatalog.

Description of Use: Specifies a link based tax defined by the link category and vehicle type. In the current model the only tax applied is for Kiel Canal (CATEGORY=570).

Editing Options: No edits; Changes will be allowed only in the export phase merging the scenario specific tables and the base tables.

Used by: "Editable tables" subgroup under "Create the editable files", "Compare other tables" subgroup under "Edit the data > Create the tables specific of scenario", "Tax calculation" subgroup under "Samgods Model > LOS calculation > Data Preparation" and "Create the new base" subgroup under "Handling scenario > Scenario Export".

3.2.3.10. Tax_Country_Base2019

05_Input_data\Input_data.mdb\Tax_Country_Base2019

This table, Table 54, provides information about the tax SEK_KM per country ID_COUNTRY and vehicle type ID_VEHICLE.

Table 54 - Format of "Tax_Country_Base2019" table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
ID_COUNTRY	Country code	Integer	-1
ID_VEHICLE	Vehicle type	Integer	201
SEK_KM	Country tax per km [SEK/km]	Double	13.77

Software Required: Microsoft Access or Cube Database window (see Help>Cube Base>Database window), ArcCatalog.

Description of Use: Specifies a link based tax defined by country and vehicle type. (NB. -1 values refer to countries outside Sweden).

Editing Options: No edits; Changes will be allowed only in the export phase merging the scenario specific tables and the base tables.

Used by: "Editable tables" subgroup under "Create the editable files", "Compare other tables" subgroup under "Edit the data > Create the tables specific of scenario", "Tax calculation" subgroup under "Samgods Model > LOS calculation > Data Preparation" and "Create the new base" subgroup under "Handling scenario > Scenario Export".

3.2.3.11. Tax_Link_Base2019

05_Input_data\Input_data.mdb\Tax_Link_Base2019

This table, Table 55, provides information about the tax SEK per link A-B and vehicle type VEH_NR.

Table 55 - Format of "Tax_Link_Base2019" table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	4
A	Start node in VY Numbering	Integer	2015
B	End node in VY Numbering	Integer	78051
VEH_NR	Vehicle type	Integer	304
SEK	Track fee or tax [SEK]	Double	3706.25

Software Required: Microsoft Access or Cube Database window (see Help>Cube Base>Database window), ArcCatalog.

Description of Use: Specifies a link based tax by vehicle type.

Editing Options: No edits; all the Changes will be allowed only in the export phase merging the scenario specific tables and the base tables.

Used by: "Editable tables" subgroup under "Create the editable files", "Compare other tables" subgroup under "Edit the data > Create the tables specific of scenario", "Tax calculation" subgroup under "Samgods Model > LOS calculation > Data Preparation" and "Create the new base" subgroup under "Handling scenario > Scenario Export".

NOTE: For the same link it is possible to define tax values based on country criteria, category criteria and also its selection (three tables above). However the final result will be based on the following rule:

TAX_COUNTRY < TAX_CATEGORY < TAX_LINK

The value in the Tax_Link table will override the other values, so the final result will come from the evaluation of an OR logical condition. Zero values also have a meaning, inserting a zero in the table value will set the tax to zero. For instance 0 in the Tax_Link table will set the tax value for the specific link to zero.

3.2.3.12. Toll_Link_Base2019

05_Input_data\Input_data.mdb\Toll_Link_Base2019

This table, Table 56, provides information about the toll SEK per link A-B and vehicle type VEH_NR.

Table 56 - Format of "Toll_Link_Base2019" table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	4
A	Start node in VY Numbering	Integer	11964
B	End node in VY Numbering	Integer	11969
VEH_NR	Vehicle type	Integer	104
SEK	Link toll [SEK] per passing vehicle	Double	809
DESCRIPT	Description of the infrastructure (in general bridges)	String	Toll Oresund

Software Required: Microsoft Access or Cube Database window (see Help>Cube Base>Database window), ArcCatalog.

Description of Use: Defines a toll applied to a link per vehicle type.

Editing Options: No edits; Changes will be allowed only in the export phase merging the scenario specific tables and the base tables.

Used by: "Editable tables" subgroup under "Create the editable files", "Compare other tables" subgroup under "Edit the data > Create the tables specific of scenario", "Tax calculation" subgroup under "Samgods Model > LOS calculation > Data Preparation" and "Create the new base" subgroup under "Handling scenario > Scenario Export".

3.2.3.13. Vehicles_parameters_PartA_Base2019

05_Input_data\Input_data.mdb\Vehicles_parameters_PartA_Base2019

This table, Table 57, provides information about the vehicle parameters related to the cost and property of the vehicle identified by vehicle type VEH_NR (or DESCRIPTIO or LABEL).

Table 57 - Format of "Vehicles_parameters_PartA_Base2019" table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	4
ID	Index for vehicle type	Integer	4
VEH_NR	Vehicle number	Integer	104
DESCRIPTIO	Description of vehicle type	String	Lorry HGV 25-40 tonne
LABEL	Short name for the vehicle type	String	HGV24
VESSELTYPE	Vessel Type (container/non container)	Integer	0
CAPACITY	Maximum Load Capacity (Tonnes)	Double	28
COORFACT	Coordination factor. Factor used to catch the fact that the available volume for each vehicle movement will be lower than the calculated annual consolidation volumes on the OD-legs	Single	10
HOURS_COST	Hour cost [SEK/h]	Double	288
KM_COST	Km cost [SEK/km]	Double	3.7794
ONFER_H_C	On Ferry Hour Cost (SEK/hour)	Double	488.4
ONFER_KM_C	On Ferry Km Cost (SEK/km)	Double	2.9
POSICOST	Positioning Cost (SEK/vehicle)	Double	0
DFLTFREQ	Default frequency (per week)	Double	84
F_DUES_VH	Fairway Dues per Vehicle (SEK/vessel)	Double	0
F_DUES_TON	Fairway Dues per Tonne (SEK/tonne)	Double	0
SPEED	Speed (only sea modes) (km/hour)	Double	-1
VDF_SPEC	Volume delay function index (FUNCTION in link table)	Double	64
MODE_1	Code for network mode alternative 1	String	a
MODE_2	Code for network mode alternative 2	String	-
FUNC_FILE	Set of applied travel time functions applied	String	V102
EMPTY_V	Dummy variable to take in account empty vehicles during the creation of OD vehicle matrices. (0=no 1=yes)	Integer	1
MAX_SPEED	Define speed limits for road vehicles	Double	116

Software Required: Microsoft Access or Cube Database window (see Help>Cube Base>Database window), ArcCatalog.

Description of Use: Defines all the parameters related to cost and time coefficients for the logistics model (files under LogMod\Input\COST) by vehicle type. Also controls the codes used in opening/closing links in the network (parameters SPEED, VDF_SPEC, MODE_1, MODE_2, FUNC_FILE) during LOS and assignment steps.

Editing Options: No edits; Changes will be allowed only in the export phase merging the scenario specific tables and the base tables.

Used by: "Editable tables" subgroup under "Create the editable files", "Create the tables specific of scenario" subgroup under "Edit the data" and its subgroup "Compare other tables", "Data Preparation" subgroup under "Samgods Model > LOS calculation" and "Create the new base" subgroup under "Handling scenario > Scenario Export".

3.2.3.14. Vehicles_parameters_PartB_Base2019

05_Input_data\Input_data.mdb\Vehicles_parameters_PartB_Base2019

This table, Table 58, provides information about the vehicle parameters related to cost for loading and unloading identified by vehicle type VEH_NR and commodity ID_COM.

Table 58 - Format of "Vehicles_parameters_PartB_Base2019" table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	4
ID	Index for vehicle type	Integer	4
ID_COM	Identifier for commodity group	Integer	16
VEH_NR	Vehicle number	Integer	104
CONT_LTI	Container Load Time (hours)	Double	1
CONT_LCO	Container Load Cost (SEK/tonne)	Double	17
CONT_LTI_T	Container Load Time at transfer (hours)	Double	1
CONT_LCO_T	Container Load Cost at transfer (SEK/tonne)	Double	17
NC_LTI	Non container Load Time (hours)	Double	2
NC_LCO	Non container Load Cost (SEK/tonne)	Double	3
NC_LTIT	Non container Load Time at transfer (hours)	Double	2
NC_LCOT	Non container Load Cost at transfer (SEK/tonne)	Double	3

Software Required: Microsoft Access or Cube Database window (see Help>Cube Base>Database window), ArcCatalog.

Description of Use: Defines all the parameters related to cost and time coefficients for the logistics model (files under LogMod\Input\COST).

Editing Options: No edits; Changes will be allowed only in the export phase merging the scenario specific tables and the base tables.

Used by: "Editable tables" subgroup under "Create the editable files", "Create the tables specific of scenario" subgroup under "Edit the data" and its subgroup "Compare other tables", "Data Preparation" subgroup under "Samgods Model > LOS calculation" and "Create the new base" subgroup under "Handling scenario > Scenario Export".

3.2.3.15. Scenarios_List

05_Input_data\Input_data.mdb\Scenarios_List

This table, Table 59, holds information about the elasticity scenarios identified by ID_SCENARIO.

Table 59 - Format of "Scenarios_List" table.

Field	Description	Data Format	Example
ID	Counter	Integer	4
ID_SCENARIO	Scenario number	Integer	4
Mode	Description of mode in which sensitivity test is applied (can be a main mode or a combination of vehicle types)	String	Road
Scenario	Scenario types	String	KM_3
KM_COST	Variation in km cost	Double	1.02
HOURS_COST	Variation in hour cost	Double	1
NC_LTI	Variation in non-container loading time	Double	1
NC_LTIT	Variation in non-container loading time transit	Double	1
CONT_LTI	Variation in container loading time	Double	1
CONT_LTI_T	Variation in container loading time transfer	Double	1
TOLL	Variation in toll	Double	1
TRACK_F	Variation in track fee	Double	1
F_DUES_VH	Variation in ferry due vehicles	Double	1
F_DUES_TON	Variation in ferry due tons	Double	1
ID_VEHICLES	Vehicle types range	String	101-106

Software Required: Microsoft Access or Cube Database window (see Help>Cube Base>Database window), ArcCatalog.

Description of Use: Defines all the parameters related to cost and time coefficients for sensitivity tests within "Elasticity module".

Editing Options: Edits from Cube or Microsoft Access.

Used by: "Elasticity module".

3.2.4. Scenario specific data

In term of structure all the tables listed above have a copy in the scenario specific data, shown by the relations presented in Table 60.

Table 60 - Relation between base and scenario specific data.

Base Table	Scenario Specific Table
Base2019	Sc_{SCENARIO_SHORTNAME}_Link
	Sc_{SCENARIO_SHORTNAME}_Node
Cargo_Base2019	Sc_{SCENARIO_SHORTNAME}_Cargo
Frequency_Data_Base2019	Sc_{SCENARIO_SHORTNAME}_Frequency_Data_Link
	Sc_{SCENARIO_SHORTNAME}_Frequency_Data_Node
Node_terminals_Base2019	Sc_{SCENARIO_SHORTNAME}_Node_Terminals

Nodes_Base2019	Sc_{SCENARIO_SHORTNAME}_Nodes
Nodes_Commodities_Base2019	Sc_{SCENARIO_SHORTNAME}_Nodes_commodities
PropLink_Base2019	Sc_{SCENARIO_SHORTNAME}_PropLink
Rail_Capacity_Base2019	Sc_{SCENARIO_SHORTNAME}_Rail_Capacity
Tax_Category_Base2019	Sc_{SCENARIO_SHORTNAME}_Tax_Category
Tax_Country_Base2019	Sc_{SCENARIO_SHORTNAME}_Tax_Country
Tax_Link_Base2019	Sc_{SCENARIO_SHORTNAME}_Tax_Link
Toll_Link_Base2019	Sc_{SCENARIO_SHORTNAME}_Toll_Link
Vehicles_parameters_PartA_Base2019	Sc_{SCENARIO_SHORTNAME}_Vehicles_Parameters_PartA
Vehicles_parameters_PartB_Base2019	Sc_{SCENARIO_SHORTNAME}_Vehicles_Parameters_PartB

All the scenario specific tables (except SC_{SCENARIO_SHORTNAME}_ProprLink, SC_{SCENARIO_SHORTNAME}_Vehicles_Parameters_PartA , SC_{SCENARIO_SHORTNAME}_Vehicles_Parameters_PartB and SC_{SCENARIO_SHORTNAME}_Cargo) have an extra attribute UP_DATE or UP_DATE_N that will record the differences between the scenario and the reference case.

This field, with string format, is used to store the information regarding how to update the base data. The following values are used

- U - Update an existing value in the base table;
- A - Append a new record to the base table;
- D - Delete a record from the base table.

These values are automatically managed by the applications “Edit the data”. The user must not type, modify, or change them. For ProprLink and Vehicles_Parameters all the elements present in these table will overwrite those in the reference case, e.g. a simpler substitution.

There are two other tables that are managed differently from the general rule: General_{SCENARIO_SHORTNAME} and LogMod_{SCENARIO_SHORTNAME}. These are scenario specific and are not managed through the general difference record keeping. Those tables hold the definition of several control parameters used in the Logistics Module and in the GUI. They contain parameters that are controlled by catalog keys and could vary between scenarios.

3.2.4.1. General_{SCENARIO_SHORTNAME}

05_Input_data\Input_data.mdb\General_{SCENARIO_SHORTNAME}

This table, Table 61, holds general information about the scenario.

Table 61 - Format of “General_{SCENARIO_SHORTNAME}” table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
SC_N	Scenario number (1-default, higher if saved also in emmebank)	Integer	1
DATE_C	Date and time of creation	String	14/08/2013 09:24
DATE_L	Date and time of last modification if the scenario is in read/write mode, otherwise the date of lock.	String	14/08/2013 11:01

Field	Description	Data Format	Example
ZONES_M	Number of zones	Integer	1120
GCOST	Attribute name for extra cost on links [SEK]	String	EC_V
GCOST_KM	Attribute name for extra cost per km on links [SEK/km]	String	EC_KM_V
DF	Daily factor for all the modes except rail mode [number of days per year]	Integer	250
DFR	Daily factor for rail mode [number of days per year]	Integer	250
READ_WRITE	State of scenario (only read or read/write Yes=only read)	String	Yes

Software Required: Microsoft Access or Cube Database window (see Help>Cube Base>Database window), ArcCatalog.

Description of Use: This table responds to a high variety of uses:

- SC_N is used to recode where the base network was saved in the emmebank (1 if not, higher is saved). Since EMME is not used in the model anymore, it will always be 1
- DATE_C and DATE_L are the time references to check when updating existing temporary data in the model. They are also used for long time storage purposes
- ZONE_M, GCOST and GCOST_KM refer to this kind of attributes saved in the network
- DF and DFR: general parameters for assignment
- READ_WRITE: state variable to prevent further edits of a scenario, or to leave the scenario as editable.

Editing Options: The first two points listed above, and the last one, are managed by the system, never changed by the user. The others (ZONE_M, GCPST, GCOST_KM,DF,DFR) are modifiable from catalog keys present in the interface under "Edit the data" application.

Used by: “Prepare temporary data” subgroup under “Create the editable files”, “Create the tables specific of scenario” subgroup under “Edit the data”, “PWC_Matrices” and several subgroups under “Samgods Model”.

3.2.4.2. LogMod_{SCENARIO_SHORTNAME} 05_Input_data\Input_data.mdb\LogMod_{SCENARIO_SHORTNAME}

This table, Table 62, holds information from the GUI used in the LogMod module.

Table 62 - Format of “LogMod_{SCENARIO_SHORTNAME}” table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
INTER_RATE	Parameter INTEREST, interest rate used in cost calculations [%/year]	Double	0.1
STUFF	Parameter STUFF, costs for stuffing and stripping of containers at the origin and destination of a chain [SEK per tonne]	Double	60
CONTYPE	Parameter ALL_LORRY_TYPE_CONSOL, 0/1 switch that determines whether or not consolidation is allowed for all lorry types	Integer	1
INODLO	Parameter INDIVIDUAL_OD_LEG_OPTIMIZE, 0/1 switch that determines whether or not the optimization is done for each chain leg individually in a transport chain	Integer	1

MATD4FO	Parameter MINIMUM_ANNUAL_TONNE_DEMAND_4_FREQ_OPTIMIZE [Tonnes], Minimum demand for frequency optimization	Double	100
CONSOL_L	First value of parameter CONSOL. It sets the default lower bound for the consolidation levels.	Double	0.05
CONSOL_U	Second value of parameter CONSOL. It sets the default upper bound for the consolidation levels.	Double	0.95
TONNES	Parameter TONNES. If this parameter is a number, then this number will be used as the typical shipment size for this commodity. If this the parameter is set to DYNAMIC_MAX, DYNAMIC_AVERAGE or DYNAMIC_GEOMEAN the typical shipment size will be different for different zones and calculated as the maximum, average or geometric mean of the PWC matrix-values for the current origin zone	String	DYNAMIC_AVERAGE
LSTCNT	Parameter LSTCNT It sets the number of output files: 1= only best chains; 2 = best chains and second best chains. The current default is 5. It is recommended to not change this default since it is related to Rail Capacity Management module.	Integer	5
DATA	Parameter DATA, Output variables for the optimal transport solution [e.g.1,2,3, max is 8]. Nbrs 6 and 7 are useful when analysing detail in the results since all relevant data for the transport chains are available. The cost data are split into different components, operational costs, loading/unloading costs and infrastructure costs.	String	6,7
FACTOR	Parameter FACTOR, Initial consolidation factor in BuildChain (1st iteration)	Single	0.75
LOGCTL	Parameter LOGCTL, indicator (0/1) that determines whether or not CTL file settings will be logged in the common log file for the commodity	Integer	1
LOGFLS	Parameter LOGFLS, indicator (0/1) that determines whether or not input file information will be logged in the common log file for the commodity	Integer	1
LOGCST	Parameter LOGCST, indicator (0/1) that determines whether or not cost parameters will be in the common log file for the commodity	Integer	1
BESTOUT	Parameter BESTOUT, integer that determines whether or not DATA reports should be print out per each solution (best, second, third, etc. solution)	Integer	1

Software Required: Microsoft Access or Cube Database window (see Help>Cube Base>Database window), ArcCatalog.

Description of Use: This table is used in setting up the control files for BuildChain, ChainChoi, BuildChainRCM and ChainChoiRCM. All the parameters listed above control the process both in terms of reporting (log files) and settings for some variables. See reference 2 for their meaning and usage.

Editing Options: In "Edit the data" application each parameter is present as catalog key. Its value could be revised directly from the Scenario Window. For further details see reference 6.

Used by: “Prepare temporary data” subgroup under “Create the editable files,” “Prepare Data third part” subgroup under “Samgods Model > Logistics Module”, “Delete” and “Scenario Import” subgroups under “Handling scenario” and “General tables” subgroup under “Handling scenario > Scenario Export”.

3.2.5. Manage database

3.2.5.1. History

05_Input_data\Input_data.mdb\History

This table, Table 63, holds information about the different instances.

Table 63 - Format of "History" table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
MODEL	Folder of the original model used to create the new model (father model)	String	{CATALOG_DIR}
BASE_SCE	Name of Base scenario in original model	String	Base2019

Software Required: Microsoft Access, Cube Database Window (see Help -> Cube Base -> Database window), ArcMap, ArcCatalog.

Description of Use: For setting up new models (new model is created each time it is required to modify some general settings or input file such as chain types, etc). The table maintains the information of the father model used to setup the new model. This table traces the relationships among different versions.

Editing Options: Always changed by the system.

Used by: "General tables" subgroup under "Handling scenario > Scenario Export."

3.2.5.2. Model_description

05_Input_data\Input_data.mdb\Model_description

This table, Table 64, holds information about the programs related to the setup.

Table 64 - Format of "Model_description" table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
NAME	Software name	String	Cube
REALISE	Software version	String	6.1.0

Software Required: Microsoft Access, Cube Database Window (see Help -> Cube Base -> Database window), ArcMap, ArcCatalog.

Description of Use: Defines the release version for each program used in the model. This information could allow be checked regarding whether the correct version of a particular model is used.

Editing Options: No edits; always changed by the system.

Used by: "Installation," "General tables" subgroup under "Handling scenario > Scenario Export" and "Scenario Import" subgroup under "Handling scenario".

3.3. Calibration data

The calibration data is used when running the model in calibration mode. When using the model as standard or advance user this data is not modified along the run. It represents the calibrated conditions that should be used in evaluating different scenarios and represents an input an invariant input for the model.

3.3.1. Speed and vessel capacity factors

05_Input_data\Calibration\Input_Data_Calibration_Base2019.mdb\ Base2019_Link

05_Input_data\Calibration\Input_Data_Calibration_Base2045.mdb\ MainSc2045_Link

This table,Table 65, provides the scaling and adding factors on network links.

Table 65 - Format of "Base2019_Link" and "MainSc2045_Link" tables.

Field	Description	Data Format	Example
OBJECTID	Index	Integer	1
A	Start node in VY Numbering	Integer	2027
B	End node in VY Numbering	Integer	2068
SPEED_1_FA	Scaling factor for Speed_1	Double	1.029411765
SPEED_2_FA	Scaling factor for Speed_2	Double	1.029411765
Descript	Name of the infrastructure with modified speed	String	_
SPEED_1_TE	Adding factor for Speed_1	Double	0
SPEED_2_TE	Adding factor for Speed_2	Double	0
UL3_FA	Scaling factor for Capacity for vessels on sea (dwell tons)	Double	1
UL3_TE	Adding factor for Capacity for vessels on sea (dwell tons)	Double	0

Software Required: Microsoft Access, Cube Database Window (see Help -> Cube Base -> Database window).

Description of Use: Defines the scaling and adding factors applied to SPEED_1, SPEED2 and UL3 in the network links.

Editing Options: No edits. Results from the calibration procedure.

Used by: "Samgods Model > Initialization", "Samgods Model > LOS Calculation" (and elasticity module).

3.3.2. Scaling factor for Kiel Canal

05_Input_data\Calibration\Input_Data_Calibration_Base2019.mdb\KielCanal_Parameter_Base2019

05_Input_data\Calibration\Input_Data_Calibration_Base2045.mdb\KielCanal_Parameter_MainSC2045

This table, Table 66, provide the scaling factor for the Kiel Canal tolls.

Table 66 - Format of "KielCanal_Parameter_Base2019 " and "KielCanal_Parameter_MainSC2045" tables.

Field	Description	Data Format	Example
ID	Index	Integer	1
Factor	Scaling factor for Kiel Canal	Double	2.2

Software Required: Microsoft Access, Cube Database Window (see Help -> Cube Base -> Database window).

Description of Use: Defines the toll scaling factor on Kiel.

Editing Options: No edits. Results from the calibration procedure.

Used by: "Samgods Model > Initialization", "Samgods Model > LOS Calculation" (and elasticity module).

3.3.3. Locked solution list

05_Input_data\Calibration\Input_Data_Calibration_Base2019.mdb\Locked_2019

05_Input_data\Calibration\Input_Data_Calibration_Base2045.mdb\Locked_2045

This table, Table 67, provides the list of locked solutions which will be excluded in the logistic chain choice, usually associated to high volumes.

Table 67 - Format of "Locked_2019" and "Locked_2045" tables.

Field	Description	Data Format	Example
ID	Index	Integer	49
Commodity	Commodity group	Integer	1
FromNode	Production zone	Integer	960700
SubCell	Sub cell in the PWC matrix	Integer	0
ToNode	Attraction zone	Integer	960100
Freq	Frequency	Integer	-1
Mode	Associated mode	String	I
NNodes	Number of nodes on the route	Integer	3
Node1	Starting terminal	Integer	960711
Node2	Next terminal	Integer	930511
Node3	Next terminal	Integer	960111
Node4	Next terminal	Integer	
Node5	Next terminal	Integer	
Node6	Next terminal	Integer	
Name1	Description of first terminal	String	Rail:Narvik
Name2	Description of second terminal	String	Rail:Bensjobacken
Name3	Description of third terminal	String	Rail:Olso
Name4	Description of fourth terminal	String	
Name5	Description of fifth terminal	String	
Name6	Description of sixth terminal	String	

Software Required: Microsoft Access, Cube Database Window (see Help -> Cube Base -> Database window).

Description of Use: Defines the locked solutions.

Editing Options: No edits. Results from the calibration procedure.

Used by: "Samgods Model > Initialization", "Samgods Model > Logistic Module\RCM" (and elasticity module).

3.3.4. Factors for cost terminals

05_Input_data\Calibration\Input_Data_Calibration_Base2019.mdb\Nodes_Base2019

05_Input_data\Calibration\Input_Data_Calibration_Base2045.mdb\Nodes_MianSc2045

This table,Table 69, provides the scaling and adding factors to the cost and time technological factors on terminals and ports.

Table 68 - Format of "Nodes_Base2019" and "Nodes_MainSc2045" tables.

Field	Description	Data Format	Example
OBJECTID	Index	Integer	1
N	Node number in VY Numbering	Integer	386
ZONEID	Node number in EMME Numbering	Integer	848021
C_TECH_FAC_FA	Scaling factor for cost technological factor	Double	0.8
C_TECH_FAC_TE	Adding factor for cost technological factor	Double	0
T_TECH_FAC_FA	Scaling factor for time technological factor	Double	0.8
T_TECH_FAC_TE	Adding factor for time technological factor	Double	0

Software Required: Microsoft Access, Cube Database Window (see Help -> Cube Base -> Database window).

Description of Use: Defines the scaling and adding factors applied to cost and time technological factors for terminals and ports.

Editing Options: No edits. Results from the calibration procedure.

Used by: "Samgods Model > Initialization", "Samgods Model > Logistic Module" (and elasticity module).

3.3.5. Parameters_Kielcalibration

05_Input_data\Calibration\Input_Data_Calibration_Base2019.mdb\Parameters_Kielcalibration

This table, Table 69, holds information about the calibration of Kiel canal scaling factor.

Table 69 - Format of "*Parameters_Kielcalibration*" table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
ID	ID record	Integer	1.0
STEP	Step length in increasing or decreasing the Kiel canal scaling factor (starting from 1, 1+STEP or 1-STEP depending the search function)	Double	0.02
MINVAL	Minimum boundary for scaling factor. If after adjustment the value is below this value, it will be reset to VAL0	Double	0.01
DIFMAX	Maximum difference between modelled and surveyed value. In this case the distribution of tons between Kiel Canal and Jylland. 2 is in percentage	Double	2
VAL0	Reset value used in case the procedure gives negative or less than MINVAL results.	Double	0.02

Software Required: Microsoft Access, Cube Database Window (see Help -> Cube Base -> Database window).

Description of Use: Defines the control parameters in the adjust procedure for the Kiel Canal scaling factor.

Editing Options: No edits. Inputs for the calibration procedure.

Used by: "Samgods\Parameters calculation," "General tables" subgroup under "Handling scenario > Scenario Export" and "Scenario Import" subgroup under "Handling scenario".

3.3.6. Parameters_portcalibration

05_Input_data\Calibration\Input_Data_Calibration_Base2019.mdb\Parameters_portcalibration

This table, Table 70, holds information about the searching method applied in the calibration process. .

Table 70 - Format of "*Parameters_portcalibration*" table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
ID	ID record	Integer	1.0
STEP	Step length in increasing or decreasing the Kiel canal scaling factor (starting from 1, 1+STEP or 1-STEP depending on the search direction)	Double	0.02
MINVAL	Minimum boundary for scaling factor. If after adjustment the value is below this value, it will be reset to VAL0	Double	0.01
DIFMAX	Maximum difference between modelled and surveyed value. In this case it is the total tonne throughput per port area and commodity group. (100*1000 tons since statistics are tons/1000)	Double	100
VAL0	Reset value used in case the procedure gives negative or less than MINVAL results.	Double	0.02

Software Required: Cube Data Window, Dbf editor.

Description of Use: Defines the control parameters in the scaling factor adjustment procedure for Port Areas per commodity group.

Editing Options: No edits. Inputs for the calibration procedure.

Used by: "Samgods\Parameters calculation," "General tables" subgroup under "Handling scenario > Scenario Export" and "Scenario Import" subgroup under "Handling scenario".

3.3.7. Port Area parameters per commodity group

05_Input_data\Calibration\Input_Data_Calibration_Base2019.mdb\PortAreaParams_16_Comm_Base2019 and
05_Input_data\Calibration\Input_Data_Calibration_Base2045.mdb\PortAreaParams_16_Comm_MainSc2045

This table, Table 71, provide the scaling factor per commodity and port area.

Table 71 - Format of "*PortAreaParams_16_Comm*" table.

Field	Description	Data Format	Example
ID	Counter	Integer	1
PortArea	Port Area number	Integer	1
COM01	Scaling factor for COMMODITY group 1	Long	1000
COM02	Scaling factor for COMMODITY group 2	Long	0.5
COM03	Scaling factor for COMMODITY group 3	Long	0.9
COM04	Scaling factor for COMMODITY group 4	Long	1000
COM05	Scaling factor for COMMODITY group 5	Long	1000
COM06	Scaling factor for COMMODITY group 6	Long	2.4

COM07	Scaling factor for COMMODITY group 7	Long	0.5
COM08	Scaling factor for COMMODITY group 8	Long	0.4
COM09	Scaling factor for COMMODITY group 9	Long	3
COM10	Scaling factor for COMMODITY group 10	Long	3
COM11	Scaling factor for COMMODITY group 11	Long	1000
COM12	Scaling factor for COMMODITY group 12	Long	1.5
COM13	Scaling factor for COMMODITY group 13	Long	1000
COM14	Scaling factor for COMMODITY group 14	Long	2.7
COM15	Scaling factor for COMMODITY group 15	Long	3
COM16	Scaling factor for COMMODITY group 16	Long	1000

Software Required: Microsoft Access, Cube Database Window (see Help -> Cube Base -> Database window).

Description of Use: Defines the scaling factor applied in TIME skim per port area and commodity group.

Editing Options: No edits. Results from the calibration procedure.

Used by: "Samgods\Logistics Module\" "General tables" subgroup under "Handling scenario > Scenario Export" and "Scenario Import" subgroup under "Handling scenario."

3.3.8. Rail capacity factors

05_Input_data\Calibration\Input_Data_Calibration_Base2019.mdb\Rail_Capacity_Base2019

05_Input_data\Calibration\Input_Data_Calibration_Base2045.mdb\Rail_Capacity_MainSc2045

This table, Table 72, provides the scaling and adding factors on rail capacities at link level.

Table 72 - Format of "Rail_Capacity_Base2019" and "Rail_Capacity_MainSc2045" tables.

Field	Description	Data Format	Example
OBJECTID	Index	Integer	1
A	Start node in VY Numbering	Integer	75557
B	End node in VY Numbering	Integer	75563
ORIGCAP_FA	Scaling factor for rail capacity	Double	0.044776119
ORIGCAP_TE	Adding factor for rail capacity	Double	0
OBJECTID	Index	Integer	1

Software Required: Microsoft Access, Cube Database Window (see Help -> Cube Base -> Database window).

Description of Use: Defines the scaling and adding factors applied to Rail capacity table.

Editing Options: No edits. Results from the calibration procedure.

Used by: "Samgods Model > Initialization", "Samgods Model > LOS Calculation" (and elasticity module).

3.3.9. Factors for taxes by country

05_Input_data\Calibration\Input_Data_Calibration_Base2019.mdb\Tax_Country_Base2019

05_Input_data\\Calibration\Input_Data_Calibration_MainSc2045.mdb\Tax_Country_MainSc2045

This table,Table 73, provides information about the scaling and adding parameters for tax SEK_KM by country ID_COUNTRY and vehicle type ID_VEHICLE.

Table 73 - Format of "Tax_Country_Base2019" and "Tax_Country_MainSc2045" table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
ID_COUNTRY	Country code	Integer	501
ID_VEHICLE	Vehicle type	Integer	201
SEK_KM_FA	Scaling factor for country tax per km	Double	1
SEK_KM_TE	Adding factor for country tax per km	Double	0

Software Required: Microsoft Access or Cube Database window (see Help>Cube Base>Database window), ArcCatalog.

Description of Use: Specifies scaling and adding factors on the link based tax defined by country and vehicle type.

Editing Options: No edits. Results from the calibration procedure.

Used by: "Samgods Model > Initialization", "Samgods Model > Logistic Module" (and elasticity module).

3.3.10. Factors for taxes by Link

05_Input_data\Calibration\Input_Data_Calibration_Base2019.mdb\Tax_Link_Base2019

05_Input_data\Calibration\Input_Data_Calibration_MainSc2045.mdb\Tax_Link_MainSc2045

This table, Table 74, provides information about the scaling and adding parameters on tax SEK per link A-B and vehicle type VEH_NR.

Table 74 - Format of "Tax_Link_Base2019" and "Tax_Link_MainSc2045" tables.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
A	Start node in VY Numbering	Integer	2015
B	End node in VY Numbering	Integer	78051
VEH_NR	Vehicle type	Integer	301
SEK_FA	Scaling factors for the track fee or tax	Double	1
SEK_TE	Adding factors for the track fee or tax	Double	0

Software Required: Microsoft Access or Cube Database window (see Help>Cube Base>Database window), ArcCatalog.

Description of Use: Specifies scaling and adding factors on the link based tax defined by link and vehicle type.

Editing Options: No edits. Results from the calibration procedure.

Used by: "Samgods Model > Initialization", "Samgods Model > Logistic Module" (and elasticity module).

3.3.11. Factors for tolls by link

05_Input_data\Calibration\Input_Data_Calibration_Base2019.mdb\Toll_Link_Base2019

05_Input_data\Calibration\Input_Data_Calibration_MainSc2045.mdb\Toll_Link_MainSc2045

This table, Table 75, provides information about the scaling and adding parameters applied to the toll SEK per link A-B and vehicle type VEH_NR.

Table 75 - Format of "Toll_Link_Base2019" and "Toll_Link_MainSc2045" tables.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	260
A	Start node in VY Numbering	Integer	11964
B	End node in VY Numbering	Integer	11969
VEH_NR	Vehicle type	Integer	101
SEK_FA	Scaling factor for the Link toll [SEK] per passing vehicle	Double	0.82
SORT	Toll sorting index	String	1196601101
DESCRIPT	Description of the infrastructure (in general bridges)	String	Toll Oresund
SEK_TE	Adding factor for the Link toll [SEK] per passing vehicle	Double	809

Software Required: Microsoft Access or Cube Database window (see Help>Cube Base>Database window), ArcCatalog.

Description of Use: Defines a toll applied to a link per vehicle type.

Editing Options: No edits. Results from the calibration procedure.

Used by: "Samgods Model > Initialization", "Samgods Model > Logistic Module" (and elasticity module).

3.3.12. Scaling parameters for vehicle attributes Part A

05_Input_data\Calibration\Input_Data_Calibration_Base2019.mdb\Vehicles_parameters_PartA_Base2019

05_Input_data\Calibration\Input_Data_Calibration_Base2045.mdb\Vehicles_parameters_PartA_MainSc2045

Table 76, provides information about the scaling of vehicle costs and properties.

Table 76 - Format of "*Vehicles_parameters_PartA_Base2019*" and "*Vehicles_parameters_PartA_MainSc2045"* tables.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
ID	Index for vehicle type	Integer	1
VEH_NR	Vehicle type	Integer	101
CAPACITY_FA	Scaling factor for Capacity	Double	1
COORFACT_FA	Scaling factor for coordination factor	Double	1
HOURS_COST_FA	Scaling factor for hours cost	Double	1.1

KM_COST_FA	Scaling factor for km cost	Double	1.1
ONFER_H_C_FA	Scaling factor for on ferry hour cost	Double	0.5
ONFER_KM_C_FA	Scaling factor for on ferry km cost	Double	0.5
POSICOST_FA	Scaling factor for positioning cost	Double	1
DFLTFREQ_FA	Scaling factor for default frequency	Double	1
F_DUES_VH_FA	Scaling factor for ferry dues vehicle cost	Double	1
F_DUES_TON_FA	Scaling factor for ferry dues tons cost	Double	1
MAX_SPEED_FA	Scaling factor for max speed	Double	1
CAPACITY_TE	Adding factor for Capacity	Double	0
COORFACT_TE	Adding factor for coordination factor	Double	0
HOURS_COST_TE	Adding factor for hours cost	Double	0
KM_COST_TE	Adding factor for km cost	Double	0
ONFER_H_C_TE	Adding factor for on ferry hour cost	Double	0
ONFER_KM_C_TE	Adding factor for on ferry km cost	Double	0
POSICOST_TE	Adding factor for positioning cost	Double	0
DFLTFREQ_TE	Adding factor for default frequency	Double	0
F_DUES_VH_TE	Adding factor for ferry dues vehicle cost	Double	0
F_DUES_TON_TE	Adding factor for ferry dues tons cost	Double	0
MAX_SPEED_TE	Adding factor for max speed	Double	0

Software Required: Microsoft Access, Cube Database Window (see Help -> Cube Base -> Database window), ArcCatalog.

Description of Use: Define the scaling factors and Adding factors applied to vehicle parameters table in Samgods.

Editing Options: Updated during the calibration process. No need to change for standard run.

Used by: : “Samgods Model > Initialization”, “Samgods Model > Logistics Module\Prepare data application.” (and elasticity module).

3.3.13. Scaling parameters for vehicle attributes Part B

05_Input_data\Calibration\Input_Data_Calibration_Base2019.mdb\Vehicles_parameters_PartB_Base2019

05_Input_data\Calibration\Input_Data_Calibration_Base2045.mdb\Vehicles_parameters_PartB_MainSc2045

Table 77 provides information about the scaling of vehicle costs and properties.

Table 77 - Format of “*Vehicles_parameters_PartB_Base2019*” and “*Vehicles_parameters_PartB_MainSc2045”* tables.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
ID	Index for vehicle type	Integer	1
ID_COM	Commodity group	Integer	1
VEH_NR	Vehicle number	Integer	101
CONT_LTI_FA	Scaling factor for Container Load Time	Double	88
CONT_LCO_FA	Scaling factor for Container Load Cost	Double	88
CONT_LTI_T_FA	Scaling factor for Container Load Time at transfer	Double	88
CONT_LCO_T_FA	Scaling factor for Container Load Cost at transfer	Double	88
NC_LTI_FA	Scaling factor for Non container Load Time	Double	0.9
NC_LCO_FA	Scaling factor for Non container Load Cost (SEK/tonne)	Double	0.9

NC_LTIT_FA	Scaling factor for Non container Load Time at transfer	Double	0.9
NC_LCOT_FA	Scaling factor for Non container Load Cost at transfer	Double	0.9
CONT_LTI_TE	Adding factor for Container Load Time	Double	0
CONT_LCO_TE	Adding factor for Container Load Cost	Double	0
CONT_LTI_T_TE	Adding factor for Container Load Time at transfer	Double	0
CONT_LCO_T_TE	Adding factor for Container Load Cost at transfer	Double	0
NC_LTI_TE	Adding factor for Non container Load Time	Double	0
NC_LCO_TE	Adding factor for Non container Load Cost (SEK/tonne)	Double	0
NC_LTIT_TE	Adding factor for Non container Load Time at transfer	Double	0
NC_LCOT_TE	Adding factor for Non container Load Cost at transfer	Double	0

Software Required: Microsoft Access, Cube Database Window (see Help -> Cube Base -> Database window), ArcCatalog.

Description of Use: Define the scaling factors and adding factors by vehicle type and commodity group to vehicle parameters table in Samgods.

Editing Options: Updated during the calibration process. No need to change for standard run.

Used by: : “Samgods Model > Initialization”, “Samgods Model > Logistics Module\Prepare data application.” (and elasticity module).

3.4. Output data

The output data can be split into two classes; the first one is the output that always will be generated by the model independently of the user choices, the second one is only generated on user request.

3.4.1. General tables in geodatabase

The general tables provide general information about the scenario.

3.4.1.1. Model description

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Model_description

This table, Table 78, is a copy of Table 64.

Table 78 - Format of “Model_description” table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
NAME	Software name	String	Cube
REALISE	Software version	String	6.1.0

Visualizing Options: Microsoft Access or Cube Database window (see Help>Cube Base>Database window), ArcCatalog.

Description of Use: Defines the release version for each program involved in the model. It is used for long-term management of the model.

Used by: Not used.

Made by user choice: No.

3.4.1.2. Outputs

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\outputs

This table, Table 79, holds information about which outputs that been produced.

Table 79 - Format of "outputs" table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	2
OUTPUTR	Description of the output	String	LOS_ROAD
ID_COM	Commodity code (0 for all)	Double	0
DATE_E	Date of last modification for the input data used to create this output	String	03-Feb-15 07:17 PM

Visualizing Options: Microsoft Access or Cube Database window (see Help>Cube Base>Database window), ArcCatalog.

Description of Use: Storage of some input data settings and some output data for the last model runs.

Created by: "Prepare temporary data" subgroup under "Create the editable files."

Updated by: several subgroups in the "Samgods Model" application.

Made by user choice: No.

3.4.1.3. Node_labels

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Node_labels

This table, Table 80, holds information about the nodes.

Table 80 - Format of "Node_labels" table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
N	Node number VY Numbering	Integer	1
NORIG	Node number Emme numbering	Integer	711400
SCBSTANN	SCBSTANN code	Integer	114
ID_COUNTRY	Country code	Integer	1
ID_REGION	Region code	Integer	114
MODE_N	Mode for access to terminals	Integer	0
UI4	User field (not used in the current model)	Integer	0
X	Coordinate x (SWEREF99_TM)	Integer	1620000
Y	Coordinate y (SWEREF99_TM)	Integer	6601000
CENTRALL	Description	String	Upplands-Väsby

Visualizing Options: Microsoft Access or Cube Database window (see Help>Cube Base>Database window), ArcCatalog.

Description of Use: Table with labels for each zone in the network. For reporting purposes and inside the model for mapping of data between Voyager and EMME node numbering systems.

Created by: “Data Preparation” subgroup under “Samgods Model > LOS calculation.”

Used by: “Change matrix format” application.

Made by user choice: No.

3.4.1.4. ProprLink_{SCENARIO_SHORTNAME}

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\ProprLink_{SCENARIO_SHORTNAME}

This table, Table 81, holds information about the output proportional table.

Table 81 - Format of “ProprLink_{SCENARIO_SHORTNAME}” table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	696
A	Start node	Integer	2793
B	End node	Integer	2794
REGION	SCBSTANN code	Integer	136
WEIGHT	Proportion of the link within the SCBSTANN code (for instance 100 means 100% of the link is in 136 SCBSTANN code)	Double	100

Software Required: Microsoft Access or Cube Database window (see Help>Cube Base>Database window), ArcCatalog.

Description of Use: Table with all road and rail links that are distributed in different SCBSTANN areas. Each record gives the proportion of the length of the link part residing in each SCBSTANN area. The proportion is used to estimate tonne km and vehicle km statistics per region and county. (See reports #9, 16, 17 and 18).

Used by: “Reports per geographical aggregation” subgroup under “Samgods Model > Results > Results 1.0,” “Samgods Model > Results RCM > Results1.0”, “Create the new base” subgroup under “Handling scenario > Scenario Export” and “Create the scenario tables” subgroup under “Handling scenario > Scenario Export > Create the new scenario specific tables”.

3.4.2. Network format in geodatabase

Here, the transports are presented in network format. The link tables are all identified by a link given in VY numbering. If not the network is does not contain the term Bid (or Bidir or similar, short for bidirectional) then the network is directed, otherwise it is aggregated to an undirected (bidirectional) network.

3.4.2.1. Load_net_Road_0 and Load_net_Road_RCM

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Load_net_Road_o

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Load_net_Road_RCM

The node table, Table 82, and the link table, Table 83, holds information about the transports per road link A-B.

Table 82 - Format of "Load_net_Road_0_Node" and "Load_net_Road_RCM_Node" tables.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
SHAPE	Feature class type (point)	OLE Object	Long Binary Data
N	Node number in VY Numbering	Integer	1
X	Coordinate x (SWEREF99_TM)	Double	1620000
Y	Coordinate y (SWEREF99_TM)	Double	6601000
NORIG	Original node number based on the combination of ID_Country, ID_region and MODE_N values	Integer	711400
SCBSTANN	Scbstann code	Integer	114
ID_REGION	Region code	Integer	114
MODE_N	Code for allowed vehicles accessing the node	Integer	0
UI4	User field (not used in the current model)	Double	0
CENTRALL	Node description in terms of location	String	Upplands-Väsby

Table 83 - Format of "Load_net_Road_0_Link" and "Load_net_Road_RCM_Link" tables.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	16
SHAPE	Feature class type (lane)	OLE Object	Long Binary Data
A	Start node in VY Numbering	Integer	16
B	End node in VY Numbering	Integer	2813
Shape_Length	Length based on distance between coordinates in meters	Double	1359.1541
MODESTR	String with all the allowed modes	String	Xabc
SPEED_1	Vehicle speed in kms per hour for all vehicles except vehicles 102-106 in Sweden	Double	50

Field	Description	Data Format	Example
SPEED_2	Vehicle speed in kms per hour for vehicles 102-106 in Sweden	Double	50
CATEGORY	Link category	Integer	201
FUNCTION	Index for vdf function	Double	61
NLANES	Number of lanes (may be a decimal number)	Double	1
UL2	Distance in kms. User link data in emme used to enable holding link lengths longer than 999 kms.	Double	1.36
UL3	Capacity for vessels on sea (dwell tons)	Double	0
ID_COUNTRY	Country code	Integer	1
MODE_L	Code for allowed vehicles on the link	Integer	1
DISTANCE	Distance in kms (not equals to UL2)	Double	1.36
SWEDEN	Boolean variable indicating if the link is in Sweden	Integer	1
LGV3	Yearly vehicle 101 flow (number of loaded vehicles)	Double	3
LGV3T	Yearly vehicle 101 tonne flow	Double	2.1511
LGV3E	Yearly vehicle 101 flow (number of empty vehicles)(number of empty vehicles)	Double	0.5
MGV16	Yearly vehicle 102 flow (number of loaded vehicles) (number of loaded vehicles)	Double	0
MGV16T	Yearly vehicle 102 tonne flow	Double	0
MGV16E	Yearly vehicle 102 flow (number of empty vehicles)(number of empty vehicles)	Double	0
MGV24	Yearly vehicle 103 flow (number of loaded vehicles) (number of loaded vehicles)	Double	0
MGV24T	Yearly vehicle 103 tonne flow	Double	0
MGV24E	Yearly vehicle 103 flow (number of empty vehicles)(number of empty vehicles)	Double	0
HGV40	Yearly vehicle 104 flow (number of loaded vehicles) (number of loaded vehicles)	Double	0
HGV40T	Yearly vehicle 104 tonne flow	Double	0
HGV40E	Yearly vehicle 104 flow (number of empty vehicles)(number of empty vehicles)	Double	0
HGV60	Yearly vehicle 105 flow (number of loaded vehicles) (number of loaded vehicles)	Double	0.17989
HGV60T	Yearly vehicle 105 tonne flow	Double	0.8457
HGV60E	Yearly vehicle 105 flow (number of empty vehicles)(number of empty vehicles)	Double	0.50340
HGV74	Yearly vehicle 106 flow (number of loaded vehicles) (number of loaded vehicles)	Double	0

Field	Description	Data Format	Example
HGV74T	Yearly vehicle 106 tonne flow	Double	0
HGV74E	Yearly vehicle 106 flow (number of empty vehicles)(number of empty vehicles)	Double	0
TOT_ROAD	Yearly vehicle flow (number of loaded vehicles) (number of loaded vehicles) for the road mode	Double	3.17989
TOT_ROAD_T	Yearly tonne flow for the road mode	Double	2.9968
TOT_ROAD_E	Yearly vehicle flow (number of empty vehicles)(number of empty vehicles) for the road mode	Double	1.00340

Visualizing Options: Microsoft Access or Cube GIS window (see Help>Cube Base>GIS window), ArcCatalog, ArcMap.

Description of Use: Assigned network for the road mode for standard logistic module and Rail Capacity Management.

Created by: "Road Assignment" subgroup under "Samgods Model > Assignment" and "Road Assignment RCM" subgroup under "Samgods Model > RCM Assignment."

Used by: "Results" and "Results RCM" subgroups under "Samgods Model."

Made by user choice: No.

3.4.2.2. Load_net_Rail_0

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Load_net_Rail_0

The node table, Table 84, and the link table, Table 85, holds information about the transports per rail link A-B.

Table 84 - Format of "Load_net_Rail_0_Node" table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
SHAPE	Feature class type (point)	OLE Object	Long Binary Data
N	Node number in VY Numbering	Integer	1
X	Coordinate x (SWEREF99_TM)	Double	1620000
Y	Coordinate y (SWEREF99_TM)	Double	6601000
NORIG	Original node number based on the combination of ID_Country, ID_region and MODE_N values	Integer	711400
SCBSTANN	Scbstann code	Integer	114
ID_REGION	Region code	Integer	114
MODE_N	Code for allowed vehicles accessing the node	Integer	MODE_N
UI4	User field (not used in the current model)	Double	0

Field	Description	Data Format	Example
CENTRALL	Node description in terms of location	String	Upplands-Väsby

Table 85 - Format of "Load_net_Rail_0_Link" table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
SHAPE	Feature class type (Polyline)	OLE Object	Long Binary Data
A	Start node in VY Numbering	Integer	21
B	End node in VY Numbering	Integer	2127
Shape_Length	Length based on distance between coordinates in meters	Double	206.1552
MODESTR	String with all the allowed modes	String	Xabc
SPEED_1	Speed in kms per hour for all modes except v102-106 in Sweden	Double	50
SPEED_2	Speed in kms per hour for vehicle types v102-106 in Sweden	Double	0
CATEGORY	Link category	Integer	211
FUNCTION	Index for vdf function	Double	66
NLANES	Number of lanes (may be a decimal number)	Double	1
UL2	Distance in kms. User link data in emme used to enable holding link lengths longer than 999 kms.	Double	1.36
UL3	Field for capacity constrains in Vanel canal (tonnes)	Double	0
TRAKBANDEL	Trakbandel number for specific link	Integer	1011
ORIGINALCAP	Capacity on rail links from Capacity table (number of trains per day)	Double	0
ID_COUNTRY	Country code	Integer	1
MODE_L	Code for allowed vehicles on the link	Integer	2
SWEDEN	Boolean variable indicating if the link is in Sweden	Integer	1
CLOSE_	Flag 0/1 to treat vehicles 202/203	Integer	0
KOMBI	Yearly vehicle 201 flow (number of loaded vehicles)	Double	0
KOMBIT	Yearly vehicle 201 tonne flow	Double	0
KOMBIE	Yearly vehicle 201 flow (number of empty vehicles)	Double	0
KOMXL	Yearly vehicle 210 flow (number of loaded vehicles)	Double	0
KOMXLT	Yearly vehicle 210 tonne flow	Double	0
KOMXLE	Yearly vehicle 210 flow (number of empty vehicles)	Double	0
FS_TRAIN	Yearly vehicle 202 flow (number of loaded vehicles)	Double	325.2379
FS_TRAINT	Yearly vehicle 202 tonne flow	Double	166064.421875
FS_TRAINE	Yearly vehicle 202 flow (number of empty vehicles)	Double	325.23791
SYS22	Yearly vehicle 204 flow (number of loaded vehicles)	Double	0

Field	Description	Data Format	Example
SYS22T	Yearly vehicle 204 tonne flow	Double	0
SYS22E	Yearly vehicle 204 flow (number of empty vehicles)	Double	0
SYS25	Yearly vehicle 205 flow (number of loaded vehicles)	Double	0
SYS25T	Yearly vehicle 205 tonne flow	Double	0
SYS25E	Yearly vehicle 205 flow (number of empty vehicles)	Double	0
SYS30	Yearly vehicle 206 flow (number of loaded vehicles)	Double	0
SYS30T	Yearly vehicle 206 tonne flow	Double	0
SYS30E	Yearly vehicle 206 flow (number of empty vehicles)	Double	0
SYSXL	Yearly vehicle 211 flow (number of loaded vehicles)	Double	0
SYSXLT	Yearly vehicle 211 tonne flow	Double	0
SYSXLE	Yearly vehicle 211 flow (number of empty vehicles)	Double	0
WG550	Yearly vehicle 207 flow (number of loaded vehicles)	Double	33.71220
WG550T	Yearly vehicle 207 tonne flow	Double	14486.2989
WG550E	Yearly vehicle 207 flow (number of empty vehicles)	Double	130.22619
WG750	Yearly vehicle 208 flow (number of loaded vehicles)	Double	0
WG750T	Yearly vehicle 208 tonne flow	Double	0
WG750E	Yearly vehicle 208 flow (number of empty vehicles)	Double	0.956900
WG950	Yearly vehicle 209 flow (number of loaded vehicles)	Double	0
WG950T	Yearly vehicle 209 tonne flow	Double	0
WG950E	Yearly vehicle 209 flow (number of empty vehicles)	Double	36.2745
WGEXL	Yearly vehicle 212 flow (number of loaded vehicles)	Double	0
WGEXLT	Yearly vehicle 212 tonne flow	Double	0
WGEXLE	Yearly vehicle 212 flow (number of empty vehicles)	Double	36.2745
FEEDW	Yearly vehicle 203 flow (number of loaded vehicles)	Double	383.6697
FEEDWT	Yearly vehicle 203 tonne flow	Double	166064.421875
FEEDWE	Yearly vehicle 203 flow (number of empty vehicles)	Double	325.23791
FEEDV	Yearly vehicle 202 flow (number of loaded vehicles)	Double	0
FEEDVT	Yearly vehicle 202 tonne flow	Double	0
FEEDVE	Yearly vehicle 202 flow (number of empty vehicles)	Double	0
TOT_RAIL	Yearly vehicle flow (number of loaded vehicles) for the rail mode	Double	417.3819391
TOT_RAIL_T	Yearly tonne flow for the rail mode	Double	180550.71875
TOT_RAIL_E	Yearly vehicle flow (number of empty vehicles) for the rail mode	Double	492.695495

Visualizing Options: Microsoft Access or Cube GIS window (see Help>Cube Base>GIS window), ArcCatalog, ArcMap.

Description of Use: Assigned network for the rail mode.

Created by: "Rail Assignment" subgroup under "Samgods Model > Assignment."

Used by: "Results" subgroup under "Samgods Model."

Made by user choice: No.

3.4.2.3. Load_net_Sea_0 and Load_net_Sea_RCM

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Load_net_Sea_0

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Load_net_Sea_RCM

The node table, Table 86, and the link table, Table 87, holds information about the transports per sea link A-B.

Table 86 - Format of "Load_net_Sea_0_Node" and "Load_net_Sea_RCM_Node" tables.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
SHAPE	Feature class type (point)	OLE Object	Long Binary Data
N	Node number in VY Numbering	Integer	1
X	Coordinate x (SWEREF99_TM)	Double	1620000
Y	Coordinate y (SWEREF99_TM)	Double	6601000
NORIG	Original node number based on the combination of ID_Country, ID_region and MODE_N values	Integer	711400
SCBSTANN	Scbstann code	Integer	114
ID_REGION	Region code	Integer	114
MODE_N	Code for allowed vehicles accessing the node	Integer	3
UI4	User field (not used in the current model)	Double	0
CENTRALL	Node description in terms of location	String	Upplands-Väsby

Table 87 - Format of "Load_net_Sea_0_Link" and "Load_net_Sea_RCM_Link" table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
SHAPE	Feature class type (lane)	OLE Object	Long Binary Data
A	Start node in VY Numbering	Integer	41
B	End node in VY Numbering	Integer	2407
Shape_Length	Length based on distance between coordinates in meters	Double	231.94827

Field	Description	Data Format	Example
SPEED_1	Speed in kms per hour for all modes except vehicle 102-106 in Sweden	Double	9.3
SPEED_2	Speed in kms per hour for vehicle types vehicle 102-106 in Sweden	Double	0
CATEGORY	Link category	Integer	221
FUNCTION	Index for vdf function	Double	61
NLANES	Number of lanes (may be a decimal number)	Double	1
UL2	Distance in kms. User link data in emme used to enable holding link lengths longer than 999 kms.	Double	1.36
MODESTR	String with all the allowed modes	String	Xabc
ID_COUNTRY	Country code	Integer	1
MODE_L	Code for allowed vehicles on the link	Integer	3
CLOSED	0/1 flag to close links based on capacity saved in UL3 (applied to Kiel Canal)	Integer	0
SWEDEN	Boolean variable indicating if the link is in Sweden	Integer	1
CV5	Yearly vehicle flow (number of loaded vehicles) for vehicle 301	Double	1328.875
CV5T	Yearly tonne flows for vehicle 301	Double	1576008.0087
CV5E	Yearly flow (number of empty vehicles) for vehicle 301	Double	494.89151
CV16	Yearly vehicle flow (number of loaded vehicles) for vehicle 302	Double	0.48649999499322
CV16T	Yearly tonne flows for vehicle 302	Double	1897.0262
CV16E	Yearly flow (number of empty vehicles) for vehicle 302	Double	92.2993011474609
CV27	Yearly vehicle flow (number of loaded vehicles) for vehicle 303	Double	0.0064
CV27T	Yearly tonne flows for vehicle 303	Double	41.8562
CV27E	Yearly flow (number of empty vehicles) for vehicle 303	Double	59.1561012268066
CV100	Yearly vehicle flow (number of loaded vehicles) for vehicle 304	Double	0
CV100T	Yearly tonne flows for vehicle 304	Double	0
CV100E	Yearly flow (number of empty vehicles) for vehicle 304	Double	0.04459999874234
OV1	Yearly vehicle flow (number of loaded vehicles) for vehicle 305	Double	0.522
OV1T	Yearly tonne flows for vehicle 305	Double	104.5458
OV1E	Yearly flow (number of empty vehicles) for vehicle 305	Double	0.07059999555349
OV2	Yearly vehicle flow (number of loaded vehicles) for vehicle 306	Double	0
OV2T	Yearly tonne flows for vehicle 306	Double	0
OV2E	Yearly flow (number of empty vehicles) for vehicle 306	Double	0
OV3	Yearly vehicle flow (number of loaded vehicles) for vehicle 307	Double	53.4078979492188
OV3T	Yearly tonne flows for vehicle 307	Double	46724.79296875

Field	Description	Data Format	Example
OV3E	Yearly flow (number of empty vehicles) for vehicle 307	Double	849.075988769531
OV5	Yearly vehicle flow (number of loaded vehicles) for vehicle 308	Double	13.5809001922607
OV5T	Yearly tonne flows for vehicle 308	Double	16943.318359375
OV5E	Yearly flow (number of empty vehicles) for vehicle 308	Double	170.317993164062
OV10	Yearly vehicle flow (number of loaded vehicles) for vehicle 309	Double	48.0507011413574
OV10T	Yearly tonne flows for vehicle 309	Double	120034.1796875
OV10E	Yearly flow (number of empty vehicles) for vehicle 309	Double	98.8669967651367
OV20	Yearly vehicle flow (number of loaded vehicles) for vehicle 310	Double	8.51709938049316
OV20T	Yearly tonne flows for vehicle 310	Double	42584.1484375
OV20E	Yearly flow (number of empty vehicles) for vehicle 310	Double	34.8592987060547
OV40	Yearly vehicle flow (number of loaded vehicles) for vehicle 311	Double	2.90810012817383
OV40T	Yearly tonne flows for vehicle 311	Double	29069.599609375
OV40E	Yearly flow (number of empty vehicles) for vehicle 311	Double	0.25110000371933
OV80	Yearly vehicle flow (number of loaded vehicles) for vehicle 312	Double	
OV80T	Yearly tonne flows for vehicle 312	Double	17966.50390625
OV80E	Yearly flow (number of empty vehicles) for vehicle 312	Double	0.11080000549555
OV100	Yearly vehicle flow (number of loaded vehicles) for vehicle 313	Double	0
OV100T	Yearly tonne flows for vehicle 313	Double	0
OV100E	Yearly flow (number of empty vehicles) for vehicle 313	Double	0
OV250	Yearly vehicle flow (number of loaded vehicles) for vehicle 314	Double	0
OV250T	Yearly tonne flows for vehicle 314	Double	0
OV250E	Yearly flow (number of empty vehicles) for vehicle 314	Double	0
RO3	Yearly vehicle flow (number of loaded vehicles) for vehicle 315	Double	71.7285995483398
RO3T	Yearly tonne flows for vehicle 315	Double	57497.5703125
RO3E	Yearly flow (number of empty vehicles) for vehicle 315	Double	54.013599395752
RO6	Yearly vehicle flow (number of loaded vehicles) for vehicle 316	Double	0
RO6T	Yearly tonne flows for vehicle 316	Double	0
RO6E	Yearly flow (number of empty vehicles) for vehicle 316	Double	0
RO10	Yearly vehicle flow (number of loaded vehicles) for vehicle 317	Double	0
RO10T	Yearly tonne flows for vehicle 317	Double	0
RO10E	Yearly flow (number of empty vehicles) for vehicle 317	Double	0
ROF2	Yearly vehicle flow (number of loaded vehicles) for vehicle 318	Double	0
ROF2T	Yearly tonne flows for vehicle 318	Double	0

Field	Description	Data Format	Example
ROF2E	Yearly flow (number of empty vehicles) for vehicle 318	Double	0
ROF5	Yearly vehicle flow (number of loaded vehicles) for vehicle 319	Double	0
ROF5T	Yearly tonne flows for vehicle 319	Double	0
ROF5E	Yearly flow (number of empty vehicles) for vehicle 319	Double	0
ROF7	Yearly vehicle flow (number of loaded vehicles) for vehicle 320	Double	0
ROF7T	Yearly tonne flows for vehicle 320	Double	0
ROF7E	Yearly flow (number of empty vehicles) for vehicle 320	Double	0
RAF5	Yearly vehicle flow (number of loaded vehicles) for vehicle 321	Double	0
RAF5T	Yearly tonne flows for vehicle 321	Double	0
RAF5E	Yearly flow (number of empty vehicles) for vehicle 321	Double	0
INW	Yearly vehicle flow (number of loaded vehicles) for vehicle 322	Double	0
INWT	Yearly tonne flows for vehicle 322	Double	0
INWE	Yearly flow (number of empty vehicles) for vehicle 322	Double	0
TOT_SEA	Yearly vehicle flow (number of loaded vehicles) for mode sea	Double	1528.982421875
TOT_SEA_T	Yearly tonne flows for mode sea	Double	1908871.55018125
TOT_SEA_E	Yearly flow (number of empty vehicles) for mode sea	Double	1853.9580078125

Visualizing Options: Microsoft Access or Cube GIS window (see Help>Cube Base>GIS window), ArcCatalog, ArcMap.

Description of Use: Assigned network for the sea mode

Created by: “Sea Assignment” subgroup under “Samgods Model > Assignment” and “Sea Assignment RCM” subgroup under “Samgods Model > RCM Assignment.”

Used by: “Results” and "Results RCM" subgroups under “Samgods Model”.

Made by user choice: No.

3.4.2.4. Load_net_Air_0 and Load_net_Air_RCM

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Load_net_Air_0

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Load_net_Air_RCM

The node table, Table 88, and the link table, Table 89, holds information about the transports per air link A-B.

Table 88 - Format of “Load_net_Air_0_Node” and “Load_net_Air_RCM_Node” tables.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
SHAPE	Feature class type (point)	OLE Object	Long Binary Data

Field	Description	Data Format	Example
N	Node number in VY Numbering	Integer	1
X	Coordinate x(SWEREF99_TM)	Double	1620000
Y	Coordinate y (SWEREF99_TM)	Double	6601000
NORIG	Original node number based on the combination of ID_Country, ID_region and MODE_N values	Integer	711400
SCBSTANN	Scbstann code	Integer	114
ID_REGION	Region code	Integer	114
MODE_N	Code for allowed vehicles accessing the node	Integer	MODE_N
UI4	User field (not used in the current model)	Double	0
CENTRALL	Node description in terms of location	String	Upplands-Väsby

Table 89 - Format of "Load_net_Air_0_Link" and "Load_net_Air_RCM_Link" tables.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
SHAPE	Feature class type (lane)	OLE Object	Long Binary Data
A	Start node in VY Numbering	Integer	62
B	End node in VY Numbering	Integer	2356
Shape_Length	Length based on distance between coordinates in meters	Double	476.759897627719
SPEED_1	Speed in kms per hour for all modes except v102-106 in Sweden	Double	600
SPEED_2	Speed in kms per hour for vehicle types v102-106 in Sweden	Double	0
CATEGORY	Link category	Integer	241
FUNCTION	Index for vdf function	Double	61
NLANES	Number of lanes (may be a decimal number)	Double	1
UL2	Distance in kms. User link data in emme used to enable holding link lengths longer than 999 kms.	Double	1.36
MODESTR	String with all the allowed modes	String	Xabc
ID_COUNTRY	Country code	Integer	1
MODE_L	Code for allowed vehicles on the link	Integer	5
SWEDEN	Boolean variable indicating if the link is in Sweden	Integer	1
FLYG	Yearly vehicle flow (number of loaded vehicles) for vehicle 401	Double	0
FLYGT	Yearly tonne flows for vehicle 401	Double	0
FLYGE	Yearly flow (number of empty vehicles) for vehicle 401	Double	0

Visualizing Options: Microsoft Access or Cube GIS window (see Help>Cube Base>GIS window), ArcCatalog, ArcMap.

Description of Use: Assigned network for the air mode.

Created by: “Sea Assignment” subgroup under “Samgods Model > Assignment” and “Sea Assignment RCM” subgroup under “Samgods Model > RCM Assignment”.

Used by: “Results” and "Results RCM" subgroup under “Samgods Model”.

Made by user choice: No.

3.4.2.5. Loaded_net_0

Scenario_Tree\{SCENARIO_SHORTNAME}\Output0_{SCENARIO_SHORTNAME}.mdb\Loaded_net_0

The node table, Table 90, and the link table, Table 91, holds information about the transports per link A-B for the full network.

Table 90 - Format of “Loaded_net_0_Node” table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
SHAPE	Feature class type (point)	OLE Object	Long Binary Data
N	Node number in VY Numbering	Integer	1
X	Coordinate x (SWEREF99_TM)	Double	1620000
Y	Coordinate y (SWEREF99_TM)	Double	6601000
NORIG	Original node number based on the combination of ID_Country, ID_region and MODE_N values	Integer	711400
SCBSTANN	Scbstann code	Integer	114
ID_REGION	Region code	Integer	114
MODE_N	Code for allowed vehicles accessing the node	Integer	MODE_N
UI4	User field (not used in the current model)	Double	0
CENTRALL	Node description in terms of location	String	Upplands-Väsby
GEOMETRYSOURCE	Number representing to which network the node belongs (1-Road 2-Rail 3_sea 4-Air)	Double	4

Table 91 - Format of “Loaded_net_0_Link” table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	40
SHAPE	Feature class type (polyline)	OLE Object	Long Binary Data
A	Start node in VY Numbering	Integer	36
B	End node in VY Numbering	Integer	2791

Field	Description	Data Format	Example
Shape_Length	Length based on distance between coordinates in meters	Double	325.729949474258
SPEED_1	Speed in kms per hour for all modes except v102-106 in Sweden	Double	50
SPEED_2	Speed in kms per hour for vehicle types v102-106 in Sweden	Double	50
CATEGORY	Link category	Integer	201
FUNCTION	Index for vdf function	Double	61
NLANES	Number of lanes (may be a decimal number)	Double	1
UL2	Distance in kms. User link data in emme used to enable holding link lengths longer than 999 kms.	Double	1.36
UL3	Capacity for vessels on sea (dwell tons)	Double	0
MODESTR	String with all the allowed modes	String	Xabc
DISTANCE	Distance in kms (not equals to UL2)	Double	1.36
ID_COUNTRY	Country code	Integer	1
MODE_L	Code for allowed vehicles on the link	Integer	1
CLOSED	Flag 0/1 for Sea assignment to close links where Vessel capacity > UL3	Integer	0
CLOSE_	Flag 0/1 for rail assignment to close links where train type 202 or 203 is not allowed	Integer	0
SWEDEN	Boolean variable indicating if the link is in Sweden	Integer	1
ORIGINALCAP	Original capacity in bidirectional number of trains per day (from 3.2.3.8 Rail_Capacity_Base2019)	Double	0
LGV3	Yearly vehicle flow (number of loaded vehicles) for vehicle 101	Double	0
LGV3T	Yearly tonne flows for vehicle 101	Double	0
LGV3E	Yearly flow (number of empty vehicles) for vehicle 101	Double	0
MGV16	Yearly vehicle flow (number of loaded vehicles) for vehicle 102	Double	0
MGV16T	Yearly tonne flows for vehicle 102	Double	0
MGV16E	Yearly flow (number of empty vehicles) for vehicle 102	Double	0
MGV24	Yearly vehicle flow (number of loaded vehicles) for vehicle 103	Double	0
MGV24T	Yearly tonne flows for vehicle 103	Double	0
MGV24E	Yearly flow (number of empty vehicles) for vehicle 103	Double	0
HGV40	Yearly vehicle flow (number of loaded vehicles) for vehicle 104	Double	0
HGV40T	Yearly tonne flows for vehicle 104	Double	0
HGV40E	Yearly flow (number of empty vehicles) for vehicle 104	Double	0
HGV60	Yearly vehicle flow (number of loaded vehicles) for vehicle 105	Double	0
HGV60T	Yearly tonne flows for vehicle 105	Double	0
HGV60E	Yearly flow (number of empty vehicles) for vehicle 105	Double	0

Field	Description	Data Format	Example
HGV74	Yearly vehicle flow (number of loaded vehicles) for vehicle 106	Double	0
HGV74E	Yearly tonne flows for vehicle 106	Double	0
HGV74T	Yearly flow (number of empty vehicles) for vehicle 106	Double	0
TOT_ROAD	Yearly vehicle flow (number of loaded vehicles) for mode road	Double	0
TOT_ROAD_T	Yearly tonne flows for mode road	Double	0
TOT_ROAD_E	Yearly flow (number of empty vehicles) for mode road	Double	0
KOMBI	Yearly vehicle 201 flow (number of loaded vehicles)	Double	0
KOMBIT	Yearly vehicle 201 tonne flow	Double	0
KOMBIE	Yearly vehicle 201 flow (number of empty vehicles)	Double	0
KOMXL	Yearly vehicle 210 flow (number of loaded vehicles)	Double	0
KOMXLT	Yearly vehicle 210 tonne flow	Double	0
KOMXLE	Yearly vehicle 210 flow (number of empty vehicles)	Double	0
FS_TRAIN	Yearly vehicle 202 flow (number of loaded vehicles)	Double	325.2379
FS_TRAINT	Yearly vehicle 202 tonne flow	Double	166064.421875
FS_TRAINE	Yearly vehicle 202 flow (number of empty vehicles)	Double	325.23791
SYS22	Yearly vehicle 204 flow (number of loaded vehicles)	Double	0
SYS22T	Yearly vehicle 204 tonne flow	Double	0
SYS22E	Yearly vehicle 204 flow (number of empty vehicles)	Double	0
SYS25	Yearly vehicle 205 flow (number of loaded vehicles)	Double	0
SYS25T	Yearly vehicle 205 tonne flow	Double	0
SYS25E	Yearly vehicle 205 flow (number of empty vehicles)	Double	0
SYS30	Yearly vehicle 206 flow (number of loaded vehicles)	Double	0
SYS30T	Yearly vehicle 206 tonne flow	Double	0
SYS30E	Yearly vehicle 206 flow (number of empty vehicles)	Double	0
SYSXL	Yearly vehicle 211 flow (number of loaded vehicles)	Double	0
SYSXLT	Yearly vehicle 211 tonne flow	Double	0
SYSXLE	Yearly vehicle 211 flow (number of empty vehicles)	Double	0
WG550	Yearly vehicle 207 flow (number of loaded vehicles)	Double	33.71220
WG550T	Yearly vehicle 207 tonne flow	Double	14486.2989
WG550E	Yearly vehicle 207 flow (number of empty vehicles)	Double	130.22619
WG750	Yearly vehicle 208 flow (number of loaded vehicles)	Double	0
WG750T	Yearly vehicle 208 tonne flow	Double	0
WG750E	Yearly vehicle 208 flow (number of empty vehicles)	Double	0.956900

Field	Description	Data Format	Example
WG950	Yearly vehicle 209 flow (number of loaded vehicles)	Double	0
WG950T	Yearly vehicle 209 tonne flow	Double	0
WG950E	Yearly vehicle 209 flow (number of empty vehicles)	Double	36.2745
WGEXL	Yearly vehicle 212 flow (number of loaded vehicles)	Double	0
WGEXLT	Yearly vehicle 212 tonne flow	Double	0
WGEXLE	Yearly vehicle 212 flow (number of empty vehicles)	Double	36.2745
FEEDW	Yearly vehicle 203 flow (number of loaded vehicles)	Double	383.6697
FEEDWT	Yearly vehicle 203 tonne flow	Double	166064.421875
FEEDWE	Yearly vehicle 203 flow (number of empty vehicles)	Double	325.23791
FEEDV	Yearly vehicle 202 flow (number of loaded vehicles)	Double	0
FEEDVT	Yearly vehicle 202 tonne flow	Double	0
FEEDVE	Yearly vehicle 202 flow (number of empty vehicles)	Double	0
TOT_RAIL	Yearly vehicle flow (number of loaded vehicles) for the rail mode	Double	417.3819391
TOT_RAIL_T	Yearly tonne flow for the rail mode	Double	180550.71875
TOT_RAIL_E	Yearly vehicle flow (number of empty vehicles) for the rail mode	Double	492.695495
CV5	Yearly vehicle flow (number of loaded vehicles) for vehicle 301	Double	0
CV5T	Yearly tonne flows for vehicle 301	Double	0
CV5E	Yearly flow (number of empty vehicles) for vehicle 301	Double	0
CV16	Yearly vehicle flow (number of loaded vehicles) for vehicle 302	Double	0
CV16T	Yearly tonne flows for vehicle 302	Double	0
CV16E	Yearly flow (number of empty vehicles) for vehicle 302	Double	0
CV27	Yearly vehicle flow (number of loaded vehicles) for vehicle 303	Double	0
CV27T	Yearly tonne flows for vehicle 303	Double	0
CV27E	Yearly flow (number of empty vehicles) for vehicle 303	Double	0
CV100	Yearly vehicle flow (number of loaded vehicles) for vehicle 304	Double	0
CV100T	Yearly tonne flows for vehicle 304	Double	0
CV100E	Yearly flow (number of empty vehicles) for vehicle 304	Double	0
OV1	Yearly vehicle flow (number of loaded vehicles) for vehicle 305	Double	0
OV1T	Yearly tonne flows for vehicle 305	Double	0
OV1E	Yearly flow (number of empty vehicles) for vehicle 305	Double	0
OV2	Yearly vehicle flow (number of loaded vehicles) for vehicle 306	Double	0
OV2T	Yearly tonne flows for vehicle 306	Double	0
OV2E	Yearly flow (number of empty vehicles) for vehicle 306	Double	0

Field	Description	Data Format	Example
OV3	Yearly vehicle flow (number of loaded vehicles) for vehicle 307	Double	0
OV3T	Yearly tonne flows for vehicle 307	Double	0
OV3E	Yearly flow (number of empty vehicles) for vehicle 307	Double	0
OV5	Yearly vehicle flow (number of loaded vehicles) for vehicle 308	Double	0
OV5T	Yearly tonne flows for vehicle 308	Double	0
OV5E	Yearly flow (number of empty vehicles) for vehicle 308	Double	0
OV10	Yearly vehicle flow (number of loaded vehicles) for vehicle 309	Double	0
OV10T	Yearly tonne flows for vehicle 309	Double	0
OV10E	Yearly flow (number of empty vehicles) for vehicle 309	Double	0
OV20	Yearly vehicle flow (number of loaded vehicles) for vehicle 310	Double	0
OV20T	Yearly tonne flows for vehicle 310	Double	0
OV20E	Yearly flow (number of empty vehicles) for vehicle 310	Double	0
OV40	Yearly vehicle flow (number of loaded vehicles) for vehicle 311	Double	0
OV40T	Yearly tonne flows for vehicle 311	Double	0
OV40E	Yearly flow (number of empty vehicles) for vehicle 311	Double	0
OV80	Yearly vehicle flow (number of loaded vehicles) for vehicle 312	Double	0
OV80T	Yearly tonne flows for vehicle 312	Double	0
OV80E	Yearly flow (number of empty vehicles) for vehicle 312	Double	0
OV100	Yearly vehicle flow (number of loaded vehicles) for vehicle 313	Double	0
OV100T	Yearly tonne flows for vehicle 313	Double	0
OV100E	Yearly flow (number of empty vehicles) for vehicle 313	Double	0
OV250	Yearly vehicle flow (number of loaded vehicles) for vehicle 314	Double	0
OV250T	Yearly tonne flows for vehicle 314	Double	0
OV250E	Yearly flow (number of empty vehicles) for vehicle 314	Double	0
RO3	Yearly vehicle flow (number of loaded vehicles) for vehicle 315	Double	0
RO3T	Yearly tonne flows for vehicle 315	Double	0
RO3E	Yearly flow (number of empty vehicles) for vehicle 315	Double	0
RO6	Yearly vehicle flow (number of loaded vehicles) for vehicle 316	Double	0
RO6T	Yearly tonne flows for vehicle 316	Double	0
RO6E	Yearly flow (number of empty vehicles) for vehicle 316	Double	0
RO10	Yearly vehicle flow (number of loaded vehicles) for vehicle 317	Double	0
RO10T	Yearly tonne flows for vehicle 317	Double	0
RO10E	Yearly flow (number of empty vehicles) for vehicle 317	Double	0

Field	Description	Data Format	Example
ROF2	Yearly vehicle flow (number of loaded vehicles) for vehicle 318	Double	0
ROF2T	Yearly tonne flows for vehicle 318	Double	0
ROF2E	Yearly flow (number of empty vehicles) for vehicle 318	Double	0
ROF5	Yearly vehicle flow (number of loaded vehicles) for vehicle 319	Double	0
ROF5T	Yearly tonne flows for vehicle 319	Double	0
ROF5E	Yearly flow (number of empty vehicles) for vehicle 319	Double	0
ROF7	Yearly vehicle flow (number of loaded vehicles) for vehicle 320	Double	0
ROF7T	Yearly tonne flows for vehicle 320	Double	0
ROF7E	Yearly flow (number of empty vehicles) for vehicle 320	Double	0
RAF5	Yearly vehicle flow (number of loaded vehicles) for vehicle 321	Double	0
RAF5T	Yearly tonne flows for vehicle 321	Double	0
RAF5E	Yearly flow (number of empty vehicles) for vehicle 321	Double	0
INW	Yearly vehicle flow (number of loaded vehicles) for vehicle 322	Double	0
INWT	Yearly tonne flows for vehicle 322	Double	0
INWE	Yearly flow (number of empty vehicles) for vehicle 322	Double	0
TOT_SEA	Yearly vehicle flow (number of loaded vehicles) for mode sea	Double	0
TOT_SEA_T	Yearly tonne flows for mode sea	Double	0
TOT_SEA_E	Yearly flow (number of empty vehicles) for mode sea	Double	0
FKYG	Yearly vehicle flow (number of loaded vehicles) for vehicle 401	Double	0
FKYGT	Yearly tonne flows for vehicle 401	Double	0
FKYGE	Yearly flow (number of empty vehicles) for vehicle 401	Double	0
VOLTO	Yearly vehicle flow (number of loaded vehicles) for all modes	Double	0
TONTO	Yearly tonne flows for all modes	Double	0
EMPTOE	Yearly flow (number of empty vehicles) for all modes	Double	0
GEOMETRYSOURCE	Number representing to which network the link belongs (1-Road 2-Rail 3_sea 4-Air)	Double	4
TRAKBANDEL	Trakbandel code for specific link	Integer	1110

Visualizing Options: Microsoft Access or Cube GIS window (see Help>Cube Base>GIS window), ArcCatalog.

Description of Use: Assigned network for all modes. It is the merge of each mode network (Loaded_net_road_0, Loaded_net_rail_0, Loaded_net_sea_0, Loaded_net_air)_0.

Created by: “Results” subgroup under “Samgods Model”.

Used by: “Data Preparation LP” subgroup under “Samgods Model\Rail Capacity Management”.

Made by user choice: No.

3.4.2.6. Loaded_Bid_0 and Loaded_Bid_RCM

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Loaded_Bid_0

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Loaded_Bid_RCM

The node table, Table 92, and the link table, Table 93, holds information about the transports per (undirected, bidirectional) link A-B.

Table 92 - Format of "Loaded_Bid_0_Node" and "Loaded_Bid_RCM_Node" tables.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
SHAPE	Feature class type (point)	OLE Object	Long Binary Data
N	Node number in VY Numbering	Integer	1
X	Coordinate x (SWEREF99_TM)	Double	1620000
Y	Coordinate y (SWEREF99_TM)	Double	6601000
NORIG	Original node number based on the combination of ID_Country, ID_region and MODE_N values	Integer	711400
SCBSTANN	Scbstann code	Integer	114
ID_REGION	Region code	Integer	114
MODE_N	Code for allowed vehicles accessing the node	Integer	MODE_N
UI4	User field (not used in the current model)	Double	0
CENTRALL	Node description in terms of location	String	Upplands-Väsby

Table 93 - Format of "Loaded_Bid_0_Link" and "Loaded_Bid_RCM_Link" table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
SHAPE	Feature class type (Polyline	OLE Object	Long Binary Data
A	Start node in VY Numbering	Integer	1
B	End node in VY Numbering	Integer	2659
Shape_Length	Length based on distance between coordinates in meters	Double	230.867927616822
CATEGORY	Link category	Integer	110
FUNCTION	Index for vdf function	Double	61
NLANES	Number of lanes (may be a decimal number)	Double	1
UL2	Distance in kms. User link data in emme used to enable holding link lengths longer than 999 kms.	Double	1.36
ID_COUNTRY	Country code	Integer	1
MODE_L	Code for allowed vehicles on the link	Integer	1

Field	Description	Data Format	Example
CLOSED	Flag 0/1 for vehicles 202/203	Integer	0
TOT_ROAD_TM_BD	Bidirectional yearly flow for the mode road (in millions)	Double	1.35
TOT_RAIL_TM_BD	Bidirectional yearly flow for the mode rail (in millions)	Double	0
TOT_SEA_TM_BD	Bidirectional yearly flow for the mode sea (in millions)	Double	0

Visualizing Options: Microsoft Access or Cube GIS window (see Help>Cube Base>GIS window), ArcCatalog, ArcMap.

Description of Use: Assigned network with bidirectional flows for road, rail and sea.

Created by: "Results 1.0" subgroup under "Samgods Model > Results" and : "Results 1.0" subgroup under "Samgods Model > Results RCM".

Used by: Not use in the model, final report (see Scenario Outputs > Samgods Reports > Reports > Bidirectional tons per mode and Scenario Outputs > RCM Reports > Bidirectional tons per mode).

Made by user choice: No.

3.4.2.7. Load_net_Rail_RCM

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Load_net_Rail_RCM

The node table, Table 94, and the link table, Table 95, holds information about the transports per rail link A-B. Fields with * only have values for domestic rail links.

Table 94 - Format of "Load_net_Rail_RCM_Node" table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
SHAPE	Feature class type (point)	OLE Object	Long Binary Data
N	Node number in VY Numbering	Integer	1
X	Coordinate x (SWEREF99_TM)	Double	1620000
Y	Coordinate y (SWEREF99_TM)	Double	6601000
NORIG	Original node number based on the combination of ID_Country, ID_region and MODE_N values	Integer	711400
SCBSTANN	Scbstann code	Integer	114
ID_REGION	Region code	Integer	114
MODE_N	Code for allowed vehicles accessing the node	Integer	MODE_N
UI4	User field (not used in the current model)	Double	0
CENTRALL	Node description in terms of location	String	Upplands-Väsby

Table 95 - Format of "Load_net_Rail_RCM_Link" table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
SHAPE	Feature class type (Polyline)	OLE Object	Long Binary Data
A	Start node in VY Numbering	Integer	21
B	End node in VY Numbering	Integer	2127
Shape_Length	Length based on distance between coordinates in meters	Double	206.155281301845
ID_LINK	Link identified for rail link. Two links in opposite direction share the same ID_LINK.	Integer	25
SPEED_1	Speed in kms per hour for all modes except v102-106 in Sweden	Double	50
SPEED_2	Speed in kms per hour for vehicle types v102-106 in Sweden	Double	0
CATEGORY	Link category	Integer	211
FUNCTION	Index for vdf function	Double	61
NLANES	Number of lanes (may be a decimal number)	Double	1
UL2	Distance in kms. User link data in emme used to enable holding link lengths longer than 999 kms.	Double	1.36
MODESTR	String with all the allowed modes	String	Xabc
ID_COUNTRY	Country code	Integer	1
MODE_L	Code for allowed vehicles on the link	Integer	2
SWEDEN	Boolean variable indicating if the link is in Sweden	Integer	1
CAP*	Original capacity in bidirectional number of trains per day on rail links. From Capacity table	Double	78
PREVCAP*	Capacity in previous Adjust Capacity Loop [bidirectional trains per day] - if not used PREVCAP=CAP	Double	78
FREMME2*	Emme node number for start node on rail	Integer	1002
TOEMME2*	Emme node number for end node on rail	Integer	1003
CURRENTCAP*	Capacity in current Adjust Capacity Loop [bidirectional trains per day] - if not used CURRENTCAP=CAP.	Double	78
KOMBI	Yearly vehicle 201 flow (number of loaded vehicles)	Double	0
KOMBIT	Yearly vehicle 201 tonne flow	Double	0
KOMBIE	Yearly vehicle 201 flow (number of empty vehicles)	Double	0
KOMXL	Yearly vehicle 210 flow (number of loaded vehicles)	Double	0
KOMXLT	Yearly vehicle 210 tonne flow	Double	0
KOMXLE	Yearly vehicle 210 flow (number of empty vehicles)	Double	0
FS_TRAIN	Yearly vehicle 202 flow (number of loaded vehicles)	Double	325.2379
FS_TRAINT	Yearly vehicle 202 tonne flow	Double	166064.421875
FS_TRAINE	Yearly vehicle 202 flow (number of empty vehicles)	Double	325.23791

Field	Description	Data Format	Example
SYS22	Yearly vehicle 204 flow (number of loaded vehicles)	Double	0
SYS22T	Yearly vehicle 204 tonne flow	Double	0
SYS22E	Yearly vehicle 204 flow (number of empty vehicles)	Double	0
SYS25	Yearly vehicle 205 flow (number of loaded vehicles)	Double	0
SYS25T	Yearly vehicle 205 tonne flow	Double	0
SYS25E	Yearly vehicle 205 flow (number of empty vehicles)	Double	0
SYS30	Yearly vehicle 206 flow (number of loaded vehicles)	Double	0
SYS30T	Yearly vehicle 206 tonne flow	Double	0
SYS30E	Yearly vehicle 206 flow (number of empty vehicles)	Double	0
SYSXL	Yearly vehicle 211 flow (number of loaded vehicles)	Double	0
SYSXLT	Yearly vehicle 211 tonne flow	Double	0
SYSXLE	Yearly vehicle 211 flow (number of empty vehicles)	Double	0
WG550	Yearly vehicle 207 flow (number of loaded vehicles)	Double	33.71220
WG550T	Yearly vehicle 207 tonne flow	Double	14486.2989
WG550E	Yearly vehicle 207 flow (number of empty vehicles)	Double	130.22619
WG750	Yearly vehicle 208 flow (number of loaded vehicles)	Double	0
WG750T	Yearly vehicle 208 tonne flow	Double	0
WG750E	Yearly vehicle 208 flow (number of empty vehicles)	Double	0.956900
WG950	Yearly vehicle 209 flow (number of loaded vehicles)	Double	0
WG950T	Yearly vehicle 209 tonne flow	Double	0
WG950E	Yearly vehicle 209 flow (number of empty vehicles)	Double	36.2745
WGEXL	Yearly vehicle 212 flow (number of loaded vehicles)	Double	0
WGEXLT	Yearly vehicle 212 tonne flow	Double	0
WGEXLE	Yearly vehicle 212 flow (number of empty vehicles)	Double	36.2745
FEEDW	Yearly vehicle 203 flow (number of loaded vehicles)	Double	383.6697
FEEDWT	Yearly vehicle 203 tonne flow	Double	166064.421875
FEEDWE	Yearly vehicle 203 flow (number of empty vehicles)	Double	325.23791
FEEDV	Yearly vehicle 202 flow (number of loaded vehicles)	Double	0
FEEDVT	Yearly vehicle 202 tonne flow	Double	0
FEEDVE	Yearly vehicle 202 flow (number of empty vehicles)	Double	0
TOT_RAIL	Yearly vehicle flow (number of loaded vehicles) for the rail mode	Double	417.3819391
TOT_RAIL_T	Yearly tonne flow for the rail mode	Double	180550.71875
TOT_RAIL_E	Yearly vehicle flow (number of empty vehicles) for the rail mode	Double	492.695495

Field	Description	Data Format	Example
TRAKBANDEL	Trakbandel code for specific link	Integer	1110

Visualizing Options: Microsoft Access or Cube GIS window (see Help>Cube Base>GIS window), ArcCatalog, ArcMap.

Description of Use: Assigned network for the rail mode from Rail Capacity Management.

Created by: "Rail Assignment RCM" subgroup under "Samgods Model > RCM Assignment".

Used by: "Results RCM" subgroup under "Samgods Model".

Made by user choice: No.

3.4.2.8. Loaded_net_RCM

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Load_net_RCM

The node table, Table 96, and the link table, Table 97, holds information about the transports per link A-B for the full network. Fields with * only have values for domestic rail links.

Table 96 - Format of "Load_net_RCM_Node" table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
SHAPE	Feature class type (point)	OLE Object	Long Binary Data
N	Node number in VY Numbering	Integer	1
X	Coordinate x (SWEREF99_TM)	Double	1620000
Y	Coordinate y (SWEREF99_TM)	Double	6601000
NORIG	Original node number based on the combination of ID_Country, ID_region and MODE_N values	Integer	711400
SCBSTANN	Scbstann code	Integer	114
ID_REGION	Region code	Integer	114
MODE_N	Code for allowed vehicles accessing the node	Integer	MODE_N
UI4	User field (not used in the current model)	Double	0
CENTRALL	Node description in terms of location	String	Upplands-Väsby
GEOMETRYSOURCE	Number representing to which network the node belongs (1-Road 2-Rail 3_sea 4-Air)	Double	4

Table 97 - Format of "Load_net_RCM_Link" table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	40
SHAPE	Feature class type (lane)	OLE Object	Long Binary Data
A	Start node in VY Numbering	Integer	36

Field	Description	Data Format	Example
B	End node in VY Numbering	Integer	2791
Shape_Length	Length based on distance between coordinates in meters	Double	325.729949474258
SPEED_1	Speed in kms per hour for all modes except vehicles 102-106 in Sweden	Double	50
SPEED_2	Speed in kms per hour for vehicle types 102-106 in Sweden	Double	50
CATEGORY	Link category	Integer	201
FUNCTION	Index for vdf function	Double	61
NLANES	Number of lanes (may be a decimal number)	Double	1
UL2	Distance in kms. User link data in emme used to enable holding link lengths longer than 999 kms.	Double	1.36
DISTANCE	Distance in kms (not equals to UL2)	Double	1.36
ID_COUNTRY	Country code	Integer	1
MODE_L	Code for allowed vehicles on the link	Integer	1
CLOSED	Flag 0/1 for Sea assignment to close links where Vessel capacity > UL3	Integer	0
SWEDEN	Boolean variable indicating if the link is in Sweden	Integer	1
LGV3	Yearly vehicle flow (number of loaded vehicles) for vehicle 101	Double	0
LGV3T	Yearly tonne flows for vehicle 101	Double	0
LGV3E	Yearly flow (number of empty vehicles) for vehicle 101	Double	0
MGV16	Yearly vehicle flow (number of loaded vehicles) for vehicle 102	Double	0
MGV16T	Yearly tonne flows for vehicle 102	Double	0
MGV16E	Yearly flow (number of empty vehicles) for vehicle 102	Double	0
MGV24	Yearly vehicle flow (number of loaded vehicles) for vehicle 103	Double	0
MGV24T	Yearly tonne flows for vehicle 103	Double	0
MGV24E	Yearly flow (number of empty vehicles) for vehicle 103	Double	0
HGV40	Yearly vehicle flow (number of loaded vehicles) for vehicle 104	Double	0
HGV40T	Yearly tonne flows for vehicle 104	Double	0
HGV40E	Yearly flow (number of empty vehicles) for vehicle 104	Double	0
HGV60	Yearly vehicle flow (number of loaded vehicles) for vehicle 105	Double	0
HGV60T	Yearly tonne flows for vehicle 105	Double	0
HGV60E	Yearly flow (number of empty vehicles) for vehicle 105	Double	0
HGV74	Yearly vehicle flow (number of loaded vehicles) for vehicle 106	Double	0
HGV74E	Yearly tonne flows for vehicle 106	Double	0
HGV74T	Yearly flow (number of empty vehicles) for vehicle 106	Double	0

Field	Description	Data Format	Example
TOT_ROAD	Yearly vehicle flow (number of loaded vehicles) for mode road	Double	0
TOT_ROAD_T	Yearly tonne flows for mode road	Double	0
TOT_ROAD_E	Yearly flow (number of empty vehicles) for mode road	Double	0
KOMBI	Yearly vehicle 201 flow (number of loaded vehicles)	Double	0
KOMBIT	Yearly vehicle 201 tonne flow	Double	0
KOMBIE	Yearly vehicle 201 flow (number of empty vehicles)	Double	0
KOMXL	Yearly vehicle 210 flow (number of loaded vehicles)	Double	0
KOMXLT	Yearly vehicle 210 tonne flow	Double	0
KOMXLE	Yearly vehicle 210 flow (number of empty vehicles)	Double	0
FS_TRAIN	Yearly vehicle 202 flow (number of loaded vehicles)	Double	325.2379
FS_TRAINT	Yearly vehicle 202 tonne flow	Double	166064.421875
FS_TRAINE	Yearly vehicle 202 flow (number of empty vehicles)	Double	325.23791
SYS22	Yearly vehicle 204 flow (number of loaded vehicles)	Double	0
SYS22T	Yearly vehicle 204 tonne flow	Double	0
SYS22E	Yearly vehicle 204 flow (number of empty vehicles)	Double	0
SYS25	Yearly vehicle 205 flow (number of loaded vehicles)	Double	0
SYS25T	Yearly vehicle 205 tonne flow	Double	0
SYS25E	Yearly vehicle 205 flow (number of empty vehicles)	Double	0
SYS30	Yearly vehicle 206 flow (number of loaded vehicles)	Double	0
SYS30T	Yearly vehicle 206 tonne flow	Double	0
SYS30E	Yearly vehicle 206 flow (number of empty vehicles)	Double	0
SYSXL	Yearly vehicle 211 flow (number of loaded vehicles)	Double	0
SYSXLT	Yearly vehicle 211 tonne flow	Double	0
SYSXLE	Yearly vehicle 211 flow (number of empty vehicles)	Double	0
WG550	Yearly vehicle 207 flow (number of loaded vehicles)	Double	33.71220
WG550T	Yearly vehicle 207 tonne flow	Double	14486.2989
WG550E	Yearly vehicle 207 flow (number of empty vehicles)	Double	130.22619
WG750	Yearly vehicle 208 flow (number of loaded vehicles)	Double	0
WG750T	Yearly vehicle 208 tonne flow	Double	0
WG750E	Yearly vehicle 208 flow (number of empty vehicles)	Double	0.956900
WG950	Yearly vehicle 209 flow (number of loaded vehicles)	Double	0
WG950T	Yearly vehicle 209 tonne flow	Double	0
WG950E	Yearly vehicle 209 flow (number of empty vehicles)	Double	36.2745

Field	Description	Data Format	Example
WGEXL	Yearly vehicle 212 flow (number of loaded vehicles)	Double	0
WGEXLT	Yearly vehicle 212 tonne flow	Double	0
WGEXLE	Yearly vehicle 212 flow (number of empty vehicles)	Double	36.2745
FEEDW	Yearly vehicle 203 flow (number of loaded vehicles)	Double	383.6697
FEEDWT	Yearly vehicle 203 tonne flow	Double	166064.421875
FEEDWE	Yearly vehicle 203 flow (number of empty vehicles)	Double	325.23791
FEEDV	Yearly vehicle 202 flow (number of loaded vehicles)	Double	0
FEEDVT	Yearly vehicle 202 tonne flow	Double	0
FEEDVE	Yearly vehicle 202 flow (number of empty vehicles)	Double	0
TOT_RAIL	Yearly vehicle flow (number of loaded vehicles) for the rail mode	Double	417.3819391
TOT_RAIL_T	Yearly tonne flow for the rail mode	Double	180550.71875
TOT_RAIL_E	Yearly vehicle flow (number of empty vehicles) for the rail mode	Double	492.695495
CV5	Yearly vehicle flow (number of loaded vehicles) for vehicle 301	Double	0
CV5T	Yearly tonne flows for vehicle 301	Double	0
CV5E	Yearly flow (number of empty vehicles) for vehicle 301	Double	0
CV16	Yearly vehicle flow (number of loaded vehicles) for vehicle 302	Double	0
CV16T	Yearly tonne flows for vehicle 302	Double	0
CV16E	Yearly flow (number of empty vehicles) for vehicle 302	Double	0
CV27	Yearly vehicle flow (number of loaded vehicles) for vehicle 303	Double	0
CV27T	Yearly tonne flows for vehicle 303	Double	0
CV27E	Yearly flow (number of empty vehicles) for vehicle 303	Double	0
CV100	Yearly vehicle flow (number of loaded vehicles) for vehicle 304	Double	0
CV100T	Yearly tonne flows for vehicle 304	Double	0
CV100E	Yearly flow (number of empty vehicles) for vehicle 304	Double	0
OV1	Yearly vehicle flow (number of loaded vehicles) for vehicle 305	Double	0
OV1T	Yearly tonne flows for vehicle 305	Double	0
OV1E	Yearly flow (number of empty vehicles) for vehicle 305	Double	0
OV2	Yearly vehicle flow (number of loaded vehicles) for vehicle 306	Double	0
OV2T	Yearly tonne flows for vehicle 306	Double	0
OV2E	Yearly flow (number of empty vehicles) for vehicle 306	Double	0
OV3	Yearly vehicle flow (number of loaded vehicles) for vehicle 307	Double	0
OV3T	Yearly tonne flows for vehicle 307	Double	0
OV3E	Yearly flow (number of empty vehicles) for vehicle 307	Double	0

Field	Description	Data Format	Example
OV5	Yearly vehicle flow (number of loaded vehicles) for vehicle 308	Double	0
OV5T	Yearly tonne flows for vehicle 308	Double	0
OV5E	Yearly flow (number of empty vehicles) for vehicle 308	Double	0
OV10	Yearly vehicle flow (number of loaded vehicles) for vehicle 309	Double	0
OV10T	Yearly tonne flows for vehicle 309	Double	0
OV10E	Yearly flow (number of empty vehicles) for vehicle 309	Double	0
OV20	Yearly vehicle flow (number of loaded vehicles) for vehicle 310	Double	0
OV20T	Yearly tonne flows for vehicle 310	Double	0
OV20E	Yearly flow (number of empty vehicles) for vehicle 310	Double	0
OV40	Yearly vehicle flow (number of loaded vehicles) for vehicle 311	Double	0
OV40T	Yearly tonne flows for vehicle 311	Double	0
OV40E	Yearly flow (number of empty vehicles) for vehicle 311	Double	0
OV80	Yearly vehicle flow (number of loaded vehicles) for vehicle 312	Double	0
OV80T	Yearly tonne flows for vehicle 312	Double	0
OV80E	Yearly flow (number of empty vehicles) for vehicle 312	Double	0
OV100	Yearly vehicle flow (number of loaded vehicles) for vehicle 313	Double	0
OV100T	Yearly tonne flows for vehicle 313	Double	0
OV100E	Yearly flow (number of empty vehicles) for vehicle 313	Double	0
OV250	Yearly vehicle flow (number of loaded vehicles) for vehicle 314	Double	0
OV250T	Yearly tonne flows for vehicle 314	Double	0
OV250E	Yearly flow (number of empty vehicles) for vehicle 314	Double	0
RO3	Yearly vehicle flow (number of loaded vehicles) for vehicle 315	Double	0
RO3T	Yearly tonne flows for vehicle 315	Double	0
RO3E	Yearly flow (number of empty vehicles) for vehicle 315	Double	0
RO6	Yearly vehicle flow (number of loaded vehicles) for vehicle 316	Double	0
RO6T	Yearly tonne flows for vehicle 316	Double	0
RO6E	Yearly flow (number of empty vehicles) for vehicle 316	Double	0
RO10	Yearly vehicle flow (number of loaded vehicles) for vehicle 317	Double	0
RO10T	Yearly tonne flows for vehicle 317	Double	0
RO10E	Yearly flow (number of empty vehicles) for vehicle 317	Double	0
ROF2	Yearly vehicle flow (number of loaded vehicles) for vehicle 318	Double	0
ROF2T	Yearly tonne flows for vehicle 318	Double	0
ROF2E	Yearly flow (number of empty vehicles) for vehicle 318	Double	0

Field	Description	Data Format	Example
ROF5	Yearly vehicle flow (number of loaded vehicles) for vehicle 319	Double	0
ROF5T	Yearly tonne flows for vehicle 319	Double	0
ROF5E	Yearly flow (number of empty vehicles) for vehicle 319	Double	0
ROF7	Yearly vehicle flow (number of loaded vehicles) for vehicle 320	Double	0
ROF7T	Yearly tonne flows for vehicle 320	Double	0
ROF7E	Yearly flow (number of empty vehicles) for vehicle 320	Double	0
RAF5	Yearly vehicle flow (number of loaded vehicles) for vehicle 321	Double	0
RAF5T	Yearly tonne flows for vehicle 321	Double	0
RAF5E	Yearly flow (number of empty vehicles) for vehicle 321	Double	0
INW	Yearly vehicle flow (number of loaded vehicles) for vehicle 322	Double	0
INWT	Yearly tonne flows for vehicle 322	Double	0
INWE	Yearly flow (number of empty vehicles) for vehicle 322	Double	0
TOT_SEA	Yearly vehicle flow (number of loaded vehicles) for mode sea	Double	0
TOT_SEA_T	Yearly tonne flows for mode sea	Double	0
TOT_SEA_E	Yearly flow (number of empty vehicles) for mode sea	Double	0
FLYG	Yearly vehicle flow (number of loaded vehicles) for vehicle 401	Double	0
FLYGT	Yearly tonne flows for vehicle 401	Double	0
FLYGE	Yearly flow (number of empty vehicles) for vehicle 401	Double	0
VOLTO	Yearly vehicle flow (number of loaded vehicles) for all modes	Double	0
TONTO	Yearly tonne flows for all modes	Double	0
EMPTOE	Yearly flow (number of empty vehicles) for all modes	Double	0
ID_LINK	Link identified for rail link. Two links in opposite direction share the same ID_LINK.	Integer	25
CAP*	Original capacity in bidirectional trains per day on rail links. From Capacity table	Double	78
PREVCAP*	Capacity in previous Adjust Capacity Loop [bidirectional trains per day] - if not used PREVCAP=CAP	Double	78
FREMME2*	Emme node number for start node	Integer	1002
TOEMME2*	Emme node number for end node	Integer	1003
CURRENTCAP	Capacity in current Adjust Capacity Loop [bidirectional trains per day] - if not used CURRENTCAP=CAP.	Double	78
TRAKBANDEL	Trakbandel code for specific link	Integer	1110

Visualizing Options: Microsoft Access or Cube GIS window (see Help>Cube Base>GIS window), ArcCatalog, ArcMap.

Description of Use: Assigned network for all modes from Rail Capacity Management. It is the merge of all mode networks (Load_net_road_RCM, Load_net_rail_RCM, Load_net_sea_RCM, Load_net_air_RCM).

Created by: “Results RCM” subgroup under “Samgods Model”.

Used by: “Results RCM” subgroup under “Samgods Model” to produce related reports (Report_1, Report_4, etc).

Made by user choice: No.

3.4.2.9. Rail_BiDir

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Rail_BiDir

The node table, Table 98, and the link table, Table 99, holds information about the transports per rail (undirected, bidirectional) link A-B. Fields with * only have values for domestic rail links.

Table 98 - Format of “Rail_BiDir_Node” table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
SHAPE	Feature class type (point)	OLE Object	Long Binary Data
N	Node number in VY Numbering	Integer	1
X	Coordinate x (SWEREF99_TM)	Double	1620000
Y	Coordinate y (SWEREF99_TM)	Double	6601000
NORIG	Original node number based on the combination of ID_Country, ID_region and MODE_N values	Integer	711400
SCBSTANN	Scbstann code	Integer	114
ID_REGION	Region code	Integer	114
MODE_N	Code for allowed vehicles accessing the node	Integer	MODE_N
UI4	User field (not used in the current model)	Double	0
CENTRALL	Node description in terms of location	String	Upplands-Väsby
GEOMETRYSOURCE	Number representing to which network the node belongs (1-Road 2-Rail 3_sea 4-Air)	Double	4

Table 99 - Format of “Rail_BiDir_Link” table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
SHAPE	Feature class type (Polyline)	OLE Object	Long Binary Data
A	Start node in VY Numbering	Integer	21
B	End node in VY Numbering	Integer	2127
Shape_Length	Length based on distance between coordinates in meters	Double	206.155281301845
ID_LINK	Link identified for rail link. Two links in opposite direction share the same ID_LINK.	Integer	25

Field	Description	Data Format	Example
TRAKBANDEL	Trakbandel number for specific link	Integer	1011
CAP*	Maximum number of bidirectional trains per day (from 3.2.3.8 Rail_Capacity_Base2019)	String	418
TOT_LOAD	Number of loaded bidirectional trains per day	Double	71.24434
TOT_EMPT	Number of unloaded bidirectional trains per day	Double	31.21692
TOT_ASS	Number of total bidirectional trains per day (loaded unloaded)	Double	102.4613
DIFF_VC	Difference between TOT_ASS and CAP	Double	-315.539
FLAG_OVCAP	Flag 0/1. 1 means the link is overcapacity by at least 1 train	Integer	1
FLAG_PER	Flag 0/1. 1 means the link is overcapacity by at least 10%	Double	0
FLAG_TOT	Flag 0/1 if FLAG_OVCAP=1 or FLAG_PER=1	Double	1
SPEED_1	Speed in kms per hour for all modes except v102-106 in Sweden	Double	50
SPEED_2	Speed in kms per hour for vehicle types v102-106 in Sweden	Double	0
CATEGORY	Link category	Integer	211
FUNCTION	Index for vdf function	Double	61
NLANES	Number of lanes (may be a decimal number)	Double	1
UL2	Distance in kms. User link data in emme used to enable holding link lengths longer than 999 kms.	Double	1.36
UL3	Capacity for vessels on sea (dwell tons)	Double	0
MODESTR	String with all the allowed modes	String	Xabc
ID_COUNTRY	Country code	Integer	1
MODE_L	Code for allowed vehicles on the link	Integer	2
SWEDEN	Boolean variable indicating if the link is in Sweden	Integer	1
PREVCAP*	Capacity in previous Adjust Capacity Loop [bidirectional trains per day] - if not used PREVCAP=CAP	Double	78
FREMME2	Start Emme node	Integer	1002
TOEMME2	End Emme node	Integer	1003
CURRENTCAP*	Capacity in current Adjust Capacity Loop [bidirectional trains per day] - if not used CURRENTCAP=CAP. * values are present only for domestic rail links.	Double	78
KOMBI	Yearly vehicle 201 flow (number of loaded vehicles)	Double	0
KOMBIT	Yearly vehicle 201 tonne flow	Double	0
KOMBIE	Yearly vehicle 201 flow (number of empty vehicles)	Double	0
KOMXL	Yearly vehicle 210 flow (number of loaded vehicles)	Double	0
KOMXLT	Yearly vehicle 210 tonne flow	Double	0

Field	Description	Data Format	Example
KOMXLE	Yearly vehicle 210 flow (number of empty vehicles)	Double	0
FS_TRAIN	Yearly vehicle 202 flow (number of loaded vehicles)	Double	325.2379
FS_TRAINT	Yearly vehicle 202 tonne flow	Double	166064.421875
FS_TRAINE	Yearly vehicle 202 flow (number of empty vehicles)	Double	325.23791
SYS22	Yearly vehicle 204 flow (number of loaded vehicles)	Double	0
SYS22T	Yearly vehicle 204 tonne flow	Double	0
SYS22E	Yearly vehicle 204 flow (number of empty vehicles)	Double	0
SYS25	Yearly vehicle 205 flow (number of loaded vehicles)	Double	0
SYS25T	Yearly vehicle 205 tonne flow	Double	0
SYS25E	Yearly vehicle 205 flow (number of empty vehicles)	Double	0
SYS30	Yearly vehicle 206 flow (number of loaded vehicles)	Double	0
SYS30T	Yearly vehicle 206 tonne flow	Double	0
SYS30E	Yearly vehicle 206 flow (number of empty vehicles)	Double	0
SYSXL	Yearly vehicle 211 flow (number of loaded vehicles)	Double	0
SYSXLT	Yearly vehicle 211 tonne flow	Double	0
SYSXLE	Yearly vehicle 211 flow (number of empty vehicles)	Double	0
WG550	Yearly vehicle 207 flow (number of loaded vehicles)	Double	33.71220
WG550T	Yearly vehicle 207 tonne flow	Double	14486.2989
WG550E	Yearly vehicle 207 flow (number of empty vehicles)	Double	130.22619
WG750	Yearly vehicle 208 flow (number of loaded vehicles)	Double	0
WG750T	Yearly vehicle 208 tonne flow	Double	0
WG750E	Yearly vehicle 208 flow (number of empty vehicles)	Double	0.956900
WG950	Yearly vehicle 209 flow (number of loaded vehicles)	Double	0
WG950T	Yearly vehicle 209 tonne flow	Double	0
WG950E	Yearly vehicle 209 flow (number of empty vehicles)	Double	36.2745
WGEXL	Yearly vehicle 212 flow (number of loaded vehicles)	Double	0
WGEXLT	Yearly vehicle 212 tonne flow	Double	0
WGEXLE	Yearly vehicle 212 flow (number of empty vehicles)	Double	36.2745
FEEDW	Yearly vehicle 203 flow (number of loaded vehicles)	Double	383.6697
FEEDWT	Yearly vehicle 203 tonne flow	Double	166064.421875
FEEDWE	Yearly vehicle 203 flow (number of empty vehicles)	Double	325.23791
FEEDV	Yearly vehicle 202 flow (number of loaded vehicles)	Double	0
FEEDVT	Yearly vehicle 202 tonne flow	Double	0

Field	Description	Data Format	Example
FEEDVE	Yearly vehicle 202 flow (number of empty vehicles)	Double	0
TOT_RAIL	Yearly vehicle flow (number of loaded vehicles) for the rail mode	Double	417.3819391
TOT_RAIL_T	Yearly tonne flow for the rail mode	Double	180550.71875
TOT_RAIL_E	Yearly vehicle flow (number of empty vehicles) for the rail mode	Double	492.695495
GEOMETRYSOURCE	Number representing to which network the link belongs (1-Road 2-Rail 3_sea 4-Air)	Double	4

Visualizing Options: Microsoft Access or Cube GIS window (see Help>Cube Base>GIS window), ArcCatalog, ArcMap.

Description of Use: Assigned network for the rail mode from Rail Capacity Management with daily and yearly flows.

Created by: "Reports 1.0" subgroup under "Samgods Model > Results RCM".

Made by user choice: No.

3.4.2.10. Compare_Bid

Scenario_Tree\Base2019\Output0_Base2019.mdb\Compare_Bid

The node table, Table 100, and the link table, Table 101, holds information about the differences in transports per (undirected, bidirectional) link A-B.

Table 100 - Format of "Compare_Bid_Node" table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
SHAPE	Feature class type (point)	OLE Object	Long Binary Data
N	Node number in VY Numbering	Integer	1
X	Coordinate x (SWEREF99_TM)	Double	1620000
Y	Coordinate y (SWEREF99_TM)	Double	6601000
NORIG	Original node number based on the combination of ID_Country, ID_region and MODE_N values	Integer	711400
SCBSTANN	Scbstann code	Integer	114
ID_REGION	Region code	Integer	114
MODE_N	Code for allowed vehicles accessing the node	Integer	MODE_N
UI4	User field (not used in the current model)	Double	0
CENTRALL	Node description in term of location	String	Upplands-Väsby
GEOMETRYSOURCE	Number representing to which network the node belongs (1-Road 2-Rail 3_sea 4-Air)	Double	4

Table 101 - Format of "Compare_Bid_Link" table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
SHAPE	Feature class type (Polyline)	OLE Object	Long Binary Data
A	Start node in VY Numbering	Integer	1
B	End node in VY Numbering	Integer	2659
Shape_Length	Length based on distance between coordinates in meters	Double	230.867927616822
CATEGORY	Link category	Integer	110
FUNCTION	Index for vdf function	Double	61
NLANES	Number of lanes (could be with -decimals	Double	1
UL2	Distance in kms. User link data in emme used to enable holding link lengths longer than 999 kms.	Double	1.36
ID_COUNTRY	Country code	Integer	1
MODE_L	Code for allowed vehicles on the link	Integer	1
CLOSED	Flag 0/1 for vehicles 202/203	Integer	0
RAIL_STD	Bidirectional yearly tonnes for mode Rail (in millions) from Standard Logistics Module	Double	0
SEA_STD	Bidirectional yearly tonnes for mode Sea (in millions) from Standard Logistics Module	Double	0
ROAD_STD	Bidirectional yearly tonnes for mode road (in millions) from Standard Logistics Module	Double	1.35
GEOMETRYSOURCE	Flag 1/2: 1 from RCM network, 2 from Standard Logistics Module	Double	1
RAIL_RCM	Bidirectional yearly tonnes for mode Rail (in millions) from Rail Capacity Management Procedure	Double	0
SEA_RCM	Bidirectional yearly tonnes for mode Sea (in millions) from Rail Capacity Management Procedure	Double	0
ROAD_RCM	Bidirectional yearly tonnes for mode road (in millions) from Rail Capacity Management Procedure	Double	1.35
DIF_A_ROAD	Difference between ROAD_RCM and ROAD_STD (in millions of tonnes)	Double	0
DIF_A_RAIL	Difference between RAIL_RCM and RAIL_STD (in millions of tonnes)	Double	0
DIF_A_SEA	Difference between SEA_RCM and SEA_STD (in millions of tonnes)	Double	0
DIF_P_ROAD	Difference percentage between ROAD_RCM and ROAD_STD (%)	Double	0
DIF_P_RAIL	Difference percentage between RAIL_RCM and RAIL_STD (%)	Double	0
DIF_P_SEA	Difference percentage between SEA_RCM and SEA_STD (%)	Double	0

Visualizing Options: Microsoft Access or Cube GIS window (see Help>Cube Base>GIS window), ArcCatalog, ArcMap.

Description of Use: Differences of bidirectional flows (in millions of tons) for Road, Sea and Rail mode on two results, one from standard logistics module and the other from rail capacity management procedure.

Created by: “Results 1.0” subgroup under “Samgods Model > Results” and : “Results 1.0” subgroup under “Samgods Model > Results RCM”.

Used by: Not use in the model, final report (see Scenario Outputs\RCM Reports\ Comparison Ml Tons RCM vs. Standard per mode).

Made by user choice: No.

3.4.3. Table format in geodatabase

Here, tables in the geodatabase are presented.

3.4.3.1. CHAIN_OD_COV_{SCENARIO_SHORTNAME}_0_1, CHAIN_OD_COV_{SCENARIO_SHORTNAME}_RCM_1 and CHAIN_OD_COV_{SCENARIO_SHORTNAME}_CBA_1

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\CHAIN_OD_COV_{SCENARIO_SHORTNAME}_0_1

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\CHAIN_OD_COV_{SCENARIO_SHORTNAME}_RCM_1

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\CHAIN_OD_COV_{SCENARIO_SHORTNAME}_CBA_1

This table, Table 102, holds information of coverage of vehicles, created by the LogMod module.

Table 102 - Format of "CHAIN_OD_COV_{SCENARIO_SHORTNAME}_0_1", "CHAIN_OD_COV_{SCENARIO_SHORTNAME}_RCM_1" and "CHAIN_OD_COV_{SCENARIO_SHORTNAME}_CBA_1" tables.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
CHAIN_TY	Chain Type	String	A
NSHIP_D	Number of Shipments Domestic	Double	9187.49
NSHIP_I	Number of Shipments International	Double	239.81
NSHIP_T	Number of Shipments Total Domestic	Double	9187.49
KM_DOM	Km Domestic	Double	48992.5
KM_INT	Km International	Double	2498.34
KM_TOT	Km Total Domestic	Double	52656.48
TON_DOM	Tonnes Domestic	Double	2492.91
TON_INT	Tonnes International	Double	184.62
TON_TOT	Tonnes Total Domestic	Double	2492.91
TKM_DOM	TonneKm Domestic	Double	429749.55
TKM_INT	TonneKm International	Double	37927.9
TKM_TOT	TonneKm Total Domestic	Double	483111.92
COST_DOM	Costs (SEK) Domestic	Double	8039900.44
COST_INT	Costs (SEK) International	Double	383296.88
COST_TOT	Costs (SEK) Total Domestic	Double	8039900.44
AC_TKM_DOM	Average Logistic Cost Domestic	Double	18.71
AC_TKM_INT	Average Logistic Cost International	Double	10.11

Field	Description	Data Format	Example
AC_TKM_TOT	Average Logistic Cost Total Domestic	Double	16.64

Visualizing Options: Microsoft Access or Cube Database window (see Help>Cube Base>Database window).

Description of Use: Translation of ChainChoio_{SCENARIO_SHORTNAME}.rep, ChainChoioFIN_{SCENARIO_SHORTNAME}.rep and ChainChoiCBAo_{SCENARIO_SHORTNAME}.rep in geodatabase tables for the part related to chain types. The first is the merge of all the reports ChainChoiXX.rep from Standard Logistics Module and the second is the merge of all the reports ChainChoiXXFIN.rep from Rail Capacity Management Module. The third one is from CBA. These files reside under LogMod_Y\ChainChoi\Output folder and OutputCBA folder and are merged via MERGE.exe program.

The three geodatabase tables are the source for "Report_2_LM_CHAINS" under data panel Samgods Report > Logistics Module > OD Covered or RCM Reports > Logistics Module > OD Covered or CBA Report > OD.

Created by: "Save Reports" subgroup under "Samgods Model > Logistics Module" and "Save Reports" subgroup under "Samgods Model > Rail Capacity Management > Run Final Process" and "Save Reports" subgroup under "CBA Analysis – ASEK values > Logistics Module".

Made by user choice: No.

3.4.3.2. COM_L_D_{SCENARIO_SHORTNAME}_0_1, COM_L_D_{SCENARIO_SHORTNAME}_RCM_1 and COM_L_D_{SCENARIO_SHORTNAME}_CBA_1

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\COM_L_D_{SCENARIO_SHORTNAME}_0_1

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\COM_L_D_{SCENARIO_SHORTNAME}_RCM_1

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\COM_L_D_{SCENARIO_SHORTNAME}_CBA_1

Table 103 - Format of "COM_L_D_{SCENARIO_SHORTNAME}_0_1", "COM_L_D_{SCENARIO_SHORTNAME}_RCM_1" and "COM_L_D_{SCENARIO_SHORTNAME}_CBA_1" tables.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
COMM	Commodity group	Integer	1
TRANVOL	Actual transported tons (tonnes)	Double	5212689
DEMANDVOL	PWC values (tonnes)	Double	5212689
SUCCESRATE	Success Rate (100% means all the transport chains got a solution)	Double	100

Visualizing Options: Microsoft Access or Cube Database window (see Help>Cube Base>Database window).

Description of Use: Translation of ChainChoio_{SCENARIO_SHORTNAME}.rep, ChainChoioFIN_{SCENARIO_SHORTNAME}.rep and ChainChoiCBAo_{SCENARIO_SHORTNAME}.rep in geodatabase tables for the part related to chain types. The first is the merge of all the reports ChainChoiXX.rep from Standard Logistics Module and the second is the merge of all the reports ChainChoiXXFIN.rep from Rail Capacity Management Module. The third one is from CBA. These files reside

under LogMod_Y\ChainChoi\Output folder and OutputCBA folder (for the normal user Y=1) and are merged via MERGE.exe program.

The three geodatabase tables are the source for “Report_2_LM_DEMAND" under data panel Samgods Report > Logistics Module > OD Covered or RCM Reports > Logistics Module > OD Covered or CBA Report > OD.

Created by: “Save Reports” subgroup under ”Samgods Model > Logistics Module” and “Save Reports” subgroup under “Samgods Model > Rail Capacity Management > Run Final Process” and “Save Reports” subgroup under “CBA Analysis – ASEK values > Logistics Module”.

Made by user choice: No.

3.4.3.3. VHCL_OD_COV_{SCENARIO_SHORTNAME}_0_1, VHCL_OD_COV_{SCENARIO_SHORTNAME}_RCM_1 and VHCL_OD_COV_{SCENARIO_SHORTNAME}_CBA_1

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\VHCL_OD_COV_{SCENARIO_SHORTNAME}_0_1

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\VHCL_OD_COV_{SCENARIO_SHORTNAME}_RCM_1

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\VHCL_OD_COV_{SCENARIO_SHORTNAME}_CBA_1

Table 104 - Format of “VHCL_OD_COV_{SCENARIO_SHORTNAME}_0”, “VHCL_OD_COV_{SCENARIO_SHORTNAME}_RCM” and “VHCL_OD_COV_{SCENARIO_SHORTNAME}_CBA” tables.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
VEH_TY	Vehicle Type	Integer	101
DESCR	Description of vehicle type	String	Lorry light LGV.< 3.5 ton
NSHIP_D	Number of Shipments Domestic	Double	59.56
NSHIP_I	Number of Shipments International	Double	59.65
NSHIP_T	Number of Shipments Total Domestic	Double	0.75
NV_DOM	Number of Vehicles Domestic	Double	58.91
NV_INT	Number of Vehicles International	Double	58.99
NV_TOT	Number of Vehicles Total Domestic	Double	0.09
KM_DOM	Km Domestic	Double	4608.5
KM_INT	Km International	Double	4612.13
KM_TOT	Km Total Domestic	Double	6.72
TON_DOM	Tonnes Domestic	Double	92.61
TON_INT	Tonnes International	Double	92.73
TON_TOT	Tonnes Total Domestic	Double	0.12

Field	Description	Data Format	Example
TKM_DOM	TonneKm Domestic	Double	7529.42
TKM_INT	TonneKm International	Double	7535.17
TKM_TOT	TonneKm Total Domestic	Double	10.27
ALF_DOM	Average Load Factor Domestic	Double	0.79
ALF_INT	Average Load Factor International	Double	0.79
ALF_TOT	Average Load Factor Total Domestic	Double	0.68
AVDIST_DOM	Average Distance Domestic	Double	78.2
AVDIST_INT	Average Distance International	Double	78.2
AVDIST_TOT	Average Distance Total Domestic	Double	73.9

Table 105 - Specific attributes for "VHCL_OD_COV_{SCENARIO_SHORTNAME}_CBA" table

Field	Description	Data Format	Example
Fekm_DOM	Ferry Km Domestic	Double	0.5
Fekm_INT	Ferry Km International	Double	2.6
Fekm_TOT	Ferry Km Total Domestic	Double	7

Description of Use: Translation of ChainChoio_{SCENARIO_SHORTNAME}.rep, ChainChoioFIN_{SCENARIO_SHORTNAME}.rep and ChainChoiCBAo_{SCENARIO_SHORTNAME}.rep in geodatabase tables for the part related to chain types. The first is the merge of all the reports ChainChoiXX.rep from Standard Logistics Module and the second is the merge of all the reports ChainChoiXXFIN.rep from Rail Capacity Management Module. The third one is from CBA. These files reside under LogMod_Y\ChainChoi\Output folder and OutputCBA folder and are merged via MERGE.exe program.

The three geodatabase tables are the source for "Report_2_Logistics Module" under data panel Samgods Report\Logistics Module\OD Covered , RCM Reports\ Logistics Module\OD Covered, CBA Report\OD .

Visualizing Options: Microsoft Access or Cube Database window (see Help>Cube Base>Database window).

Created by: "Save Reports" subgroup under "Samgods Model > Logistics Module" and "Save Reports" subgroup under "Samgods Model > Rail Capacity Management > Run Final Process" and "Save Reports" subgroup under "CBA Analysis – ASEK values > Logistics Module".

Made by user choice: No.

3.4.3.4. Report_1_{SCENARIO_SHORTNAME}_0 and Report_1_{SCENARIO_SHORTNAME}_RCM

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Report_1_{SCENARIO_SHORTNAME}_o

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Report_1_{SCENARIO_SHORTNAME}_RCM

Table 106 - Format of "Report_1_{SCENARIO_SHORTNAME}_0" and "Report_1_{SCENARIO_SHORTNAME}_RCM" tables.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1

Field	Description	Data Format	Example
VEH_NR	Vehicle type	Integer	101
VEH_CLASS	Description of vehicle	String	LGV3
VKM_A_TOT	Total vehicle kilometres	Double	9277.03
VKM_A_DTOT	Total vehicle kilometres (Dtotal)	Double	9258.29
VKM_L_TOT	Loaded vehicle kilometres	Double	4600.46
VKM_L_DTOT	Loaded vehicle kilometres (Dtotal)	Double	4591.29
VKM_E_TOT	Unloaded vehicle kilometres	Double	4676.57
VKM_E_DTOT	Unloaded vehicles (Dtotal)	Double	4666.99

Description of Use: The two geodatabase tables are the source for "Report_1 Tot VHC and VHCKM by VHC Type" under data panel Reports > Logistics Module and Reports > Rail Capacity Management.

Visualizing Options: Microsoft Access or Cube GIS window (see Help>Cube Base>GIS window), ArcCatalog.

Created by: “Results” and “Results RCM” subgroups under “Samgods Model”.

Made by user choice: No.

3.4.3.5. COMMODITYFlows

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\COMMODITYFlows

Table 107 - Format of “COMMODITYFlows” table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
KEYLINK	Primary key obtained as combination of A*100000+B. To let join further	Integer	102659
TRAKBANDE	Trakbandel on rail links	Integer	0
EMMEFR	Emme start node	Integer	711400
EMMETO	Emme end node	Integer	300025
A	Start node in VY Numbering	Integer	1
B	End node in VY Numbering	Integer	2659
KTONTO	Total bidirectional ktons (all modes) in a year	Double	2862
VOLTO	Daily total bidirectional loaded vehicles (all modes)	Double	183.69
EMPTOE	Daily total bidirectional unloaded vehicles (all modes)	Double	95.35
P01_KTON	Ktons bidirectional Commodity group 1 in a year	Double	6
P02_KTON	Ktons bidirectional Commodity group 2 in a year	Double	33
P03_KTON	Ktons bidirectional Commodity group 3 in a year	Double	167
P04_KTON	Ktons bidirectional Commodity group 4 in a year	Double	277
P05_KTON	Ktons bidirectional Commodity group 5 in a year	Double	7
P06_KTON	Ktons bidirectional Commodity group 6 in a year	Double	308
P07_KTON	Ktons bidirectional Commodity group 7 in a year	Double	254
P08_KTON	Ktons bidirectional Commodity group 8 in a year	Double	192
P09_KTON	Ktons bidirectional Commodity group 9 in a year	Double	59
P10_KTON	Ktons bidirectional Commodity group 10 in a year	Double	63
P11_KTON	Ktons bidirectional Commodity group 11 in a year	Double	61

Field	Description	Data Format	Example
P12_KTON	Ktons bidirectional Commodity group 12 in a year	Double	125
P13_KTON	Ktons bidirectional Commodity group 13 in a year	Double	44
P14_KTON	Ktons bidirectional Commodity group 14 in a year	Double	37
P15_KTON	Ktons bidirectional Commodity group 15 in a year	Double	8
P16_KTON	Ktons bidirectional Commodity group 16 in a year	Double	0
P01_VDAY	Daily loaded vehicles bidirectional Commodity group 1	Double	1.017
P02_VDAY	Daily loaded vehicles bidirectional Commodity group 2	Double	4.375
P03_VDAY	Daily loaded vehicles bidirectional Commodity group 3	Double	14.957
P04_VDAY	Daily loaded vehicles bidirectional Commodity group 4	Double	40.773
P05_VDAY	Daily loaded vehicles bidirectional Commodity group 5	Double	1.629
P06_VDAY	Daily loaded vehicles bidirectional Commodity group 6	Double	37.202
P07_VDAY	Daily loaded vehicles bidirectional Commodity group 7	Double	25.631
P08_VDAY	Daily loaded vehicles bidirectional Commodity group 8	Double	30.838
P09_VDAY	Daily loaded vehicles bidirectional Commodity group 9	Double	10.801
P10_VDAY	Daily loaded vehicles bidirectional Commodity group 10	Double	13.365
P11_VDAY	Daily loaded vehicles bidirectional Commodity group 11	Double	18.668
P12_VDAY	Daily loaded vehicles bidirectional Commodity group 12	Double	20.557
P13_VDAY	Daily loaded vehicles bidirectional Commodity group 13	Double	12.467
P14_VDAY	Daily loaded vehicles bidirectional Commodity group 14	Double	5.511
P15_VDAY	Daily loaded vehicles bidirectional Commodity group 15	Double	0.904
P16_VDAY	Daily loaded vehicles bidirectional Commodity group 16	Double	0.275
CAPUTIL	Utilization rate ([number of trains per day / Capacity]*100)	Double	0
CAPTRAINS	Daily capacity on rail links	Double	0
SWEDEN	Boolean variable indicating if the link is in Sweden	Integer	1
UL2	Distance in kms. User link data in emme used to enable holding link lengths	Double	1.36
DISTANCE	Distance in kms (not equals to UL2)	Double	1.36
MODE_L	ID mode (1 road. 2 rail etc.)	Integer	2

Description of Use: The geodatabase table is the source for "layer in GIS map" under data panel Scenario output > RCM Report > GIS maps > GIS map with Ktons per commodity group. Annual vehicles can be calculated from daily vehicles multiplying by DF or DFR.

Visualizing Options: Microsoft Access or Cube GIS window (see Help>Cube Base>GIS window), ArcCatalog.

Created by: “Results RCM” subgroup under “Samgods Model”.

Made by user choice: No.

3.4.3.6. Report_3_TonKM_perMode_0 and Report_3_TonKM_perMode_RCM

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Report_3_TonKM_perMode_0

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Report_3_TonKM_perMode_RCM

Table 108 - Format of “Report_3_TonKM_perMode_0” and “Report_3_TonKM_perMode_RCM” tables.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1

Field	Description	Data Format	Example
SCENARIO	STANDARD/RCM (method that produces the results)	String	STANDARD
ROAD	Total domestic tonnekm from model (in million) for road mode	Double	42.04
RAIL	Total domestic tonnekm from model (in million) for rail mode	Double	33.62
SEA	Total domestic tonnekm from model (in million) for sea mode	Double	38.79
AIR	Total international tonnekm from model (in million) for air mode	Double	2.34
ROADS	Total domestic tonnekm from statistics (in million) for road mode - value hardcoded in script 02_APPLICATIONS\2_RUN\RESULTS\NEMAT01A.S	Double	39.9
RAILS	Total domestic tonnekm from model (in million) for rail mode - value hardcoded in script 02_APPLICATIONS\2_RUN\RESULTS\NEMAT01A.S	Double	22.3
SEAS	Total domestic tonnekm from model (in million) for sea mode- value hardcoded in script 02_APPLICATIONS\2_RUN\RESULTS\NEMAT01A.S	Double	36.9
ROADD	Absolute Differences between modelled and statistics for road mode	Double	2.14
RAILD	Absolute Differences between modelled and statistics for rail mode	Double	11.32
SEAD	Absolute Differences between modelled and statistics for sea mode	Double	1.89
RMSE	Root-mean-square error	Double	8.26

Description of Use: The two geodatabase tables are the source for "Report_3_TonKm_per_Mode_with_2019Statistics" under data panel Reports > Logistics Module and Reports > Rail Capacity Management.

Visualizing Options: Microsoft Access or Cube GIS window (see Help>Cube Base>GIS window), ArcCatalog.

Created by: “Results” and “Results RCM” subgroups under “Samgods Model”.

Made by user choice: No.

3.4.3.7. Report_4_{SCENARIO_SHORTNAME}_0 and Report_4_{SCENARIO_SHORTNAME}_RCM

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Report_4_{SCENARIO_SHORTNAME}_0

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Report_4_{SCENARIO_SHORTNAME}_RCM

Table 109 - Format of “Report_4_{SCENARIO_SHORTNAME}_0” and “Report_4_{SCENARIO_SHORTNAME}_RCM” tables.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
VEH_NR	Vehicle type	Integer	101
VEH_CLASS	Description of vehicle type	String	LGV3

TKM_TOT	Total tonnekm	Double	7520.17
TKM_DTOT	Total domestic tonnekm	Double	7505.61
TKM_INT	International tonnekm	Double	14.56

Description of Use: The two geodatabase tables are the source for " Report_4_Total tonkm by VHC Type" under data panel Reports > Logistics Module and Reports > Rail Capacity Management.

Visualizing Options: Microsoft Access or Cube GIS window (see Help>Cube Base>GIS window), ArcCatalog.

Created by: "Results" and "Results RCM" subgroups under "Samgods Model".

Made by user choice: No.

3.4.3.8. Report_5_{SCENARIO_SHORTNAME}_0, Report_5_{SCENARIO_SHORTNAME}_RCM and Report_5_{SCENARIO_SHORTNAME}_CBA

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Report_5_{SCENARIO_SHORTNAME}_0

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Report_5_{SCENARIO_SHORTNAME}_RCM

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Report_5_{SCENARIO_SHORTNAME}_CBA

Table 110 - Format of "Report_5_{SCENARIO_SHORTNAME}_0", "Report_5_{SCENARIO_SHORTNAME}_RCM" and "Report_5_{SCENARIO_SHORTNAME}_CBA" tables.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
ZONE_N	Zone number	Integer	1
ZONE_ORIG	Original zone number based on the combination of ID_Country, ID_region and MODE_N values	Integer	711400
CENTRALL	Node description in terms of location	String	Upplands-Väsby
P01_IMPORT	Total logistic cost in import for Commodity 1	Double	832.67
P01_EXPORT	Total logistic cost in export for Commodity 1	Double	859.21
…	…	…	…
P16_IMPORT	Total logistic cost in import for Commodity 16	Double	161690.81
P16_EXPORT	Total logistic cost in export for Commodity 16	Double	67590.22

Description of Use: The three geodatabase tables are the source for "Report_5_Total logistic cost at zone-level " under data panel Samgods Report\Logistics Module\OD Covered , RCM Reports\ Logistics Module\OD Covered, CBA Report\OD.

Visualizing Options: Microsoft Access or Cube GIS window (see Help>Cube Base>GIS window), ArcCatalog, ArcCatalog.

Created by: "Save Reports" subgroup under "Samgods Model > Logistics Module" and "Save Reports" subgroup under "Samgods Model > Rail Capacity Management > Run Final Process" and "Save Reports" subgroup under "CBA Analysis – ASEK values > Logistics Module".

Made by user choice: No.

3.4.3.9. Report_6_{SCENARIO_SHORTNAME}_0, Report_6_{SCENARIO_SHORTNAME}_RCM and Report_6_{SCENARIO_SHORTNAME}_CBA

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Report_6_{SCENARIO_SHORTNAME}_0

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Report_6_{SCENARIO_SHORTNAME}_RCM

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Report_6_{SCENARIO_SHORTNAME}_CBA

Table 111 - Format of "Report_6_{SCENARIO_SHORTNAME}_0", "Report_6_{SCENARIO_SHORTNAME}_RCM" and "Report_6_{SCENARIO_SHORTNAME}_CBA" tables.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	93
ZONE_N	Zone number	Integer	173
ZONE_ORIG	Original zone number based on the combination of ID_Country, ID_region and MODE_N values	Integer	786011
PORTAREANR	Port area number	Integer	2
CENTRALL	Node description in terms of location	String	Hultsfred
P01_DAIMPORN	Imported tons for commodity 1	Double	0.06
P01_DAEXPORN	Exported tons for commodity 1	Double	0.07
P01_REGULARN	Regular tons for commodity 1	Double	0.54
…	…	…	…
P16_DAIMPORN	Imported tons for commodity 35	Double	0
P16_DAEXPORN	Exported tons for commodity 35	Double	0
P16_REGULARN	Regular tons for commodity 35	Double	0

Description of Use: The three geodatabase tables are the source for "Report_6_Goods flow through terminals (number of tonnes in and out per year)" under data panel Samgods Report > Logistics Module > OD Covered or RCM Reports > Logistics Module > OD Covered or CBA Report > OD.

Visualizing Options: Microsoft Access or Cube GIS window (see Help>Cube Base>GIS window), ArcCatalog.

Created by: "Save Reports" subgroup under "Samgods Model > Logistics Module" and "Save Reports" subgroup under "Samgods Model > Rail Capacity Management > Run Final Process" and "Save Reports" subgroup under "CBA Analysis – ASEK values > Logistics Module".

Made by user choice: No.

3.4.3.10. Report_6b_{SCENARIO_SHORTNAME}_0, Report_6b_{SCENARIO_SHORTNAME}_RCM and Report_6b_{SCENARIO_SHORTNAME}_CBA

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Report_6b_{SCENARIO_SHORTNAME}_0

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Report_6b_{SCENARIO_SHORTNAME}_RCM

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Report_6b_{SCENARIO_SHORTNAME}_CBA

Table 112 - Format of "Report_6_{SCENARIO_SHORTNAME}_0", Report_6_{SCENARIO_SHORTNAME}_RCM" and "Report_6_{SCENARIO_SHORTNAME}_CBA" tables.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	93
ZONE_N	Zone number	Integer	173
ZONE_ORIG	Original zone number based on the combination of ID_Country, ID_region and MODE_N values	Integer	786011
PORTAREANR	Port area number	Integer	2
CENTRALL	Node description in terms of location	String	Hultsfred
P01PORT	Sum of all in and out flows from sea (exclusion of land based transfers) for Commodity 1	Double	0.06
P02PORT	.....	Double	0.07
...		...	...
P16PORT	Sum of all in and out flows from sea (exclusion of land based transfers) for Commodity 35	Double	0

Description of Use: The three geodatabase tables are the source for "Report_6b_Goods flow through terminals (number of tonnes in and out per year)" under data panel Samgods Report > Logistics Module > OD Covered or RCM Reports > Logistics Module > OD Covered or CBA Report > OD. They are also input for calculation of " Report_13_Tons_per_PortArea_and_Commodity_Group".

Visualizing Options: Microsoft Access or Cube GIS window (see Help>Cube Base>GIS window), ArcCatalog.

Created by: "Save Reports" subgroup under "Samgods Model > Logistics Module" and "Save Reports" subgroup under "Samgods Model > Rail Capacity Management > Run Final Process" and "Save Reports" subgroup under "CBA Analysis – ASEK values > Logistics Module".

Made by user choice: No.

3.4.3.11. Report_7_{SCENARIO_SHORTNAME}_0, Report_7_{SCENARIO_SHORTNAME}_RCM and Report_7_{SCENARIO_SHORTNAME}_CBA

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Report_7_{SCENARIO_SHORTNAME}_0

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Report_7_{SCENARIO_SHORTNAME}_RCM

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Report_7_{SCENARIO_SHORTNAME}_CBA

Table 113 - Format of "Report_7_{SCENARIO_SHORTNAME}_0", "Report_7_{SCENARIO_SHORTNAME}_RCM" and "Report_7_{SCENARIO_SHORTNAME}_CBA" tables.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
COMMODITY	Commodity type	Integer	1
ROAD	Domestic tonnekm container on road	Double	1003.78
RAIL	Domestic tonnekm container on rail	Double	2440.79
SEA	Domestic tonnekm container on sea	Double	0.84
AIR	Domestic tonnekm container on air	Double	0
V101	Domestic tonnekm container Vehicle type 101	Double	1.2
....	Domestic tonnekm container	Double	...
V401	Domestic tonnekm container Vehicle type 401	Double	0

Description of Use: The three geodatabase tables are the source for "Report_7_Domestic tonnekm with container per mode (road, rail, sea, air) and vehicle cl" under data panel Samgods Report > Logistics Module > OD Covered or RCM Reports > Logistics Module > OD Covered or CBA Report > OD.

Visualizing Options: Microsoft Access or Cube GIS window (see Help>Cube Base>GIS window), ArcCatalog, ArcCatalog.

Created by: "Save Reports" subgroup under "Samgods Model > Logistics Module" and "Save Reports" subgroup under "Samgods Model > Rail Capacity Management > Run Final Process" and "Save Reports" subgroup under "CBA Analysis – ASEK values > Logistics Module".

Made by user choice: No.

3.4.3.12. Report_8_{SCENARIO_SHORTNAME}_0, Report_8_{SCENARIO_SHORTNAME}_RCM and Report_8_{SCENARIO_SHORTNAME}_CBA

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Report_8_{SCENARIO_SHORTNAME}_0

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Report_8_{SCENARIO_SHORTNAME}_RCM

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Report_8_{SCENARIO_SHORTNAME}_CBA

Table 114 - Format of "Report_8_{SCENARIO_SHORTNAME}_0", "Report_8_{SCENARIO_SHORTNAME}_RCM" and "Report_8_{SCENARIO_SHORTNAME}_CBA" tables.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
COMMODITY	Commodity type	String	1

Field	Description	Data Format	Example
ROAD	Domestic vehiclekm container on road	Double	98.28
RAIL	Domestic vehiclekm container on rail	Double	4.82
SEA	Domestic vehiclekm container on sea	Double	0.09
AIR	Domestic vehiclekm container on air	Double	0
V101	Domestic vehiclekm container Vehicle type 101	Double	1.2
....	Domestic vehiclekm container	Double	...
V401	Domestic vehiclekm container Vehicle type 401	Double	0

Description of Use: The three geodatabase tables are the source for "Report_8_Domestic vehicle kms with container per mode (road, rail, sea, air) and vehicle cl" under data panel Samgods Report > Logistics Module > OD Covered or RCM Reports > Logistics Module > OD Covered or CBA Report > OD.

Visualizing Options: Microsoft Access or Cube GIS window (see Help>Cube Base>GIS window), ArcCatalog, ArcCatalog.

Created by: "Save Reports" subgroup under "Samgods Model > Logistics Module" and "Save Reports" subgroup under "Samgods Model > Rail Capacity Management > Run Final Process" and "Save Reports" subgroup under "CBA Analysis – ASEK values > Logistics Module".

Made by user choice: No.

3.4.3.13. Report_9_{SCENARIO_SHORTNAME}_0 and Report_9_{SCENARIO_SHORTNAME}_RCM

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Report_9_{SCENARIO_SHORTNAME}_0

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Report_9_{SCENARIO_SHORTNAME}_RCM

Table 115 - Format of "Report_9_{SCENARIO_SHORTNAME}_0" and "Report_9_{SCENARIO_SHORTNAME}_RCM" tables.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
REGION	Region code	Integer	114
ID_COUNTRY	Country code	Integer	1
DESCRIP	Description of region	String	Upplands Väsby
VKM_L_ROAD	Road loaded vehiclekm	Double	2134.9469
TKM_ROAD	Road tonnekm	Double	46437.5225
VKM_E_ROAD	Road empty vehiclekm	Double	1744.6717
VKM_L_RAIL	Rail loaded vehiclekm	Double	38.3121
TKM_RAIL	Rail tonnekm	Double	20523.7748
VKM_E_RAIL	Rail empty vehiclekm	Double	11.7594
VKM_A_ROAD	Road total vehiclekm	Double	3879.6186

Field	Description	Data Format	Example
VKM_A_RAIL	Rail total vehiclekm	Double	50.0715

Description of Use: The two geodatabase tables are the source for "Report_9_Vehicle kms and Tonne kms per geographic region" under data panel Samgods Reports > Reports and RCM Reports > Reports.

Visualizing Options: Microsoft Access or Cube GIS window (see Help>Cube Base>GIS window), ArcCatalog, ArcCatalog.

Created by: “Results” and “Results RCM” subgroups under “Samgods Model”.

Made by user choice: No.

3.4.3.14. Report_10_{SCENARIO_SHORTNAME}_0, Report_10_{SCENARIO_SHORTNAME}_RCM and Report_10_{SCENARIO_SHORTNAME}_CBA

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Report_10_{SCENARIO_SHORTNAME}_0

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Report_10_{SCENARIO_SHORTNAME}_RCM

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Report_10_{SCENARIO_SHORTNAME}_CBA

Table 116 - Format of “Report_10_{SCENARIO_SHORTNAME}_0”, “Report_10_{SCENARIO_SHORTNAME}_RCM” and “Report_10_{SCENARIO_SHORTNAME}_CBA” tables.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
COMMODITY	Commodity type	String	1
TYPE	Domestic, International or Total Domestic	String	Domestic
ROAD	Tonka on road	Double	397113.25
RAIL	Tonnekm on rail	Double	39074.77
SEA	Tonnekm on sea	Double	32762.63
AIR	Tonnekm on air	Double	0
V101	Tonnekm Vehicle type 101	Double	1.2
….	Tonnekm….	Double	…
V401	Tonnekm Vehicle type 401	Double	0

Description of Use: The three geodatabase tables are the source for “Report_10_Transport work (tonne kms) per mode and vehicle cl, total and split per commodity, domestic, tdomestic and international" under data panel Samgods Report > Logistics Module > OD Covered or RCM Reports > Logistics Module > OD Covered or CBA Report > OD Covered.

Visualizing Options: Microsoft Access or Cube GIS window (see Help>Cube Base>GIS window), ArcCatalog.

Created by: “Save Reports” subgroup under ”Samgods Model > Logistics Module” and “Save Reports” subgroup under “Samgods Model > Rail Capacity Management > Run Final Process” and “Save Reports” subgroup under “CBA Analysis – ASEK values > Logistics Module”.

Made by user choice: No.

3.4.3.15. Report_11_{SCENARIO_SHORTNAME}_0, Report_11_{SCENARIO_SHORTNAME}_RCM and Report_11_{SCENARIO_SHORTNAME}_CBA

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Report_11_{SCENARIO_SHORTNAME}_o

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Report_11_{SCENARIO_SHORTNAME}_RCM

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Report_11_{SCENARIO_SHORTNAME}_CBA

Table 117 - Format of "Report_11_{SCENARIO_SHORTNAME}_0", "Report_11_{SCENARIO_SHORTNAME}_RCM" and "Report_11_{SCENARIO_SHORTNAME}_CBA" tables.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
COMMODITY	Commodity type	String	1
TYPE	Domestic, International or Total Domestic	String	Domestic
ROAD	Tons on road	Double	4805.92
RAIL	Tons on rail	Double	421.46
SEA	Tons on sea	Double	158.2
AIR	Tons on air	Double	0
V101	Tons Vehicle type 101	Double	1.2
....	Tons....	Double	...
V401	Tons Vehicle type 401	Double	0

Description of Use: The three geodatabase tables are the source for "Report_11_ Transported goods volume per mode and vehicle cl, total and split per commodity, domestic, tdomestic and international" under data panel Samgods Report > Logistics Module > OD Covered or RCM Reports > Logistics Module > OD Covered or CBA Report > OD Covered.

Visualizing Options: Microsoft Access or Cube GIS window (see Help>Cube Base>GIS window), ArcCatalog.

Created by: "Save Reports" subgroup under "Samgods Model > Logistics Module" and "Save Reports" subgroup under "Samgods Model > Rail Capacity Management > Run Final Process" and "Save Reports" subgroup under "CBA Analysis – ASEK values > Logistics Module".

Made by user choice: No.

3.4.3.16. Report_12_{SCENARIO_SHORTNAME}_0, Report_12_{SCENARIO_SHORTNAME}_RCM and Report_12_{SCENARIO_SHORTNAME}_CBA

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Report_12_{SCENARIO_SHORTNAME}_o

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Report_12_{SCENARIO_SHORTNAME}_RCM

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Report_12_{SCENARIO_SHORTNAME}_CBA

Table 118 - Format of "Report_12_{SCENARIO_SHORTNAME}_0", "Report_12_{SCENARIO_SHORTNAME}_RCM" and "Report_12_{SCENARIO_SHORTNAME}_CBA" tables.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
COMMODITY	Commodity type	String	1
VH_CL	Vehicle type	Integer	101
DOM_NODEC	Node cost pure domestic (SEK)	Double	0
DOM_LINKC	Link cost pure domestic (SEK)	Double	0
IMPORT_NOD	Node cost import (SEK)	Double	0
IMPORT_LIN	Link cost import (SEK)	Double	0
EXPORT_NOD	Node cost export (SEK)	Double	0
EXPORT_LIN	Link cost export (SEK)	Double	0
INT_NODC	Node cost international (SEK)	Double	0
INT_LINC	Link cost international (SEK)	Double	0
NCOSTDTOT	Node cost total domestic (SEK)	Double	0
LCOSTDTOT	Loading cost total domestic (SEK)	Double	0
LTIMEDTOT	Loading time total domestic Cost (SEK)	Double	0
NINTERDTOT	Node Interest total domestic Cost (SEK)	Double	0
POSCDTOT	Positioning Cost total domestic (SEK)	Double	0
FWYCDTOT	Fway Dues total domestic (SEK)	Double	0
PILTCDTOT	Pilot Fee total domestic (SEK)	Double	0
LICOSDTOT	Link cost total domestic (SEK)	Double	0
TRPTCDTOT	Trp Time total domestic cost (SEK)	Double	0
LINTECDTOT	Link interest cost total domestic (SEK)	Double	0
DISCDTOT	Distance cost total domestic (SEK)	Double	0
INFRCDTOT	Infrastructure cost total domestic (SEK)	Double	0
KMDTOT	Km total domestic (km)	Double	0

Field	Description	Data Format	Example
TONSDTOT*	Tonnes total domestic (Tonnes)	Double	0
LIFTDTOT	Lifted tonnes total domestic (Tonnes)	Double	0
TRANSTDTOT	Transfer tonnes total domestic (Tonnes)	Double	0
TONKMDTOT	Tonnekm total domestic (Tonnekm)	Double	0
TRTIMEDTOT	Transport time total domestic (hours)	Double	0
LOADTMDTOT	Loading time total domestic (hours)	Double	0
NCOSTINT	Node cost international (SEK)	Double	0
LCOSTINT	Loading cost international (SEK)	Double	0
LTIMEINT	Loading time international Cost (SEK)	Double	0
NINTERINT	Node Interest international Cost (SEK)	Double	0
POSCINT	Positioning Cost international (SEK)	Double	0
FWYCINT	Fway Dues international (SEK)	Double	0
PILTCINT	Pilot Fee international (SEK)	Double	0
LICOSINT	Link cost international (SEK)	Double	0
TRPTCINT	Trp Time international cost (SEK)	Double	0
LINTERCINT	Link interest cost international (SEK)	Double	0
DISCINT	Distance cost international (SEK)	Double	0
INFRCINT	Infrastructure cost international (SEK)	Double	0
KMINT	Km international (km)	Double	0
TONINT*	Tonnes international (Tonnes)	Double	0
LIFTINT	Lifted tonnes international (Tonnes)	Double	0
TRANSTINT	Transfer tonnes total domestic (Tonnes)	Double	0
TONKMINT	Tonnekm international (Tonnekm)	Double	0
TRTIMEINT	Transport time international (hours)	Double	0
LOADTMINT	Loading time international (hours)	Double	0

Description of Use: The three geodatabase tables are the source for “Report_12_node and link costs per vehicle and product group" under data panel Samgods Report > Logistics Module > OD Covered or RCM Reports > Logistics Module > OD Covered or CBA Report > OD Covered.

Visualizing Options: Microsoft Access or Cube GIS window (see Help>Cube Base>GIS window), ArcCatalog.

Created by: “Save Reports” subgroup under ”Samgods Model > Logistics Module” and “Save Reports” subgroup under “Samgods Model > Rail Capacity Management > Run Final Process” and “Save Reports” subgroup under “CBA Analysis – ASEK values > Logistics Module”.

Made by user choice: No.

Other notes: Attributes related to kms and tonnekms are comparable with

- CHAIN_OD_COV_{Scenario_ShortName}_{Select_commodity}_1,
- CHAIN_OD_COV_{Scenario_ShortName}_RCM_1 and
- CHAIN_OD_COV_{Scenario_ShortName}_CBA_1

Attributes with * cannot compare since for shipments, vehicles and tonnes as double counting is introduced. The problem is related to red cell that is assigned to both International and DomesticTotal, shown in Table 119.

Table 119 – Double counting.

Domestic Orig&Dest node			**D**
Foreign Orig/Dest node	Idist>0	Ddist>0	**I/Dtotal**
		DDist=0	**I**
	Idist=0		**Dtotal**

3.4.3.17. Report_13_Portarea_0_STD and Report_13_Portarea_RCM

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Report_13_Portarea_0_STD

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Report_13_Portarea_RCM

Table 120 - Format of “Report_13_Portarea_0_STD” and “Report_13_Portarea_RCM” tables.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
PORTAREA	Port area number	Integer	1
DES	3 tables are saved, each of them has a different DES (Model results, Statistics, Differences)	String	Model results
PDES	Port area description	String	Haparanda-Skellefteå
COM01	Tons/1000 per port area and commodity group 1	Double	0
…	…	…	…
COM16	Tons/1000 per port area and commodity group 16	Double	21.52
TOT	Total Tons/1000 per port area	Double	9170.14

Description of Use: The two geodatabase tables are the source for "Report_13_Tons_per_PortArea_and_Commodity_Group" under data panel Reports > Logistics Module and Reports > Rail Capacity Management.

Visualizing Options: Microsoft Access or Cube GIS window (see Help>Cube Base>GIS window), ArcCatalog

Created by: Created by: "Results" and "Results RCM" subgroups under "Samgods Model".

Made by user choice: No.

3.4.3.18. Report_14_Oresund_Kiel_0_STD and Report_14_Oresund_Kiel_RCM

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Report_14_Oresund_Kiel_0_STD

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Report_14_Oresund_Kiel_RCM

Table 121 - Format of "Report_14_Oresund_Kiel_0_STD" and "Report_14_Oresund_Kiel_RCM" tables.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
DES	Description of type of statistics and infrastructure (Oresund road, Oresund rail, Kiel Canal, Jylland)	String	OresundRoad
STATISTIC	Unit of statistics (vehicles or tons): the model results will be compared against vehicles or tons depending on the value present in this field	String	Vehicles
VALUE_	Value of statistics (tons or vehicles depending on ID_S)	Integer	251589
TOTVH	Total vehicles from model	Double	495658
TOTTON	Total tons from model	Double	5418635.63197
DIF	Absolute differences between MODEL and VALUE_	Double	244069
DIF_PER	Relative differences between MODEL and VALUE_	Double	0.97
MODEL	Total vehicles or tons from model depending on ID_S value	Double	495658

Description of Use: The two geodatabase tables are the source for "Report_14_Oresund Bridge_Kiel Canal_Jylland" under data panel Reports > Logistics Module and Reports > Rail Capacity Management.

Visualizing Options: Microsoft Access or Cube GIS window (see Help>Cube Base>GIS window), ArcCatalog.

Created by: "Results" and "Results RCM" subgroups under "Samgods Model".

Made by user choice: No.

3.4.3.19. Report_15_RailLinksRCM

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Report_15_RailLinksRCM

Table 122 - Format of "Report_15_RailLinksRCM" table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1

Field	Description	Data Format	Example
ID_LINK	ID_LINK from capacity table	Integer	1
A	Start node in VY Numbering	Integer	2000
B	End node in VY Numbering	Integer	2001
EMME_A	Start Emme node	Integer	1002
EMME_B	End Emme node	Integer	1003
TRAKBANDEL	Trakbandel code for specific link	Integer	1110
CAP	Capacity in bidirectional trains per day (from Capacity table)	String	418
TOT_LOAD	Number of loaded bidirectional trains per day	Double	71.24434
TOT_EMPT	Number of unloaded bidirectional trains per day	Double	31.21692
TOT_ASS	Number of total bidirectional trains per day (loaded+unloaded)	Double	102.4613
DIFF_VC	Difference between TOT_ASS and CAP	Double	-315.539
FLAG_OVCAP	Flag 0/1. 1 means the link is overcapacity by at least 1 train	Integer	0
FLAG_PER	Flag 0/1. 1 means the link is overcapacity by at least 1%	Integer	0
FLAG_TOT	Flag 0/1. 1 means that the FLAG_OVCAP=1 or FLAG_PER=1. Represent all the links with overcapacity conditions.	Integer	0
MARG_COST	Marginal cost	Double	0.5

Description of Use: The table is the source for "Report_15_Trains per day (tot, empty, loaded) (RCM)" under data panel Reports > Rail Capacity Management. This specific output is produced only for Rail Capacity Management.

Visualizing Options: Microsoft Access or Cube GIS window (see Help>Cube Base>GIS window), ArcCatalog.

Created by: “Results RCM” subgroup under “Samgods Model”.

Made by user choice: No.

3.4.3.20. Report_16_{SCENARIO_SHORTNAME}_0 and Report_16_{SCENARIO_SHORTNAME}_RCM

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Report_16_{SCENARIO_SHORTNAME}_0

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Report_16_{SCENARIO_SHORTNAME}_RCM

Table 123 - Format of “Report_16_{SCENARIO_SHORTNAME}_0” and “Report_16_{SCENARIO_SHORTNAME}_RCM” table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
ID_COUNTY	County code	Integer	1
NAME	County name	String	Stockholm

Field	Description	Data Format	Example
VKM_LGV3	VehicleKm Vehicle type 101	Double	773.22
VKM_MGV16	VehicleKm Vehicle type 102	Double	15643.87
VKM_MGV24	VehicleKm Vehicle type 103	Double	25213.88
VKM_HGV40	VehicleKm Vehicle type 104	Double	30262.45
VKM_HGV60	VehicleKm Vehicle type 105	Double	106313.66
VKM_HGV74	VehicleKm Vehicle type 106	Double	0
VKM_ROAD	VehicleKm total road	Double	178207.09
VKM_LGV3P	Percentage Vehicle type 101 (VHM_LGV3/VHM_ROAD*100)	Double	0.43
VKM_MGV16P	Percentage Vehicle type 102 (VKM_MGV16/VHM_ROAD*100)	Double	8.78
VKM_MGV24P	Percentage Vehicle type 103 (VKM_MGV24/VHM_ROAD*100)	Double	14.15
VKM_HGV40P	Percentage Vehicle type 104 (VKM_HGV40/VHM_ROAD*100)	Double	16.98
VKM_HGV60P	Percentage Vehicle type 105 (VKM_HGV60/VHM_ROAD*100)	Double	59.66
VKM_HGV74P	Percentage Vehicle type 106 (VKM_HGV60/VHM_ROAD*100)	Double	0

Description of Use: The two geodatabase tables are the source for "Report_16_VHCLKM and distribution by county - totals" under data panel Samgods Reports > Reports and RCM Reports > Reports.

Visualizing Options: Microsoft Access or Cube GIS window (see Help>Cube Base>GIS window), ArcCatalog, ArcCatalog.

Created by: “Results” and “Results RCM” subgroups under “Samgods Model”.

Made by user choice: No.

3.4.3.21. Report_17_{SCENARIO_SHORTNAME}_0 and Report_17_{SCENARIO_SHORTNAME}_RCM

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Report_17_{SCENARIO_SHORTNAME}_o

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Report_17_{SCENARIO_SHORTNAME}_RCM

Table 124 - Format of “Report_17_{SCENARIO_SHORTNAME}_0” and “Report_17_{SCENARIO_SHORTNAME}_RCM” tables.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
ID_COUNTY	County code	Integer	1

Field	Description	Data Format	Example
NAME	County name	String	Stockholm
VKLGV311	VehicleKm Vehicle type 101	Double	442.74
VKMGV1611	VehicleKm Vehicle type 102	Double	10749.62
VKMGV2411	VehicleKm Vehicle type 103	Double	16649.97
VKHGV4011	VehicleKm Vehicle type 104	Double	22261.32
VKHGV6011	VehicleKm Vehicle type 105	Double	67905.24
VKMHGV7411	VehicleKm Vehicle type 106	Double	0
VKROAD11	VehicleKm total road	Double	118008.9
VKLGV3P11	Percentage Vehicle type 101 (VHM_LGV3_11/VHM_ROAD_11*100)	Double	0.38
VKMGV16P11N	Percentage Vehicle type 102 (VKM_MGV16_11/VHM_ROAD_11*100)	Double	9.11
VKMGV24P11N	Percentage Vehicle type 103 (VKM_MGV24_11/VHM_ROAD_11*100)	Double	14.11
VKHGV40P11N	Percentage Vehicle type 104 (VKM_HGV40_11/VHM_ROAD_11*100)	Double	18.86
VKHGV60P11N	Percentage Vehicle type 105 (VKM_HGV60_11/VHM_ROAD_11*100)	Double	57.54
VKHGV74P11N	Percentage Vehicle type 106 (VKM_HGV60_11/VHM_ROAD_11*100)	Double	0

Description of Use: The two geodatabase tables are the source for “Report_17_VHCLKM and distribution by county - E10 roads" under data panel Samgods Reports > Reports and RCM Reports > Reports. It contains the same results as per Report_16 but filtered on roads with CATEGORY=11 (E10 roads).

Visualizing Options: Microsoft Access or Cube GIS window (see Help>Cube Base>GIS window), ArcCatalog, ArcCatalog.

Created by: “Results” and “Results RCM” subgroups under “Samgods Model”.

Made by user choice: No.

3.4.3.22. Report_18_{SCENARIO_SHORTNAME}_0 and Report_18_{SCENARIO_SHORTNAME}_RCM

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Report_18_{SCENARIO_SHORTNAME}_0

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Report_18_{SCENARIO_SHORTNAME}_RCM

Table 125 - Format of “Report_18_{SCENARIO_SHORTNAME}_0” and “Report_18_{SCENARIO_SHORTNAME}_RCM” tables.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1

Field	Description	Data Format	Example
ID_COUNTY	County code	Integer	1
NAME	County name	String	Stockholm
VKLGV3OR	VehicleKm Vehicle type 101	Double	330.48
VKMGV16OR	VehicleKm Vehicle type 102	Double	4894.25
VKMGV24OR	VehicleKm Vehicle type 103	Double	8563.91
VKHGV40OR	VehicleKm Vehicle type 104	Double	8001.13
VKHGV60OR	VehicleKm Vehicle type 106	Double	38408.42
VKHGV74OR	VehicleKm Vehicle type 106	Double	38408.42
VKROADOR	VehicleKm total road	Double	60198.19
VKLGV3POR	Percentage Vehicle type 101 (VHM_LGV3_OR/VHM_ROAD_OR*100)	Double	0.55
VKMGV16POR	Percentage Vehicle type 102 (VKM_MGV16_ORN/VHM_ROAD_OR*100)	Double	8.13
VKMGV24POR	Percentage Vehicle type 103 (VKM_MGV24_ORN/VHM_ROAD_OR*100)	Double	14.23
VKHGV40POR	Percentage Vehicle type 104 (VKM_HGV40_ORN/VHM_ROAD_OR*100)	Double	13.29
VKHGV60POR	Percentage Vehicle type 106 (VKM_HGV60_ORN/VHM_ROAD_OR*100)	Double	63.8
VKHGV74POR	Percentage Vehicle type 106 (VKM_HGV60_ORN/VHM_ROAD_OR*100)	Double	0

Description of Use: The two geodatabase tables are the source for "Report_18_VHCLKM and distribution by country - Other roads" under data panel Samgods Reports > Reports and RCM Reports > Reports. It contains the same results as per Report_16 but filtered on roads with CATEGORY<>11.

Visualizing Options: Microsoft Access or Cube GIS window (see Help>Cube Base>GIS window), ArcCatalog, ArcCatalog.

Created by: “Results” and “Results RCM” subgroups under “Samgods Model”.

Made by user choice: No.

3.4.3.23. Report_19_{SCENARIO_SHORTNAME}_0, Report_19_{SCENARIO_SHORTNAME}_RCM and Report_19_{SCENARIO_SHORTNAME}_CBA

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Report_19_{SCENARIO_SHORTNAME}_0

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Report_19_{SCENARIO_SHORTNAME}_RCM

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Report_19_{SCENARIO_SHORTNAME}_CBA

Table 126 - Format of "Report_19_{SCENARIO_SHORTNAME}_0", "Report_19_{SCENARIO_SHORTNAME}_RCM" and "Report_19_{SCENARIO_SHORTNAME}_CBA" tables.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	35
ZONE_N	Voyager node number	Integer	35
ZONE_ORIG	Emme node number	Integer	718012
CENTRALL	Terminal description	String	Stockholm-Årsta
P01LOAD	Loaded tons on rail terminal commodity 01	Double	0.66
P01UNLOAD	Unloaded tons on rail terminal Commodity 01	Double	10.73
P02LOAD	Loaded tons on rail terminal commodity 02	Double	55
P02UNLOAD	Unloaded tons on rail terminal Commodity 02	Double	484.36
P03LOAD	Loaded tons on rail terminal commodity 03	Double	2.48
P03UNLOAD	Unloaded tons on rail terminal Commodity 03	Double	14.54
P04LOAD	Loaded tons on rail terminal commodity 04	Double	1.87
P04UNLOAD	Unloaded tons on rail terminal Commodity 04	Double	1.44
P05LOAD	Loaded tons on rail terminal commodity 05	Double	3.8
P05UNLOAD	Unloaded tons on rail terminal Commodity 05	Double	3.47
P06LOAD	Loaded tons on rail terminal commodity 06	Double	14.93
P06UNLOAD	Unloaded tons on rail terminal Commodity 06	Double	328.54
P07LOAD	Loaded tons on rail terminal commodity 07	Double	0.04
P07UNLOAD	Unloaded tons on rail terminal Commodity 07	Double	167.98
P08LOAD	Loaded tons on rail terminal commodity 08	Double	0
P08UNLOAD	Unloaded tons on rail terminal Commodity 08	Double	0
P09LOAD	Loaded tons on rail terminal commodity 09	Double	1.45
P09UNLOAD	Unloaded tons on rail terminal Commodity 09	Double	12.66
P10LOAD	Loaded tons on rail terminal commodity 10	Double	676.26
P10UNLOAD	Unloaded tons on rail terminal Commodity 10	Double	1384.15
P11LOAD	Loaded tons on rail terminal commodity 11	Double	1.64
P11UNLOAD	Unloaded tons on rail terminal Commodity 11	Double	33.77
P12LOAD	Loaded tons on rail terminal commodity 12	Double	7.6
P12UNLOAD	Unloaded tons on rail terminal Commodity 12	Double	6.57
P13LOAD	Loaded tons on rail terminal commodity 13	Double	0
P13UNLOAD	Unloaded tons on rail terminal Commodity 13	Double	116.52
P14LOAD	Loaded tons on rail terminal commodity 14	Double	567.28
P14UNLOAD	Unloaded tons on rail terminal Commodity 14	Double	381.28
P15LOAD	Loaded tons on rail terminal commodity 15	Double	0.01
P15UNLOAD	Unloaded tons on rail terminal Commodity 15	Double	0
P16LOAD	Loaded tons on rail terminal commodity 16	Double	7.02
P16UNLOAD	Unloaded tons on rail terminal Commodity 16	Double	3.93

Description of Use: The three geodatabase tables are the source for "Report #19 Loaded and unloaded tons on rail terminals" under data panel Samgods Report > Logistics Module > OD Covered or RCM Reports > Logistics Module > OD Covered or CBA Report > OD. It contains the total loaded and unloaded tons divided by scale parameter per each rail terminal.

Visualizing Options: Microsoft Access or Cube GIS window (see Help>Cube Base>GIS window), ArcCatalog, ArcCatalog.

Created by: "Save Reports" subgroup under "Samgods Model > Logistics Module" and "Save Reports" subgroup under "Samgods Model > Rail Capacity Management > Run Final Process" and "Save Reports" subgroup under "CBA Analysis – ASEK values > Logistics Module".

Made by user choice: No.

3.4.3.24. Report_20_{SCENARIO_SHORTNAME}_CBA

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Report_20_{SCENARIO_SHORTNAME}_CBA

Table 127 - Format of "Report_20_{SCENARIO_SHORTNAME}_CBA" table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
ID_COM	Commodity type	String	1
ORDCDTOT	Order cost domestic	String	155713694
INVCDTOT	Inventory cost domestic	Double	292369180
ORDCINT	Order cost international	Double	43217624
INVCINT	Inventory cost international	Double	87972825

Description of Use: The geodatabase table is the for "Report #20 Order and inventory costs for TDOM and INT (CBA)" under data panel "CBA Report > OD Covered".

Visualizing Options: Microsoft Access or Cube GIS window (see Help>Cube Base>GIS window), ArcCatalog.

Created by: "Save Reports" subgroup under "CBA Analysis – ASEK values > Logistics Module".

Made by user choice: No.

3.4.3.25. Report_21_{Scenario_ShortName}_RCM

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Report_21_{SCENARIO_SHORTNAME}_RCM

Table 128 - Format of "Report_21_{SCENARIO_SHORTNAME}_RCM" table.

Field	Description	Data Format	Example
ID	Counter	Integer	1
COMMODITY	Commodity group	String	COM 1
KTKMDOM	Total domestic tonkm (year)	Double	4452970.43
KTKMINT	International tonkm (year)	Double	17883038.00
VKMDOM	Total domestic loaded vhclkm (daily)	Double	313307.98
VKMINT	International loaded vhclkm (daily)	Double	692097.85
EVKMTDOM	Total domestic empty vhclkm (daily)	Double	0.00
EVKMTINT	International empty vhclkm (daily)	Double	0.00

Description of Use: The geodatabase table is the input table for “Report #21 Domestic Total and International Tonskm and Vkm per commodity group RCM - Rail" under data panel ”RCM Report > Reports”

Visualizing Options: Microsoft Access or Cube GIS window (see Help>Cube Base>GIS window), ArcCatalog

Created by: “Results RCM” subgroups under “Samgods Model”

Made by user choice: No.

3.4.3.26. Vehicles_loaded_and_empty_witin_Swedish_territory_CBA

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Vehicles_loaded_and_empty_witin_Swedish_territory_CBA

Table 129 - Format of “Vehicles_loaded_and_empty_witin_Swedish_territory_CBA” table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
GVEH_TY	Vehicle Type to sort the results in three cases: • All vehicles apart ferries => GVEH_TY=0 • Road and rail vehicles on ferry => GVEH_TY=300 • Ferry vehicles => GVEH_TY=301	Integer	300
VEH_TY	Vehicle Type	Double	101
KM_L_TOT	Km Total Domestic Loaded Vehicles	Double	1792.95
KM_E_TOT	Km Total Empty Domestic	Double	1203.88
KM_TOT	Number of Km Total Domestic Total vehicles (Loaded +Empties)	Double	341.33
TKM_L_TOT	TonneKm Total Domestic Loaded Vehicles	Double	1917.77
TKM_TOT	Number of TonneKm Total Domestic Total vehicles (Loaded +Empties)	Double	184.3
NV_L_TOT	Number of Total Domestic Loaded Vehicles	Double	32.07
NV_E_TOT	Number of Empty Vehicles Total Domestic	Double	19.11
NV_TOT	Number of Total Domestic Total vehicles (Loaded	Double	4.46

Description of Use: The geodatabase table is the input table for “Vehicles, loaded and empty, within Swedish territory" under data panel “CBA Report > Main Reports”

Visualizing Options: Microsoft Access or Cube GIS window (see Help>Cube Base>GIS window), ArcCatalog

Created by: “Main Reports” subgroups under “Cost Benefit Analysis - ASEK Values > CBAAnalysis”

Made by user choice: No.

3.4.3.27. Costs_D_I_X_T_{SCENARIO_SHORTNAME}_CBA

Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb\Costs_D_I_X_T_{SCENARIO_SHORTNAME}_CBA

Table 130 - Format of “Costs_D_I_X_T_{SCENARIO_SHORTNAME}_CBA” table.

Field	Description	Data Format	Example
OBJECTID	Counter	Integer	1
GVEH_TY	Vehicle Type to sort the results in three cases:	Integer	300
VH_TY	Vehicle Type number	Double	101
VHCLONFERR	Vehicle Type number on ferry	Double	101
DMXT	Flag for 0=domestic 1=import 2= export 3= transit	Integer	1
DESC_	Description for DMXT	String	domestic
TRPCOSTRCM	Transport Cost RCM	Double	187903.91
INVCOSTRCM	Inventory Cost RCM	Double	1284034.49
EMPCOSTRCM	Empties Cost RCM	Double	27455.54
TRPCOSTCBA	Transport Cost CBA	Double	187903.91
INVCOSTCBA	Inventory Cost CBA	Double	1284034.49
EMPCOSTCBA	Empties Cost CBA	Double	27455.54

Description of Use: CBA, linked in the interface as 2 Report B Costs_D_I_X_T by vehicle type". Used to produce {SCENARIO_DIR}\CBA_Final_report_{SCENARIO_CODE}.txt.

Visualizing Options: Microsoft Access or Cube GUI, ArcCatalog.

Created by: "Main Reports" subgroups under "Cost Benefit Analysis - ASEK Values > CBA Analysis".

Made by user choice: No.

3.4.4. Results in matrix format

In the following tables there are the list of matrices created by the model.

3.4.4.1. LOS matrices

Table 131 - LOS matrices.

Folder	Name of matrix file	Name of matrix	Description	User choice:
{Scenario_Dir}	COST_ROAD_{SCENARIO_SHORTNAME}.MAT	D101_{SCENARIO_SHORTNAME}, … D106_{SCENARIO_SHORTNAME}	Distance (km) for vehicle type 101-106	Yes
		T101_{SCENARIO_SHORTNAME}, … T106_{SCENARIO_SHORTNAME}	Time (hours) for vehicle type 101-106	
		X101_{SCENARIO_SHORTNAME}, … X106_{SCENARIO_SHORTNAME}	Extra costs for vehicle type 101-106	
		DD101_{SCENARIO_SHORTNAME}, … DD106_{SCENARIO_SHORTNAME}	Domestic distance (km) for vehicle type 101-106	
{Scenario_Dir}	COST_RAIL_{SCENARIO_SHORTNAME}.MAT	D201_{SCENARIO_SHORTNAME}, D202_{SCENARIO_SHORTNAME}, D204_{SCENARIO_SHORTNAME}, …D212_{SCENARIO_SHORTNAME}	Distance (km) for vehicle type 201, …	Yes
		T201_{SCENARIO_SHORTNAME}, T202_{SCENARIO_SHORTNAME}, T204_{SCENARIO_SHORTNAME}, …T212_{SCENARIO_SHORTNAME}	Time (hours) for vehicle type 201, …	
		X201_{SCENARIO_SHORTNAME}, X202_{SCENARIO_SHORTNAME}, X204_{SCENARIO_SHORTNAME}, …X212_{SCENARIO_SHORTNAME}	Extra costs for vehicle type 201, …	
		DD201_{SCENARIO_SHORTNAME}, DD202_{SCENARIO_SHORTNAME},	Domestic distance (km) for vehicle type 201, …212	

Folder	Name of matrix file	Name of matrix	Description	User choice:
		DD204_{SCENARIO_SHORTNAME, ...DD212_{SCENARIO_SHORTNAME		
{Scenario_Dir}	COST_SEA_{SCENARIO_SHORTNAME}.MAT	D301_{SCENARIO_SHORTNAME},... D322_{SCENARIO_SHORTNAME}	Distance (km) for vehicle type 301-322	Yes
		T301_{SCENARIO_SHORTNAME}, ... T322_{SCENARIO_SHORTNAME}	Time (hours) for vehicle type 301-322	
		X301_{SCENARIO_SHORTNAME}, ... X322_{SCENARIO_SHORTNAME}	Extra costs for vehicle type 301-322	
		DD301_{SCENARIO_SHORTNAME},... DD322_{SCENARIO_SHORTNAME}	Domestic distance (km) for vehicle type 301-322	
{Scenario_Dir}	COST_AIR_{SCENARIO_SHORTNAME}.MAT	D401_{SCENARIO_SHORTNAME}	Distance (km) for vehicle type 401	Yes
		T401_{SCENARIO_SHORTNAME}	Time (hours) for vehicle type 401	
		X401_{SCENARIO_SHORTNAME}	Extra costs for vehicle type 401	
		DD01_{SCENARIO_SHORTNAME}	Domestic distance (km) for vehicle type 401	

Structure: Origin (on rows), Destination (on columns), Value (double) on matrix cell.

Description of Use: to store the LOS matrices at the end of cost calculation phase.

Visualizing Options: Cube Matrix window (see Help>Cube Base>Matrix window).

Created by: “LOS calculation” subgroup under “Samgods Model”.

Made by user choice: Yes.

3.4.4.2. Trip Matrices from Standard Logistic Module

Table 132 - Trip Matrices from Standard Logistic Module.

Folder	Name of matrix file	Name of matrix	Description	User choice:
{Scenario_Dir}	ROAD_VHCLFLOW0_{SCENARIO_SHORTNAME}.MAT	101_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 101 per year	No
		102_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 102 per year	
		103_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 103 per year	
		104_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 104 per year	
		105_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 105 per year	
		106_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 106 per year	
		Road_{SCENARIO_SHORTNAME}	OD Loaded Vehicles total road mode per year	
{Scenario_Dir}	RAIL_VHCLFLOW0_{SCENARIO_SHORTNAME}.MAT	201_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 201 per year	No
		202_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 202 per year	
		204_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 204 per year	
		205_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 205 per year	
		206_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 206 per year	
		207_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 207 per year	
		208_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 208 per year	
		209_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 209 per year	
		210_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 210 per year	
		211_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 211 per year	
		212_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 212 per year	

Folder	Name of matrix file	Name of matrix	Description	User choice:
		Rail_{SCENARIO_SHORTNAME}	OD Loaded Vehicles total rail mode per year	
{Scenario_Dir}	SEA_VHCLFLOW0_{SCENARIO_SHORTNAME}.MAT	301_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 301 per year	No
		302_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 302 per year	
		303_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 303 per year	
		304_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 304 per year	
		305_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 305 per year	
		306_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 306 per year	
		307_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 307 per year	
		308_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 308 per year	
		309_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 309 per year	
		310_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 310 per year	
		311_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 311 per year	
		312_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 312 per year	
		313_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 313 per year	
		314_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 314 per year	
		315_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 315 per year	
		316_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 316 per year	
		317_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 317 per year	

Folder	Name of matrix file	Name of matrix	Description	User choice:
		318_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 318 per year	
		319_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 319 per year	
		320_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 320 per year	
		321_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 321 per year	
		322_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 322 per year	
		Sea_{SCENARIO_SHORTNAME}	OD Loaded Vehicles total Sea mode per year	
{Scenario_Dir}	AIR_VHCLFLOWo_{SCENARIO_SHORTNAME}.MAT	Air_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 401 per year. (mode air)	No
{Scenario_Dir}	ROAD_TONo_{SCENARIO_SHORTNAME}.MAT	101_{SCENARIO_SHORTNAME}	OD Tons 101 per year	No
		102_{SCENARIO_SHORTNAME}	OD Tons 102 per year	
		103_{SCENARIO_SHORTNAME}	OD Tons 103 per year	
		104_{SCENARIO_SHORTNAME}	OD Tons 104 per year	
		105_{SCENARIO_SHORTNAME}	OD Tons 105 per year	
		106_{SCENARIO_SHORTNAME}	OD Tons 106 per year	
		Road_{SCENARIO_SHORTNAME}	OD Tons total road mode per year	
{Scenario_Dir}	RAIL_TONo_{SCENARIO_SHORTNAME}.MAT	201_{SCENARIO_SHORTNAME}	OD Tons 201 per year	No
		202_{SCENARIO_SHORTNAME}	OD Tons 202 per year	
		204_{SCENARIO_SHORTNAME}	OD Tons 204 per year	
		205_{SCENARIO_SHORTNAME}	OD Tons 205 per year	

Folder	Name of matrix file	Name of matrix	Description	User choice:
		206_{SCENARIO_SHORTNAME}	OD Tons 206 per year	
		207_{SCENARIO_SHORTNAME}	OD Tons 207 per year	
		208_{SCENARIO_SHORTNAME}	OD Tons 208 per year	
		209_{SCENARIO_SHORTNAME}	OD Tons 209 per year	
		210_{SCENARIO_SHORTNAME}	OD Tons 210 per year	
		211_{SCENARIO_SHORTNAME}	OD Tons 211 per year	
		212_{SCENARIO_SHORTNAME}	OD Tons 212 per year	
		Rail_{SCENARIO_SHORTNAME}	OD Tons total rail mode per year	
{Scenario_Dir}	SEA_TON0_{SCENARIO_SHORTNAME}.MAT	301_{SCENARIO_SHORTNAME}	OD Tons 301 per year	No
		302_{SCENARIO_SHORTNAME}	OD Tons 302 per year	
		303_{SCENARIO_SHORTNAME}	OD Tons 303 per year	
		304_{SCENARIO_SHORTNAME}	OD Tons 304 per year	
		305_{SCENARIO_SHORTNAME}	OD Tons 305 per year	
		306_{SCENARIO_SHORTNAME}	OD Tons 306 per year	
		307_{SCENARIO_SHORTNAME}	OD Tons 307 per year	
		308_{SCENARIO_SHORTNAME}	OD Tons 308 per year	
		309_{SCENARIO_SHORTNAME}	OD Tons 309 per year	
		310_{SCENARIO_SHORTNAME}	OD Tons 310 per year	

Folder	Name of matrix file	Name of matrix	Description	User choice:
		311_{SCENARIO_SHORTNAME}	OD Tons 311 per year	
		312_{SCENARIO_SHORTNAME}	OD Tons 312 per year	
		313_{SCENARIO_SHORTNAME}	OD Tons 313 per year	
		314_{SCENARIO_SHORTNAME}	OD Tons 314 per year	
		315_{SCENARIO_SHORTNAME}	OD Tons 315 per year	
		316_{SCENARIO_SHORTNAME}	OD Tons 316 per year	
		317_{SCENARIO_SHORTNAME}	OD Tons 317 per year	
		318_{SCENARIO_SHORTNAME}	OD Tons 318 per year	
		319_{SCENARIO_SHORTNAME}	OD Tons 319 per year	
		320_{SCENARIO_SHORTNAME}	OD Tons 320 per year	
		321_{SCENARIO_SHORTNAME}	OD Tons 321 per year	
		322_{SCENARIO_SHORTNAME}	OD Tons 322 per year	
		Sea_{SCENARIO_SHORTNAME}	OD Tons total Sea mode per year	
{Scenario_Dir}	AIR_TON0_{SCENARIO_SHORTNAME}.MAT	Air_{SCENARIO_SHORTNAME}	OD Tons 401 per year. (mode air)	No
{Scenario_Dir}	ROAD_EMP0_{SCENARIO_SHORTNAME}.MAT	101_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 101 per year	No
		102_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 102 per year	
		103_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 103 per year	
		104_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 104 per year	

Folder	Name of matrix file	Name of matrix	Description	User choice:
		105_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 105 per year	
		106_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 106 per year	
		Road_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles total road mode per year	
{Scenario_Dir}	RAIL_EMP0_{SCENARIO_SHORTNAME}.MAT	201_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 201 per year	No
		202_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 202 per year	
		204_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 204 per year	
		205_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 205 per year	
		206_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 206 per year	
		207_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 207 per year	
		208_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 208 per year	
		209_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 209 per year	
		210_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 210 per year	
		211_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 211 per year	
		212_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 212 per year	
		Rail_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles total rail mode per year	
{Scenario_Dir}	SEA_EMP0_{SCENARIO_SHORTNAME}.MAT	301_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 301 per year	No
		302_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 302 per year	
		303_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 303 per year	

Folder	Name of matrix file	Name of matrix	Description	User choice:
		304_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 304 per year	
		305_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 305 per year	
		306_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 306 per year	
		307_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 307 per year	
		308_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 308 per year	
		309_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 309 per year	
		310_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 310 per year	
		311_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 311 per year	
		312_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 312 per year	
		313_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 313 per year	
		314_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 314 per year	
		315_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 315 per year	
		316_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 316 per year	
		317_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 317 per year	
		318_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 318 per year	
		319_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 319 per year	
		320_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 320 per year	
		321_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 321 per year	

Folder	Name of matrix file	Name of matrix	Description	User choice:
		322_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 322 per year	
		Sea_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles total Sea mode per year	
{Scenario_Dir}	AIR_EMPo_{SCENARIO_SHORTNAME}.MAT	Air_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 401 per year. (mode air)	No

Structure: Origin (on rows), Destination (on columns), Value (18.6 double) on matrix cell

Description of Use: to store the trip matrices calculated by standard logistic module

Visualizing Options: Cube Matrix window (see Help>Cube Base>Matrix window)

Created by: "Conversion from LogMod to VY" subgroup under "Samgods Model > Assignment"

Made by user choice: No

3.4.4.3. Trip Matrices from Rail Capacity Management

Table 133 - Trip Matrices from Rail Capacity Management.

Folder	Name of matrix file	Name of matrix	Description	Made by user:
{Scenario_Dir}	ROAD_VHCLFLOW_FIN_{SCENARIO_SHORTNAME}.MAT	101_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 101 per year	No
		102_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 102 per year	
		103_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 103 per year	
		104_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 104 per year	
		105_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 105 per year	
		106_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 106 per year	

Folder	Name of matrix file	Name of matrix	Description	Made by user:
		Road_{SCENARIO_SHORTNAME}	OD Loaded Vehicles total road mode per year	
{Scenario_Dir}	RAIL_VHCLFLOW_FIN_{SCENARIO_SHORTNAME}.MAT	201_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 201 per year	No
		202_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 202 per year	
		204_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 204 per year	
		205_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 205 per year	
		206_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 206 per year	
		207_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 207 per year	
		208_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 208 per year	
		209_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 209 per year	
		210_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 210 per year	
		211_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 211 per year	
		212_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 212 per year	
		Rail_{SCENARIO_SHORTNAME}	OD Loaded Vehicles total rail mode per year	
{Scenario_Dir}	SEA_VHCLFLOW_FIN_{SCENARIO_SHORTNAME}.MAT	301_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 301 per year	No
		302_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 302 per year	
		303_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 303 per year	
		304_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 304 per year	
		305_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 305 per year	

Folder	Name of matrix file	Name of matrix	Description	Made by user:
		306_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 306 per year	
		307_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 307 per year	
		308_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 308 per year	
		309_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 309 per year	
		310_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 310 per year	
		311_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 311 per year	
		312_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 312 per year	
		313_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 313 per year	
		314_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 314 per year	
		315_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 315 per year	
		316_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 316 per year	
		317_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 317 per year	
		318_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 318 per year	
		319_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 319 per year	
		320_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 320 per year	
		321_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 321 per year	
		322_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 322 per year	
		Sea_{SCENARIO_SHORTNAME}	OD Loaded Vehicles total Sea mode per year	

Folder	Name of matrix file	Name of matrix	Description	Made by user:
{Scenario_Dir}	AIR_VHCLFLOW_FIN_{SCENARIO_SHORTNAME}.MAT	Air_{SCENARIO_SHORTNAME}	OD Loaded Vehicles 401 per year. (mode air)	No
{Scenario_Dir}	ROAD_TON_FIN_{SCENARIO_SHORTNAME}.MAT	101_{SCENARIO_SHORTNAME}	OD Tons 101 per year	No
		102_{SCENARIO_SHORTNAME}	OD Tons 102 per year	
		103_{SCENARIO_SHORTNAME}	OD Tons 103 per year	
		104_{SCENARIO_SHORTNAME}	OD Tons 104 per year	
		105_{SCENARIO_SHORTNAME}	OD Tons 105 per year	
		106_{SCENARIO_SHORTNAME}	OD Tons 106 per year	
		Road_{SCENARIO_SHORTNAME}	OD Tons total road mode per year	
{Scenario_Dir}	RAIL_TON_FIN_{SCENARIO_SHORTNAME}.MAT	201_{SCENARIO_SHORTNAME}	OD Tons 201 per year	No
		202_{SCENARIO_SHORTNAME}	OD Tons 202 per year	
		204_{SCENARIO_SHORTNAME}	OD Tons 204 per year	
		205_{SCENARIO_SHORTNAME}	OD Tons 205 per year	
		206_{SCENARIO_SHORTNAME}	OD Tons 206 per year	
		207_{SCENARIO_SHORTNAME}	OD Tons 207 per year	
		208_{SCENARIO_SHORTNAME}	OD Tons 208 per year	
		209_{SCENARIO_SHORTNAME}	OD Tons 209 per year	
		210_{SCENARIO_SHORTNAME}	OD Tons 210 per year	
		211_{SCENARIO_SHORTNAME}	OD Tons 211 per year	

Folder	Name of matrix file	Name of matrix	Description	Made by user:
		212_{SCENARIO_SHORTNAME}	OD Tons 212 per year	
		Rail_{SCENARIO_SHORTNAME}	OD Tons total rail mode per year	
{Scenario_Dir}	SEA_TON_FIN_{SCENARIO_SHORTNAME}.MAT	301_{SCENARIO_SHORTNAME}	OD Tons 301 per year	No
		302_{SCENARIO_SHORTNAME}	OD Tons 302 per year	
		303_{SCENARIO_SHORTNAME}	OD Tons 303 per year	
		304_{SCENARIO_SHORTNAME}	OD Tons 304 per year	
		305_{SCENARIO_SHORTNAME}	OD Tons 305 per year	
		306_{SCENARIO_SHORTNAME}	OD Tons 306 per year	
		307_{SCENARIO_SHORTNAME}	OD Tons 307 per year	
		308_{SCENARIO_SHORTNAME}	OD Tons 308 per year	
		309_{SCENARIO_SHORTNAME}	OD Tons 309 per year	
		310_{SCENARIO_SHORTNAME}	OD Tons 310 per year	
		311_{SCENARIO_SHORTNAME}	OD Tons 311 per year	
		312_{SCENARIO_SHORTNAME}	OD Tons 312 per year	
		313_{SCENARIO_SHORTNAME}	OD Tons 313 per year	
		314_{SCENARIO_SHORTNAME}	OD Tons 314 per year	
		315_{SCENARIO_SHORTNAME}	OD Tons 315 per year	
		316_{SCENARIO_SHORTNAME}	OD Tons 316 per year	

Folder	Name of matrix file	Name of matrix	Description	Made by user:
		317_{SCENARIO_SHORTNAME}	OD Tons 317 per year	
		318_{SCENARIO_SHORTNAME}	OD Tons 318 per year	
		319_{SCENARIO_SHORTNAME}	OD Tons 319 per year	
		320_{SCENARIO_SHORTNAME}	OD Tons 320 per year	
		321_{SCENARIO_SHORTNAME}	OD Tons 321 per year	
		322_{SCENARIO_SHORTNAME}	OD Tons 322 per year	
		Sea_{SCENARIO_SHORTNAME}	OD Tons total Sea mode per year	
{Scenario_Dir}	AIR_TON_FIN_{SCENARIO_SHORTNAME}.MAT	Air_{SCENARIO_SHORTNAME}	OD Tons 401 per year. (mode air)	No
{Scenario_Dir}	ROAD_EMP_FIN_{SCENARIO_SHORTNAME}.MAT	101_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 101 per year	No
		102_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 102 per year	
		103_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 103 per year	
		104_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 104 per year	
		105_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 105 per year	
		106_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 106 per year	
		Road_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles total road mode per year	
{Scenario_Dir}	RAIL_EMP_FIN_{SCENARIO_SHORTNAME}.MAT	201_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 201 per year	No
		202_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 202 per year	
		204_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 204 per year	

Folder	Name of matrix file	Name of matrix	Description	Made by user:
		205_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 205 per year	
		206_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 206 per year	
		207_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 207 per year	
		208_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 208 per year	
		209_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 209 per year	
		210_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 210 per year	
		211_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 211 per year	
		212_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 212 per year	
		Rail_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles total rail mode per year	
{Scenario_Dir}	SEA_EMP_FIN_{SCENARIO_SHORTNAME}.MAT	301_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 301 per year	No
		302_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 302 per year	
		303_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 303 per year	
		304_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 304 per year	
		305_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 305 per year	
		306_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 306 per year	
		307_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 307 per year	
		308_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 308 per year	
		309_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 309 per year	

Folder	Name of matrix file	Name of matrix	Description	Made by user:
		310_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 310 per year	
		311_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 311 per year	
		312_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 312 per year	
		313_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 313 per year	
		314_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 314 per year	
		315_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 315 per year	
		316_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 316 per year	
		317_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 317 per year	
		318_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 318 per year	
		319_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 319 per year	
		320_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 320 per year	
		321_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 321 per year	
		322_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 322 per year	
		Sea_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles total Sea mode per year	
{Scenario_Dir}	AIR_EMP_FIN_{SCENARIO_SHORTNAME}.MAT	Air_{SCENARIO_SHORTNAME}	OD Empty Loaded Vehicles 401 per year. (mode air)	No

Structure: Origin (on rows), Destination (on columns), Value (18.6 double) on matrix cell

Description of Use: to store the trip matrices calculated by Rail Capacity Management module

Visualizing Options: Cube Matrix window (see Help>Cube Base>Matrix window)

Created by: “Conversion from LogMod to VY” subgroup under “Samgods Model > RCM Assignment”

Input and output file reference

Made by user choice: No

3.4.4.4. Other matrices

All the following matrices:

COMPARE_LOS_ROAD_{SCENARIO_SHORTNAME_{ScenarioC_name}
COMPARE_LOS_RAIL_{SCENARIO_SHORTNAME}_{ScenarioC_name}
COMPARE_LOS_SEA_{SCENARIO_SHORTNAME}_{ScenarioC_name}
COMPARE_LOS_AIR_{SCENARIO_SHORTNAME}_{ScenarioC_name}
COMPARE_OD_ROAD_X_{SCENARIO_SHORTNAME}_{ScenarioC_name}
COMPARE_OD_RAIL_X_{SCENARIO_SHORTNAME}_{ScenarioC_name}
COMPARE_OD_SEA_X_{SCENARIO_SHORTNAME}_{ScenarioC_name}
COMPARE_OD_AIR_X_{SCENARIO_SHORTNAME}_{ScenarioC_name}
COMPARE_TON_ROAD_X_{SCENARIO_SHORTNAME}_{ScenarioC_name}
COMPARE_TON_RAIL_X_{SCENARIO_SHORTNAME}_{ScenarioC_name}
COMPARE_TON_SEA_X_{SCENARIO_SHORTNAME}_{ScenarioC_name}
COMPARE_TON_AIR_X_{SCENARIO_SHORTNAME}_{ScenarioC_name}

Will be created if the user wishes to verify differences between scenarios.

Structure: Origin (on rows), Destination (on columns), Value (double) on matrix cell.

Description of Use: store the differences between scenarios for the same matrix. *_{SCENARIO_SHORTNAME} is the name of the scenario the application is run from. {ScenarioC_name} is the chosen scenario, called the base scenario, to compare against*. The differences are calculated with the equation

Dif_of_pair_value=OD_pair_value current scenario – OD_pair_value base scenario

(i.e. values greater than zero mean that the OD pair value in the current scenario is greater than the base scenario).

Visualizing Options: Cube Matrix window (see Help>Cube Base>Matrix window).

Created by: ”Compare” application.

Made by user choice: Yes.

3.4.4.5. Other output related to matrices

Each matrix listed in the point 3.4.4.1and 3.4.4.2 is also exportable in csv or dbf format. The exported matrices will have the following file name:

{Scenario_DIR}\{Type of matrix}_{Type of mode}_{Matrix name}{Vhclnubmber}_VOY.CSV (or DBF).

Table 134 - Matrix format.

Field	Description	Data Format
Origin	Origin zone	Integer
Destination	Destination zone	Integer
Value	Value	Double

Visualizing Options: Microsoft excel.

Created by: ”Change matrix format” application

Made by user choice: Yes

3.4.5. Report files

Under scenario folder after having run all the applications in the model will be six files:

- Report_SG_{Scenario_code}.txt
- Report_ED_{Scenario_code}.txt
- Report_HL_{Scenario_code}.txt
- Calibration_1.txt
- CBA_Final_report_{Scenario_code}.txt
- {SCENARIO_SHORTNAME}_Catalogkeys.CSV

For the description of the first three reports created and their meaning, please see reference 6 for further details.

Calibration_1.txt is a report produced which holds information of main reporting managed by Outputs_Calibration_Template_rev10.xlsm (see section 3.4.8.8 Outputs_Calibration_Template_rev11.xlsm for details).

CBA_Final_report contains CBA analysis applying Trafikverket outlined methodology (see reference 4 for further details).

{SCENARIO_SHORTNAME}_Catalogkeys.CSV registers the catalogue keys used in Cube during the run of applications.

3.4.6. Temporary data to visualize scenario data

Under scenario folder after having run all the application in the model will be four files:

- Input_data.mxr and Input_data.mxd, Scenario_Data.vpr
- Scenario_Data.mdb

The first group has the purpose to define default legends to visualize in the GIS window all the data.

The second file is the temporary geodatabase with the scenario data created by join of the scenario specific tables and base tables, in other words the real scenario data. It could be existed or not based on the user choices. It is used only by the “Edit the data application” and no other applications point to it.

3.4.7. LogMod folder

The structure and input/output files for LogMod folder is covered by reference 2. Here will be listed the input and output files highlighting the outputs related to the Rail Capacity Management and CBA – ASEK Value. For a description of RCM procedure please refer to section 6.7. For a description of Cost Benefit Analysis – ASEK Value, please see reference 6 for further details.

Table 135 - LogMod folder.

Catalog Folder	First Level	Second Level	Third Level	Fourth Level	Description
{CATALOG_DIR}	{Scenario_Folder}	LogMod_Y			Main folder with all the inputs and outputs for Logistics Module and Rail Capacity Management Module. Executable and input files for parallelization of processes and log file from RCM procedure Error.log
{CATALOG_DIR}	{Scenario_Folder}	LogMod_Y	BUILDCHAIN		Folder with all the control files and executable for BuildChain.exe The control files are two groups: BuildChain_Common.ctl, BuildChain_Special.ctl, BuildChainXX.ctl Logselect.dat Select.dat The first group has general parameters for all the commodities or specific commodity groups. The second one specific settings per each commodity (XX).
{CATALOG_DIR}	{Scenario_Folder}	LogMod_Y	BUILDCHAIN	OUTPUT	BuildChainxx.log (only if Do you want to produce BuildChainxx.log files? catalog key set to 'yes' or 'all') Chainsxx.dat Connectionxx.lst (related to Select.dat) Chainsxx_RCM.dat
{CATALOG_DIR}	{Scenario_Folder}	LogMod_Y	ChainChoi		Folder with all the control files and executable for ChainChoi.exe, and LP2CC.exe The control files are two groups:

Catalog Folder	First Level	Second Level	Third Level	Fourth Level	Description
					ChainChoi_Common.ctl, ChainChoi_Special.ctl, ChainChoiXX.ctl The first group has general parameters for all the commodities or specific commodity groups. The second one specific settings per each commodity (XX). Folder includes also java script ConsolidRateMode.jar and data file Select.dat.
{CATALOG_DIR}	{Scenario_Folder}	LogMod_Y	ChainChoi	OUTPUT	Output data files from ChainChoi.exe in standard logmod procedure by commodity group (XX): • ChainChoiXXSTD.rep • ChainChoiXXSTD.out • ChainChoXXdata06STD.out • ChainChoiXXdata07STD.out • ConnectionXX.lst (related to Select.dat) • VhclRepXXSTD.rep • VhclRepXXSTD.fac Output data files from ChainChoi.exe in RCM procedure by commodity group XX: • ChainChoiXXLPX.out (as ChainChoixxSTD.out with solutions from LP) • ChainChoXXdata06RCM.out • ChainChoiXXRCM.out • ChainChoiXXRCM.rep • VhclRepXXRCM.rep • VhclRepXXRCM.fac From LP2CC.exe by commodity group XX:

Catalog Folder	First Level	Second Level	Third Level	Fourth Level	Description
					• ChainChoiXXXTD.rep • ChainChoiXXXTD.out • ChainChoXXdata06XTD.out • ChainChoiXXdata07XTD.out • VhclRepXXXTD.rep • VhclRepXXXTD.fac LockedXX.log with locked solutions by (commodity group XX)
{CATALOG_DIR}	{Scenario_Folder}	LogMod_Y	ChainChoi	OUTPUT\CoVo	By commodity group XX • CONSOLXX_CHAINTYPE.314 • VOLUMEXX_ CHAINTYPE.314
{CATALOG_DIR}	{Scenario_Folder}	LogMod_Y	ChainChoi	outputCBA	From LP2CC.exe by commodity group XX: • ChainChoiXXCBA.fac • ChainChoiXXCBA.rep • VhclRepXXCBA.fac • VhclRepXXCBA.rep
{CATALOG_DIR}	{Scenario_Folder}	LogMod_Y	ChainChoi	ConsolRate4Mode	From ConsolidRateMode.exe by commodity group XX: • CONSOLXX-MODE.314
{CATALOG_DIR}	{Scenario_Folder}	LogMod_Y	Extract		Folder includes the executable extract.exe, while also the support files • emptyfrac.dat • EXTRACTALL.BAT • EXTRACTALL_FIN.BAT

Input and output file reference

Catalog Folder	First Level	Second Level	Third Level	Fourth Level	Description
					• EXTRACTFIN.CTL • EXTRACTSTD.CTL
{CATALOG_DIR}	{Scenario_Folder}	LogMod_Y	Extract	OUTPUT	The first set of files represent the OD matrices for empties, tonnes and total vehicles and has been produced by extract procedure by vehicle XXX. • OD_EmpXXX_STD.314 • OD_EmpXXX_FIN.314 • OD_TonnesXXX_STD.314 • OD_TonnesXXX_FIN.314 • OD_VhclXXX_STD.314 • OD_VhclXXX_FIN.314
{CATALOG_DIR}	{Scenario_Folder}	LogMod_Y	Input		Chaintype.lis is used by Standard Logistics Module and Rail Capacity Management Module.
{CATALOG_DIR}	{Scenario_Folder}	LogMod_Y	Input	COST	CARGO.TXT, PILOTFEES.TXT, and by commodity group XX VHCLS_COMXX.TXT
{CATALOG_DIR}	{Scenario_Folder}	LogMod_Y	Input	GENERAL	AVERAGEVEHICLECAPACITY.txt CalibrationParameters.txt is used to rescale LOS matrices using the scaling factors per port area. They are input to Standard Logistic Module and Rail Capacity Management internally scaling the LOS matrices per each commodity group. OtherCostMatters.ctl main parameters for logmod and rcm LBD_Ratio.dat

Catalog Folder	First Level	Second Level	Third Level	Fourth Level	Description
					MAXCAPANDCONSOLEXCEPT.DAT
{CATALOG_DIR}	{Scenario_Folder}	LogMod_Y	Input	Locked	LockedXXXX.dat with list of chains locked where XXXX is scenario year
{CATALOG_DIR}	{Scenario_Folder}	LogMod_Y	Input	LOS	FREQAIR.314 FREQCOMBI.314 FREQCONTAINERVESSEL.314 FREQIWW.314 FREQLORRY.314 FREQOTHERVESSEL.314 FREQRAILFERRY.314 FREQROADFERRY.314 FREQROROVESSEL.314 FREQSYSTEM.314 FREQWAGGONLOAD.314 And by vehicle type XXX • VXXX_ddist.314 • VXXX_dist.314 • VXXX_timeh.314 • VXXX_xkr.314 • VXXX_MC.314 (marginal cost matrices)
{CATALOG_DIR}	{Scenario_Folder}	LogMod_Y	Input	NODES	CONTAINERHANDLING.txt DIRECTFEEDERTRAIN.txt DIRECTSEA.txt

Catalog Folder	First Level	Second Level	Third Level	Fourth Level	Description
					DIRECTSYSTEMTRAIN.txt DIRECTWAGONLOAD.txt NODES.txt TRANSFERCOMBISEA.txt TRANSFERFEEDERTRAINWAGONLOAD.txt TRANSFERROADAIR.txt TRANSFERROADCOMBI.txt TRANSFERROADROAD.txt TRANSFERROADROADFERRY.txt TRANSFERROADSEA.txt TRANSFERROADTRAIN.txt TRANSFERSEASEA.txt TRANSFERSYSTEMTRAINSEA.txt TRANSFERWAGONLOADRAILFERRY.txt TRANSFERWAGONLOADSEA.txt
{CATALOG_DIR}	{Scenario_Folder}	LogMod_Y	INPUT_CBA	COST	CARGO.TXT, OtherCostMatters.txt (file with INTER and STUFF values), PILOTFEES.TXT, and by commodity group XX VHCLS_COMXX.TXT (*) Values modified by table ScalingF_VehASEK
{CATALOG_DIR}	{Scenario_Folder}	LogMod_Y	INPUT_CBA	GENERAL	averageVehicleCpacity.txt CalibrationParameters.txt is used to rescale LOS matrices using the scaling factors per port area. For CBA is equals to 1.

Catalog Folder	First Level	Second Level	Third Level	Fourth Level	Description
{CATALOG_DIR}	{Scenario_Folder}	LogMod_Y	INPUT_CBA	LOS	By vehicle type XXX • vXXX_dtimeh.314 (domestic time - new) • vXXX_dxkr.314 (domestic cost - new) • vXXX_timeh.314 (time without rescaling parameters) • vXXX_xkr.314
{CATALOG_DIR}	{Scenario_Folder}	LogMod_Y	INPUT_CBA	NODES	ContainerHandling.txt DirectFeederTrain.txt DirectSea.txt DirectSystemTrain.txt DirectWagonLoad.txt Nodes.txt TransferCombiSea.txt transferfeedertrainwagonload.txt TransferRoadAir.txt TransferRoadCombi.txt TransferRoadRoad.txt TransferRoadRoadFerry.txt TransferRoadSea.txt TransferRoadTrain.txt TransferSeaSea.txt TransferSystemTrainSea.txt TransferWagonloadRailFerry.txt

Catalog Folder	First Level	Second Level	Third Level	Fourth Level	Description
					TransferWagonloadSea.txt Same files as NODES folder except Nodes.txt. Here the technological factors are all rescaled to 1
{CATALOG_DIR}	{Scenario_Folder}	LogMod_Y	MERGEREP		MergeRep.exe program, related mergerep.ctl file and MERGEREPALL.BAT (for standard) and MERGEREPFIN.BAT (for final process)
{CATALOG_DIR}	{Scenario_Folder}	LogMod_Y	LOG		Folder with all .log files from Standard Logistics Module and Rail Capacity Management module (by commodity group XX): • logXXFIN.log • logXXSTD.log • logXXCBA.log • logXX_4RCM.log • EXTRACT_FIN.LOG • EXTRACT_STD.LOG • MERGEREP.LOG • mergerepSTD.log And chk files, when each program is successful, this produces chk file by commodity group XX • BuildChainXX_4RCM.chk • ChainChoiXX.chk • ChainChoXX_4RCM.chk • ChainChoiXXCBA.chk • extractoFIN.chk • extractoSTD.chk • mergerepSTD.chk

Catalog Folder	First Level	Second Level	Third Level	Fourth Level	Description
					• mergerepFIN.chk • mergerepCBA.chk • SD_ok.chk
{CATALOG_DIR}	{Scenario_Folder}	LogMod_Y	MERGEREP	OUTPUT	ChainChoiSTD.rep ChainChoiXTD.rep ChainChoiCBA.rep
{CATALOG_DIR}	{Scenario_Folder}	LogMod_Y	RCM		Folder with MPS.jar, CLP64.exe and SOplex.exe programs together: control files for different steps: • Compact.ctl – compact spanning tree data • LOS_CBA.CTL • mps_LP.ctl - control file for LP0, LP1, etc • UTI_CBA.ctl – control file for CBA analysis • COMMODITY.CTL - reports for maps by commodity group Input data: • Spanning tree data for all modes (PathTreeRail.txt, PathTreeSea.txt, PathTreeRoad.txt and PathTreeAir.txt) • Compacted spanning tree data for all modes (PathTreeRail.cmp, PathTreeSea.cmp, PathTreeRoad.cmp and PathTreeAir.cmp) • Links_List.txt and Nodes_List.txt • RailLinkCapacitiesBidirectional_STD.dat and RailLinkCapacitiesBidirectional_STD.new • Exported_network_BS19.txt (used in Cost Benefit analysis – network with time and cost per link) • Exported_network_BS19_Original.txt

Catalog Folder	First Level	Second Level	Third Level	Fourth Level	Description
					Intermediate files: • mps_ok_COPY_0JCM_1.chk • mps_ok_COPY_0W_1.chk • mps_ok_COPY_1CM_1.chk • mps_ok_COPY_1W_1.chk • mps_ok_COPY_1_2.chk • JLISTA.dat • LinkFlows_Itr0.dat • LinkFlows_Itr1.dat • LowFlows_LP0.dat • LowFlows_LP1.dat • LP_Rail_defs.dat • MPS_ColumnInfo.dat • MPS_ColumnSelectInfo.dat • LP_Rail_LP0.MPS • LP_Rail_LP1.MPS • LP_RAIL_LP0.out • LP_RAIL_LP1.out • JLISTA.sln • ErrorSL.txt • ErrorSTN.txt • LockedSTDLogMod_Soln_CapImpact_0.txt • LockedSTDLogMod_Soln_CapImpact_1.txt

Catalog Folder	First Level	Second Level	Third Level	Fourth Level	Description
					log files • IOLog_LP0.log • IOLog_LP1.log • IO_LOG.log • LOS_STN.log • LP0-A.log • LP1-A.log • LP_iter.log • RunTime_mps_LP.log For explanation of relationship between steps, programs and files in RCM see section 6.7.
{CATALOG_DIR}	{Scenario_Folder}	LogMod_Y	RCM	ColumnMerge	Intermediate files for each commodity group XX : • ColGen2LPXX.dat • LP_RailXX.dat
{CATALOG_DIR}	{Scenario_Folder}	LogMod_Y	RCM	ColumnData	Intermediate files for ach commodity group XX: • ColGen2LPXX-1.dat • ColGen2LPXX-2.dat • LP_RailXX-1.dat • LP_RailXX-2.dat
{CATALOG_DIR}	{Scenario_Folder}	LogMod_Y	RCM	output	chk.txt Commodity_STD.dat and Commodity_XTD – converted into COMMODITYFlows table present in GDB EmptySplit.dat – costs for empty vehicles

Input and output file reference

Catalog Folder	First Level	Second Level	Third Level	Fourth Level	Description
					RAIL_TONKM_VKM_SUM_STD.DAT and RAIL_TONKM_VKM_SUM_XTD.DAT TransportPLUSTotalCosts_STD.txt and TransportPLUSTotalCosts_XTD.txt VehicleTrpEmpInv_Input_FerryCostAllocation_STD.dat, VehicleTrpEmpInv_Input_FerryCostAllocation_XTD.dat VehicleTrpEmpInv_Input_STD.dat, VehicleTrpEmpInv_Input_XTD.dat and VehicleTrpEmpInv_Input_CBA.dat VOD_DMXT_FERRY_V_T_E_DD_D_T.dat and VOD_DMXT01.dat … VOD_DMXT16.dat

While all the outputs above are described under specific documentation for logistic module and Rail Capacity Management, Exported_Network_XX.txt is produced through Cube and its format is as follow:

Table 136 - Exported_network_xx.txt

Field	Description	Data Format	Example
A	A node	Integer	1
B	B node	Integer	2049
LinkType	Link type	Integer	110
Length	Length in km	Double	0.26
T101	Time in hours (calculation from UL2/SPEED_1)	Double	0.31
T102	Time in hours (calculation from UL2/SPEED_2)	Double	0.31
T103	Time in hours (calculation from UL2/SPEED_2)	Double	0.31
T104	Time in hours (calculation from UL2/SPEED_2)	Double	0.31
T105	Time in hours (calculation from UL2/SPEED_2)	Double	0.31
T106	Time in hours (calculation from UL2/SPEED_2)	Double	-1
T201	Time in hours (calculation from UL2/SPEED_2)	Double	-1
T202	Time in hours (calculation from UL2/SPEED_2)	Double	-1
T203	Time in hours (calculation from UL2/SPEED_2)	Double	-1
T204	Time in hours (calculation from UL2/SPEED_2)	Double	-1
T205	Time in hours (calculation from UL2/SPEED_2)	Double	-1
T206	Time in hours (calculation from UL2/SPEED_2)	Double	-1
T207	Time in hours (calculation from UL2/SPEED_2)	Double	-1
T208	Time in hours (calculation from UL2/SPEED_2)	Double	-1
T209	Time in hours (calculation from UL2/SPEED_2)	Double	-1
T210	Time in hours (calculation from UL2/SPEED_2)	Double	-1
T211	Time in hours (calculation from UL2/SPEED_2)	Double	-1
T212	Time in hours (calculation from UL2/SPEED_2)	Double	-1
T301	Speed has two options: if CATEGORY is 80, 85, 89 & 540 speed comes from SPEED_1 present in the network For all the others from vehicle parameters table based on vehicle number	Double	-1
T302		Double	-1
T303		Double	-1
T304		Double	-1
T305		Double	-1
T306		Double	-1
T307		Double	-1
T308		Double	-1

Field	Description	Data Format	Example
T309		Double	-1
T310		Double	-1
T311		Double	-1
T312		Double	-1
T313		Double	-1
T314		Double	-1
T315		Double	-1
T316		Double	-1
T317		Double	-1
T318		Double	-1
T319		Double	-1
T320		Double	-1
T321		Double	-1
T322		Double	-1
T401	Time in hours (calculation from UL2/SPEED_1)	Double	-1
C101	C101=KM_TAX101*UL2 + TOLL101	Double	0
C102	C102=KM_TAX102*UL2 + TOLL102	Double	0
C103	C103=KM_TAX103*UL2 + TOLL103	Double	0
C104	C104=KM_TAX104*UL2 + TOLL104	Double	0
C105	C105=KM_TAX105*UL2 + TOLL105	Double	0
C106	C106=KM_TAX106*UL2 + TOLL106	Double	0
C201	C201=KM_TAX201*UL2 + TOLL201	Double	5.55
C202	C202=KM_TAX202*UL2 + TOLL202	Double	4.62
C203	C203=KM_TAX202*UL2 + TOLL202	Double	4.62
C204	C204=KM_TAX204*UL2 + TOLL204	Double	8.21
C205	C205=KM_TAX205*UL2 + TOLL205	Double	9.27
C206	C206=KM_TAX206*UL2 + TOLL206	Double	46.61
C207	C207=KM_TAX207*UL2 + TOLL207	Double	6.36
C208	C208=KM_TAX208*UL2 + TOLL208	Double	7.4
C209	C209=KM_TAX209*UL2 + TOLL209	Double	7.82
C210	C210=KM_TAX210*UL2 + TOLL210	Double	6.44
C211	C211=KM_TAX211*UL2 + TOLL211	Double	7.4

Field	Description	Data Format	Example
C212	C212=KM_TAX212*UL2 + TOLL212	Double	9.6
C301	C301=KM_TAX301*UL2 + TOLL301	Double	0
C302	C302=KM_TAX302*UL2 + TOLL302	Double	0
C303	C303=KM_TAX303*UL2 + TOLL303	Double	0
C304	C304=KM_TAX304*UL2 + TOLL304	Double	0
C305	C305=KM_TAX305*UL2 + TOLL305	Double	0
C306	C306=KM_TAX306*UL2 + TOLL306	Double	0
C307	C307=KM_TAX307*UL2 + TOLL307	Double	0
C308	C308=KM_TAX308*UL2 + TOLL308	Double	0
C309	C309=KM_TAX309*UL2 + TOLL309	Double	0
C310	C310=KM_TAX310*UL2 + TOLL310	Double	0
C311	C311=KM_TAX311*UL2 + TOLL311	Double	0
C312	C312=KM_TAX312*UL2 + TOLL312	Double	0
C313	C313=KM_TAX313*UL2 + TOLL313	Double	0
C314	C314=KM_TAX314*UL2 + TOLL314	Double	0
C315	C315=KM_TAX315*UL2 + TOLL315	Double	0
C316	C316=KM_TAX316*UL2 + TOLL316	Double	0
C317	C317=KM_TAX317*UL2 + TOLL317	Double	0
C318	C318=KM_TAX318*UL2 + TOLL318	Double	0
C319	C319=KM_TAX319*UL2 + TOLL319	Double	0
C320	C320=KM_TAX320*UL2 + TOLL320	Double	0
C321	C321=KM_TAX321*UL2 + TOLL321	Double	0
C322	C322=KM_TAX322*UL2 + TOLL322	Double	0
C401	C401=KM_TAX401*UL2 + TOLL401	Double	0
ID_COUNTRY	Flag of nationality	Integer	1

3.4.8. Other files with different purposes

Under scenario folder a set of files is present with different purposes:

- calibration procedure files
- exported information in dbf, Emme, csv format from geodatabase (to exchange the data with users without Cube Interface)
- general results from Standard Logistics Module and Rail Capacity Management Module
- warm start procedure
- debugging

- select link analysis
- visualization in GIS environment
- results using general statistics in excel and comparison across different scenarios

3.4.8.1. Calibration procedure files

The Calibration procedure invokes a cycling process where scaling factors for Port Areas and commodity groups together the Kiel canal scaling factor are altered along the run. The process produces some txt files that keep the scaling factor information in each loop.

The scaling factors for port areas and commodity groups are saved in the following files:

- CalParameter_Loop_1.txt - parameters in the first loop - this file is a copy of the file specified in " Initial values for port calibration by Port Area and commodity group:", in the current model " PortAreaParams_16_Comm.txt" under 05_Inputs\Calibration
- CalParameter_Loop_2.txt - parameters estimated after completion of loop 1
- CalParameterNextLoop.txt - parameters used in next loop - identical to CalParameter_Loop_"lastloop".txt, in the example lastloop=2

The scaling factor for Kiel Canal has a different treatment since is only one value:

- The initial value is provided by the interface with catalog key "Starting value for scaling factor on Kiel canal" is copied in ParKiel_{Scenario_code}.txt file from ParKiel_ini.txt file;
- KielNextValue.txt holds the scaling factor along all the iterations. Its structure is LoopNbr Scaling factor. The value used is obtained looking up LoopNbr.

The following files contain statistics on the calibration procedure:

- Differences_{Scenario_code}.csv - differences in tons between modelled and statistics per port area and commodity group
- PortArea_report_{Scenario_code}_loop1.csv - same information present in Report_13_Tons_per_PortArea_and_Commodity_Group,
- PortArea_report_RCM_{Scenario_code}_Loop1.csv - same information present in Report_13_Tons_per_PortArea_and_Commodity_Group (RCM)
- RMSE_loops.txt – same content of Report_14_Oresund Bridge_Kiel Canal and Jylland for STD and RCM in each loop

3.4.8.2. Exported files

The following files represent information saved in main geodatabase and exported to allow access to information for modellers or users without a valid Cube Licence.

- Capacity_table_{Scenario_Code}.dbf - scenario specific table with ID_LINK and CAPACITY for all rail links. This is the export of Rail_Capacity_{SCENARIO_SHORTNAME} (merged table between Rail_Capacity_Base2019 and SC_Rail_Capacity_{SCENARIO_SHORTNAME}). See 3.2.3.8 for table structure.
- Rail_capacities_STD_{Scenario_Code}.DBF - scenario specific table with initial values from Adjust Procedure. Rail_Capacity_{SCENARIO_SHORTNAME} (merged table between Rail_Capacity_Base2019 and SC_Rail_Capacity_{SCENARIO_SHORTNAME}). See 3.2.3.8 for table structure.
- EMME_NET_Base2019.211 and V101_102_LINK_SPEEDS.DAT: Scenario network exported in EMME format (211) together the speed definitions per each link in DAT format. The speed table has the following headers " Inode Jnode v101 v102" where:

- Inode=Initial emme node number
- Jnode=final emme node number
- V101 = speed in km/h for vehicle type 101
- V102 = speed in km/h for vehicle types 102-106

- General_Table_{SCENARIO_SHORTNAME}.DBF is the exported table General_{SCENARIO_SHORTNAME} containing all the main parameters of the model. It is used in the Samgods application when is required to read a general variable.
- RENUM_NODES.DBF has the same information of RENUM_NODES table. This file could be link in the Matrix Window showing the emme zone number instead of the voyager node numbers. For details refer to Matrix Window > Using zone labels on the Cube Help.

3.4.8.3. Reports from STD Logistics Module , Rail Capacity Management Module and Cost Benefit Analysis – ASEK values runs

Three report files are produced using MERGE.exe program:

- ChainChoio_{SCENARIO_SHORTNAME}.rep
- ChainChoio_{SCENARIO_SHORTNAME}FIN.rep
- chainchoiCBAo_{SCENARIO_SHORTNAME}.rep

For their description refer to Logistic Module technical documentation.

Each report contains statistics at vehicle type level, chain level and commodity level. These files are saved as reports (Report_2_Logistics Module, Report_2_LM_CHAINS, Report_2_LM_DEMAND) and tables (VHCL_OD_COV, CHAIN_OD_COV, COM_L_D) in the model.

3.4.8.4. Warm start procedure

The cycling process for LP could be restart after a previous run from a different point. For instance, if in a previous run only LP0 has been performed, it is possible to run Rail Capacity Management module adding LP1. To recode the history of previous run, the type of stages performed is recoded in Log_file_1.log.

The system maintains this file and the user must never change its content.

Each step (Standard Logistic Module, LP0, LP1 and so forth) produces a line with a different code. These codes are used to manage the right execution order.

The codes associated to each step are listed in Table 137.

Table 137 - Codes under log_file_1.log.

LP	LPAdjust	Description	Date	Time
99	99	STD	16-Feb-15	1:06 AM
-1	0	LP0	16-Feb-15	1:57 AM
99	99	FIN	16-Feb-15	6:52 AM
1	0	LP1	17-Feb-15	8:52 AM

The file logfile_scenario.dat contains the last values printed out from the model, it is a temporary file. Information is later on saved in log_file_1.log where x is the loop number. Per each loop a different log file is produced and maintained.

3.4.8.5. Debugging

Some intermediate outputs are saved in scenario folder to allow checks on some complex calculations.

The calculation carried out in application Samgods\LOS Calculation\Data preparation leads to a network containing all the tolls and taxes defined with the different input tables (Tax_by_Link, Tax_by_Category, Tax_by_Country, Toll_by_link and user extra attributes EC_V and EC_KM_V) together the different rules to open or close a particular link to a particular vehicle type. The intermediate output with all the information required for the next steps (LOS calculation, assignment in Standard Logistics Module and Rail Capacity Management Module) is saved under scenario folder with name FINAL_NETWORK_{Scenario_Code}.NET. This file can be accessed from Data Panel under Scenario Outputs\Other\ Network with costs for checking.

The .NET file is a binary format used in Cube Interface, therefore only Cube can open and visualize the network in the Network Window (Graphics). A part this, the structure is identical to a Geodatabase network. In the network are present the node, Table 138, and link, Table 139, tables.

Table 138 - Format of "FINAL_NETWORK_{Scenario_Code}.NET.node" table.

Field	Description	Data Format	Example
N	Node number	Integer	1
NORIG	Original node number based on the combination of ID_Country, ID_region and MODE_N values	Integer	711400
SCBSTANN	SCBSTANN code	Integer	114
ID_REGION	Region code	Integer	114
MODE_N	Mode code	Integer	0
UI4	User field (not used in the current model)	Double	0
CENTRALL	Node description in terms of location	String	Upplands-Väsby
X	Coordinate x (SWEREF99_TM)	Double	1620000
Y	Coordinate y (SWEREF99_TM)	Double	6601000

Table 139 - Format of "FINAL_NETWORK_{Scenario_Code}.NET.Link" table.

Field	Description	Data Format	Example
AX/BX	Minimum X coordinate	Double	10648
AY/BY	Minimum Y coordinate	Double	257
A	Start node	Integer	2231
B	End node	Integer	2353
OBJECTID	ID object	Integer	625
ID_LINK	Link identified for rail link. Two links in opposite direction share the same ID_LINK.	Integer	25
ORIGINALCAP	Original value for capacity in bidirectional trains per day	Double	23
M_101	Flag 0/1 If 1 open to 101	Integer	0
M_102	Flag 0/1 If 1 open to 102	Integer	0
M_103	Flag 0/1 If 1 open to 103	Integer	0
M_104	Flag 0/1 If 1 open to 104	Integer	0
M_106	Flag 0/1 If 1 open to 106	Integer	0

Field	Description	Data Format	Example
M_201	Flag 0/1 If 1 open to 201	Integer	1
M_202	Flag 0/1 If 1 open to 202	Integer	3
M_204	Flag 0/1 If 1 open to 204	Integer	1
M_205	.....	Integer	1
M_401	Flag 0/1 If 1 open to 401	Integer	0
MODESTR	String with all the allowed modes	String	xdwhi
SPEED_1	Speed in kms per hour for all modes except v102-106 in Sweden	Double	70
SPEED_2	Speed in kms per hour for vehicle types v102-106 in Sweden	Double	0
CATEGORY	Link category	Integer	70
FUNCTION	Index for vdf function	Double	66
NLANES	Number of lanes (may be a decimal number)	Double	1
UL2	Distance in kms. User link data in emme used to enable holding link lengths longer than 999 kms.	Double	1.36
UL3	Capacity for vessels on sea (dwell tons)	Double	0
ID_COUNTRY	Country code	Integer	1
EC_V101	Extra cost on link (defined via EC_V attribute in the network) for v101	Double	-99999
EC_KM_V101	Extra costkm on link (defined via EC_KM_V attribute in the network) for v101	Double	-99999
EC_V102	Extra cost on link (defined via EC_V attribute in the network) for v102	Double	-99999
EC_KM_V102	Extra costkm on link (defined via EC_KM_V attribute in the network) for v102	Double	-99999
EC_V103	.....	Double	-99999
EC_KM_V103	.....	Double	-99999
AORIG	Emme initial node number	Integer	4246
BORIG	Emme final node number	Integer	9088
KM_TAX101	Sum of TAX_C, EC_KM_V for V101	Double	0
TOLL101	Sum of TAX_LT, TAX_L, EC_V,TOLL_L for V101	Double	0
KM_TAX102	Sum of TAX_C, EC_KM_V for V102	Double	0
TOLL102	Sum of TAX_LT, TAX_L, EC_V,TOLL_L for V102	Double	0
KM_TAX103	.....	Double	0
TOLL103	.....	Double	0
KM_TAX401	Sum of TAX_C, EC_KM_V for V401	Double	0
TOLL401	Sum of TAX_LT, TAX_L, EC_V,TOLL_L for V401	Double	0
MODE_L	Mode	Integer	2

The variables listed above has the following meaning:

- TAX_C: country tax based on Tax_Country_{SCENARIO_SHORTNAME} table - SEK/km
- TAX_LT: tax by category on Tax_Category_{SCENARIO_SHORTNAME} table - SEK
- TAX_L: tax by link on Tax_Link_{SCENARIO_SHORTNAME} table - SEK
- TOLL_L: toll on link from Toll_Link_{SCENARIO_SHORTNAME} table - SEK
- EC_V: extra cost applied using EC_V attribute in the network (see user manual for details) - SEK
- EC_KM_V: extra cost km applied using EC_KM_V attribute in the network (see user manual for details) - SEK

Those taxes and tolls are recombined into two attributes:

- KM_TAX: includes TAX_C and EC_KM_V, in other words values based on distance
- TOLL: includes TAX_LT, TAX_L , TOLL_L and EC_V, therefore values based on a link

The final results of KM_TAX and TOLL are not merely the sum of the individual values since TAX_C, TAX_LT and TAX_L mutually exclude each other. We have the following cases:

- if TAX_L is specified, TAX_C and TAX_LT will be not applied
- if TAX_L is not specified and TAX_LT has a value, only TAX_LT will be applied
- if TAX_L and TAX_LT are not specified, only TAX_C will be applied.

Also values equal to zero have a meaning, since a zero-valued tax could be specified by TAX_L=0, and that will give a tax level at 0. To treat this case all the values are initialized to -99999, before applying any specific values from tables in geodatabase.

Furthermore, the following tables are saved:

- Tax_by_Link_{Scenario_code}.DBF: taxes for each link in specific scenario (see structure from 3.2.3.11)
- Tax_Category_{Scenario_code}.DBF: Taxes by category type (see structure from 3.2.3.9)
- Tax_Country_{Scenario_code}.DBF: Taxes by country (see structure from 3.2.3.10)
- Toll_by_link_{Scenario_code}.DBF: tolls by link (see structure from 3.2.3.12)
- Vh_par_tot.DBF: union of part A and Part B vehicle parameters tables by vehicle type and commodity group
- Check_overcapacity_{Scenario_code}.txt: number of links overcapacity before applying RCM procedure.
- Nodes.DBF: List of nodes.
- Parameters_Kielcalibration.dbf: Parameters used in calibration.
- Parameters_portcalibration.dbf: Parameters used in calibration.
- Scaling_Nodes.DBF, Scaling_PartA.DBF, Scaling_PartB.DBF, Scaling_Rail_Capacity.DBF, Scaling_speed_network.dbf, Scaling_Tax_country.DBF, Scaling_Tax_Link.DBF, Scaling_Toll_Link.dbf: Scaling files.
- V101_SpeedFlowCurves.DBF, V102_SpeedFlowCurves.DBF: delay functions.
- Vh_par_fin_1_8_{Scenario_code}.DBF, Vh_par_fin_9_16_{Scenario_code}.DBF, Vhl_par_PartA.DBF: Vehicle parameters.

3.4.8.6. Select link analysis

The Select Link application has two different modalities:

- The former allows to skim the loaded vehicles and tons for specific chains going through a list of nodes or links and per commodity.
- The latter is a fixed tool to produce the road matrices (in terms of loaded, unloaded and ton matrices for road mode).

The standard output for the two cases is therefore different. All the outputs for option A (select link) are linked in the GUI. No outputs for Option B are accessible from the interface but reside under the SelectLink folder selected in setting up the scenario.

Option A: Select Link

Under SelectLink\{SelectLink_name} the following files listed in Table 140 will be present.

Table 140 - List of outputs under SelectLink folder for SelectLink output Suffix STD refers to Standard Logistics Results, SL to RCM.

File name	Type	Description
SelectDirect.ctl	Control file	control file for program
SelectDirectSTD.ctl		
ErrorSL.txt	Output	LOG error
ErrorSLSTD.txt		LOG error
RCM.NET		Output network with selected volumes by vehicle type
STD.NET		Output network with selected volumes by vehicle type
RCM_COMMODITY.NET		Output network with selected volumes by commodity group
STD_COMMODITY.NET		Output network with selected volumes by commodity group
AIR_TON_FIN_MainSc2045.MAT		
AIR_TON_MainSc2045.MAT		
AIR_VHCLFLOW_FIN_MainSc2045.MAT		
AIR_VHCLFLOW_MainSc2045.MAT		
RAIL_TON_FIN_MainSc2045.MAT		
RAIL_TON_MainSc2045.MAT		
RAIL_VHCLFLOW_FIN_MainSc2045.MAT		
RAIL_VHCLFLOW_MainSc2045.MAT		
ROAD_TON_FIN_MainSc2045.MAT		
ROAD_TON_MainSc2045.MAT		
ROAD_VHCLFLOW_FIN_MainSc2045.MAT		
ROAD_VHCLFLOW_MainSc2045.MAT		
SEA_TON_FIN_MainSc2045.MAT		
SEA_TON_MainSc2045.MAT		
SEA_VHCLFLOW_FIN_MainSc2045.MAT		
SEA_VHCLFLOW_MainSc2045.MAT		Matrices in Binary format
ChainsSL.dat		Selected chain list in RCM
ChainsSLSTD.dat		Selected chain list in STD
ConCumSL.dat		Matrix in dat format

Input and output file reference

File name	Type	Description
ConCumSLSTD.dat		Matrix in dat format
ConnectionsSL.dat		
ConnectionsSLSTD.dat		
LinksSumSL.dat		Link list with loaded vehicles and tons
LinksSumSLSTD.dat		Link list with loaded vehicles and tons

Option B: Traversal Matrices

Table 141 - List of outputs under SelectLink folder for a Traversal Matrices output.

File name	Output name	Format
SelectLink\SLTravmat	ErrorSL.txt	String file
	ErrorSLSTD.txt	String file
	SelectDirect.ctl	Control file
	SelectDirectSTD.ctl	Control file
SelectLink\SLTravmat\FIN	v101_emp.314	314 Emme matrix file
	v101_ton.314	314 Emme matrix file
	v101_vhcl.314	314 Emme matrix file
	v102_emp.314	314 Emme matrix file
	v102_ton.314	314 Emme matrix file
	v102_vhcl.314	314 Emme matrix file
	v103_emp.314	314 Emme matrix file
	v103_ton.314	314 Emme matrix file
	v103_vhcl.314	314 Emme matrix file
	v104_emp.314	314 Emme matrix file
	v104_ton.314	314 Emme matrix file
	v104_vhcl.314	314 Emme matrix file
	v105_emp.314	314 Emme matrix file
	v105_ton.314	314 Emme matrix file
	v105_vhcl.314	314 Emme matrix file
SelectLink\SLTravmat\STD	v101_emp.314	314 Emme matrix file
	v101_ton.314	314 Emme matrix file
	v101_vhcl.314	314 Emme matrix file
	v102_emp.314	314 Emme matrix file
	v102_ton.314	314 Emme matrix file
	v102_vhcl.314	314 Emme matrix file
	v103_emp.314	314 Emme matrix file
	v103_ton.314	314 Emme matrix file
	v103_vhcl.314	314 Emme matrix file
	v104_emp.314	314 Emme matrix file
	v104_ton.314	314 Emme matrix file
	v104_vhcl.314	314 Emme matrix file
	v105_emp.314	314 Emme matrix file
	v105_ton.314	314 Emme matrix file
	v105_vhcl.314	314 Emme matrix file

3.4.8.7. GIS maps

These folders contain compatible output networks for ArcGIS users. The folder can be shared among other people without the Cube interface requirements.

The maps are listed in Table 142 where:

- The first folder has the absolute tons and vehicles per commodity group and totals saved in a geodatabase feature class under the gdb file.
- The second folder has the differences between the two scenarios for the same quantities.

For unit and meaning of attributes present in ABS_GIS{SCENARIO_SHORTNAME}, folder refer to Table 107.

Table 142 - GIS maps.

File name	Output name	Format
ABS_GIS{SCENARIO_SHORTNAME}	GeodatabaseYYYY_CMD.gdb where YYYY is the base year 2019 or the prognosis year 2045	Personal geodatabase ArcGIS format
	GeodatabaseYYYY_CMD.vpr (present after mxd is opened) where YYYY is the base year 2019 or the prognosis year 2045	Cube visual project file
	Output_CMD_STD_GIS_TON.mxd	ArcGIS map document for tons (by commodity group) Standard Logistic Model
	Output_CMD_STD_GIS_VHCL.mxd	ArcGIS map document for vehicles (by commodity group) Standard Logistic Model
	Output_CMD_RCM_GIS_TON.mxd	ArcGIS map document for tons (by commodity group) Rail Capacity Management
	Output_CMD_RCM_GIS_VHCL.mxd	ArcGIS map document for vehicles (by commodity group) Rail Capacity Management
DIFF_GISYYYY_2019	GeodatabaseDIFFYYYY-2019_STAN.gdb where YYYY is the base year 2019 or the prognosis year 2045	Personal geodatabase ArcGIS format
	GeodatabaseDIFFYYYY-2019_STAN.vpr where YYYY is the base year 2019 or the prognosis year 2045	Cube visual project file
	Output_BaseYYYY_2019_CMD_GIS.mxd where YYYY is the base year 2019 or the prognosis year 2045	ArcGIS map document

3.4.8.8. Outputs_Calibration_Template_rev11.xlsm

In the past several reports were post produced after full run with quite an important level of effort. Thus, the reports were created to ease this procedure and for further easement the output called “Calibration_1.txt” is produced for each scenario which contains all the following reports:

- Report 1 TonKm (*1,000,000) total domestic by mode (international for air)
- Report 2 Port areas statictics Tons*1,000
- Report 3 TonKm*1000 by commodity group on rail
- Report 4 Kiel and Oresund bridges (percentage diff on Oresund, Percentage transport on Kiel Canal vs Kiel+Jylland)
- Report 5 Tonkm Road vehicle type distribution
- Report 6 Tonkm Rail main vehicle types

- Report 7 Vhkm Road vehicle type distribution
- Report 8 Tons Sea main vehicle distribution
- Report 9 Tonnes per sea vessel distribution
- Report 10 Vkm loaded + empty

The spreadsheet has the following tabs:

- Inputs
- Data Import
- Reports ABS
- Reports %
- Diagrams_1_scenario
- Diagrams_all_scenarios

To import Calibration_1.txt go under “Inputs” tab and click on “Import Data” button (providing location of scenario you want to import) seen in Figure 3.

All tables under “Reports” and diagrams under “Diagrams_1_scenario” are automatically updated.

There is also the option to import other scenarios for comparison from other excel files. In the example under “Outputs_Calibration_Test6.xlsm” Test6 has been imported. To import another scenario, it is sufficient to click “Get comparison data”. This will automatically update “Reports” and “Diagrams_all_scenarios”.

The excel file has been built with the following principles:

1. You must create a file for each scenario;
2. You can keep track of all previous scenarios, importing incrementally each previous scenario. For instance: first scenario in my example is Base2012. This will be populated only with statistics and Base2012 values. Second scenario will import first its own values (Test1) and Base2012 values will be paste from first excel. Test 2 will be populated with its own values and Test1 and Base 2012 will be copied from “Output_Calibration_Test1.xlsm” file. Etc.
3. It is possible to keep memory up to 22 scenarios.

No actions are required by final user in updating tables or diagrams. The user must just fill out properly fields (entries marked as <-- just change this) present under “Inputs” spreadsheet and click two buttons.

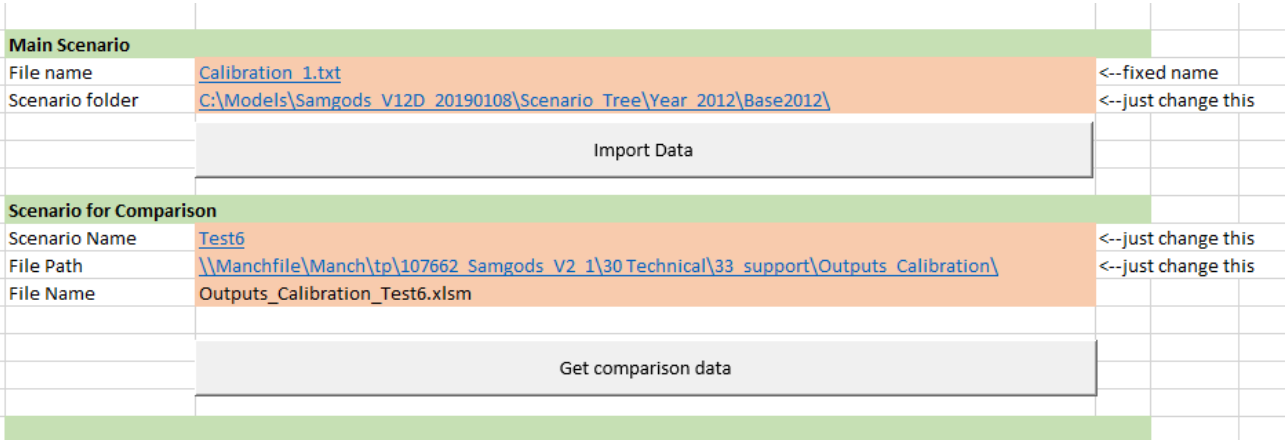


Figure 3 - Interface to import results for base year.

4 The model structure

The Samgods model could be described as a set of different software integrated in a standalone interface. The technical documentation refers to the GUI interface implemented in Cube software and in this chapter the different physical elements constituting the model will be explored. The naming and syntax used is derived from the Cube Software.

The model can be viewed in Cube interface opening the catalog file, always placed under the model folder, having extension .cat. The purpose with this file is to coordinate all the various parts of the model in terms of:

- Applications - files with .app extension
- Scenario keys - elements saved in .cat file
- Location of input and output data - based on program steps present in each application
- Give access to all the input and output data by scenario
- Define the rules on how to use the model (developer or user class)

The catalog file (named SamGods.cat) stores all the connections, maps and definition values for each entity listed above.

The catalog keys, listed in the catalog files, have a variety of purposes. They can define:

- The execution order for the applications
- Enable or disable the creation of specific outputs
- Point to an input file or parameter

The Cube-applications represent the programming parts, using the input data and applying the set of rules defined via the scripting language, they produce specific outputs and manage the data (see the description of each application for more details).

The list of catalog keys defined in the model, classified by user rights and application usage are listed in Table 143.

Table 143 - Catalog keys.

Catalog key name		**Example of value**	**User**	**Application**
Catalog name	**Interface name**			
Install_driver	Hard Drive where the model resides	C:\	Developer	Installation
				Samgods Model
				Elasticity module
Cube_software	Cube software	6.5.1	Developer	Installation
				Samgods Model
GIS_software	ArcGis Software	10.8.2	Developer	Installation
				Samgods Model
Python_Software	Python software	27	Developer	Installation
				Samgods Model
LogMod_software	Logistics Model Software	1.2.3	Developer	Installation
				Samgods Model
Cube_Folder	Location of Cube Program	C:\Program Files (x86)\	Developer	Samgods Model
Installation_DOS	Path to cmd.exe	C:\windows\sysnative\cmd.exe	Developer	Installation
				Samgods Model
				Select Link Analysis
				Elasticity module
				Cost Benefit Analysis - ASEK Values
Python	Location of python program	C:\Python27\ArcGIS10.8	Developer	Installation
				Edit the data

The model structure

Catalog key name		**Example of value**	**User**	**Application**
Catalog name	**Interface name**			
				Samgods Model
				Compare Scenarios
				Handling scenario
				Select Link Analysis
				Cost Benefit Analysis - ASEK Values
				Create Maps
JavaVersion	Location of Java folder	C:\windows\sysnative\cmd.exe	Developer	Samgods Model
				Select Link Analysis
				Elasticity module
				Installation
				Cost Benefit Analysis - ASEK Values
Base_Scenario	Scenario name for the BASE Scenario	Base2019	Developer	Create the editable files
				Edit the data
				Samgods Model
				Handling scenario
				Compare Scenarios
				Select Link Analysis
				Elasticity module
				Installation
				Cost Benefit Analysis - ASEK Values

Catalog key name		Example of value	User	Application
Catalog name	**Interface name**			
Scenario_copy	Which scenario do you want to copy as new scenario?	Base2019	All	Create the editable files
Waittime	Wait time for prompt messages during execution (default 10 minutes=600 seconds)	600	Developer and Advanced User	Create the editable files
				Samgods Model
				Cost Benefit Analysis - ASEK Values
				Elasticity Module
read_write	Do you want to lock the scenario permanently from further editing?	Yes	All	Edit the data
Calibration _scenario	Calibration parameters for reference scenario (Base2019 for year 2019 and MainSc2045 for year 2045)	Base2019	All	Edit the data
				Samgods Model
				Elasticity module
Edit_soft	Select from which source you want to import your edits	GIS Window (Use input files constructed by the Cube GUI)	All	Edit the data
EMME_data	Emme network file	C:\Models\SamGods_V123\05_Input_Data\2019_2045\rev150424\Base2045_corr\Samgods_Base_2045(rev150424).211	All	Edit the data
EMME_speed	Emme speed table	C:\Models\SamGods_V123\05_Input_Data\2019_2045\rev150424\new_road_2030_Samgods_1_0_V101_102_link_speeds.DAT	All	Edit the data
Up_parameters	General parameters [Table]	{CATALOG_DIR}\Scenario_Data.mdb\General_Base2019	Developer	Edit the data
GCOST	Attribute name for the extracost on specific link (SEK)	EC_V	All	Edit the data
				Handling scenario
GCOST_D		EC_KM_V	All	Edit the data

Catalog key name		**Example of value**	**User**	**Application**
Catalog name	**Interface name**			
	Attribute name for the extracost on specific link (SEK/km)			Handling scenario
DF	Number of operating days per year for all modes (except for Rail Mode) (days/year)	250	Developer and Advanced User	Handling scenario
				Edit the data
DFR	Number of operating days per year for Rail Mode (days/year)	250	Developer and Advanced User	Handling scenario
				Edit the data
Zones	Number of zones/terminals in network (see value in scenario network)	1383	All	Create the editable files
				Edit the data
				Samgods Model
				PWC_Matrices
				Select Link Analysis
				Cost Benefit Analysis - ASEK Values
				Elasticity module
LogParam	General parameters for Logistic Module [Table]	{CATALOG_DIR}\Scenario_Tree\Base2019\Scenario_Data.mdb\LogMod_Base2019	Developer	Handling scenario
				Edit the data
INTER_RATE	Interest rate used in cost calculations (%/year)	0.1	All	Handling scenario
				Edit the data
STUFF	Stuffing cost (SEK/tonne)	60	All	Handling scenario
				Edit the data
LSTCNT	Number of transport chain solutions for the Logistics Module	5	All	Handling scenario
				Edit the data

Catalog key name		Example of value	User	Application
Catalog name	**Interface name**			
DATA	Output variables for the optimal transport solution [e.g.1,2,3, max is 8]	6,7	All	Handling scenario
				Edit the data
FACTOR	Initial consolidation factor in BuildChain (First iteration - from 0 to 1)	0.75	All	Handling scenario
				Edit the data
CONTYPE	Allow consolidation for all lorry types	Yes	All	Handling scenario
				Edit the data
INODLO	Evaluate transport chains one leg at a time	Yes	All	Handling scenario
				Edit the data
MATD4FO	Lower bound for frequency optimisation (Annual Tonnes/Shipment)	1000	All	Handling scenario
				Edit the data
CONSOL_L	Lower bound for consolidation factor (applied to all commodities - from 0 to 1)	0.05	All	Handling scenario
				Edit the data
CONSOL_U	Upper bound for consolidation factor (applied to all commodities from 0 to 1)	0.95	All	Handling scenario
				Edit the data
TONNES	Calculation for demand affecting shipment size	DYNAMIC_AVERAGE	All	Handling scenario
				Edit the data
LOGCTL	Do you want to log parameters from control files?	Yes	All	Handling scenario
				Edit the data
LOGFLS	Do you want to log reading of input data?	Yes	All	Handling scenario
				Edit the data
LOGCST		Yes	All	Handling scenario

Catalog key name		**Example of value**	**User**	**Application**
Catalog name	**Interface name**			
	Do you want to log cost values from vehicle files?			Edit the data
BESTOUT	For which logistic solutions do you want to produce output data? (0=none, 1=Best solution, 2=Best + Second)	1	All	Handling scenario Edit the data
Del_tmp	Do you want to delete the temporary geodatabase? (Tick=yes)	Tick	All	Handling scenario Edit the data
Mxd_file	ArcMap GIS Project File	{CATALOG_DIR}\Scenario_Tree\{SCENARIO_SHORTNAME}\Input_Data.mxd	All	Edit the data
Up_cargo	Commodity data [Table]	{CATALOG_DIR}\Scenario_Tree\{SCENARIO_SHORTNAME}\Scenario_Data.mdb\Cargo_{SCENARIO_SHORTNAME}	All	Edit the data
Up_Vehicles_par	General parameters of Vehicle types [Table]	{CATALOG_DIR}\Scenario_Tree\Base2019\Scenario_Data.mdb\Vehicles_Parameters_Base2019_PartA	All	Edit the data
Up_Vehicles_par_B	Specific parameters of Vehicle types by commodity group [Table]	{CATALOG_DIR}\Scenario_Tree\Base2019\Scenario_Data.mdb\Vehicles_Parameters_Base2019_PartB	All	Edit the data
Up_Tax_C	Table with tax by country (SEK/km) [Table]	{CATALOG_DIR}\Scenario_Tree\{SCENARIO_SHORTNAME}\Scenario_Data.mdb\Tax_Country_{SCENARIO_SHORTNAME}	All	Edit the data
Up_Tax_L	Tax by Category (SEK) [Table]	{CATALOG_DIR}\Scenario_Tree\{SCENARIO_SHORTNAME}\Scenario_Data.mdb\Tax_Category_{SCENARIO_SHORTNAME}	All	Edit the data
Up_tax_link	Tax by Link (SEK) [Table]	{CATALOG_DIR}\Scenario_Tree\{SCENARIO_SHORTNAME}\Scenario_Data.mdb\Tax_Link_{SCENARIO_SHORTNAME}	All	Edit the data

Catalog key name		Example of value	User	Application
Catalog name	**Interface name**			
Up_toll	Toll for bridges (SEK) [Table]	{CATALOG_DIR}\Scenario_Tree\{SCENARIO_SHORTNAME}\Scenario_Data.mdb\Toll_Link_{SCENARIO_SHORTNAME}	All	Edit the data
Up_net	Network specific of scenario [Geodata]	{CATALOG_DIR}\Scenario_Tree\{SCENARIO_SHORTNAME}\Scenario_Data.mdb\Network	All	Edit the data
Up_node_terminals	Port terminals pilot fees values (SEK/vehicle) [Geodata]	{CATALOG_DIR}\Scenario_Tree\{SCENARIO_SHORTNAME}\Scenario_Data.mdb\Ports_Swe	All	Edit the data
Up_nodes	Zones and terminals attributes [Geodata]	{CATALOG_DIR}\Scenario_Tree\{SCENARIO_SHORTNAME}\Scenario_Data.mdb\Nodes	All	Edit the data
Up_no_comm	Nodes commodities (interchanges allow) [Geodata]	{CATALOG_DIR}\Scenario_Tree\{SCENARIO_SHORTNAME}\Scenario_Data.mdb\Nodes_commodities	All	Edit the data
Up_freq	Frequency data (# transport/ week)[Geodata]	{CATALOG_DIR}\Scenario_Tree\{SCENARIO_SHORTNAME}\Scenario_Data.mdb\Frequency_network	All	Edit the data
Up_Rail_Capacity	Table with Rail Capacity [Table]	{CATALOG_DIR}\Scenario_Tree\{SCENARIO_SHORTNAME}\Scenario_Data.mdb\Rail_Capacity_{SCENARIO_SHORTNAME}	All	Edit the data
Step_by_step	Run only one step, or run all steps	All steps	All	Samgods Model
				Elasticity Module
Year	Choose PWC matrices	2019	All	Elasticity Module
				PWC_Matrices
				Select Link Analysis
				Samgods Model
				Create Maps
Select_cal_cos_mode		All	All	Samgods Model

Catalog key name		**Example of value**	**User**	**Application**
Catalog name	**Interface name**			
	Select the mode for the LOS Calculation and the Assignment steps			Elasticity Module
Select_commodity	Select commodities for the Logistics Module (for all commodities, select 0)	0	All	Elasticity Module
				Samgods Model
				Compare
				Handling scenario
				PWC_Matrices
				Cost Benefit Analysis - ASEK Values
log_out	Do you want to produce buildchainxx.log files?	None	All	Elasticity Module
				Samgods Model
CSTVARI	Stochastic approach: parameter for logit distribution (0=no stochastic approach used or actual value i.e. 0.1) by commodity and f2f type	C:\Models\Samgods_V12D_20200501\05_Input_Data\Input_Data.mdb\CSTVARI	Developer	Samgods model
				Elasticity Module
N_flows	Total number of commodities (excluding empty commodities)	16	Developer	Samgods model
				Cost Benefit Analysis - ASEK Values
				Elasticity Module
				PWC_Matrices
CON_RATE_SELECTION	Do you want to use exogenous consolidation rates?	No	All	Samgods Model
FOLDER_CR	If yes in previous catalog key, provide location of consolidation rates folder	{CATALOG_DIR}\Scenario_Tree\Year_2019\Base2019\LogMod_1\ChainChoi\output\	All	Samgods Model
Cluster_p		Yes	All	Samgods Model

Catalog key name		**Example of value**	**User**	**Application**
Catalog name	**Interface name**			
	Do you want to run the Logistics Module on several processors?			Elasticity Module
				Cost Benefit Analysis - ASEK Values
Cluster_nodes	How many processors would you like to run simultaneously?	4	All	Cost Benefit Analysis - ASEK Values
				Samgods Model
				Elasticity Module
Cluster_nodes_LP2CC	How many processors would you like to run simultaneously for LP2CC?	4	All	Cost Benefit Analysis - ASEK Values
				Samgods Model
				Elasticity Module
scal_factor	Scaling factor for outputs	Thousands	All	Cost Benefit Analysis - ASEK Values
				Samgods Model
				Elasticity Module
RescLOS	Do you want to produce rescaled LOS and MC matrices per commodity group?	No	All	Samgods model
				Elasticity Module
UTIL_PERCENT	Cut off criteria for RCM process (will consider links with Number of vehicles over Capacity > XX% where XX is the value defined)	30	D/A-user	Samgods model
				Elasticity Module
maxiters_EA	Maximum number of iterations in Rail assignment	1	D/A-user	Samgods model
				Elasticity Module
SpeedFlowCurve	Delay function for Empty assignment (Derivate)	2*10000*(MAX(0,VOLC[LI.ID_LINK]-C))	D/A-user	Samgods model
				Elasticity Module
Save_Output_RCM		Yes, for all iterations	All	Samgods Model

The model structure

Catalog key name		**Example of value**	**User**	**Application**
Catalog name	**Interface name**			
	Options to save output files from RCM process			Elasticity Module
RCM_Loop	Maximum number of loops for Linear Programming process (LP)	1	All	Samgods Model
				Elasticity Module
Lock_file	Table with list of locked solutions	2019	D/A-user	Samgods Model
				Elasticity Module
SHIPCUT	Shipment size cut-off (tonnes)	1	All	Samgods model
				Elasticity Module
CAPCOST	Marginal cost limit in MPS.jar (SEK)	998801	All	Samgods model
				Elasticity Module
EXTRA_CAPCOST	Acquisition of extra capacity (SEK)	1000000000	All	Samgods model
				Elasticity Module
Debug_checklist	Link number to use in debug mode CheckLinkN_itXX.dat Max 10 links (comma s, ex. 1,25,182,164)	342	D/A-user	Samgods Model
				Elasticity Module
RAIlMODES	List of rail modes in RCM	GHhIiTUDdEFf	D/A-user	Samgods Model
				Elasticity Module
				Select Link Analysis
RAILVHCL	List of vehicle types on Rail mode	201,202,203,204,205,206,207,208,209,210,211,212	D/A-user	Samgods Model
				Elasticity Module
Chains	List of chains for different numbers of vehicle types	Chain_List_2045	D/A-user	Samgods model
				Elasticity Module

Catalog key name		Example of value	User	Application
Catalog name	**Interface name**			
				Cost Benefit Analysis - ASEK Values
OverallLoopMax	Maximum number of loops in calibration process	1	Developer	Samgods Model
				Select Link Analysis
Resume_option	Restart process from loop	1	Developer	Samgods Model
				Elasticity Module
				Cost Benefit Analysis - ASEK Values
ConsolTable	Consolidation factors table	{CATALOG_DIR}\05_Input_Data\Input_Data.mdb\ BuildChain_CONSOL	D/A-user	Elasticity Module
				Samgods Model
				Handling scenario
Select_compare	What do you want to compare?	All	All	Compare Scenarios
ScenarioC_name	Scenario's name to use in comparison (ex. Test17)	Base2019	All	Compare Scenarios
ScenarioC_dir	Scenario folder for comparison (ex. {CATALOG_DIR}\Scenario_Tree\Year_2019\Test17\)	{CATALOG_DIR}\Scenario_Tree\Base2019\	All	Compare Scenarios
Choice	Select how you want to use Handling Scenario application	(3) EXPORT the model in a new folder using the current scenario as Base	All	Handling scenario
New_folder	For choice 3 or 4 provide an absolute path to the location of the destination model (ex. C:\Samgods_New_version\)	C:\SamGods_v2\	All	Handling scenario
New_Base	For choice 3 or 4 provide the name of the base scenario in the destination model	Base2019	All	Handling scenario
Format	Do you want to export in csv, DBF or GDB format?	CSV	All	Change matrix format

Catalog key name		**Example of value**	**User**	**Application**
Catalog name	**Interface name**			
GDB_c_u	Do you want to create a new geodatabase or use an existing one?	Existing	All	Change matrix format
GDB_folder	Define the GDB where the matrix should be exported	{CATALOG_DIR}\Scenario_Tree\{SCENARIO_SHORTNAME}\Outputo_{SCENARIO_SHORTNAME}.mdb COST	All	Change matrix format
Type_mat	What kind of matrix do you want to export?	COST	All	Change matrix format
Type_mode	What is the mode that you want for the matrices?	ROAD	All	Change matrix format
Type_VHCL	What vehicle type do you want for the LOS matrices?	101	All	Change matrix format
Type_COST	Do you want the distance, time, domestic distance or extracost LOS matrix?	Extracost	All	Change matrix format
Type_VHCL_1	What type of vehicle type (or total) do you want for the VEHICLES and TONNES matrices?	202	All	Change matrix format
ScenarioJA_Dir	Full scenario folder for comparison (JA-reference scenario - before investment) (Base2019 folder if Year_2019, MainSc2045 folder if Year_2045)	C:\Models\Samgods_V12D_20190531\Scenario_Tree\Year_2019\Base2019\	All	Cost Benefit Analysis - ASEK Values
ScenarioJA_Name	Scenario's name to use in comparison (JA-reference scenario - before investment) (Base2019 if Year_2019, MainSc2045 if Year_2045)	Base2019	All	Cost Benefit Analysis - ASEK Values

Catalog key name		Example of value	User	Application
Catalog name	**Interface name**			
Include_empties	Include the cost of empty transports in the calculation of system costs	No	All	Cost Benefit Analysis - ASEK Values
Domestic_W	Weighting factor Domestic	1.0	All	Cost Benefit Analysis - ASEK Values
Import_W	Weighting factor Import	0.5	All	Cost Benefit Analysis - ASEK Values
Export_W	Weighting factor Export	0.5	All	Cost Benefit Analysis - ASEK Values
Transit_W	Weighting factor Transit	0.0	All	Cost Benefit Analysis - ASEK Values
FolderSL	SelectLink analysis name (max 6 characters)	SL1	All	Select Link Analysis
List_type	Numbering system for link list	ID_LINK (Example 1,2,201,207)	All	Select Link Analysis
A_B	List of links	1,15,329	All	Select Link Analysis
VISITLINK	Selection criteria for links	ANY ; any of given links must be used	All	Select Link Analysis
List_type_n	Numbering system for node list	Voyager (Example 1,2049,2083,2039)	All	Select Link Analysis
N	List of nodes	111,011,102	All	Select Link Analysis
VISITNODE	Selection criteria for nodes	ANY ; any of given nodes must be used	All	Select Link Analysis
SL_Comm	List of commodities for Select Link Analysis (0 for All)	0	All	Select Link Analysis
Selection_rule	Select the method being applied for conditions on nodes and links	node AND link selection (both met)	All	Select Link Analysis
TravMat	Do you want to produce traversal matrices? (Untick=no Tick=yes)	Yes	All	Select Link Analysis
GISMaps	Do you want to produce GIS Maps by Commodity group?	Yes	All	Select Link Analysis
				Samgods Model
Scenario_Table	Table with scenarios want to run for the elasticity calculation	C:\Models\Samgods_V12D_20190829\05_Input_Data\Input_Data.mdb\Scenarios_List	All	Elasticity Module

The model structure

Catalog key name		**Example of value**	**User**	**Application**
Catalog name	**Interface name**			
Min_Loop	Lowest scenario in sensitivity run	2	All	Elasticity Module
Max_Loop	Highest scenario in sensitivity run	10	All	Elasticity Module

The list of applications and subgroups defined in the model is shown in Table 144. Numbers between parentheses represent the execution order within a subgroup.

Table 144 - Applications and subgroups.

Application name	Subgroup level 1	Subgroup level 2	Subgroup level 3	Subgroup level 4	File name
Installation					{CATALOG_DIR}\02_Applicaions\5_Installation\Installation_st.app
Create the editable files					{CATALOG_DIR}\02_Applications\1_Editing\Setup.app
	Prepare temporary data (1)				{CATALOG_DIR}\02_Applications\1_Editing\EDIT_PREPAR.app
	Editable tables (2)				{CATALOG_DIR}\02_Applications\1_Editing\EDIT_TABLES.app
	Editable map data (3)				{CATALOG_DIR}\02_Applications\1_Editing\EDIT_MAP.app
Edit the data					{CATALOG_DIR}\02_Applications\1_Editing\Edit.app
	Create the tables specific of scenario (1)				{CATALOG_DIR}\02_Applications\1_Editing\CREATE_TABLES.app
		Numbering System Voyager			{CATALOG_DIR}\02_Applications\1_Editing\Numbering\NUMBER01.app
		Emme Edits			{CATALOG_DIR}\02_Applications\1_Editing\EMMEEDITS.app
		Compare Nodes and Node_terminals			{CATALOG_DIR}\02_Applications\1_Editing\Comparison\COMPAR01.app
		Compare other tables			{CATALOG_DIR}\02_Applications\1_Editing\EDIT_OTHERS.app
		Rail Capacity and Net Checks			{CATALOG_DIR}\02_Applications\1_Editing\Capacity\RAILCA01.app
		Frequency matrices			{CATALOG_DIR}\02_Applications\1_Editing\Frequency.app
	Consistency checks with				{CATALOG_DIR}\02_Applications\1_Editing\Consistency_checks.app

The model structure

Application name	Subgroup level 1	Subgroup level 2	Subgroup level 3	Subgroup level 4	File name
	calibration tables (2)				
	Save changes in the main gdb (3)				{CATALOG_DIR}\02_Applications\1_Editing\CREATE_SAVE.app
		Regions for links			{CATALOG_DIR}\02_Applications\1_Editing\Regions\REGION01.app
Samgods Model					{CATALOG_DIR}\02_Applications\2_Run\SamGod_VY.app
	Initialization (1)				{CATALOG_DIR}\02_Applications\2_Run\Ini\INITIA00.app
	LOS calculation (4)				{CATALOG_DIR}\02_Applications\2_Run\Costs_VY\COST_VY.app
		Data Preparation			{CATALOG_DIR}\02_Applications\2_Run\Costs_VY\DATAPREPARATION_VY.app
			Tax calculation		{CATALOG_DIR}\02_Applications\2_Run\Costs_VY\DATAPREPARATION_VY_01.app
			Data for RCM		{CATALOG_DIR}\02_Applications\2_Run\Costs_VY\DATARCM.APP
Samgods Model		Road			{CATALOG_DIR}\02_Applications\2_Run\Costs_VY\ROAD.app
		Rail			{CATALOG_DIR}\02_Applications\2_Run\Costs_VY\RAIL.app
		Sea			{CATALOG_DIR}\02_Applications\2_Run\Costs_VY\SEA.app
		Air			{CATALOG_DIR}\02_Applications\2_Run\Costs_VY\AIR.app
		Conversion from VY to LogMod			{CATALOG_DIR}\02_Applications\2_Run\Costs_VY\CONVERALL.app
			From VY to LogMod Road		{CATALOG_DIR}\02_Applications\2_Run\Costs_VY\CONCOSTVYE2.app
			From VY to LogMod Rail		{CATALOG_DIR}\02_Applications\2_Run\Costs_VY\CONRAILVYE2.app
			From VY to LogMod Sea		{CATALOG_DIR}\02_Applications\2_Run\Costs_VY\CONSEAVYE2.app

Application name	Subgroup level 1	Subgroup level 2	Subgroup level 3	Subgroup level 4	File name
			From VY to LogMod Air		{CATALOG_DIR}\02_Applications\2_Run\Costs_VY\CONAIRVYE2.app
	Logistics Module (5)				{CATALOG_DIR}\02_Applications\2_Run\LogisticModVY\LOGMOD.app
		Prepare data			{CATALOG_DIR}\02_Applications\2_Run\LogisticModVY\PREPARE.app
		Prepare Data second part			{CATALOG_DIR}\02_Applications\2_Run\LogisticModVY\PREPARE_01.app
		Prepare Data third part			{CATALOG_DIR}\02_Applications\2_Run\LogisticModVY\PREPARE_02_rev.app
		Run the logistic model			{CATALOG_DIR}\02_Applications\2_Run\LogisticModVY\RUNTMODEL.app
		Save Reports			{CATALOG_DIR}\02_Applications\2_Run\LogisticModVY\SAVEREPORTS.app
			Stocastic results		{CATALOG_DIR}\02_Applications\2_Run\LogisticModVY\STOCASTIC01.app
	Assignment (6)				{CATALOG_DIR}\02_Applications\2_Run\ASS_VY\ASS_VY.app
		Conversion from LogMod to VY			{CATALOG_DIR}\02_Applications\2_Run\ASS_VY\CONVERSION OF EMME MATRICES.app
		Road Assignment			{CATALOG_DIR}\02_Applications\2_Run\ASS_VY\ASS_ROAD_VY.app
		Rail Assignment			{CATALOG_DIR}\02_Applications\2_Run\ASS_VY\ASS_RAIL_VY.app
		Sea Assignment			{CATALOG_DIR}\02_Applications\2_Run\ASS_VY\ASS_SEA_VY.app
		Air Assignment			{CATALOG_DIR}\02_Applications\2_Run\ASS_VY\ASS_AIR_VY.app
	Results (7)				{CATALOG_DIR}\02_Applications\2_Run\Results\RESULTS.app
		Results 1.0			{CATALOG_DIR}\02_Applications\2_Run\Results\RESULTS_NEW.app
Samgods			Port Areas		{CATALOG_DIR}\02_Applications\2_Run\Results\PORTAR01.app

The model structure

Application name	Subgroup level 1	Subgroup level 2	Subgroup level 3	Subgroup level 4	File name
			GIS maps by Commodity groups		{CATALOG_DIR}\02_Applications\2_Run\Results\Bidire02.app
			Oresund Kiel and Jylland		{CATALOG_DIR}\02_Applications\2_Run\Results\ORESUN01.app
			Reports per geographical aggregation		{CATALOG_DIR}\02_Applications\2_Run\Results\REPORT01.app
	Rail Capacity Management (8)				{CATALOG_DIR}\02_Applications\9_RCM1\RAILCA01.app
		Data Preparation LP			{CATALOG_DIR}\02_Applications\9_RCM1\Dataprep_LP\DATAPR01.app
		Warm start			{CATALOG_DIR}\02_Applications\9_RCM1\WARMST01.app
		LP Loop			{CATALOG_DIR}\02_Applications\9_RCM1\LP\LPLOOP01.app
			LP0 step		{CATALOG_DIR}\02_Applications\9_RCM1\LP\LP0\LP0STEP.app
			LP1+ step		{CATALOG_DIR}\02_Applications\9_RCM1\LP\LP1\LP1ST01.app
				Run BuildChainRCM and ChainChoiRCM	{CATALOG_DIR}\02_Applications\9_RCM1\LP\LP1\RUNBUILDCHAINRCM.app
				Run MPS LP Extract	{CATALOG_DIR}\02_Applications\9_RCM1\LP\LP1\RUNMPS_LP_EXTRACT.app
				Check convergence	{CATALOG_DIR}\02_Applications\9_RCM1\LP\LP1\CHECKC01.app
		Run Final Process			{CATALOG_DIR}\02_Applications\9_RCM1\Final\RUNFIN01.app
			Prepare control files		{CATALOG_DIR}\02_Applications\9_RCM1\Final\PREPARE_02.app
			Run the final process		{CATALOG_DIR}\02_Applications\9_RCM1\Final\RUNTMODEL.app
			Save Reports		{CATALOG_DIR}\02_Applications\9_RCM1\Final\SAVEREPORTS.app

Application name	Subgroup level 1	Subgroup level 2	Subgroup level 3	Subgroup level 4	File name
	RCM Assignment (9)				{CATALOG_DIR}\02_Applications\9_RCM1\ASS_VY\ASS_VY.app
		Conversion from LogMod to VY			{CATALOG_DIR}\02_Applications\\9_RCM1\ASS_VY\\CONVERSION OF EMME MATRICES.app
		Road Assignment RCM			{CATALOG_DIR}\02_Applications\\9_RCM1\ASS_VY\\ASS_ROAD_VY.app
		Rail Assignment RCM			{CATALOG_DIR}\02_Applications\\9_RCM1\ASS_VY\\ASS_RAIL_VY.app
		Sea Assignment RCM			{CATALOG_DIR}\02_Applications\\9_RCM1\ASS_VY\\ASS_SEA_VY.app
Samgods		Air Assignment RCM			{CATALOG_DIR}\02_Applications\\9_RCM1\ASS_VY\\ASS_AIR_VY.app
	Results RCM (10)				{CATALOG_DIR}\02_Applications\9_RCM1\Results\RESULTS.app
		Reports 1.0			{CATALOG_DIR}\02_Applications\9_RCM1\Results\REPORTNEW.app
			PORT AREAS		{CATALOG_DIR}\02_Applications\9_RCM1\Results\PORTAR01.app
			GIS maps on commodity groups		{CATALOG_DIR}\02_Applications\9_RCM1\Results\ Bidire01.app
			Oresund Kiel and Jylland		{CATALOG_DIR}\02_Applications\9_RCM1\Results\ORESUN01.app
			Rail Capacity		{CATALOG_DIR}\02_Applications\9_RCM1\Results\RAILCA01.app
			Reports per geographical aggregation		{CATALOG_DIR}\02_Applications\9_RCM1\Results\REPORT01.app
	Parameters calculation (11)				{CATALOG_DIR}\02_Applications\2_Run\Calibr\PARAMETERS.app
Compare Scenarios					{CATALOG_DIR}\02_Applications\3_Compare\Compare.app

The model structure

Application name	**Subgroup level 1**	**Subgroup level 2**	**Subgroup level 3**	**Subgroup level 4**	**File name**
	LOS Matrices (1)				{CATALOG_DIR}\02_Applications\3_Compare\LOSMAT.app
	OD Matrices (2)				{CATALOG_DIR}\02_Applications\3_Compare\OD_matrices\ODMATR01.app
	Assignment (3)				{CATALOG_DIR}\02_Applications\3_Compare\ASSIGNMENT.app
	Comparison (4)				{CATALOG_DIR}\02_Applications\3_Compare\Compar01.app
					{CATALOG_DIR}\02_Applications\4_Handling\Handling.app
	Delete (1)				{CATALOG_DIR}\02_Applications\4_Handling\DELETE.app
	Compact (2)				{CATALOG_DIR}\02_Applications\4_Handling\COMPACT.app
	Scenario Export (3)				{CATALOG_DIR}\02_Applications\4_Handling\SCENARIOEXPORT.app
		Model Export			{CATALOG_DIR}\02_Applications\4_Handling\MODELEXPORT.app
		General tables			{CATALOG_DIR}\02_Applications\4_Handling\GENERAL_TABLES.app
		Create the new base			{CATALOG_DIR}\02_Applications\4_Handling\CREATE_NEW_BSE.app
		Create the new scenario specific tables			{CATALOG_DIR}\02_Applications\4_Handling\CREATE_SS_TABLE_T.app
			Create the scenario tables		{CATALOG_DIR}\02_Applications\4_Handling\CREATE_SS_TABLE.app
			Create the scenario specific tables		{CATALOG_DIR}\02_Applications\4_Handling\CREATE_SS_TABLE_2.app
Handling scenario	Scenario Import (4)				{CATALOG_DIR}\02_Applications\4_Handling\SCENARIOIMPORT.app
PWC_Matrices					{CATALOG_DIR}\02_Applications\6_PWC_matrices\PWC_MA01.app

Application name	Subgroup level 1	Subgroup level 2	Subgroup level 3	Subgroup level 4	File name
Change matrix format					{CATALOG_DIR}\02_Applications\7_Matrix_form\Change01.app
Select Link Analysis					{CATALOG_DIR}\02_Applications\10_SelectLink\SelectLink01.app
	Data prepare(1)				{CATALOG_DIR}\02_Applications\10_SelectLink\DATAPR01.app
	Selection for loaded unloaded vehicles and tons(2)				{CATALOG_DIR}\02_Applications\10_SelectLink\SELECTION_T_LV.app
		Create selection files			{CATALOG_DIR}\02_Applications\10_SelectLink\CREATEFILES.app
		Produce matrices with volumes and tons			{CATALOG_DIR}\02_Applications\10_SelectLink\PRODUCEMAPS.app
		Produce maps with volumes and tons			{CATALOG_DIR}\02_Applications\10_SelectLink\PRODUCMAPS.app
		Produce maps by Commodity group			{CATALOG_DIR}\02_Applications\10_SelectLink\STAN.app
Cost Benefit Analysis - ASEK Values					{CATALOG_DIR}\02_Applications\11_CBA\CBA_AS01.app
	Data Preparation				{CATALOG_DIR}\02_Applications\11_CBA\DATAPREPARATION_VY.APP
		Tax calculation			{CATALOG_DIR}\02_Applications\11_CBA\DATAPREPARATION_VY_01.APP
		Data for CBA			{CATALOG_DIR}\02_Applications\11_CBA\DATARCM.APP
	CBA Analysis(2)				{CATALOG_DIR}\02_Applications\11_CBA\LP2CC\LP2CCCBA.APP
		Prepare data			{CATALOG_DIR}\02_Applications\11_CBA\LP2CC\PREPARE.app

The model structure

Application name	Subgroup level 1	Subgroup level 2	Subgroup level 3	Subgroup level 4	File name
		Prepare Data second part			{CATALOG_DIR}\02_Applications\11_CBA\LP2CC\PREPARE_01.app
		Prepare Data third part			{CATALOG_DIR}\02_Applications\11_CBA\LP2CC\PREPARE_02.app
		Los call			{CATALOG_DIR}\02_Applications\11_CBA\LOSCAL01.APP
		Run LP2CC			{CATALOG_DIR}\02_Applications\11_CBA\LP2CC\RUNTMODEL.app
		Save Reports			{CATALOG_DIR}\02_Applications\11_CBA\LP2CC\SAVEREPORTS.app
		Main Reports			{CATALOG_DIR}\02_Applications\11_CBA\LP2CC\MAINREPORTS01.app
					{CATALOG_DIR}\02_Applications\12_Elasticity\Elasticity_Module_v2.app
	Initialization (1)				{CATALOG_DIR}\02_Applications\12_Elasticity\1_Run\1_Ini\INITIA00.app
	LOS calculation (4)				{CATALOG_DIR}\02_Applications\12_Elasticity\1_Run\2_Costs\COST_VY.app
		Data Preparation			{CATALOG_DIR}\02_Applications\12_Elasticity\1_Run\2_Costs\DATAPREPARATION_VY.app
			Tax calculation		{CATALOG_DIR}\02_Applications\12_Elasticity\1_Run\2_Costs\DATAPREPARATION_VY_EL.app
			Data for RCM		{CATALOG_DIR}\02_Applications\12_Elasticity\1_Run\2_Costs\DATARCM.APP
		Road			{CATALOG_DIR}\02_Applications\12_Elasticity\1_Run\2_Costs\ROAD.app
		Rail			{CATALOG_DIR}\02_Applications\12_Elasticity\1_Run\2_Costs\RAIL.app
		Sea			{CATALOG_DIR}\02_Applications\12_Elasticity\1_Run\2_Costs\SEA.app
		Air			{CATALOG_DIR}\02_Applications\12_Elasticity\1_Run\2_Costs\AIR.app
		Conversion from VY to LogMod			{CATALOG_DIR}\02_Applications\12_Elasticity\1_Run\2_Costs\CONVERALL.app
Elasticity Module			From VY to LogMod Road		{CATALOG_DIR}\02_Applications\12_Elasticity\1_Run\2_Costs\CONCOSTVYE2.app

Application name	Subgroup level 1	Subgroup level 2	Subgroup level 3	Subgroup level 4	File name
			From VY to LogMod Rail		{CATALOG_DIR}\02_Applications\12_Elasticity\1_Run\2_Costs\CONRAILVYE2.app
			From VY to LogMod Sea		{CATALOG_DIR}\02_Applications\12_Elasticity\1_Run\2_Costs\CONSEAVYE2.app
			From VY to LogMod Air		{CATALOG_DIR}\02_Applications\12_Elasticity\1_Run\2_Costs\CONAIRVYE2.app
	Logistics Module (5)				{CATALOG_DIR}\02_Applications\12_Elasticity\1_Run\3_LogisticMod\LOGMOD.app
		Prepare data			{CATALOG_DIR}\02_Applications\12_Elasticity\1_Run\3_LogisticMod\PREPARE.app
		Prepare Data second part			{CATALOG_DIR}\02_Applications\12_Elasticity\1_Run\3_LogisticMod\PREPARE_01.app
		Prepare Data third part			{CATALOG_DIR}\02_Applications\12_Elasticity\1_Run\3_LogisticMod\PREPARE_02_rev.app
		Run the logistic model			{CATALOG_DIR}\02_Applications\12_Elasticity\1_Run\3_LogisticMod\RUNTMODEL.app
		Save Reports			{CATALOG_DIR}\02_Applications\12_Elasticity\1_Run\3_LogisticMod\SAVEREPORTS.app
	Rail Capacity Management (6)				{CATALOG_DIR}\02_Applications\12_Elasticity\2_RCM\RAILCAPACITYMANAGEMENT.app
		Data Preparation LP			{CATALOG_DIR}\02_Applications\12_Elasticity\2_RCM\1_Dataprep_LP\DATAPR01.app
		LP Loop			{CATALOG_DIR}\02_Applications\12_Elasticity\2_RCM\2_LP_steps\LPLOOP01.app
			LP0 step		{CATALOG_DIR}\02_Applications\12_Elasticity\2_RCM\2_LP_steps\LP0STEP.app
			LP1+ step		{CATALOG_DIR}\02_Applications\12_Elasticity\2_RCM\2_LP_steps\LP1ST01.app
				Run BuildChainRCM and ChainChoiRCM	{CATALOG_DIR}\02_Applications\12_Elasticity\2_RCM\2_LP_steps\RUNBUILDCHAINRCM.app
				Run MPS LP Extract	{CATALOG_DIR}\02_Applications\12_Elasticity\2_RCM\2_LP_steps\RUNMPS_LP_EXTRACT.app

Application name	Subgroup level 1	Subgroup level 2	Subgroup level 3	Subgroup level 4	File name
				Check convergence	{CATALOG_DIR}\02_Applications\12_Elasticity\2_RCM\2_LP_steps\CHECKC01.app
		Run Final Process			{CATALOG_DIR}\02_Applications\12_Elasticity\2_RCM\3_Final\RUNMODEL.app
			Prepare control files		{CATALOG_DIR}\02_Applications\12_Elasticity\2_RCM\3_Final\PREPARE_02.app
			Run the final process		{CATALOG_DIR}\02_Applications\12_Elasticity\2_RCM\3_Final\RUNFIN01.app
			Save Reports		{CATALOG_DIR}\02_Applications\12_Elasticity\2_RCM\3_Final\SAVEREPORTS.app
	Elasticity Report (7)				{CATALOG_DIR}\02_Applications\12_Elasticity\3_Elasticities\ELASTI01.app
	Assignment (8)*				{CATALOG_DIR}\02_Applications\12_Elasticity\3_Elasticities\1_Run\4_AssSTD\ASS_VY.app
		Conversion from LogMod to VY			{CATALOG_DIR}\02_Applications\12_Elasticity\3_Elasticities\1_Run\4_AssSTD\CONVERSION OF EMME MATRICES.app
		Road Assignment			{CATALOG_DIR}\02_Applications\12_Elasticity\3_Elasticities\1_Run\4_AssSTD\ASS_ROAD_VY.app
		Rail Assignment			{CATALOG_DIR}\02_Applications\12_Elasticity\3_Elasticities\1_Run\4_AssSTD\ASS_Rail_VY.app
		Sea Assignment			{CATALOG_DIR}\02_Applications\12_Elasticity\3_Elasticities\1_Run\4_AssSTD\ASS_SEA_VY.app
		Air Assignment			{CATALOG_DIR}\02_Applications\12_Elasticity\3_Elasticities\1_Run\4_AssSTD\ASS_AIR_VY.app
	Results (9)*				{CATALOG_DIR}\02_Applications\12_Elasticity\3_Elasticities\1_Run\5_ResultsSTD\Results.app
		Results 1.0			{CATALOG_DIR}\02_Applications\12_Elasticity\3_Elasticities\1_Run\5_ResultsSTD\REPORT_New.app
			Port Areas		{CATALOG_DIR}\02_Applications\12_Elasticity\3_Elasticities\1_Run\5_ResultsSTD\PORTAR01.app
			Oresund Kiel and Jylland		{CATALOG_DIR}\02_Applications\12_Elasticity\3_Elasticities\1_Run\5_ResultsSTD\ORESUN01.app
			Reports per geographical aggregation		{CATALOG_DIR}\02_Applications\12_Elasticity\3_Elasticities\1_Run\5_ResultsSTD\REPORT01.app

Application name	Subgroup level 1	Subgroup level 2	Subgroup level 3	Subgroup level 4	File name
	RCM Assignment (10)*				{CATALOG_DIR}\02_Applications\12_Elasticity\3_Elasticities\2_RCM\4_AssRCM\ASS_VY.app
		Conversion from LogMod to VY			{CATALOG_DIR}\02_Applications\12_Elasticity\3_Elasticities\2_RCM\4_AssRCM\CONVERSION OF EMME MATRICES.app
		Road Assignment RCM			{CATALOG_DIR}\02_Applications\12_Elasticity\3_Elasticities\2_RCM\4_AssRCM\ASS_ROAD_VY.app
		Rail Assignment RCM			{CATALOG_DIR}\02_Applications\12_Elasticity\3_Elasticities\2_RCM\4_AssRCM\ASS_RAIL_VY.app
		Sea Assignment RCM			{CATALOG_DIR}\02_Applications\12_Elasticity\3_Elasticities\2_RCM\4_AssRCM\ASS_SEA_VY.app
		Air Assignment RCM			{CATALOG_DIR}\02_Applications\12_Elasticity\3_Elasticities\2_RCM\4_AssRCM\ASS_AIR_VY.app
	Results RCM (11)*				CATALOG_DIR}\02_Applications\12_Elasticity\2_RCM\5_ResultsRCM\RESULTS.app
		Results 1.0			{CATALOG_DIR}\02_Applications\12_Elasticity\2_RCM\5_ResultsRCM\REPORTNEW.app
			PORT AREAS		{CATALOG_DIR}\02_Applications\12_Elasticity\2_RCM\5_ResultsRCM\PORTAR01.app
			Oresund Kiel and Jylland		{CATALOG_DIR}\02_Applications\12_Elasticity\2_RCM\5_ResultsRCM\ORESUN01
			Rail Capacity		{CATALOG_DIR}\02_Applications\12_Elasticity\2_RCM\5_ResultsRCM\RAILCA01.app
			Reports per geographical aggregation		{CATALOG_DIR}\02_Applications\12_Elasticity\2_RCM\5_ResultsRCM\REPORT01
			GIS maps by Commodity groups		{CATALOG_DIR}\02_Applications\12_Elasticity\2_RCM\5_ResultsRCM\BIDIRE01.app
Create Maps					{CATALOG_DIR}\08_Standalone\CreateMaps.app

*Inactive in the elasticity model – kept for future development

5 The application structure

5.1. “Installation” application

Input data:

- None

Output data:

- Create the “Model_description” table in the Input_data.mdb and empty.mdb (under {CATALOG_DIR}\02_Applications\Edits) files. The first one is the general geodatabase, the second one is the template used for all the output geodatabases.

Purposes:

- Change the map for the files used in the model structure.
- Store the general definitions of the model for long-term storage purposes.

5.2. “Create the editable files” application

Input data:

- Scenario specific tables in the main geodatabase and base tables.

Output data:

- Scenario specific tables in the main geodabase and scenario data in the temporary geodatabase under scenario folder with name Scenario_data.mdb. Txt files under the work folder {CATALOG_DIR}\02_Applications\1_Editing to manage different checks and time data.

Purpose:

- Join the scenario tables and the base tables to create the editable data for the current scenario.

Application	**Description**	**Programs**
Prepare temporary data	**verify if scenario already exists under main database (Input_data.mdb) through a set of batch files**	1 to 7
	- create the check.txt file (check if general parameters table already exist in the main geodatabase)	
	- create the date_time1.txt (last modification of Scenario_data.mdb)	
	- create the date_time.txt (current time)	
	- create the report1.txt (verify if the temporary geodatabase already exists)	
	First case: The scenario does not exist	
	- jump step 4 because the temporary geodatabase does not exist	
	- copy all the scenario specific table from the scenario selected by Scenario_copy catalog key	
	Second case: The scenario already exists but without temporary geodatabase	
	- jump step 4 because the temporary geodatabase does not exist	
	Third case: The scenario already exists and exist the temporary geodatabase	
	First sub case: the scenario is lock - no actions are required. Process goes to end	

Application	Description	Programs
	Second sub case: the scenario is still editable - go to next step and check if any edit was made before this run in the temporary geodatabase. If yes goes to next step. If no goes to end.	
	Copy the scenario specific table in the temporary geodatabase Scenario_data.mdb	-
	General_{SCENARIO_SHORTNAME}	8
	Logmod__{SCENARIO_SHORTNAME}	9
	SC_{SCENARIO_SHORTNAME}_Cargo	10
	SC_{SCENARIO_SHORTNAME}_Vehicles_Parameters Part A	11
	SC_{SCENARIO_SHORTNAME}_Vehicles_Parameters Part B	12
	SC_{SCENARIO_SHORTNAME}_Link	13
	SC_{SCENARIO_SHORTNAME}_Node	13
	SC_{SCENARIO_SHORTNAME}_Node_Terminals (Port_swe)	14
	SC_{SCENARIO_SHORTNAME}_Nodes	15
	SC_{SCENARIO_SHORTNAME}_Nodes_commodities	16
	SC_{SCENARIO_SHORTNAME}_Frequency_data_link	17
	SC_{SCENARIO_SHORTNAME}_Frequency_data_node	18
	SC_{SCENARIO_SHORTNAME}_Tax_Country	19
	SC_{SCENARIO_SHORTNAME}_Tax_Category	20
	SC_{SCENARIO_SHORTNAME}_Tax_Link	21
	SC_{SCENARIO_SHORTNAME}_Toll_Link	22
	SC_{SCENARIO_SHORTNAME}_PropLink	23
	SC_{SCENARIO_SHORTNAME}_Rail_Capacity	24
Editable tables (2)	**Merge the scenario tables with the base tables in the temporary geodatabase**	-
	SC_{SCENARIO_SHORTNAME}_Cargo plus Cargo_Base2019	1
	SC_{SCENARIO_SHORTNAME}_Vehicles_Parameters_PartA plus Vehicles_parameters_Base2019_PartA	2
	SC_{SCENARIO_SHORTNAME}_Vehicles_Parameters_PartB plus Vehicles_parameters_Base2019_PartB	3
	SC_{SCENARIO_SHORTNAME}_Tax_Country plus Tax_Country_Base2019	4
	SC_{SCENARIO_SHORTNAME}_Tax_Category plus Tax_Category_Base2019	5
	SC_{SCENARIO_SHORTNAME}_Tax_Link plus Tax_Link_Base2019	6
	SC_{SCENARIO_SHORTNAME}_Toll_Link plus Toll_Link_Base2019	7
	SC_{SCENARIO_SHORTNAME}_Rail_Capacity plus Rail_Capacity_Base2019	8
Editable map data (3)	**Merge the scenario tables with the base tables in the temporary geodatabase creating networks and feature classes to use in GIS window**	-

Application	Description	Programs
	Sc_{SCENARIO_SHORTNAME}_Link and Sc_{SCENARIO_SHORTNAME}_Node plus Base2019_Link and Base2019_Node	-
	prepare the data to add general information from lookup tables (modes table) and create Cube network	1 to 4
	save in EMME format the Cube network created in the previous steps	5
	SC_ {SCENARIO_SHORTNAME}_node_Terminals plus Node_terminals_Base2019	6 to 7
	Sc_{SCENARIO_SHORTNAME}_Nodes plus Nodes_Base2019	8 to 9
	Sc_{SCENARIO_SHORTNAME}_Nodes_commodities_Base2019	10 to 11
	Sc_{SCENARIO_SHORTNAME}_Frequency_Data_Link and Sc_{SCENARIO_SHORTNAME}_Frequency_Data_Node plus Base:2019_Frequency_Data Network	12 to 13
	Copy Samgods_zones feature class in temporary geodatabase and end the process	14

5.3. “Edit the data” application

Input data:

- Scenario tables in the temporary geodatabase Scenario_Data.mdb under scenario folder.

Output data:

- Scenario specific tables in the main geodabase. Txt files under the work folder {CATALOG_DIR}\02_Applications\1_Editing to manage time data.

Purpose:

- Compare the editable tables, networks and feature classes in the temporary geodatabase with the base data in the main geodatabase Input_data.mdb; after comparison save the updated scenario tables, General_{SCENARIO_SHORTNAME} and Logmod_{SCENARIO_SHORTNAME} tables.

Application		Description	Programs	Subprograms
Create the tables specific of scenario (1)		Check if “Create the editable files” was run	1	
		Check if the scenario is in read or write/read mode	2	
		Delete the previous report file REPORT_ED_BS06.txt	3	
		if read mode, any change in scenario specific table is NOT copied back in the main database. All next steps will be skipped.	4	
		if read/write mode then all next steps will be run		
		Create SC_{SCENARIO_SHORTNAME}_Cargo in temporary geodatabase	5	
		Create SC_{SCENARIO_SHORTNAME}_Vehicles_parameters_PartA in temporary geodatabase	6	

Application		Description	Programs	Subprograms
		Create SC_{SCENARIO_SHORTNAME}_Vehicles_parameters_PartB in temporary geodatabase	7	
		Check if edits come from the Voyager or the Emme network	8	
	Numbering system	**In case of edits from Voyager, check all the codes to create the correct original number for the nodes:**	9	
		Check the number of zones, ID_REGION, ID_COUNTRY and MODE_N codes		1,2
		Based on the previous codes defined set the SCBSTANN code		3
		Code the NORIG value for the zones		4,5,6
		Code the NORIG value for the nodes		7,8
		Delete the information related to modes joined in the "Create editable files"		9,10
		Merge all the new ORIG codes created		11
		Skim network for subsequent steps		12
		Dump the base scenario network		13,16
		Dump the current scenario network		14
		Convert network from EMME to Voyager format		15
		Compare node and link tables of the base scenario with the current scenario		17
		Check if edits come from the Voyager or the Emme network	10	
	Emme Edits	**In case of edits from EMME, check all the codes to create the correct original number for the nodes:**	11	
		Check if EMME network is defined in 211 format; in other words if catalog key has proper value		1
		Create link and node tables from EMME network		2
		Check the number of zones, ID_REGION, ID_COUNTRY and MODE_N codes		3
		Based on the previous codes defined set the SCBSTANN code		4
		Check the number of zones		5,6,7,8
		Node table union		9
		Recode the link table		10
		Recode the extra attribute		11
		Merge link and node data in the current scenario network		12
		Dump the current scenario network		13

The application structure

Application		Description	Programs	Subprograms
		Dump the base scenario network in dbf format for subsequent steps		14
		Compare node and link tables of base scenario with current scenario		15
		Recodes modes on EMME rules		17,18,19
		Coming from edits from Voyager or edits from EMME, the process continues from this point	12	
	Compare Nodes and Node_terminals	**Compare current scenario with base scenario and scenario specific tables for nodes and node terminals**	13	
		Dump Base scenario Node terminals		1
		Dump current scenario Node terminals		2
		Compare node terminals tables of current scenario with base scenario		3
		Create SC_{SCENARIO_SHORTNAME}_Node_Terminals		4
		Dump Base scenario Nodes		5
		Dump current scenario Nodes		6
		Compare nodes tables of current scenario with base scenario		7
		Create SC_{SCENARIO_SHORTNAME}_Nodes		8
	Compare other tables	Compare current scenario with base scenario and create the following scenario specific tables:	14	
		SC_{SCENARIO_SHORTNAME}_Nodes_Commodities		1
		SC_{SCENARIO_SHORTNAME}_Tax_Country		2
		SC_{SCENARIO_SHORTNAME}_Tax_Category		3
		SC_{SCENARIO_SHORTNAME}_Tax_Link		4
		SC_{SCENARIO_SHORTNAME}_Toll_Link		5
	Rail Capacity Checks	**Check rail management data and create a scenario specific table for rail capacity**	15	
		Check consistency with network and ID_LINK numbers		1,2,3
		Dump Rail capacity table for base scenario		4
		Dump Rail capacity table for current scenario		5
		Create SC_{SCENARIO_SHORTNAME}_Rail_Capacity		6
		Create node list from network link table step 1		7
		Create node list from network link table step 2		8
		Compare node list from node and link tables to identify UNUSED nodes		9

Application		Description	Programs	Subprograms
		Verify the maximum zone number among different tables	16 to 21	
		If the network does not have any new zones, create the Sc_{SCENARIO_SHORTNAME}_Frequency_Data_Link and SC_{SCENARIO_SHORTNAME}_Freqeuncy_Data_Node tables in the temporary geodatabase	22 to 26	
	Frequency matrices	**If new terminals are added to the network it will create a list of frequency values based on the default frequency table**	27	
		Create the LOS matrices to understand the connections between terminals		1,2
		Set the default values for the frequency matrices based on the A_default_frequency table		3
		Filter the default values only for the new zones		4,5,6
		Convert the frequency matrices to network format and merge with the scenario frequency network to preserve previous edits		7
		Dump the network		8
		Create the Sc_{SCENARIO_SHORTNAME}_Frequency_Data_Link and SC_{SCENARIO_SHORTNAME}_Freqeuncy_Data_Node tables in the temporary geodatabase	28	
		Jump specific steps (if not need to updated frequencies)	29	
Consistency checks with calibration tables (2)		Compare the list of calibration parameters from Input_data_calibration.mdb and the related input data in current scenario. The application will identify if some parameters are missing in the current scenario		
		Move the calibration parameters for Nodes table from mdb to dbf format		1
		Compare the Nodes table between the current scenario and the calibration parameters and list number of error detected		2
		Move the calibration parameters for Tax_country table from mdb to dbf format		3
		Compare the Tax_Country table between the current scenario and the calibration parameters and list number of error detected		4
		Move the calibration parameters for Tax_link table from mdb to dbf format		5
		Compare the Tax_link table between the current scenario and the calibration parameters and list number of error detected		6

The application structure

Application		Description	Programs	Subprograms
		Move the calibration parameters for Toll_link table from mdb to dbf format		7
		Compare the Toll_link table between the current scenario and the calibration parameters and list number of error detected		8
		Move the calibration parameters for Capacity table from mdb to dbf format		9
		Compare the Capacity table between the current scenario and the calibration parameters and list number of error detected		10
		Move the calibration parameters for Speed_1, Speed 2 and UL 3 link table from mdb to dbf format		11
		Compare the Link table between the current scenario and the calibration parameters and list number of error detected		12
		Verify that tax plus Subsidy is not negative in Tax_Country		13
		Verify that tax plus Subsidy is not negative in Tax_Link		14
		Verify that tax plus Subsidy is not negative in Tax_Category		15
		Sum the number of errors across the different tables and produce the {SCENARIO_DIR}\Total_errors_{SCENARIO_CODE}.DBF table. In errors >0, Samgods will be not run.		16
		If errors are present, the scenario tables will be not saved in the Input_Data.mdb database, skipping step 3 in the application		17
Save changes in the main gdb (3)	Regions for links	Delete check.txt	1	1
		Check the record number in SC_Links		2,3
		Dump network		4
		Classify cases		5
		If you need the geoprocessing tool to classify links		6
		Create temporary network considering classified cases		7
		Call python for link classification		8
		Check if you need weight calculation		9,10
		Weight calculation		11,12
		Merge all tables and create SC_{SCENARIO_SHORTNAME}_PropLink		13,14,15,16
		Save the scenario specific tables from the temporary geodatabase to the main geodatabase:		
		SC_{SCENARIO_SHORTNAME}_Cargo	2	
		SC_{SCENARIO_SHORTNAME}_Vehicles_Parameters_PartA	3	
		SC_{SCENARIO_SHORTNAME}_Vehicles_Parameters_PartB	4	

Application		Description	Programs	Subprograms
		Copy SC_{SCENARIO_SHORTNAME}_Link and SC_{SCENARIO_SHORTNAME}_Node tables via python script	5	
		SC_{SCENARIO_SHORTNAME}_Node_Terminals (Port_Swe)	6	
		SC_{SCENARIO_SHORTNAME}_nodes	7	
		SC_{SCENARIO_SHORTNAME}_nodes_commodities	8	
		SC_{SCENARIO_SHORTNAME}_Frequency_Data_Link	9	
		SC_{SCENARIO_SHORTNAME}_Frequency_Data_Node	10	
		SC_{SCENARIO_SHORTNAME}_Tax_Country	11	
		SC_{SCENARIO_SHORTNAME}_Tax_Category	12	
		SC_{SCENARIO_SHORTNAME}_Tax_Link	13	
		SC_{SCENARIO_SHORTNAME}_Toll_Link	14	
		SC_{SCENARIO_SHORTNAME}_PropLink	15	
		SC_{SCENARIO_SHORTNAME}_Rail_Capacity	16	
		Delete temporary txt file containing time and date stamps	17	
		Update information of time and date on temporary txt	18	
		Update the state of the scenario (write to only read) and ZONES_M	19	
		Update the General_Base table:		
		Save new value in the temporary geodatabase Scenario_Data.mdb	20	
		Save new value in the main geodatabase Input_Data.mdb	21	
		Update the LogMod_Base table:		
		Save new value in the temporary geodatabase Scenario_Data.mdb and in the main geodatabase Input_Data.mdb	22,23	
		Delete all the temporary files created along the run	24	

5.4. "Samgods" application

Input data:

- Scenario tables and base tables in main geodatabase Input_data.mdb.

Output data:

- Refer to Output section 3.4.

Purpose:

- Provide all the input data required by the Logistics and the Rail Capacity Management Modules and derive a set of standard outputs alongside the results under Logmod folder produced by the external programs.

The description has two tables, the first one related to the Standard Logistics Module in Table 145, the second one to the Rail Capacity Management Module in Table 146.

Table 145 - Samgods application: first part Standard Logistics Module.

Application	Description	Programs	Subprograms
Initialization (1)	Check free space available on computer and pull out freespace.txt file and exogenous consolidation rates	1	
	Read freespace.txt and process the number to a token variable	2,3	
	Based on values in token variable, give a warning to user. If there is enough space no warning is raised.	4	
	Print out the list of catalog keys	5	
	Set initial value for Kiel Canal and provide the file to cycling process	6	
	Port and kiel canal parameters for search function, initial scaling factors by port area and lock solutions	7-10	
	Conversion of \Input_Data_Calibration_{Calibration_scenario}.mdb\Vehicles	11	
	Conversion of \Input_Data_Calibration_{Calibration_scenario}.mdb\Vehicles	12	
	Conversion of \Input_Data_Calibration_{Calibration_scenario}.mdb\Nodes_{	13	
	Conversion of \Input_Data_Calibration_{Calibration_scenario}.mdb\Rail_Ca	14	
	Conversion of \Input_Data_Calibration_{Calibration_scenario}.mdb\Tax_Cou	15	
	Conversion of \Input_Data_Calibration_{Calibration_scenario}.mdb\Tax_Lin	16	
	Conversion of \Input_Data_Calibration_{Calibration_scenario}.mdb\Toll_Lin	17	

Application			Description	Programs	Subprograms	
			Conversion of \Input_Data_Calibration_{Calibration_scenario}.mdb\{Calibrat	18		
			Conversion of Input_Data.mdb\V101_SpeedFlowCurves and Input_Data.mdb\V102_SpeedFlowCurves for stability issues in	19,20		
			Pilot program to skip checks on consistency between calibration parameters and current scenario	21		
			Read number of errors produced in Edit the data	22		
			Pilot preventing the full run if any error is encountered.	23		
Loop (2)			Copy the input parameters for the current loop	2		
Pilot (3)			Control the resume option of cycling process and warm start procedure within a fixed loop	3		
LOS calculation (4)	Data Preparation (1)		Create if outputX.mdb exists, if not it is created.	1	1	
			Load the parameters from general_{SCENARIO_SHORTNAME} table into the system variables	1	2	
			Verify if few outputs already exist and if they have the same input data	1	3	
			Check if the scenario is locked or still editable	1	4	
			Create the Vehicle_parameter_PartA table for the scenario	1	5	
			Apply factor and term values from {Scenario_DIR}\Scaling_PartA.DBF	1	6	
			Create the Cargo table for the scenario	1	7	
			Create the network for the scenario	1	8	
			Dump in dbf format the link and node tables	1	9	
		Tax calculation	Set the node class (see table A_nodeclass) value for all the nodes	1	10	1
			Classify the links based on the class node and the ID_COUNTRY in the A_Categories code - identify the country id for each link	1	10	2
			Merge the tax by category tables (base and current scenario) and expand table for all links	1	10	3,4
			Print in a executable file the list of condictions to create the temporary attributes in the network	1	10	13
			Merge the tax by country tables (base and current scenario), apply the scaling parameters for tax by country and expand table for all links	1	10	5,6,7,8
			Merge the tax by link tables (base and current scenario), apply the scaling parameters for tax by link and expand table for all links.	1	10	9,10,14

Application			Description	Programs	Subprograms	
			Update all attributes using the manipulation file produced instep 13 {CATALOG_DIR}\02_APPLICATIONS\2_RUN\COSTS_VY\TAX_BY_LINK_M.TXT (File Output #10)			
			Merge the toll by link tables (base and current scenario), apply the scaling parameters for toll by link and expand table for all links Update all attributes using the manipulation file produced instep 13 {CATALOG_DIR}\02_APPLICATIONS\2_RUN\COSTS_VY\TAX_BY_LINK_M.TXT (File Output #10)	1	10	11,12,15
			Merge all attributes created in the previous steps using {CATALOG_DIR}\02_APPLICATIONS\2_RUN\COSTS_VY\GEN_NET.TXT produced under step 13 (File Output #1)	1	10	16
			Update all attributes using the manipulation files produced instep 13 READ FILE = "{CATALOG_DIR}\02_APPLICATIONS\2_RUN\COSTS_VY\TAX_BY_LINKTYPE.TXT" (File Output #2) {CATALOG_DIR}\02_APPLICATIONS\2_RUN\COSTS_VY\EC_BY_LINK.TXT (File Output #3) {CATALOG_DIR}\02_APPLICATIONS\2_RUN\COSTS_VY\TAX_BY_COUNTRY.TXT (File Output #4) {CATALOG_DIR}\02_APPLICATIONS\2_RUN\COSTS_VY\TAX_BY_LINK.TXT (File Output #7) {CATALOG_DIR}\02_APPLICATIONS\2_RUN\COSTS_VY\TOLL_BY_LINK.TXT (File Output #8) {CATALOG_DIR}\02_APPLICATIONS\2_RUN\COSTS_VY\EC_KM_BY_LINK.TXT (File Output #9)	1	10	17
			Recode the mode for each vehicle type using the manipulation file produced in step 13: {CATALOG_DIR}\02_APPLICATIONS\2_RUN\COSTS_VY\MODE_BY_VEHICLE.TXT (File Output #5)	1	10	18
			Union of the different taxes and tolls	1	10	19
			Create the equations to save the final value for tax and extracost	1	10	20
			Save the final values (TAX_TOT,EXCTTOT and TOLL) for each link and by vehicle type using the final manilupation produced in step 20: {CATALOG_DIR}\02_APPLICATIONS\2_RUN\COSTS_VY\FINAL_MAN.TXT	1	10	21

Application			Description	Programs	Subprograms	
			Create the intrazonal matrix in dbf format	1	11-12	
			Change the format of intrazonal matrix from dbf to MAT	1	13	
			Save the node_labels table in Output0.mdb	1	14	
			Create the port area table for the scenario	1	15	
			Control the execution order and skip some steps not required in cycling process	1	16	
			Create the Capacity_table for current scenario	1	17	
			Merge the network from step 9 and the Capacity table to use in next assignments	1	18	
		Data for RCM	Export final network with time and cost per link for usage in ASEK calculation or external checks	1	19	1
			Create {SCENARIO_DIR}\LogMod\RCM\Nodes_List.txt	1	19	2
			Create {SCENARIO_DIR}\LogMod\RCM\Links_List.txt	1	19	3
			Read Capacity_table_{SCENARIO_CODE}.DBF and prepare data for next step	1	19	4,5
			Control the execution order on cycling process and options to run step by step the model	1	20	
	PILOT 2		Select which mode run based on Select_cal_cos_mode catalog key	2		
	Road (3)		Execution order, start the road mode	3	1	
			Delete {SCENARIO_DIR}\LogMod\RCM\PathTreeRoad.txt if exist	3	2	
			Loop between vehicle types (from 101 to 106)	3	3	
			Set the values for VOT and KMCOST reading the Vehicle_parameters table	3	4	
			Calculate the Km_TAX, TOLL, DIST_COST, VOT variables and MAX_SPEED	3	5	
			Define the speed values and free flow times	3	6	
			Skim the los matrices	3	7	
			Merge the 5 LOS matrices in one file	3	8	
			Updated the outputs table with new output	3	9 to 10	
			Skip all the other steps if Select_cal_cos_mode has "Road" value	3	11	
	Rail (4)		Execution order, start the rail mode	4	1	

The application structure

Application			Description	Programs	Subprograms	
			Delete {SCENARIO_DIR}\LogMod\RCM\PathTreeRail.txt if exist	4	2	
			Loop between vehicle types (from 201 to 212)	4	3	
			Set the values for VOT and KMCOST reading the Vehicle_parameters table for the first mode	4	4	
			Calculate the Km_TAX, TOLL, DIST_COST and VOT variables	4	5	
			Skim the los matrices	4	6	
			For all the vehicle types except 202 there is a unique mode, so jump the subsequent steps. For 202 go to next step	4	7	
			Calculate the Km_TAX, TOLL, DIST_COST and VOT variables	4	8	
			Skim the los matrices	4	9	
			Label to skip the steps 7 and 8 if vehicle type different from 202	4	10	
			Merge the 9 LOS matrices in one file	4	11	
			Updated the outputs table with new output	4	12,13	
			Skip all the other steps if Select_cal_cos_mode has "Rail" value	4	14	
	Sea (5)		Execution order, start the sea mode	5	1	
			Delete {SCENARIO_DIR}\LogMod\RCM\PathTreeSea.txt if exist	5	2	
			Read Port Area table and set up transoceanic factors in MAT format	5	3	
			Loop between vehicle types (from 301 to 322)	5	4	
			Set the values for VOT and KMCOST reading the Vehicle_parameters table for the first mode	5	5	
			Calculate the Km_TAX, TOLL, DIST_COST and VOT variables	5	6	
			Skim the los matrices	5	7	
			Merge the 21 LOS matrices in one file	5	8 to 10	
			Updated the outputs table with new output	5	11 to 12	
			Skip all the other steps if Select_cal_cos_mode has "Sea" value	5	13	
	Air (6)		Execution order, start the air mode	6	1	
			Delete {SCENARIO_DIR}\LogMod\RCM\PathTreeAir.txt if exist	6	2	
			Set the value of vehicle type	6	3	
			Set the values for VOT and KMCOST reading the Vehicle_parameters table for the first mode	6	4	

Application			Description	Programs	Subprograms	
			Calculate the Km_TAX, TOLL, DIST_COST and VOT variables	6	5	
			Skim the los matrices	6	6	
			Updated the outputs table with new output	6	7 to 8	
			Skip all the other steps if Select_cal_cos_mode has "Air" value	6	9	
	Conversion from VY to LogMod (7)		Select which mode run based on Select_cal_cos_mode catalog key	7	1	
		From VY to LogMod Road	Mode Road	7	2	1
			Loop between vehicle types (from 1 to 5)	7	2	2
			Read the vehicle type number to rename properly the output files	7	2	3
			Crate the dbf tables from the matrix file adding the NORIG code	7	2	4
			Sort the records and create the V10x_dist.314,V10x_timeh.314, V10xxkr.314 and V10x_ddist.314 under LogMod\Input\LOS folder	7	2	5
			Skip all the other steps if Select_cal_cos_mode has "Road" value	7	2	6
		From VY to LogMod Rail	Mode Rail	7	3	1
			Loop between vehicle types (from 6 to 13)	7	3	2
			Read the vehicle type number to rename properly the output files	7	3	3
			Crate the dbf tables from the matrix file adding the NORIG code	7	3	4
			Sort the records and create the V20x_dist.314,V20x_timeh.314, V20x_xkr.314 and V20x_ddist.314 under LogMod\Input\LOS folder	7	3	5
			Skip all the other steps if Select_cal_cos_mode has "Rail" value	7	3	6
		From VY to LogMod Sea	Mode Sea	7	4	1
			Loop between vehicle types (from 14 to 34)	7	4	2
			Read the vehicle type number to rename properly the output files	7	4	3
			Crate the dbf tables from the matrix file adding the NORIG code	7	4	4
			Sort the records and create the V30x_dist.314,V30x_timeh.314, V30x_xkr.314 and V30x_ddist.314 under LogMod\Input\LOS folder	7	4	5
			Skip all the other steps if Select_cal_cos_mode has "Sea" value	7	4	6
		From VY to LogMod Air	Mode air	7	5	1
			Crate the dbf tables from the matrix file adding the NORIG code			2

The application structure

Application			Description	Programs	Subprograms	
			Sort the records and create the V401_dist.314,V401_timeh.314, V401_xkr.314 and V401_ddist.314 under LogMod\Input\LOS folder	7	5	3
			Skip all the other steps if Select_cal_cos_mode has "Air" value	7	5	4
	PILOT 8		Label to skip properly the unselected modes and select if run the logistic model, selection based on Step_by_Step catalog key	8		
Logistic Module 01 (5)	Prepare data (1)		Write in txt format the Cargo_Base2019 table under LogMod\Input\Cost with name Cargo.txt	1	1	
			Merge the scenario specific table and the base table for Node_terminals_Base2019	1	2	
			Write in txt format the Node_terminals_{SCENARIO_SHORTNAME} table under LogMod\Input\Cost with name Pilotfees.txt	1	3	
			Merge Vehicle parameters table A and B and apply scaling parameters	1	4,5, 6	
			Write in txt format the Vehicle_parameters table under LogMod\Input\Cost with name VHCLS_COM01.TXT, VHCLS_COM02.TXT, VHCLS_COM03.TXT, VHCLS_COM04.TXT, VHCLS_COM05.TXT, VHCLS_COM06.TXT, VHCLS_COM07.TXT, VHCLS_COM08.TXT, VHCLS_COM09.TXT ,VHCLS_COM10.TXT, VHCLS_COM11.TXT, VHCLS_COM12.TXT, VHCLS_COM13.TXT, VHCLS_COM14.TXT, VHCLS_COM15.TXT and VHCLS_COM16.TXT	1	7,8	
			Write in txt format the Vehicle_parameters table under LogMod\Input\General with name averagevehiclecapacity.txt	1	9	
			Convert LDB_ratio from the geodatabase table onto dat file	1	10	
			Convert MaxCap and consol exception from the geodatabase table onto dat file	1	11	
			Move in dbf format for the scenario specific tables SC_{SCENARIO_SHORTNAME}_Frequency_data_Link and SC_{SCENARIO_SHORTNAME}_Frequency_Data_node	1	12	
			Merge the dbf table with the base frequency network	1	13	
			Change the format from network to matrix	1	14	
			Write in txt format under LOGMOD\INPUT\LOS\ the 10 files for frequency (.314)	1	15	
			Write in txt format under LOGMOD\INPUT\LOS\ the FREQIWW.314 file	1	16	

Application			Description	Programs	Subprograms	
	Prepare data second part (2)		Merge the scenario specific table and the base table for Nodes_{SCENARIO_SHORTNAME}	2	1	
			Add parameters for Varner Kanal	2	2	
			Write in txt format the Nodes_{SCENARIO_SHORTNAME}table under LogMod\Input\Nodes with name Nodes.txt	2	3	
			Merge the scenario specific table and the base table for Nodes_commodities_{SCENARIO_SHORTNAME}	2	4	
			Write in txt format the Nodes_Commodities_{SCENARIO_SHORTNAME} table under LogMod\Input\Nodes into 17 txt files	2	5 to 6	
			Create {SCENARIO_DIR}\LogMod\Extract\emptyfrac.dat for EXTRACT procedure	2	7	
	Prepare data third part (3)		Prepare consolidation factors by commodity group for subsequent steps	3	1	
			Change the format for BuildChain_MODES table for subsequent steps	3	2	
			Prepare BuildChain_Common.ctl and BuildChain_Special.ctl	3	3	
			Prepare ChainChain_Common.ctl, ChainChoi_Special.ctl and \INPUT\GENERAL\OtherCostMatters.ctl files	3	4	
			Manage the execution order of building exogenous_consolidation_rate_dir.ctl. If no external files are provided, the process skips the creation of the control file.	3	5	
			Create the exogenous_consolidation_rate_dir.ctl file under ChainChoi folder with information of the location of the external consolidation rates.	3	6	
			Manage the execution order of building exogenous_consolidation_rate_dir.ctl. If no external files are provided, the process skips the creation of the control file.	3	7	
			Built CTL files for BuildChain	3	8	
			Identify starting and ending part for each commodity group	3	9	
			Build CTL files for ChainChoi	3	10	
			Identify starting and ending part for each commodity group	3	11	
			Loop from commodity 1 to commodity 16 to create the control files for BuildChain.exe, ChainChoi.exe and LP2CC.exe programs	3	12	
			Control if jump another commodities	3	13	
			Create control files for BuildChain under LogMod\BUILDCHAIN	3	14	

The application structure

Application			Description	Programs	Subprograms	
			Create control files for ChainChoi under LogMod\CHAINCHOI	3	15	
			Skip other commodities if not selected All (0)	3	16	
			Convert the Chain_list table in txt format under LOGMOD\INPUT\CHAINTYPE.LIS	3	17	
			Create control files for Extract program under LogMod\Extract	3	18	
			Create control files for Mergerep program under LogMod\MERGEREP\	3	19	
			Control execution order	3	20	
	Run the logistic model (4)		Create RUNALL batch file based on catalog key selection	4	1	
			Create COMMODITY.BAT to call buildchain, chainchoi and ConsolidRateMode iteratively	4	2	
			Create batch files to call extract procedure	4	3	
			Create batch files to call runall.bat procedure and parallel process	4	4	
			Call to normal process (no parallelization) and parallelization process	4	5	
			Create Mergerepall.bat	4	6	
			Run mergerep process	4	7	
			Prepare CTL for compact spanning trees	4	8	
			Create Compact Batch file	4	9	
			Run Compact program	4	10	
	Save Reports (5)		Save the report file from ChainChoi.exe (.rep) under scenario folder	5	1	
			Change the format of report file into Voyager	5	2 to 3	
			Merge domestic distances from LOS files for subsequent step	5	4	
			Delete temporary files used to accumulate results from all commodities	5	5 to 11	
			Filter node table and produce table with only zones	5	12	
			Loop over commodities (ID_LOOPC)	5	13	
			Control the commodities that must be used (if all or single commodity)	5	14	
			Delete headers from ChainChoi\OUTPUT\ChainChoiXX01.out files	5	15	
			Calculate sum of variables for reports 5,6,7,8	5	16	

Application			Description	Programs	Subprograms	
			Merge ChainChoiXX.rep files (input for reports 10 and 11)	5	17	
			Merge VhclRepXXrep files (input for reports 12)	5	18	
			Merge ChainChoiXX.rep files (input for report 6b)	5	19	
			Merge ChainChoiXX.rep files (input for report 19)	5	20	
			Script to control the commodities that must be used (works in pair with 14)	5	21	
			Calculate report 5 and 6	5	22	
			Calculate report 7 and 8	5	23	
			Calculate report 10 and 11	5	24	
			Calculate report 12	5	25	
			Calculate report 6b and 19	5	26	
			Updated the outputs table with new output	5	27 to 28	
			Label to skip the report phase	5	29	
Assignment (6)	Conversion from LogMod to VY (1)		Loop for all the commodities (from 1 to 35)	1	1	
			Load the vehicle number from Vehicle_parameters table	1	2	
			Covert the 314 format in matrix format	1	3 to 5	
			Merge by mode the matrices	1	6 to 11	
			Updated the output tables with new output	1	12 to 13	
	PILOT 2		Select the mode based on Select_cal_cos_mode catalog key	2		
	Road Assignment (3)		Execution order, start the road mode	3	1	
			Loop between vehicle types (from 1 to 6)	3	2	
			Set the values for VOT and KMCOST reading the Vehicle_parameters table	3	3	
			Calculate the Km_TAX, TOLL, DIST_COST, VOT variables and MAX_SPEED	3	4	
			Define the speed values and free flow times	3	5	
			Assignment	3	6	
			Merge the 6 networks, one for each lorry type, into one file	3	7	
			Updated the outputs table with new output	3	8 to 9	

The application structure

Application			Description	Programs	Subprograms	
			Skip all the other steps if Select_cal_cos_mode has "Road" value	3	10	
	Rail Assignment (4)		Execution order, start the rail mode	4	1	
			Loop between vehicle types (from 7 to 17)	4	2	
			Set the values for VOT and KMCOST reading the Vehicle_parameters table for the first mode	4	3	
			Calculate the Km_TAX, TOLL, DIST_COST and VOT variables	4	4	
			Assignment	4	5	
			For all the vehicle types except 202 there is a unique mode, so jump the subsequent steps. For 202 go to next step	4	6	
			Calculate the Km_TAX, TOLL, DIST_COST and VOT variables	4	7	
			Assignment	4	8	
			Label to skip the steps 7 and 8 if vehicle type different from 202	4	9	
			Merge the12, one for each train type (one is done for vehicle 203, but that one is integrated with 202),networks into one file	4	10,11	
			Updated the outputs table with new output	4	12 to 13	
			Skip all the other steps if Select_cal_cos_mode has "Rail" value	4	14	
	Sea Assignment (5)		Execution order, start the sea mode	5	1	
			Loop between vehicle types (from 18 to 39)	5	2	
			Set the values for VOT and KMCOST reading the Vehicle_parameters table for the first mode	5	3	
			Calculate the Km_TAX, TOLL, DIST_COST and VOT variables	5	4	
			Assignment	5	5	
			Merge the 22, one for each sea vessel or ferry type, networks in one file	5	6 to 8	
			Updated the outputs table with new output	5	9 to 10	
			Skip all the other steps if Select_cal_cos_mode has "Sea" value	5	11	
	Air Assignment (6)		Execution order, start the air mode	6	1	
			Set the values for VOT and KMCOST reading the Vehicle_parameters table for the first mode	6	2	
			Calculate the Km_TAX, TOLL, DIST_COST and VOT variables	6	3	
			Assignment	6	4	
			Save the network in geodatabase format	6	5	

Application			Description	Programs	Subprograms	
			Updated the outputs table with new output	6	6 to 7	
			Skip all the other steps if Select_cal_cos_mode has "Air" value	6	8	
	PILOT 7		Set the execution order	7		
			Label to start the report phase and check in the matrices and the networks exist under the scenario folder	1		
			Merge all the assigned networks by mode into a single, common network	2		
			Create the report for vehicle and vehicle km	3		
			Save the report in the geodatabase	4		
	Results 1.0 (5)		Create network with bidirectional flow	5	1	
			Produce report 3	5	2	
		Port Areas (3)	Read report 6b	5	3	1
			Sum over port areas	5	3	2
			Produce report 13	5	3	3
		GIS maps by Commodity groups (4)	Create ArcGIS folder to export maps in ESRI format	5	4	1
			Prepare COMMODITY_STD.BAT	5	4	2
			Prepare COMMODITY_STD.CTL	5	4	3
			Run selectdirect to produce output by commodity group ({SCENARIO_DIR}\LogMod\RCM\Output\COMMODITY_STD.dat)	5	4	4
			Prepare table for map	5	4	5 to 7
			Export SHP file	5	4	8
			Run python to import SHP file onto gdb and update mxd with scenario name	5	4	9
		Oresund Kiel and Jylland (5)	Merge final network with other statistics	5	5	1
			Calculate total values	5	5	2
			Produce report 14	5	5	3
		Reports per geographical aggregation (6)	Merge Prop_link_Base2019 with scenario table	5	6	1
			Dump link table for assigned network	5	6	2
			Add CATEGORY ID_COUNTRY REGION ID_COUNTY attributes based on values in Prop_link	5	6	3
			Produce report 9	5	6	4
Results (7)			Produce first part of report 17	5	6	5

The application structure

Application			Description	Programs	Subprograms	
			Produce first part of report 18	5	6	6
			Produce report 16 totals	5	6	7
			Produce report 17 totals	5	6	8
			Produce report 18 totals	5	6	9
			Produce report 16 adding county names	5	6	10
			Produce report 17 adding county names	5	6	11
			Produce report 18 adding county names	5	6	12
			Updated the outputs table with new output	6 to 7		
			Update REPORT_GS_{SCENARIO_SHORTNAME}.prn file with the list of outputs created during the run	8		
			Delete all the temporary files	9		
			Update the logfile for entire run	10		

Table 146 - Samgods application: second part Rail Capacity Management Module

The application structure

Application					Description	Programs	Subprograms			
Rail Capacity Management (8)	Data Preparation LP (1)				Set the number of rail links as temporary variable	1	1			
					Rename OD vehicles from _0 to _STD	1	2			
	Warm start (2)				Read log_file_1.log and set up variables that will be evaluated in next step	2	1			
					Set the execution order for LP Loop (3) depending on which step has been performed in previous run (LP0, LP1 or LP2+)	2	2			
	LP Loop (3)	LP0 step (1)			Setup MPS.ctl control file	3	1	1		
					Prepare 1_RUN_MPS_LP0_step1.BAT	3	1	2		
					Execute 1_RUN_MPS_LP0_step1.BAT	3	1	3		
					Check if run finished successfully, otherwise prompt the user	3	1	4		
					Check number of links over capacity, if not present any link, skip RCM	3	1	5-6		
					Prepare 2_runLP.bat	3	1	7		
					Execute 2_runLP.bat	3	1	8		
					Prepare 3_RUN_MPS_LP0_step2.BAT	3	1	9		
					Execute 3_RUN_MPS_LP0_step2.BAT	3	1	10		
					Check if run finished successfully, otherwise prompt the user	3	1	11		
					Back up LP0 results before moving to the next iteration	3	1	12		
					Update log_file_1.log file	3	1	13		
					Skip next steps (user choice)	3	1	14		
		LP1+ (2)			Label for LP1+ process	3	2	1		
					Loop over maximum number of LP1 from catalog key "Maximum number of loops for Linear Programming process (LP)"	3	2	2		
					Set minimum loop number for a warm start	3	2	3		
			Run BuildChainR		Print out the RUNALL_RCM.BAT batch file for running the column generation step for all the commodities	3	2	4	1	

Application					Description	Programs	Subprograms			
			CM and Chain ChoiRCM (4)		Print out the batch file for calling the BuildChain and ChainChoi programs in proper sequence	3	2	4	2	
					Select if run parallelization or normal procedure	3	2	4	3	
					Label to jump to parallelization process	3	2	4	4	
					Prepare control files for parallelization process	3	2	4	5	
					Run parallelization process	3	2	4	6	
			Run MPS LP Extract (5)		Prepare 1_RUN_MPS_LP1_step1.BAT	3	2	5	1	
					Execute 1_RUN_MPS_LP1_step1.BAT	3	2	5	2	
					Check if run finished successfully, otherwise prompt the user	3	2	5	3	
					Prepare 2_run1.bat	3	2	5	4	
					Execute 2_run1.bat	3	2	5	5	
					Prepare 3_RUN_MPS_LP1_step2.BAT	3	2	5	6	
					Execute 3_RUN_MPS_LP1_step2.BAT	3	2	5	7	
					Check if run finished successfully, otherwise prompt the user	3	2	5	8	
			Check convergence (6)		Setup RCM_last_loop	3	2	6	1	
					Back up current loop	3	2	6	2	
					Update log_file_1.log	3	2	6	3	
					Skip the process if the maximum number of loops has been reached	3	2	6	4	
	Run final process (4)	Prepare control files (1)			Label for final process	5	1	1		
					Build control file for extract procedure	5	1	2		
					Check if no links are overcapacity. If so skip final process	5	1	3		
		Run the final process (2)			Print out the RUNALL_FIN.BAT batch file for calling the LP2CC program for all the commodities	5	2	1		

The application structure

Application					Description	Programs	Subprograms			
					Print out the batch file COMMODITY.BAT for call alternatively the BuildChain and ChainChoi programs	5	2	2		
					Create the batch file for the extract procedure	5	2	3		
					Set up files to describe the number of processors and batch file for calling Samgods_Parallelization_Module.jar	5	2	4		
					Run RUNALL.BAT and EXTRACTALL.BAT using the Parallelization Module or standard procedure	5	2	5		
					Create the batch file for merge.exe	5	2	6		
					Call the external program "Merge reports"	5	2	7		
		Save Reports (3)			Save the report file from ChainChoi.exe (.rep)	5	3	1		
					Change the format of the report file in Voyager	5	3	2 to 3		
					Merge domestic distances from LOS files for subsequent step	5	3	4		
					Delete temporary files used to accumulate results from all commodities	5	3	5 to 11		
					Print out the zone labels table			12		
					Loop over commodities (ID_LOOPC)	5	3	13		
					Control the commodities that must be used (if all or single commodity)	5	3	14		
					Delete headers from ChainChoi\OUTPUT\ChainChoiXX01.out files	5	3	15		
					Calculate sum of variables for reports 5,6,7,8	5	3	16		
					Merge ChainChoiXX.rep files (input for reports 10 and 11)	5	3	17		
					Merge VhclRepXXrep files (input for reports 12)	5	3	18		
					Merge ChainChoiXX.rep files (input for report 6b)	5	3	19		
					Merge ChainChoiXX.rep files (input for reports 19)	5	3	20		
					Control the commodities that must be used (works in pair with step 14)	5	3	21		

Application					Description	Programs	Subprograms			
					Calculate report 5 and 6	5	3	22		
					Calculate report 7 and 8	5	3	23		
					Calculate report 10 and 11	5	3	24		
					Calculate report 12	5	3	25		
					Calculate report 6b and 19	5	3	26		
					Updated output tables with new output	5	3	27 to 28		
					Rename LogMod\LOG\logxx.log into logxxSTD.log	5	3	29		
					Update log file	5	3	30		
RCM Assignment (9)	Conversion from LogMod to VY (1)	Note: Same as for STD			Loop for all the vehicle types (from 1 to 40)	1	1			
					Load the vehicle number from Vehicle_parameters table	1	2			
					Covert the 314 format into matrix format	1	3 to 5			
					Merge the matrices by mode in a unique MAT file	1	6 to 11			
					Updated output tables with new output	1	12 to 13			
	PILOT (2)				Choose mode for assignment	2				
	Road Assignment (3)	Note: Same as for STD			Loop between vehicle types (from 1 to 6)	3	1			
					Set the values for VOT and KMCOST reading the Vehicle_parameters table	3	2			
					Calculate the Km_TAX, TOLL, DIST_COST,VOT variables and MAX_SPEED	3	3			
					Define the speed values and free flow times	3	4			
					Assignment	3	5			
					Merge the 5 network in one file	3	6			

The application structure

Application					Description	Programs	Subprograms			
					Updated the outputs table with new output	3	7 to 8			
	Rail Assignment (4)	Note: Different from STD			Read number of bidirectional links with capacity value (maximum ID_LINK)	4	1			
					Prepare network for assignment	4	2			
					Calculate OD Empty, Loaded and Tons matrices in **daily volumes**	4	3			
					Assign Loaded, Empties and Tons matrices	4	4			
					Merge results from empty assignment and tons and loaded assignment - **convert in Year**	4	5			
					Updated the outputs table with new output	4	6 to 7			
	Sea Assignment (5)	Note: Same as for STD			Loop between vehicle types (from 18 to 39)	5	1			
					Set the values for VOT and KMCOST reading the Vehicle_parameters table for the first mode	5	2			
					Calculate the Km_TAX, TOLL, DIST_COST and VOT variables	5	3			
					Assignment	5	4			
					Merge the 21 networks in one file	5	5 to 7			
					Updated the outputs table with new output	5	8 to 9			
	Air Assignment (6)				Set the values for VOT and KMCOST reading the Vehicle_parameters table for the first mode	6	1			
					Calculate the Km_TAX, TOLL, DIST_COST and VOT variables	6	2			
					Assignment	6	3			
					Save the network in geodatabase format	6	4			
					Updated the outputs table with new output	6	5 to 6			

Application					Description	Programs	Subprograms			
	PILOT (7)				Just run a single step or all RCM process	7				
Results RCM (10)					Check execution order a label to jump here	1				
					Merge all the assigned network by mode in a unique network	2				
					Create the report for vehicle and vehicle km	3				
					Save the report in the geodatabase	4				
	Reports 1.0 (5)				Create network with bidirectional flow	5	1			
					Compare assigned networks STD and RCM	5	2			
					Produce report 3	5	3			
		Port Areas (4)			Read report 6	5	4	1		
					Sum over port areas	5	4	2		
					Produce report 13	5	4	3		
		GIS maps by Commodity groups (5)			Create ArcGIS folder to export maps in ESRI format	5	5	1		
					Prepare CTL and Batch files	5	5	2 - 3		
					Run selectdirect to produce output by commodity group {SCENARIO_DIR}\LogMod\RCM\Output\COMMODITY_XTD.dat	5	5	4		
					Prepare table for map	5	5	5 – 6		
					Export SHP file	5	5	7		
					Calculate report 21	5	5	8		
					Run python to import SHP file onto gdb and update mxd with scenario name	5	5	9		
		Oresund Kiel and Jylland (6)			Merge final network with other statistics	5	6	1		
					Calculate total values	5	6	2		
					Produce report 14	5	6	3		
		Rail Capacity (7)			Create bidirectional flow from LOAD_NET_RAIL_RCM	5	7	1,4		
					Create report 15 first step	5	7	2		
					Create report 15 second step	5	7	3		

The application structure

Application					Description	Programs	Subprograms			
					Merge Prop_link_Base2019 with scenario table	5	8	1		
					Dump link table for assigned network	5	8	2		
					Add CATEGORY ID_COUNTRY REGION ID_COUNTY attributes based on values in Prop_link	5	8	3		
					Produce report 9	5	5	4		
		Reports per geographical aggregation (8)			Produce first part of report 17	5	5	5		
					Produce first part of report 18	5	5	6		
					Produce report 16 totals	5	5	7		
					Produce report 16 adding county names	5	5	8		
					Produce report 17 totals	5	5	9		
					Produce report 17 adding county names	5	5	10		
					Produce report 18 totals	5	5	11		
					Produce report 18 adding county names	5	5	12		
					Domestic tonkm for calibration.txt file	5	9			
					Updated the outputs table with new output	6 to 7				
					Save RCM results and other report	8				
					Update REPORT_GS_{SCENARIO_SHORTNAME}. prn file with the list of outputs created during the run	9				
Parameters Calculation (11)					Skip the process if user selected to run step by step some parts	1				
					Calculation of scaling factors per port area and commodity group. See 6.9.2 for details	2				
					Prepare data for next calculation	3				
					Calculation of scaling factor for Kiel canal. See 6.9.3 for details	4				
					Label to skip the process	5				
Pilot #12					End of cycling process					

5.5. “Compare scenarios” application

Input data:

- LOS matrices
- OD matrices STD
- loaded networks STD and RCM for base scenario and selected scenario.

Output data:

- matrices with differences and networks with differences under scenario folder.

Purpose:

- Compare the matrices and the loaded network between scenarios.

Application		Description	Programs	Subprograms
LOS matrices (1)		Execution order based on "Select_compare" catalog key	1	1
		Compare Road LOS matrix between base scenario and selected scenario	1	2
		Compare Rail LOS matrix between base scenario and selected scenario	1	3
		Compare Sea LOS matrix between base scenario and selected scenario	1	4
		Compare Air LOS matrix between base scenario and selected scenario	1	5
OD Matrices (2)		Execution order based on "Select_compare" catalog key	2	1
		Compare OD Loaded vehicle matrices by road	2	2
		Compare OD Loaded vehicle matrices by rail	2	3
		Compare OD Loaded vehicle matrices by sea	2	4
		Compare OD Loaded vehicle matrices by air	2	5
		Compare OD tonne matrices by road	2	6
		Compare OD tonne matrices by rail	2	7
		Compare OD tonne matrices by sea	2	8
		Compare OD tonne matrices by air	2	9
		Compare OD empty vehicle matrices by road	2	10
		Compare OD empty vehicle matrices by rail	2	11
		Compare OD empty vehicle matrices by sea	2	12
		Compare OD empty vehicle matrices by air	2	13
Assignment (3)		Execution order based on "Select_compare" catalog key	3	1
		Compare the loaded networks from Standard Logistics Module	3	2
		Compare the loaded networks from Rail Capacity Management Module	3	3
		End of process	3	4

Application		Description	Programs	Subprograms
Comparison (4)		Create {Scenario_Dir}\DIFF_GIS2045_2019 where store gdb and mxd	4	1
		Calculate differences among COMMODITYflows tables	4	2
		Move information in shp format	4	3
		Save in gdb feature class	4	4

5.6. "Handling scenario"

Input data:

- For the export function of the entire model.

Output data:

- Depends on the choice made by user. With the export function a new model will be set up in the folder indicated by "New_folder" catalog key. It will also result in an exported scenario in another model in case the "Exp_selection" catalog key is set to 2.

Purpose:

- To manage the model in the following ways:
- To delete a scenario,
- To compress the geodatabases,
- To export a model or a single scenario,
- To check the catalog values for an imported scenario.

Application			Description	Programs	Subprograms			
Delete (1)			Set the execution order based on "Delete" catalog key	1	1			
			Check if the scenario is in read mode. In this case go to the end of process	1	2			
			Skip all the other applications	1	3			
Compact (2)			Call the python script compact_GDB.pyt to compress the input_data.mdb and output0.mdb	2	1			
	Model Export (1)		If "Exp_selection" is equal to 1, create the entire model structure in a new folder and copy all the applications and script files.	3	1	1	1	
	General Tables (2)		Create DaTE_TIME.TXT to check the data of the system and change the execution order based on "Exp_selection" catalog key	3	2	1		
			Update the Model_description table in the new Input_Data.mdb file in the new model folder	3	2	2 to 3		
			Copy the tables and feature classes from the existing input_data.mdb to the new one. Also if the "Exp_selection" is set to 2, verify that the Input_Data.mdb exists in the new folder	3	2	4		

Application			Description	Programs	Subprograms			
			If not exist jump all the processes to allow a verification by user.	3	2	5 to 6		
			Update the General_NewBase table in the new geodatabase	3	2	7		
			Update the LogMod_NewBase table in the new geodatabase	3	2	8		
			Skip all these steps if "Exp_selection" catalog key is set to 2. The previous check (2.3.4) has pointed out if is possible run this part.	3	3	1		
			Merge SC_{SCENARIO_SHORTNAME}_Link and SC_{SCENARIO_SHORTNAME}_Node with base data to create the new base network	3	3	2		
			Merge the SC_{SCENARIO_SHORTNAME}_Frequency_Data_Link and SC_{SCENARIO_SHORTNAME}_Frequency_Data_Node with the base frequency_data_Base2019 to obtain the new frequency network	3	3	3		
			Merge Sc_{SCENARIO_SHORTNAME}_Cargo and Cargo_Base2019 to create the new cargo table	3	3	4		
			Merge Sc_ {SCENARIO_SHORTNAME}_Node_Terminals with Node_Terminals_Base2019 to obtain the new Node_Terminals Base table	3	3	5		
			Merge Sc_{SCENARIO_SHORTNAME}_Nodes_Commodities with Nodes_Commodities_Base2019 to create the new Nodes_Commodities table	3	3	6		
			Merge SC_Nodes_{SCENARIO_SHORTNAME}to Nodes_Base2019 to obtain the new base nodes table	3	3	7		
			Create the new Tax_Country_{SCENARIO_SHORTNAME}table joining Sc_{SCENARIO_SHORTNAME}_Tax_Country with Tax_Country_Base2019	3	3	8		
			Create the new Tax_Category_{SCENARIO_SHORTNAME}table joining Sc_{SCENARIO_SHORTNAME}_Tax_Category with Tax_Category_Base2019	3	3	9		
			Create the new Tax_Link_{SCENARIO_SHORTNAME}table joining Sc_{SCENARIO_SHORTNAME}_Tax_Link with Tax_Link_Base2019	3	3	10		
			Create the new Toll_Link_{SCENARIO_SHORTNAME}table joining Sc_{SCENARIO_SHORTNAME}_Toll_Link with Toll_Link_Base2019	3	3	11		
	Create the new base (3)		Merge Vehciles_parameters_Base2019_PartA with SC_{SCENARIO_SHORTNAME}_Vehicle_parameters_PartA to obtain a new Vehicle_parameters base table	3	3	12		

Application			Description	Programs	Subprograms			
			Merge Vehciles_parameters_Base2019_PartB with SC_{SCENARIO_SHORTNAME}_Vehicle_parameters_PartB to obtain a new Vehicle_parameters base table	3	3	13		
			Merge ProprLink_Base2019 with SC_{SCENARIO_SHORTNAME}_ProprLink to obtain a new PropLink base table	3	3	14		
			Merge Rail_Capacity_Base2019 with SC_{SCENARIO_SHORTNAME}_Rail_Capacity to obtain a new Rail_Capacity base table	3	3	15		
	Create the new scenario specific tables (4)	Create the scenario tables (1)	Do the next steps if "Exp_selection" is equal to 2. If equal 1 the base scenario already exists	3	4	1	1	
			Rebuild the base scenario for the current scenario	3	4	1	2 to 15	
		Create the scenario specific tables(2)	Compare all the tables between the new base and the current scenario	3	4	2	1 to 18	
Scenario Import (4)			Select the execution order based on "Imp_Selection" catalog key and create Ckeck.txt file to verify if the scenario exists in the Input_Data.mdb	4	1			
			Check if the selected scenario exists, otherwise give a prompt and go to the end of process	4	2 to 3			
			Compare the values for the catalog keys existing in the catalog file and in general_{SCENARIO_SHORTNAME}table, creating a report REPORT_HL_BS05.TXT	4	4			
			End of the process	4	5			

5.7. “PWC_matrices” application

Input data:

- PWC matrices under {CATALOG_DIR}\ 01_Programs\LogMod\Input\{Year}\PWC folder in txt format. {Year} is the catalog key controlling the set of matrices per each provided year (for example 2016 or 2045).

Output data:

- PWC matrices under {CATALOG_DIR}\ 01_Programs\LogMod\Input\PWC\VY_F folder in binary voyager format.

Purpose:

- Visualize the PWC_matrices with Cube Interface.

Description	Programs
Check existence of PWC matrices, if not warning the user	1
Prepare lookup table with correspondence between Voyager and EMME numbers for zones and terminals	2
Loop over commodities 1 to 9, read PWC matrices, convert in DBF tables and finally in Voyager MAT files	From 3 to 11
Loop over commodities 10 to 16, read PWC matrices, convert in DBF tables and finally in Voyager MAT files	From 12 to 19
Delete temporary txt files (to save disk space)	From 20 to 29
If PWC matrices not present, skip all process to let user check settings	30

5.8. “Change matrix format” application

Input data:

- COST and
- OD matrices for vehicles and tonnes under {CATALOG_DIR}\Scenario_Tree\{Scenario_name} folder.

Output data:

- dbf or txt file of a selected matrix.

Purpose:

- Export a specific matrix into dbf or csv format.

Description	Programs
Detect the user choice and create temporary variable to jump at the right process	1
Read the temporary variable and jump to the right process	2
Export cost matrix in CSV format, DBF format or as table under MDB	From 3 to 8
Jump here if chosen Demand matrices instead	9
Export demand matrix in CSV format, DBF format or as table under MDB	From 10 to 17

5.9. “Select Link Analysis” application

Input data:

- Results from Samgods full run (both STD and RCM). Provide a list of nodes, links and commodities for the analysis.

Output data:

- Under SelectLink folder the output data listed in section 3.4.8.6.

Purpose:

- Perform select link analysis

The application structure

Application			Description	Programs	Subprograms			
Data prepare (1)			Prepare the vehicle parameters table	1				
Selection for loaded unloaded vehicles and tons (2)	Create selection files (1)		Prepare the folder for outputs and necessary programs in RCM folder	2	1	1		
			Read link list (RCM\Links_List.txt) and prepare dbf table for next steps	2	1	2 to 3		
			Read ID_LINK values in catalog key and prepare file for next steps	2	1	4		
			Read A and B r values in catalog key and prepare file for next steps	2	1	5		
			Union of link selection and conversion of Voyager numbering to Emme numbering	2	1	6		
			Read node table from node list RENUM_NODES.DBF	2	1	7		
			Read N vr values in catalog key and prepare file for next steps	2	1	8		
			Conversion of node list in Emme numbers if required	2	1	9		
			Check the combination of selections (maximum number of selections allowed for nodes and links)	2	1	10		
			Warning windows if exceeding some limits	2	1	11		
			Set up control files for DirectSelect.jar program	2	1	12		
			Setup batch files to run DirectSelect.jar program	2	1	13		
			Run the program	2	1	14		
	Produce matrices with volumes and tons (2)		Move the results from RCM folder to Selectlink folder	2	2	1		
			Strip off header	2	2	2		
			Read output file STD solutions and convert in dbf	2	2	3		
			Read dbf table and convert in in OD table	2	2	4		
			Read OD table and convert in MAT file	2	2	5		
			Strip off header	2	2	6		
			Read output file RCM solutions and convert in dbf	2	2	7		
			Read dbf table and convert in in OD table	2	2	8		
			Read OD table and convert in MAT file	2	2	9		
			Delete headers in LinksSumSLSTD.dat (STD results)	2	3	1		

Application			Description	Programs	Subprograms			
	Produce maps with volumes and tons (3)		Convert link results in DBF format	2	3	2		
			Create attribute names and values	2	3	3		
			Delete headers in LinksSumSL.dat (RCM results)	2	3	4		
			Convert link results in DBF format	2	3	5		
			Create attribute names and values	2	3	6		
			Dump network in NET format	2	3	7		
			Create NET file with results of select link analysis STD	2	3	8		
			Create NET file with results of select link analysis RCM	2	3	9		
	Produce maps by Commodity group (4)		Call selectdirect.jar to produce outputs by commodity group	2	4	1		
			Convert CommoditySLSTD.dat in DBF format	2	4	2		
			Merge bidirectional network and commodity table for STD and produce SHP file	2	4	3		
			Convert CommoditySL.dat in DBF format	2	4	4		
			Merge bidirectional network and commodity table for RCM and produce SHP file	2	4	5		
			Call python to move data from SHP to gdb format (independently by Cube) or Option to skip GDB and produce net format	2	4	6		
			Produce NET for STD	2	4	7		
			Produce NET for RCM	2	4	8		
			Handle choice between gdb or net output	2	4	9		

5.10. “Cost Benefit Analysis - ASEK Values” application

Input data:

- Results from Samgods full run (both STD and RCM). Provide the Toll, tax, scaling factors parameters from ASEK scenario (need to specify ASEK catalog key).

Output data:

- Listed in section 3.4.

Purpose:

- Produce reports and statistics excluding the calibration factors and using as basis the ASEK values (e.g. values suitable for Cost Benefit Analysis).

The application structure

Application		Description	Programs	Subprograms			
PILOT (1)		Set specific folders under LogMod for CBA calculation	1				
Data Preparation (2)		Check the choices made by user; if not right starts a prompt. Create the outputX.mdb if not exist and if required.	2	1	1		
		Load the parameters from general_{SCENARIO_SHORTNAME} table into the system variables	2	1	2		
		Verify if few outputs already exist and if they have the same input data	2	1	3		
		Check if the scenario is locked or still editable	2	1	4		
		Create the Vehicle_parameter table for the scenario	2	1	5		
		Apply coordination factorsfrom {Scenario_DIR}\Scaling_PartA.DBF	2	1	6		
		Create the Cargo table for the scenario	2	1	7		
		Create the network for the scenario	2	1	8		
		Dump in dbf format the link and node tables	2	1	9		
	Tax calculation	Set the node class (see table A_nodeclass) value for all the nodes	2	1	10	1	
		Classify the links based on the class node and the ID_COUNTRY in the A_Categories code - identify the country id for each link	2	1	10	2	
		Convert all the scenario tables for taxes and tolls to a link format	2	1	10	3 to 12	
		Create the network with all the extra attributes with undefined values	2	1	10	13	
		Recode the mode for each vehicle type	2	1	10	15	
		Update with scenario values all the extra attributes	2	1	10	14	
		Add the fields for MODE	2	1	10	16	
		Create the equations to save the final value for tax and extracost	2	1	10	17	
		Save the final values (TAX_TOT, EXCTTOT and TOLL) for each link and by vehicle type	2	1	10	18	
		Create the intrazonal matrix in dbf format	2	1	11		
		Change the format of intrazonal matrix from dbf to MAT	2	1	12		
		Save the node_labels table in Output0.mdb	2	1	13		
	Data for CBA	Export final network with time and cost per link for usage in ASEK calculation or external checks	2	1	14	1	
CBA Analysis (3)	Prepare data (1)	Write in txt format the Cargo_Base2019 table under LogMod\Input\Cost with name Cargo.txt	3	1	1		
		Merge the scenario specific table and the base table for Node_terminals_Base2019	3	1	2		
		Write in txt format the Node_terminals_{SCENARIO_SHORTNAME} table under LogMod\Input\Cost with name Pilotfees.txt	3	1	3		

Application		Description	Programs	Subprograms			
		Merge Vehicle parameters table A and B and apply scaling parameters	3	1	4,5,6		
		Write in txt format the Vehicle_parameters table under LogMod\Input\Cost with name VHCLS_COM01.TXT, VHCLS_COM02.TXT, VHCLS_COM03.TXT, VHCLS_COM04.TXT, VHCLS_COM05.TXT, VHCLS_COM06.TXT, VHCLS_COM07.TXT, VHCLS_COM08.TXT, VHCLS_COM09.TXT ,VHCLS_COM10.TXT, VHCLS_COM11.TXT, VHCLS_COM12.TXT, VHCLS_COM13.TXT, VHCLS_COM14.TXT, VHCLS_COM15.TXT and VHCLS_COM16.TXT	3	1	7,8		
		Write in txt format the Vehicle_parameters table under LogMod\Input\General with name averagevehiclecapacity.txt	3	1	9		
	Prepare data second part (2)	Copy all the other files from Input\Nodes to Input_CBA\Nodes	3	2	1		
		Merge the scenario specific table and the base table for Nodes_{SCENARIO_SHORTNAME}	3	2	2		
		Add parameters for Varner Kanal	3	2	3		
		Write in txt format the Nodes_{SCENARIO_SHORTNAME}table under LogMod\Input_CBA\Nodes with name Nodes.txt	3	2	4		
	Prepare data third part (3)	Convert the Chain_list table in txt format under LOGMOD\Input_CBA\CHAINTYPE.LIS	3	3	1		
	LOS Call (4)	Move parameters for port areas in CBA folder	3	4	1		
		Prepare {SCENARIO_DIR}\LogMod\RCM\LOS_CBA.ctl control file for LOS rescaling	3	4	2		
		Prepare CB_RUN_LOS.BAT to call selectDirect.jar to rescale LOS matrices	3	4	3		
		Run process and infill LOS folder with proper matrices	3	4	4		
	Run LP2CC (5)	Print out the batch file to call logistic model selecting the commodity based on the value in Select_commodity catalog key	3	5	1		
		Print out the batch file for call ASEK calculation	3	5	2		
		Change the execution order if selected the normal logistic model or advanced. Call the batch files RUNALL.BAT	3	5	3		
		Label to jump the normal logistic model and run advanced	3	5	4		
		Set up files to describe then number of processors and batch file for call the Samgods_Parallelization_Module.jar	3	5	5		
		Run RUNALL.BAT using Parallelization Module	3	5	6		
		Create the batch file for merge.exe	3	5	7		
		Call the external program "Merge reports" and check results	3	5	8		

The application structure

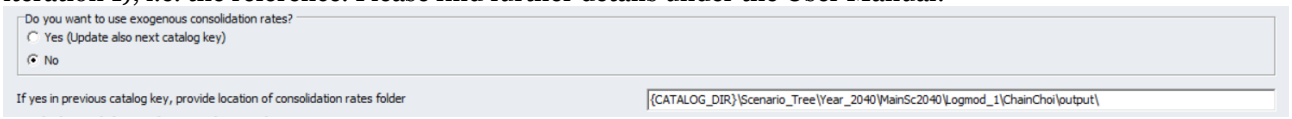
Application		Description	Programs	Subprograms			
		Prepare {SCENARIO_DIR}\LogMod\RCM\UTI_CBA.ctl	3	5	9		
		{SCENARIO_DIR}\LogMod\RCM\CB_RUN_UTI.BAT	3	5	10		
		Run CB_RUN_UTI.BAT to get rescaled costs and reports for empties	3	5	11		
	Save Reports (6)	Pilot to skip process if not main JA scenario	3	6	1		
		Delete temporary files used to accumulate results from all commodities	3	6	2		
		Save the report file from ChainChoi (.rep)	3	6	3		
		Change the format of report file into Voyager	3	6	4		
		Merge domestic distances from LOS files for subsequent step	3	6	5		
		Loop over commodities (ID_LOOPC)	3	6	6		
		Control the commodities that must be used (if all or single commodity)	3	6	7		
		Delete headers from ChainChoi\OUTPUT\ChainChoiXX01.out files	3	6	8		
		Calculate sum of variables for reports 5,6,7,8	3	6	9		
		Merge ChainChoiXX.rep files (input for reports 10 and 11)	3	6	10		
		Merge VhclRepXXrep files (input for reports 12)	3	6	11		
		Merge ChainChoiXX.rep files (input for report 6b)	3	6	12		
		Merge ChainChoiXX.rep files (input for report 19)	3	6	13		
		Script to control the commodities that must be used (works in pair with 14)	3	6	14		
		Calculate report 5 and 6	3	6	15		
		Calculate report 7 and 8	3	6	16		
		Calculate report 10 and 11	3	6	17		
		Calculate report 12	3	6	18		
		Calculate report 6b and 19	3	6	19		
		OrderCosts and Inventory Report 20	3	6	20		
		Updated the outputs table with new output	3	6	21 and 22		
		Jump here to skip reports if not JA	3	6	23		
		Create report on empties for UA scenario	3	6	24		
		Skip previous step if JA scenario	3	6	25		
	Main Reports (7)	Read {SCENARIO_DIR}\LogMod\RCM\output\VehicleTrpEmpInv_Input_CBA.dat and convert in DBF – table holds vehicle costs and vehicles on ferry costs and vhvclkm and tonkm	3	7	1		
		Add attributes to handle ferry vehicles and vehicles on ferry	3	7	2		
		Create Vehicles_loaded_and_empty_witin_Swedish_territory_CBA report	3	7	3		

Application		Description	Programs	Subprograms			
		Read {SCENARIO_DIR}\LogMod\RCM\output\VehicleTrpEmpInv_Input_XTD.dat and convert in DBF – table holds vehicle costs and vehicles on ferry costs and vhvclkm and tonkm	3	7	4		
		Add attributes to handle ferry vehicles and vehicles on ferry	3	7	5		
		Merge CBA and RCM reports to create table Costs_D_I_X_T_{Scenario_ShortName}_CBA	3	7	6		
		Comparison of Costs_D_I_X_T_{Scenario_ShortName}_CBA across JA and UA scenarios for final report {SCENARIO_DIR}\CBA_Final_report_{SCENARIO_CODE}.txt	3	7	7		
		Update list of reports under {SCENARIO_DIR}\REPORT_SG_{SCENARIO_CODE}.TXT	3	7	from 8 to 10		
PILOT (4)		Rename back Logmod folder	4				

5.11. “Elasticity module” application

The structure is identical to Samgods , with the following exceptions:

- all the assignment and report steps are deactivated
- The derivation of consolidation rates for iteration >1, where ID_SCENARIO>1 in Scenarios_List table”, the exogenous consolidation rates will be derived from the Samgods model run (equivalent to iteration 1), i.e. the reference. Please find further details under the User Manual.



The extra module Elasticity Report calculates elasticities based on Webtag formulation (see par. 8.12.7 of User Manual for details) and produces final report.

Description	Program	Subprograms
Jump here after RCM	7	1
Calculate elasticities for STD process comparing scenario 1 vs current scenario	7	2
Calculate elasticities for RCM process comparing scenario 1 vs current scenario	7	3
Merge previous calculations together and save final report	7	4
Jump to the end of the process	7	5

5.12. "Create Maps" application

This application allows the user to generate GIS maps, with absolute flows, from an existing Samgods scenario without having to run a full run of the model.

6 Applied methods in the model

6.1. Calibration method

Calibration of the Samgods model is mainly performed by applying calibration parameters to scale existing costs-attributes within the model in order to obtain correlation between model results and available measurements. In the previous version of the Samgods model (version 1.2.1) a limited amount of calibration parameters was provided (table VehicleParameters), adjustments of other attributes required changes to the actual attribute values in the model, which is was scaled back in the ASEK tables. This approach was not ideal in clarify which changes were genuinely made for changes in costs or taxes and which ones were there for calibration purposes.

In order to preserve flexibility when calibrating the model and also maintain "realistic" attribute values within the input tables, all available model-attributes within the input database have now corresponding calibration parameters. In addition, calibration parameters can be added both as multiplicative factors and/or additional terms, while only multiplicative parameters were available in V1.2.1.

To maintain a clear structure of the calibration parameters, all model attributes used in the calibration process are now included in two separate databases (Input_data_Calibration_Base2019.mdb and Input_data_Calibration_MainSc2045.mdb).

The calibration parameters provides only objects covered by calibration changes. If no calibration parameter is provided for the model attribute, the information given in the original input database would be loaded into the model without any transformation.

The general equation applied in all the modified attributes is as follow:

$$M_{a,k} = I_{a,k} * C_{a,k}^{f} + C_{a,k}^{t}$$

Where:

- $M_{a,k}$: modified values (calibrated values) of the attribute a in table k – produced when running the model
- $I_{a,k}$: original values in Input_Data.mdb of the attribute a in table k – original values
- $C_{a,k}{}^{f}$ and $C_{a,k}{}^{t}$= multiplicative and additive calibration parameters. – present in Input_data_Calibration_Base2019.mdb and Input_data_Calibration_MainSc2045.mdb with suffix _FA (f=factor) and _TE (t=additive term).- produced during the

For example, the attribute SPEED_1 (a), in table Input_Data.mdb\Base209_Link (k) included will have the corresponding factor and additive terms in Input_data_Calibration_Base2019.mdb\Base209_Link denoted as SPEED_1_FA ($C_{a,k}{}^{f}$) and SPEED_1_TE ($C_{a,k}{}^{t}$).

A numerical example of the implementation is given below, where the data provided in Table 147 represents $I_{t,k}$ and the values in Table 148 represents $C_{a,k}{}^{f}$ and $C_{a,k}{}^{t}$. In this case the table t is "Vehicles_parameters_PartA_Base2017" and attribute k is the distance based cost "KM_COST".

Table 147 $I_{t,k}$

OBJECTID	A	B	SPEED_1

2151	2027	2068	69.5
2152	2027	2070	69.5

Table 148 $C_{a,k}^f$ and $C_{a,k}^t$ factors

OBJECTID	A	B	SPEED_1_FA	SPEED_1_TE
1	2027	2068	1.029411765	0
2	2027	2070	1.029411765	0

Combining the information from Table 147 and Table 148 gives the data M_(SPEED_1,Link_Base2019) provided into the model.

M_(SPEED_1,Link_Base2019)= 69.5*1.029411765+0= 71.54412

The input data which is subject to calibration parameters $C_{a,k}^f$ and $C_{a,k}^t$ is:

- Link table: SPEED_1, SPEED2 AND UL3;
- Vehicle cost Part A and B
- Rail capacity
- Link tolls
- Tax_Link
- Tax_Country
- Nodes_Base2017: required for technological factors on cost and time on terminals

The following data has only the $C_{a,k}^f$ component:

- Kiel-canal factor
- Port area parameters

Since the iterative calibration mechanism present in V1.2.1 has not been revised.

The following tables are present for the iterative calibration mechanism.

- Parameters_Kielcalibration.dbf
- Parameters_portcalibration.dbf

Finally the Locked solutions previously save in a txt files, are now moved in the same Input_Data_Calibration.mdb for consistency and they hold their specific structure.

In order to minimize the user interaction, information about if a calibration parameter is pointing to something that does not exists in a specific scenario is provided when running “Edit the data” application. If any error occurs, the main application “Samgods” will fail pointing to the issue.

6.2. Manage different loading times, costs and capacities for different commodities

The vehicle cost table has been divided in two parts, first part (A) is by vehicle type and second part is by vehicle type and commodity group (B). Factors are applied in both cases arriving at maximum flexibility where all different attributes can be modified by commodity group.

To setup this differentiation the following technique has been applied:

1. For each commodity, the original values in Vehicle parameters table are multiplied by the factors present in Input_Data_Calibration.
2. In each control file for BuildChainXX.ctl the definition of VHCL control parameter that gives the name and location of vehicle parameters has modified using commodity name (where XX is the commodity group number) *VHCL=.\Input\Cost\VHCLS_COMXX.TXT*
3. In each control file for ChainCHainXX.ctl the definition of VHCL control parameter that gives the name and location of vehicle parameters has modified using commodity name (where XX is the commodity group number) *VHCL=.\Input\Cost\VHCLS_COMXX.TXT*

Table 149 and Table 150 show the coupling between Vehicle parameters Part A and B and calibration parameters.

Table 149 - Factors and vehicle parameter table A.

Attribute in table Vehicle parameters Part A	Factor attribute under Calibration	Term attribute under Calibration
CAPACITY	CAPACITY_FA	CAPACITY_TE
COORFACT	COORFACT_FA	COORFACT_TE
HOURS_COST	HOURS_COST_FA	HOURS_COST_TE
KM_COST	KM_COST_FA	KM_COST_TE
ONFER_H_C	ONFER_H_C_FA	ONFER_H_C_TE
ONFER_KM_C	ONFER_KM_C_FA	ONFER_KM_C_TE
POSICOST	POSICOST_FA	POSICOST_TE
DFLTFREQ	DFLTFREQ_FA	DFLTFREQ_TE
F_DUES_VH	F_DUES_VH_FA	F_DUES_VH_TE
F_DUES_TON	F_DUES_TON_FA	F_DUES_TON_TE
SPEED	None	
VDF_SPEC		
MODE_1		
MODE_2		
FUNC_FILE		
EMPTY_V		
MAX_SPEED	MAX_SPEED_FA	MAX_SPEED_TE

Table 150 - Factors and vehicle parameter table B.

Attribute in table Vehicle parameters Part B	Factor attribute under Calibration	Term attribute under Calibration
CONT_LTI	CONT_LTI_FA	CONT_LTI_TE
CONT_LCO	CONT_LCO_FA	CONT_LCO_TE
CONT_LTI_T	CONT_LTI_T_FA	CONT_LTI_T_TE
CONT_LCO_T	CONT_LCO_T_FA	CONT_LCO_T_TE
NC_LTI	NC_LTI_FA	NC_LTI_TE
NC_LCO	NC_LCO_FA	NC_LCO_TE
NC_LTIT	NC_LTIT_FA	NC_LTIT_TE
NC_LCOT	NC_LCOT_FA	NC_LCOT_TE

In Table 151 the list of VHCL definitions in BuildChain and ChainChoi.

Table 151 - List of values for VHCL control parameter in BuildChain and ChainChoi control files.

ID_COM	VHCL in BuildChain and ChainChoi
1	VHCLS_COM01.TXT
2	VHCLS_COM02.TXT
3	VHCLS_COM03.TXT

4	VHCLS_COM04.TXT
5	VHCLS_COM05.TXT
6	VHCLS_COM06.TXT
7	VHCLS_COM07.TXT
8	VHCLS_COM08.TXT
9	VHCLS_COM09.TXT
10	VHCLS_COM10.TXT
11	VHCLS_COM11.TXT
12	VHCLS_COM12.TXT
13	VHCLS_COM13.TXT
14	VHCLS_COM14.TXT
15	VHCLS_COM15.TXT
16	VHCLS_COM16.TXT

6.3. Manage different consolidation factors for different commodity groups

The consolidation range, expressed as a lower and upper limit, can be specified in two separate ways in the general control file for BuildChain and ChainChoi.

A first control parameter, CONSOL, represents a general range used when no mode specific range is specified. These range can be specified in the GUI via the following two catalog keys:

- Lower bound for consolidation factor (applied to all commodities - from 0 to 1) 0.05
- Upper bound for consolidation factor (applied to all commodities from 0 to 1) 0.95

A second set of CONSOL<mode> parameters can be specified using the table:

- "Low and upper bounds for consolidation factors" under Scenario Inputs\General tables of Data Panel.

The access to this table is only for developer or advance user in application Edit the data.

The Logistics Module will give the priority to the second values, specified by submode and commodity, and ignore the first general values. An example of general control file with these parameters specified is (notice the difference between CONSOL CONSOL<mode>):

- CONSOL=0.05,0.95
- CONSOLA=0.05,0.5
- CONSOLB=0.05,0.5
- CONSOLC=0.05,0.5
- CONSOLS=0.5,0.9

In the calibration process a unique set of consolidation parameters per mode has shown limitations and different sets for specific commodities have been used for the calibration. BuildChain_CONSOL table has 16 commodity lower and upper bounds for consolidation parameters. The implemented logic is:

- CONSOL_L and CONSOL_U hold the default values

- CONSOL_LXX - CONSOL_UXX, where XX is commodity, hold values that change in comparison to the default values. Where there is a value -1, the default value will be used

The current structure has the advantage to clearly point to differences in values across each commodity.

Table 152 - CONSOL<mode> parameters General (CONSOL_L, CONSOL_U) and by commodity group.

ID	MODE_C	CONSOL_L	CONSOL_U	Mode	ID_MODE	CONSOL_L01	CONSOL_U01	CONSOL_L02	CONSOL_U02	CONSOL_L03	CONSOL_U03	CONSOL_L04	CONSOL_U04	CONSOL_L05	CONSOL_U05	CONSOL_L06	CONSOL_U06	CONSOL_L07	CONSOL_U07	CONSOL_L08	CONSOL_U08	CONSOL_L09	CONSOL_U09	CONSOL_L10	CONSOL_U10	CONSOL_L11	CONSOL_U11	CONSOL_L12	CONSOL_U12	CONSOL_L13	CONSOL_U13	CONSOL_L14	CONSOL_U14	CONSOL_L15	CONSOL_U15	CONSOL_L16	CONSOL_U16	
1	A	0.2	0.5	Road	1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	Default
2	B	0.2	0.5	Road	1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	From Default
3	c	0.2	0.5	Road	1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	Commodity Specific
4	C	0.2	0.5	Road	1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
5	S	0.3	0.7	Road	1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
6	X	0.3	0.7	Road	1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
7	d	0.8	1	Rail	2	-1	-1	0.8	0.98	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	0.8	0.98	0.8	0.98	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
8	D	0.8	1	Rail	2	-1	-1	0.8	0.98	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	0.8	0.98	0.8	0.98	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
9	E	0.8	1	Rail	2	-1	-1	0.8	0.98	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	0.8	0.98	0.8	0.98	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
10	F	0.8	1	Rail	2	-1	-1	0.8	0.98	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	0.8	0.98	0.8	0.98	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
11	f	0.8	1	Rail	2	-1	-1	0.8	0.98	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	0.8	0.98	0.8	0.98	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
12	G	0.8	1	Rail	2	-1	-1	0.8	0.98	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	0.8	0.98	0.8	0.98	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
13	h	0.8	1	Rail	2	-1	-1	0.8	0.98	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	0.8	0.98	0.8	0.98	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
14	H	0.8	1	Rail	2	-1	-1	0.8	0.98	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	0.8	0.98	0.8	0.98	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
15	I	0.8	1	Rail	2	-1	-1	0.8	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	0.8	-1	0.8	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
16	I	0.8	1	Rail	2	-1	-1	0.8	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	0.8	-1	0.8	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
17	T	0.8	1	Rail	2	-1	-1	0.8	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	0.8	-1	0.8	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
18	U	0.8	1	Rail	2	-1	-1	0.8	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	0.8	-1	0.8	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
19	J	0.1	0.6	Sea	3	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
20	K	0.1	0.6	Sea	3	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
21	L	0.1	0.6	Sea	3	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
22	M	0.1	0.6	Sea	3	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
23	N	0.1	0.6	Sea	3	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
24	O	0.1	0.6	Sea	3	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
25	P	0.2	0.9	Sea	3	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
26	Q	0.2	0.9	Sea	3	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
27	V	0.1	0.6	Sea	3	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
28	W	0.1	0.6	Sea	3	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
29	R	0.2	0.8	Air	4	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	

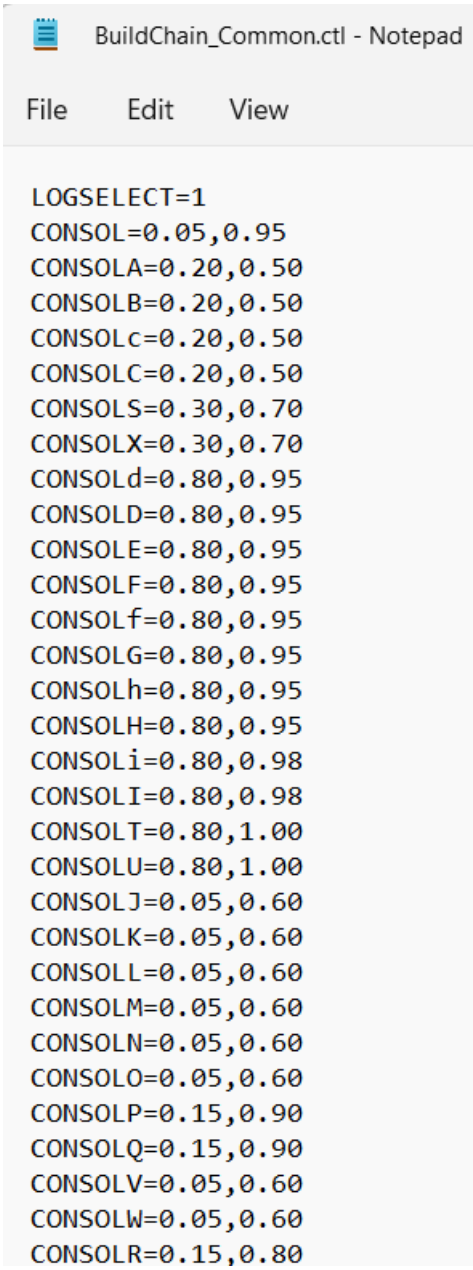
In each BuildChainxx.ctl or ChainChoixx.ctl the control parameter INCL=points to the right values depending if xx (the commodity group number) has a value that differ from general values (value in table different from -1). In all the other cases, the general values will be used.

To manage the different cases the following process is in place:

- From BuildChain_CONSOL, commodity by commodity, it is determined if special values are applied checking how many -1 are present under CONSOL_LXX and CONSOL_UXX. If the count of -1s sums to 29 it means default values must be used.
- If default values must be used under BuildChainxx.ctl INCL=BuildChain_Common.ctl will be included, otherwise INCL=BuildChain_Special.ctl will be present and under BuildChainxx.ctl it will be present the section for modified Lower and upper bound;
- Similarly to BuildChain, Chainchoixx.CTL will have INCL=ChainChoi-Common.ctl if default values must be used, while INCL=ChainChoi_Special.ctl will be present and under ChainChoixx.ctl all values for lower and upper bound will be included.
- BuildChain_Special.ctl and ChainChoi_Special.ctl just exclude the section with default values for lower and upper bound.

For instance, commodity group uses default values, so we have:

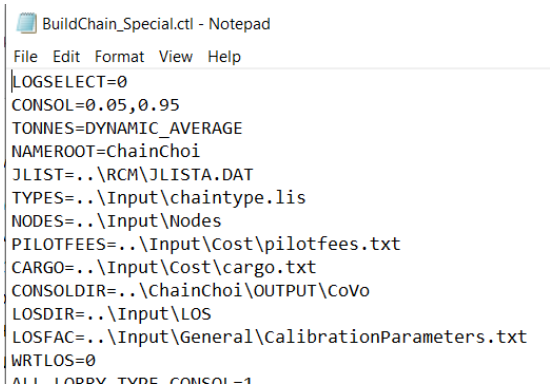
And BuildChain_Common.ctl looks like:


BuildChain_Common.ctl - Notepad
File
Edit
View
LOGSELECT=1
CONSOL=0.05,0.95
CONSOLA=0.20,0.50
CONSOLB=0.20,0.50
CONSOLc=0.20,0.50
CONSOLC=0.20,0.50
CONSOLS=0.30,0.70
CONSOLX=0.30,0.70
CONSOLd=0.80,0.95
CONSOLD=0.80,0.95
CONSOLE=0.80,0.95
CONSOLF=0.80,0.95
CONSOLf=0.80,0.95
CONSOLG=0.80,0.95
CONSOLh=0.80,0.95
CONSOLH=0.80,0.95
CONSOLi=0.80,0.98
CONSOLI=0.80,0.98
CONSOLT=0.80,1.00
CONSOLU=0.80,1.00
CONSOLJ=0.05,0.60
CONSOLK=0.05,0.60
CONSOLL=0.05,0.60
CONSOLM=0.05,0.60
CONSOLN=0.05,0.60
CONSOLO=0.05,0.60
CONSOLP=0.15,0.90
CONSOLQ=0.15,0.90
CONSOLV=0.05,0.60
CONSOLW=0.05,0.60
CONSOLR=0.15,0.80

Commodity group 2 uses special values, so under BuildChainxx.ctl we have:

```
-Start 1 2
COMMODITY=02
INCL=BuildChain_Special.ctl
CONSOLA=0.20,0.50
CONSOLB=0.20,0.50
CONSOLc=0.20,0.50
CONSOLC=0.20,0.50
CONSOLS=0.30,0.70
CONSOLX=0.30,0.70
CONSOLd=0.80,0.98
CONSOLD=0.80,0.98
CONSOLE=0.80,0.98
CONSOLF=0.80,0.98
CONSOLf=0.80,0.98
CONSOLG=0.80,0.98
CONSOLh=0.80,0.98
CONSOLH=0.80,0.98
CONSOLi=0.80,0.98
CONSOLI=0.80,0.98
CONSOLT=0.80,1.00
CONSOLU=0.80,1.00
CONSOLJ=0.05,0.60
CONSOLK=0.05,0.60
CONSOLL=0.05,0.60
CONSOLM=0.05,0.60
CONSOLN=0.05,0.60
CONSOLO=0.05,0.60
CONSOLP=0.15,0.90
CONSOLQ=0.15,0.90
CONSOLV=0.05,0.60
CONSOLW=0.05,0.60
CONSOLR=0.15,0.80
```

And BuildChain_Special.ctl misses section with lower and upper bound:



6.4. Control files revision for ASEK calculation

In the current implementation (v1.2.3) the ASEK calculation requires to rerun LP2CC.exe (last step for RCM) with the original set of costs and parameters (saved under Logmod\Input_CBA) and a different INTEREST and STUFF values. Instead of recreating the control parameters (CTL) for ChainChoi, the control setup has changed in the following manner:

- In ChainChoi_Common.ctl a new control parameter ASEK=..\Input_CBA will redirect the reading of the input data from Input folder to Input_CBA folder (e.g. the control file will contain always Input folder, in CBA analysis the folder name will be replaced by ASEK name)
- A second control parameter is OTHERCOST=..\Input\COST\OtherCostMatters.txt that points to the file that contains INTEREST and STUFF values
- A new file resides under LOGMOD\INPUT\COST\OtherCostMatters.txt and LOGMOD\INPUT_CBA\COST\OtherCostMatters.txt respectively. The first with values for Standard Logistic Module and RCM, the second for the specific calculation of CBA.

6.5. Maximum Speed on Road Mode

The speed limits for road vehicles can be specified in the MAX_SPEED attribute under Input_Data.mdb\Vehicles_parameters_PartA_{ScenarioName}. 116 km/h is the defined speed limit as it has been identified as the maximum speed in current network.

In Table 153 the maximum of Speed_1 (vehicle 101) and Speed_2 (vehicles 102 to 106) from the current network is shown, grouping by Modestr. As can be seen, road modes c, a, b and B have the maximum speed 116 km/h in Speed_1 and 110 km/h in Speed_2.

Table 153 - Maximum speed in current network

SPEED_1	SPEED_2	MODESTR
90	0	x
50	50	xabBc
116	95	xabc
110	110	xac
76	0	xd
40	0	xdfFhitDIH
50	0	xdfFhitu
50	0	xdfFhituDIH
75	0	xdfh
112	0	xdfhi
91	0	xdFhit
64	0	xdFhitu
96	0	xdFht
50	0	xdh
122	0	xdhi
91	0	xdhit
64	0	xdhitu
55	0	xfFh
94	0	xfh
81	0	xFhi
85	0	xFhit
92	0	xh
121	0	xhi
40	0	xhitu
49	0	xhtu
40	0	xp
25	0	xpq
600	0	xr
12	0	xy
12	0	xyz

The MAX_SPEED has been included in the input table as a new attribute and the implementation of constraints in maximum speed within the road assignment under Samgods model assignment and RCM assignment.

6.6. Capacity constraints on sea mode

There are two different mechanisms in place for the sea mode to limit the usage of some services and ports:

A. Constraints applied at network level (e.g. by link level, as for the Kiel Canal example, see Figure 4). This are managed at the BuildChain step and applies only to the type vehicle. Should a too large vehicle be used as type vehicle, any path using the link cannot be used. As described below this is managed by removing links with too low capacity before running the LOS-calculations for the type vehicle.

B. Constraints applied in the evaluation of alternatives during ChainChoi process (as per the Vänern Lake). When evaluated at the ChainChoi-level the generated alternatives may be generated with a too large vehicle, but at this level only the vehicles small enough will be allowed. As described below this is managed by using a port capacity limit in lake Vänern for the allowed vessel capacity in the Vänern ports (otherwise the paths would have to be scrutinized after the LOS-calculations which is possible but not efficient).

In the following two paragraphs will be discuss their implementation in the model.

6.6.1. Capacity constrains in Kiel Canal

To apply capacity constraints on network level different actions have been performed:

- provided the information of which Dwell Capacity is allowed in Kiel Canal
- compared the capacity of the vessel type with the allowed capacity in the Kiel Canal
- removed the Kiel Canal as available link when skimming the LOS matrices for sea

The first point required a modification on the input network:

- Modified for the links 551679-550658 and 550658-551679 the mode attribute allowing all the vessel types ("xyzpq")

Coded in UL3 field the maximum dwell capacity of 20.000 tonnes.

Figure 4 - The Kiel canal link.

The second and third point has required a change in the scripting related the network handling and LOS calculation:

1. when setting up the network attributes (Network step 6 under LOS Calculation > Sea application). The vessel capacity from vehicle parameter table (red file in the picture) is read via a Lookup command:

```
LOOKUP LOOKUPI=1 NAME=SEA_COST,
 LOOKUP[1]=VEH_NR, RESULT=KM_COST, ; KM_COST (distance cost in SEK)
 LOOKUP[2]=VEH_NR, RESULT=HOURS_COST, ; HOURS_COST (Vot in SEK)
 LOOKUP[3]=VEH_NR, RESULT=SPEED,  ; Speed for vehicles classes 1-17
 LOOKUP[4]=VEH_NR, RESULT=CAPACITY ;capacity for vessel - to compare with UL3
```

The capacity per each vehicle type (denoted as @MATRIX.N_VEHICLES@) is compared in the script with the capacity coded in the network (LI.1.UL3). If the vessel capacity is greater than the link capacity, the link is marked with a new attribute CLOSED=1:

```
IF(LI.1.UL3<SEA_COST(4,@MATRIX.N_VEHICLES@)&&LI.1.UL3<>0);comparison between vessel capacity and canal capacity coded in UL3
CLOSED=1
ENDIF
```

2. During the LOS calculation (Highway step 7 under LOS Calculation > Sea application)

The information of which links must be closed has recorded in the network attribute CLOSED=1 previously generated in the Network program. Using an IF statement, all the links marked as closed are added to GROUP=1. GROUP is an array available inside the HIGHWAY program to mark group of links and used for different purposes, in this case to exclude those links from the path calculation.

```
IF(LI.CLOSED=1) ADDTOGROUP=1
```

In the phase ILOOP, when generating the paths, the keyword EXCLUDEGROUP filter the available links excluding those on group 1.

```
PATHLOAD PATH=LW.SEA@MATRIX.N_VEHICLES@,
  MW[1]=PATHTRACE(LI.UL2),
  MW[2]=PATHTRACE(LI.To_SEA@MATRIX.N_VEHICLES@),
  MW[3]=PATHTRACE(LW.SEA@MATRIX.N_VEHICLES@),
  MW[4]=PATHTRACE(LW.EXTRACOST@MATRIX.N_VEHICLES@),
  MW[5]=PATHTRACE(LW.DDIST@MATRIX.N_VEHICLES@), EXCLUDEGROUP=1
```

6.6.2. Capacity constrains in Vänern Lake

Some issues have been detected when applying the method described in the previous paragraph to Vänern Lake:

- the method limits the available choices with connectivity described in the LOS-matrices
- the LOS-matrices are fully applied in ChainChoi procedure for all vehicles. In the BuildChain procedure only the "typical" vessel is applied
- if there are no paths built for the "typical" vessel, no solution would be available for the evaluation
- for the Kiel Canal that has not represented a problem since there is an alternative path not using the canal, but for Vänern Lake there is only one path in and out from Vänern. Since the appointed "typical" vessel does not comply with the capacity limits there is not any available connection, and therefore the chain is not constructed. Consequently, ChainChoi cannot at the succeeding stage select an appropriate vessel for the OD-leg through Vänern canal.

The solution applied is therefore the following:

- in the BuildChain stage the values for MaxDwtContainerVessel(Tonnes), MaxDwtRoroVessel(Tonnes) and MaxDwtOtherVessel(Tonnes) are unconstrained (e.g. 9999999)
- in the ChainChain stage the values for MaxDwtContainerVessel(Tonnes), MaxDwtRoroVessel(Tonnes) and MaxDwtOtherVessel(Tonnes) are specified as 4001 tons (limit for ports in the lake).

The solution has required:

- changes in input data (Nodes_Base2019) table adding the VanernCan attribute (with ton limits for each port in port area 14)
- A new set of attributes under nodes.txt table is used in ChainChoi CC_MAXDWTCONV, CC_MAXDWTRORV and CC_MAXDWTOTHV with values present under VanernCan
- When running BuildChain it will be used MAXDWTCONV, MAXDWTRORV and MAXDWTOTHV values
- When running ChainChoi it will be used CC_MAXDWTCONV, CC_MAXDWTRORV and CC_MAXDWTOTHV values

6.7. Rail Capacity Management procedure

For a detailed description of Rail Capacity Management procedure see reference 4 Here, we will describe the implementation in the Cube Interface, and the flow chart of information in each step of the procedure.

As a general concept the RCM procedure is an iterative process that:

- starts from the results obtained from the Standard Logistics Module
- uses some extra input files placed under LogMod\RCM folder

- sets up a linear programming problem that will generate viable alternative solutions in each iteration (compared to the best solution from standard logistics module). Should not any new alternative solutions be generated we are at the optimum!
- produces a new set of output files in terms ChainChoiNN_01LPX.out solutions to set up new OD matrices for empties and loaded vehicles
- the number of iterations is controlled by the user (setting up the related catalog key "Maximum number of loops for Linear Programming process (LP)")

All the steps could be summarized in Figure 5.

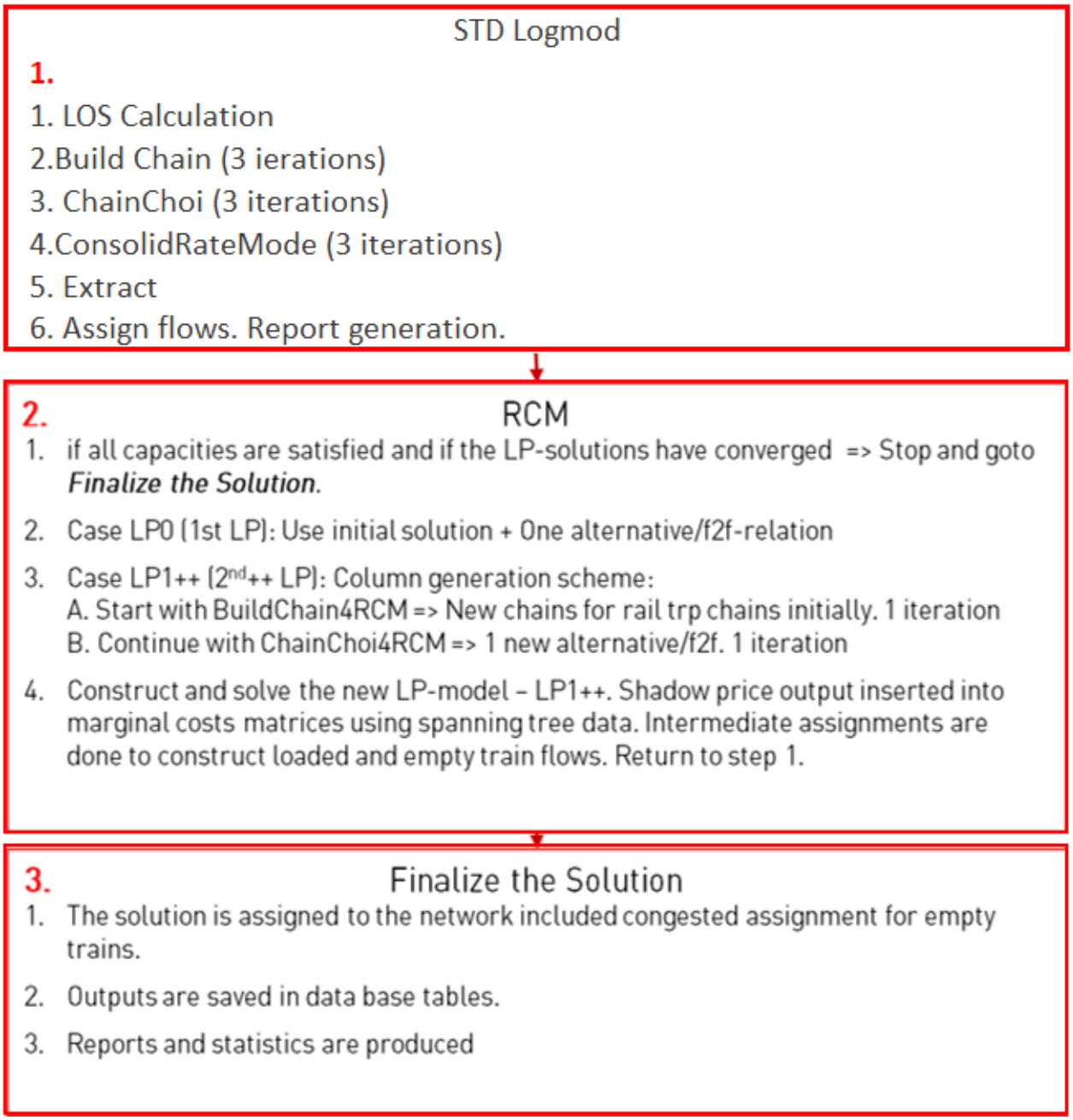


Figure 5 - Flow chart of the logistics model and RCM.

6.7.1. LP0 step

LP0 steps corresponds to point 2.2. in Figure 5. This process invokes four different steps with the following purposes:

- Step 1: all the results from the Standard Logistics Module, including spanning tree data for the railway paths to allow for link load calculations, are merged together in some extra input files for construction of the standardized MPS-formatted file LP_Rail_LP0.MPS. This is the file with all the variables and equations in the linear programming problem with the proper format for LP_Solve.exe program. The MPS.jar program is called from Cube with its control file mps_LP.ctl that contains all the input and output files (locations and names), and control parameters in the related batch file (JCMW). We refer to the documentation of the Java-program mps.jar for further details, please see reference 1.
- Step 2: the external linear program solver software is called to solve the LP problem and produces the LP_Rail_LP0.out file
- Step 3: reads the LP_Rail_Lp0.out files and extract information about marginal costs for active capacity constraints. These are summarized into marginal costs per railway path using the spanning tree data and placed into marginal cost matrices (Vxxx_MC.314). ChainChoi solutions are assembled from the LP-solution and placed into approximate firm-to-firm solution files (ChainChoiNN_02LPX.out). f2f-solutions split into two or more alternatives are split exactly according to the LP-solution, without a detailed recalculation of the costs.
- Step 4: From the ChainChoiNN_02LPX.out files the extract procedure is used to estimate a new set of OD matrices for empties and loaded trains (also for tonnes but that is not needed) for all the train types.

In Figure 6 the file naming and flow chart representing the process is shown.

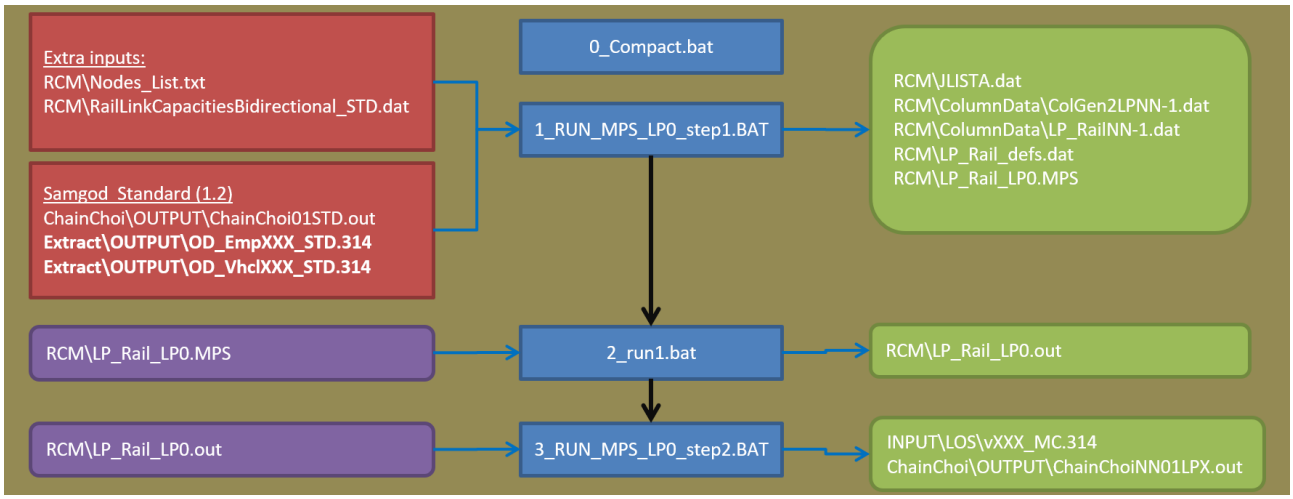


Figure 6 - LP0 process: input and output data and processes involved, where XXX is vehicle number 3 digit format and NN is the commodity group number.

The requested input data, apart from the ones produced by the Standard Logistics Module, is produced in different steps of the Samgods application:

1. PathTreeRail.txt: this file contains spanning tree data (reference 4 (Appendix C) for details on the structure) that represents all the possible paths from each origin to each destination present in the rail network. This is produced during the LOS calculation for Rail under Samgods Model > LOS Calculation > Rail application in Highway steps #6 and #9. This is not a standard output for Voyager software since it is a customization required by Trafikverket. The instructions for the proper installation are given in the User Manual. First batch file 0_Compact.bat transform spanning tree data to compact format (extension cmp).
2. Nodes_List.txt and Links_List.txt: List of nodes and links in the network both with emme and voyager number systems and primary key (Internal_node_number) per each element. They are produced under Samgods Model > LOS Calculation > Data Preparation > Data for RCM at steps #2 and #3. These are necessary because the backtracking of the paths utilize the mapping between these two sets of nodes and links, respectively.

3. RailLinkCapacitiesBidirectional_STD.dat: this is the translation in String format (ascii) of the Rail_Capacity_{SCENARIO_SHORTNAME} table for the specific scenario. The file is produced under Samgods Model > LOS Calculation > Data Preparation > Data for RCM at steps #4.

The output files from the process are presented in Table 154.

Table 154 - Output files from LP0, where XXX is vehicle type 3 digit format.

Output file	Description
RCM\JLISTA.dat	List of transport chain solutions from all the commodity groups and definition of super index, e.g. a primary key for each solution. This primary key will be referred to in the MPS file
RCM\ColumnData\ColGen2LPNN-1.dat	Intermediate file
RCM\ColumnData\LP_RailNN.dat	Intermediate file
RCM\LP_Rail_defs.dat	Computed data for the constraints in the Linear programming problem
RCM\LP_Rail_LP0.MPS	Linear Programming problem in MPS format that will be solved by LP_Solve.exe program
RCM\LP_Rail_LP0.out	Results of linear programming problem solution in LP_Solve.exe format
INPUT\LOS\vXXX_MC.314	Marginal cost matrices for V201, V202, ..V212 (only rail mode).
ChainChoi\OUTPUT\ChainChoiNN01LPX.out	Transport chain solutions produced

6.7.2. LP1 step

LP1 steps corresponds to point 2.3 in Figure 5. This process invokes the same four steps as LP0 but with two extra steps as shown in Figure 7:

- Step 1: run BuildChain.exe and ChainChoi.exe programs (Column generation model). These are special runs of the logistics modules BuildChain and ChainChoi that only operates on the transport relations defined in JLISTA.dat (the ones initially using railway). They are used for computing a new first best solution given the updated marginal costs. The modules are run with the same conditions as in iteration 3 of Standard Logistics Module in which a large number of endogenously generated input data, such as consolidation factors and volumes, are left unchanged.
- Step 2, 3, 4 and 5: same steps 1, 2, 3 of LP0

Step 5: convergence check to establish if the process should be iterated further or can be stopped. The number of iterations is controlled by “Maximum number of loops for Linear Programming process (LP)". The output files from the process can be seen in Table 155.

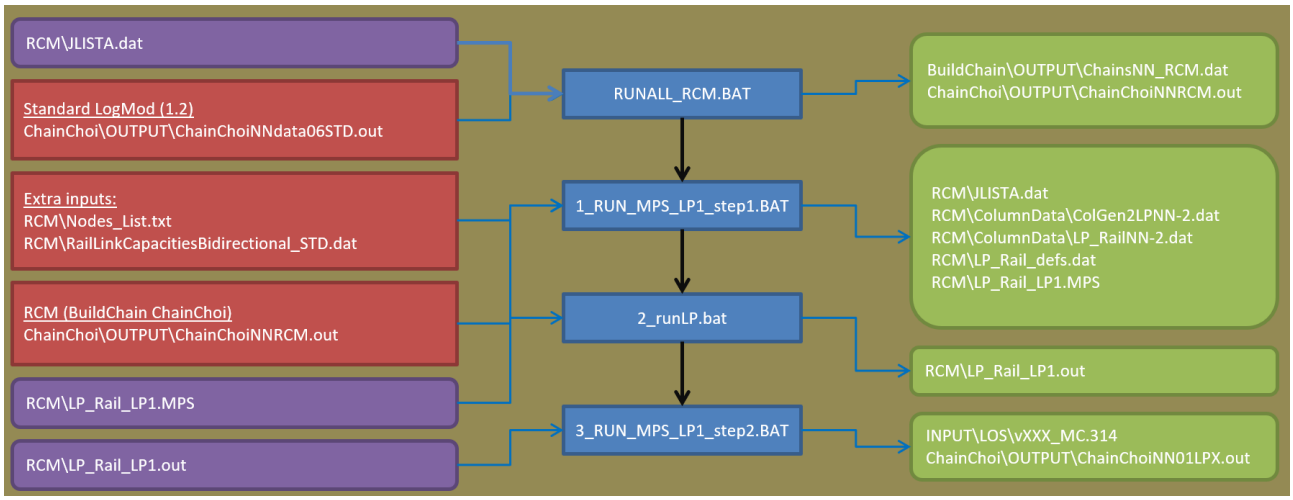


Figure 7 - LP1 process: input and output data and processes involved.

Table 155 - Output files from LP1, where XXX is the vehicle type 3 digit format and NN is the commodity group number.

Output file	**Description**
ChainChoi\OUTPUT\ChainChoiNNRCM.out	Transport chains in column generator process
RCM\ColumnData\ColGen2LPNN-2.dat	Intermediate file
RCM\ColumnData\LP_RailNN-2.dat	Intermediate file
RCM\LP_Rail_LP1.MPS	Linear Programming problem in MPS format that will be solved by LP_Solve.exe program
RCM\LP_Rail_LP1.out	Results of linear programming problem solution in LP_Solve.exe format
INPUT\LOS\vXXX_MC.314 (over-writing previous files)	Marginal cost matrices for V201, V202, .V212 (only rail mode).
ChainChoi\OUTPUT\ChainChoiNN01LPX.out (over-writing previous files)	Transport chain solutions produced

6.7.3. Final process (FIN)

The final results of Rail Capacity Management saved in ChainChoiNNLPX.out files are read and rewritten to the final solution files ChainChoiNNXTD.out, where NN is commodity group number, shown in Figure 8. In theory only the split solutions from the LP model should be modified in this process, but marginal changes in transport costs and total costs occur in many places. The output files from the process are presented in Table 156.

Figure 8 - Final process: input and output data and processes involved.

Table 156 - Output files from FIN process.

Output file	Description
ChainChoi\OUTPUT\ChainChoiNNXTD.out	Final transport chain solutions with STD Logmod format
ChainChoi\OUTPUT\ChainChoiNNXTD.fac	Aggregate report on load factors for commodity NN
ChainChoi\OUTPUT\ChainChoiNNXTD.rep	Aggregate report on costs, tonne volumes, transport statistics etc. for commodity NN
ChainChoi\OUTPUT\ChainChoiNNXTD.cst	detailed cost log for commodity NN for selected cases

6.8. Rail Assignment

6.8.1. Capacity constraints

In current implementation the process is not used since optimization lead in LP0 and 1 do not require any further balancing. It is kept here for reference.

To distribute empty trains according to an assignment including options to distribute the empty train routes while considering generalized time, marginal cost and on top of that capacity constraints the following assignment model has been coded in Highway assignment:

$$\boldsymbol{min} \sum_{\boldsymbol{train\ types}} \sum_{\boldsymbol{links}} (\boldsymbol{regular\ costs}) * (\boldsymbol{empty\ trains\ flows}) + \sum_{\boldsymbol{capacities}} \boldsymbol{Penalty}(\boldsymbol{overload}) \quad (5.1)$$

where:

- Penalty(overload): an optional function for penalizing loading above capacity
- Costs: costs specified in vehicle parameters and network (operational costs, taxes, tolls and extra costs)
- Overload: total bidirectional trains minus bidirectional capacity

The penalty function used in the equation (5.1) is:

$$\boldsymbol{Penalty}(\boldsymbol{overload}) = \mathbf{10000} \times \left(\boldsymbol{max}\left[\mathbf{0}, \left(\sum_{\boldsymbol{traintypes}} \sum_{\boldsymbol{directions}} (\boldsymbol{empty\ and\ loaded\ train\ flows}) - \boldsymbol{capacity}\right]\right)^2 (5.2)$$

The Assignment method described above is formulated as system optimization instead of user equilibrium. The first formulation is not applicable in Voyager scripting; therefore the optimal solution has been reformulated as:

INTEGRAL(0,Q) t(q)dq = $[T(q)]_0^Q$ = T(Q) – T(0) = T(Q).

where:

- t(q) = vd-function

- T(q) = the primitive function of the vd-function

Thus, by using as vd-function the derivative of the penalty function:

$$\boldsymbol{Vdf(overload) = 2 \times 10000 \times \left(max\left[0, \left(\sum_{traintypes}\sum_{directions}(empty\ and\ loaded\ train\ flows) - Capacity\right]\right)\right.}$$

(5.3)

and integrating over flows from 0 to Q (=all flows on the link), we obtain an objective value equal to the system optimal value for the penalty function term.

The proposed assignment method has been implemented in the highway program via the following steps:

- the bidirectional volumes for each rail link with capacity are stored in one array where the dimension is the ID_LINK from capacity table
- in the adjust procedure, when the times are corrected based on the vdf functions, two functions are applied:
- for all rail links that have no capacity (e.g. 0) the fix time derived from vehicle parameters is applied
- for all rail links with specified capacity, the bidirectional flows stored in the array are retrieved and compared to the capacity, if overcapacity the vdf function specified in (5.3) is applied
- the volumes are averaged along the iterations using the MSA algorithm (CONVERGENCE=AVE).

6.8.2. Domestic flows allowed only on domestic links

In current implementation the process is not used since revision of network has made redundant this feature. To avoid unrealistic routes for domestic flows (e.g. where the origin and destination are inside Sweden and foreign railway links are used for empty flows) a designated procedure has been put in place. The procedure works in the following manner:

- a dummy matrix containing information if an OD is domestic or not is used to filter the demand matrix
- two different classes (domestic flows and all the others) are provided to the assignment
- in the LINKREAD phase (when all the variables for the assignment are specified) an IF statement is used to add to group 10 all the non-domestic links (similar technique used also in Kiel Canal)
- in the ILOOP phase (when all the possible paths are constructed) two different sets of paths are produced:
- the first set has the input matrix containing only the domestic flows and the links on group 10 are excluded (using EXCLUDEGROUP=10) statement in PATHLOAD commend
- the second set uses the matrix with all the other flows and all the links are open in the network (no EXCLUDEGROUP is coded for 10).

6.9. Other Calibration procedures

6.9.1. Forbidden over-seas ship transports to domestic small ports

In current implementation the process is not used since revision of network has made redundant this feature. It is included as potential tool.

To prevent over-seas transport to enter selected small ports in Sweden in the LOS matrices the combination of OD from/to transoceanic ports is entered with a high impedance.

The following changes have been made in the model:

- The table "PortNodes" has been updated with a new field: TransOceanFac. Ports having the value equals 10 are small ports in Sweden (74 ports)

- In the Sea application, under LOS calculation, Adding logic has been inserted in step 3 of the MATRIX procedure. Its function is to read the PortNodes table to identify small ports and to read the Transoceanic factor. Furthermore, it sets a dummy matrix with scaling factors that will be applied in the next Highway step. The details of calculation are:

```
TransOceanL='1075-1099' ;range of zones that represent the transoceanic ports
JLOOP
OrigZone=Renumber(1,I) ; origin zone number in emme format
DestZone=Renumber(1,J) ; destination zone number in emme format
OrigFactor=TransOceanic(1,OrigZone) ; origin factor from port definition table (-1 means is not a port)
DestFactor=TransOceanic(1,DestZone) ; destination factor from port definition table (-1 means is not a port)


;not transoceanic
IF((INLIST(I,TransOceanL)=0)&&(INLIST(J,TransOceanL)=0)) ;if both the ports are domestic no factors are applied
MW[1]=1 ;no factor
ENDIF


IF((INLIST(I,TransOceanL)=1)||(INLIST(J,TransOceanL)=1)) ;if one of them is transoceanic the final factor is the multiplication of factor in origin and factor in destination
MW[1]=(1+OrigFactor)*(1+DestFactor)
ENDIF
ENDJLOOP
```

- In the Sea application, under LOS calculation, the HIGHWAY step 7 reads the dummy matrix produced with the previous step and applies the factor to the TIME skim:

```
MW[200]=MI.1.1 ;LOS factor
MW[2]=MW[2]*MW[200] ;apply los factor
```

6.9.2. Rescaling factors for LOS matrices in sea mode

The rescaling factors are produced by the cycling process and they are used to rescale the TIME skims applying a factor that varies per port area and commodity group.

Their implementation and calibration have required several steps in various parts of the model. They are:

- a revision of Nodes table including information of PORTAREANR
- a revision of nodes.txt file including information of PORTAREANR
- a new routine in BuildChain.exe and Chainchoi.exe that reads the scaling factors and holds in memory the rescaled values for the following LOS matrices:
- V301_timeh.314, …, V322_timeh.314 LOS
- The time value is rescaled for each OD applying the combined factor from port area in origin and destination and commodity group. An example is shown in Table 157.

- the program uses the input Table CalibrationParameters placed under Input\Calibration\Input_data_calibration_{Scenario}.mdb.
- Under the Parameters Calculation application the scaling factors are re-estimated by comparing the port statistics per port area and commodity group with model values. The values are adjusted based on the results. The function applied is as follow:

If (Abs(Diff) < 100) Then ; if the difference between modelled and statistics is less than 100 tons (DIFMAX)

Adjust = factor ; the previous value is maintained

End if

If (Diff < 0) Then ; if the difference is a negative value it means we have to reduce the factor (that is an impedance)

Adjust = factor - 0.05 ; new factor = previous factor -0.05 (STEP)

If (Adjust < 0.01) Then ; if the adjust factor is less than 0.01 (MINVAL)

Adjust = 0.05 ; is set to a minimum value 0.05 (VAL0)

End If

Else ; if the difference is a positive value it means we have to increase the factor (that is an impedance)

Adjust = factor + 0.05 ; new factor = previous factor+0.05 (STEP)

End If

End If

- The parameters that control the process are:
- DIFMAX: maximum difference between modelled and statistics (100 means 100 tons)
- STEP: the value that will use to increase the factor
- MINVAL: boundary value to evaluate small or negative factors. if Adjust <= MINVAL then Adjust = VAL0
- VAL0: reset value used if the function goes negative
- All of them could be revised modifying the table Parameters_portcalibration.dbf, see Table 158.
- The statistic used for the comparison is {CATALOG_DIR}\05_Input_Data\Input_Data.mdb\Port_statistics

Table 157 - Example on rescaling calculation for LOS sea mode.

Orig	Dest	TIMEH	Origin weighting factor (Commodity group 1)	Destination weighting factor (Commodity group 1)	Final value	Final TIMEH
718021	718121	10.067336	1.1	1.1	1.21 (1.1*1.1)	12.18148
718021	718221	0.637215	1.1	1.1	1.21	0.77103
718021	718821	9.59218	1.1	1.1	1.21	11.60654
718021	719221	7.884646	1.1	1.1	1.21	9.540422
718021	730521	12.73721	1.1	1	1.1	14.01093
718021	731921	11.457068	1.1	1	1.1	12.60277
718021	738221	9.061406	1.1	1	1.1	9.967547
718021	738222	9.066202	1.1	1	1.1	9.972822

Table 158 - Parameter to control the revision of scaling factors.

ID	STEP	MINVAL	DIFMAX	VAL0
1	0.02	0.01	100	0.02

The set of matrices per commodity group are provided to the Logistics Module and Rail Capacity Management procedure specifying a different LOS folder in the BuildChainXX.ctl and ChainChoi.ctl control files, an example for commodity 01 could look like:

```
INCL=buildchain_common.ctl
COMMODITY=01
VHCL=..\Input\Cost\vhcls_dry_bulk.txt
LOSDIR=..\Input\LOS\S01
PWC={CATALOG_DIR}_150307\01_Programs\LogMod\Input\PWC\2030\PWC_01.txt
```

6.9.3. Rescaling factor for Kiel Canal

A similar procedure to the one described in section 6.9.2 has been applied to toll on Kiel Canal.

Its implementation has been developed as follow:

- An initial scaling factor is provided using the table “KielCanal_Parameter_Base2019” under Input_data_Calibration_Base2019.mdb. The table can be selected in each scenario using the catalog key " Starting value for scaling factor on Kiel canal"
- Under "LOS calculation > Data preparation" the application Network step 17 takes this value and rescale the TOLL value for each vessel type:

```
TOLL301=LI.1.TOLL301*parKiel(1,@LOOP_CAL@)
TOLL302=LI.1.TOLL302*parKiel(1,@LOOP_CAL@)
TOLL303=LI.1.TOLL303*parKiel(1,@LOOP_CAL@)
TOLL304=LI.1.TOLL304*parKiel(1,@LOOP_CAL@)
TOLL305=LI.1.TOLL305*parKiel(1,@LOOP_CAL@)
```

where @LOOP_CAL@ represent the variable representing the current loop.

- A new set of output LOS matrices has produced rerunning the LOS calculation for Sea Mode
- Those matrices are subsequently rescaled for the scaling factors per port area and commodity group
- Under Parameters Calculation application the scaling factor is re-estimated comparing the distribution of flows between Kiel Canal and North of Jylland (here is compared the percentage of the tons through Kiel Canal against those going north of Jylland) from the model results and statistics (present in {CATALOG_DIR}\05_Input_Data\Input_Data.mdb\Other_statistics table). The function applied is as follow:

```
If (Abs(Diff) < 100) Then ; if the difference between modelled and statistics is less than 100 tons (DIFMAX)
 Adjust = factor    ; the previous value is maintained
endif
 If (Diff < 0) Then   ; if the difference is a negative value it means we have to reduce the factor (that is an impedance)
  Adjust = factor - 0.05 ; new factor = previous factor -0.05 (STEP)
  If (Adjust < 0.01) Then  ; if the adjust factor is less than 0.01 (MINVAL)
```

Adjust = 0.05 ; is set to a minimum value 0.05 (VALO)

End If

Else ; if the difference is a positive value it means we have to increase the factor (that is an impedance)

Adjust = factor + 0.05 ; new factor = previous factor+0.05 (STEP)

End If

End If

- The parameters that control the process are:
- DIFMAX: maximum difference between modelled and statistics (2 means 2%)
- STEP: the value that will use to increase the factor
- MINVAL: cut off value to evaluate small or negative factors
- VALO: reset value used if the function goes negative
- All of them could be revised modifying the table Parameters_kielcalibration.dbf, see Table 158.
- The statistic used for the comparison is {CATALOG_DIR}\05_Input_Data\Input_Data.mdb\Other_statistics table

6.10. Samgods Parallelization Module

The purpose of the Samgods Parallelization Module is to speed up the execution process by using parallelization. This is done by splitting up the workload of two or several independent program calls from running on one processor in a sequence to run on several processors in parallel.

Initially the module sorts the workload of program execution steps from the longest runtime to the shortest, then starts executing the program steps given the priority from the sorted list. The program steps are executed in parallel until the number of simultaneous executions have reached a specified limit given by the user. Each time one program step has finished, the module tries to run the next program step on the list. In the end of the process the module returns after having checked that all steps in the original program call sequence did finish.

The input to the program is three input files with fixed file names:

- “execution_times.txt",
- "runall.bat"
- "NR_OF_PROGRAM_INSTANCES.TXT”.

The file name runall.bat may be altered and overrun with the first expression in the parameter list of the module.

6.10.1. The input files

- “execution_times.txt”: This file gives the information the module needs to sort list of execution steps. The input in this file has two pieces of information per row. One is a reference to the program call to be run and the other one is the estimated runtime for that program to finish. Semicolon is used as a delimiter.
- “runall.bat”: This file contains the sequence of program calls to be executed. The parallelization module interprets two keywords namely call and rem. If the line starts with call the module reads the line and if the line starts with rem the module jumps to the next line. After the word call the name to the file to be called by the OS is found and lastly the parameter passed to the file to be called (this is the reference number to the execution times mentioned above.) It may look something like this: “call commodity 10”.

- “nr_of_program_instances.txt”: This file contains one number that tells the module how many program steps that could be ran simultaneously. It is good practice to set this number to less or equal the number of processors available for execution on the CPU or Server used. (One limiting factor may also be the available memory.)

6.10.2. Controlling the execution

After having read the input files and sorted the list of program steps, the module writes a batch file for all steps that are associated with a corresponding stop file. Each batch file contains the call that where originally found in “runall.bat”. The last line in each batch file has a command to delete the corresponding stop file. For the module to know that a particular program step has finished, frequently checks are made if the associated stop file still exist or not. If it does not, the module tries to run the next program execution step on the list. If there are no steps left to run and there are no stop files left, the execution finishes and returns.

7 Programs and licenses required

7.1. Programs

7.1.1. Cube software

For the Samgods GUI to function, certain Cube software is required. They are:

- Cube Base: 6.5.1
- Cube Voyager: 6.5.1
- Cube GIS: ArcGIS 10.8

This software is available at

- CUBE Announcements - CUBE CE (v6.5.1) Now Available - Communities

7.1.2. JAVA software

- Java runtime environment (jre). Java 8 (later program versions are also possible to use)
- Java virtual machine Windows x64

Location for the above programs:

- http://www.java.com/sv/download/ or http://download.oracle.com/otn-pub/java/jdk/7/jre-7-windows-x64.exe
- http://www.oracle.com/technetwork/java/javase/downloads/java-se-jre-7-download-432255.html

7.1.3. LP solver software

The linear program solver is an external program. Currently the solver is CLP. It is a 64-bit version of the linear programming optimizer built in June 2018 with C++ in Microsoft Development Studio. For more information, please consult https://projects.coin-or.org/Clp. Microsoft Visual C++ Redistributable for Visual Studio software might be required. The 64 bit version is required since tests with the 32-bit version of CLP resulted in failures for larger problems (recoding of CLP could have solved the problem).

7.1.4. Licence requirements

- Cube software

For the above Cube software, license for CUBE 6.5.1 CONNECT Edition (CE) is required.

- JAVA software

No licences are required.

- CLP64

Eclipse Public License (EPL). No licences are required.

8 References

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