
# RAILWAY

TECHNICAL REPORT

# Instructions

*The model consists of three segmented railway entities and a consolidated portion. The segments presented in the model are "Freight", "Passenger" and "Infrastructure". The consolidated portion includes the amounts from all active segments as well as any further headquarters assumptions.*

*Separate assumptions exist for each railway segment. When defining the scope of the model, assumptions can be entered for each individual segment model depending on the user's need. Network and operational assumptions can be entered for any of the three relevant segments, while headquarter assumptions can be entered under "Consolidated". Any other assumptions such as fixed assets and debt can be inputted for each segment, which will be merged within the "Consolidated" tab.*

*Merging of the various segment models can be controlled from the Consolidate section under Part 1 of the "Consolidated" tab. Any segments that do not exist or are to be excluded for a particular company can be controlled from here.*

## Notes

*[x] refers to the index numbers used to reference a particular cell (see Index in the Appendix). For Example, [28] refers to the Libor rate for each period of the active model. This is not the row number; it is strictly an index number.*

*The first [512] Index Numbers apply to any the three segment models of "Freight", "Passenger" and "Infrastructure". Index Numbers [512] to [643] refer to the different sections and formulas from the "Consolidated" section. The Index Numbers follow a top down approach with respect to the model. Some Index Numbers have multiple columns or rows within them that are distinguished by "Row/Column x" within the Index.*

*Some of the explanations contain a "sample formula". This is only to be used as a guide to follow along when reading the "translation" of the formula from Excel code to plain English. The specific cells that are referenced in the formula may have been adjusted since the creation of this report and therefore may be different from what is present in the current version of the model*

*Some titles of the Index Numbers may be changed based on the units or type of data (internal or external) selected in the model. For example some may be listed as Net Tons but can be changed to Tons based on an earlier input.*

*Formulas in the model after index [23] containing "IF [16] Period To is blank" will have the clause disregarded in the explanations to avoid redundancy. Formulas contain this so the model will only run up until the final period stated in the initial inputs.*

*Several words and operators are used interchangeably throughout the report. For example, multiply = *, divide = /, plus = + and subtract = –.*

# Part 1: Model Scope, Names, Dates and Timings

## Assumptions

*The cells here require the user's input and are located in the top left corner of Part One. There is also a section to the right of the Assumptions column that is 6 rows by 5 columns and contains words such as "Text", "Ratio", "Train", etc. These are used later in the model to construct headings and other inputs that use these common words.*

**[1] Name of Entity**

- Enter the name of the railway entity that will be used in the model

**[2] Operational Benchmark**

- Enter the benchmark that will we used to compare the entities performance on an operational basis

**[3] Type of Model**

- Dropdown menu containing "Freight", "Passenger" or "Infrastructure"
- Selects the type of model that will be run

**[4] No. Years**

- Enter the number of years the model will be set to run for

**[5] Compounding Frequency**

- Dropdown menu containing "1", "2", "4" or "12"
- Used to calculate how often compounding will be used in the model

**[6] Model Starting Date**

- Enter the date that the model will be set to start

**[7] Type of Model (Number)**

- Outputs a number based on [3] Type of Model, this is used when calculating the [198] Track Access Revenue and [199] Track Access Operating Cost
- =IF(C9=J16,1,IF(C9=J17,2,3))
    i. IF [3] Type of Model is = "Freight"
    ii. Then [7] is = 1
    iii. Otherwise IF [3] Type of Model is = "Passenger"
    iv. Then [7] is = 2
    v. Otherwise [7] is = 3
- 1 = "Freight", 2 = "Passenger" and 3 = "Infrastructure"

**[8] End of Month?**

- Formula checks if the date indicated in [6] Model Starting Date is the end of a month, which is then used in the calculation for [9] Model Ending Date and [15] Period From
- =IF(DAY(C12)>=28,1,)
    i. IF the day entered in [6] Model Starting Date is Greater Than or Equal To 28

ii. Then [8] is = 1
iii. Otherwise [8] is = 0

**[9] Model Ending Date**

- This cell finds the end date by taking the start date (+ 1 if the model started at the end of the month) and adding the total number of months in the model divided by the compound frequency. EDATE returns the result as a date for when the model will end
- =IF(C12="","",EDATE(C12+C14,C10*12/C11)-1)
  i. IF [6] Model Starting Date is empty
  ii. Then [9] is empty
  iii. Otherwise take the end date of ([6] Model Starting Date + [8] End of Month? and [4] No. Years * 12 (months per year) / [5] Compounding Frequency) - 1

**[10] Units**

- Enter the units that will be used throughout the model

**[11] Name of Home Currency**

- Enter the name of the main currency used by the company being modeled

**[12] Name of Foreign Currency 1**

- Enter the name of the first foreign currency that is used by the company, if any

**[13] Name of Foreign Currency 2**

- Enter the name of the second foreign currency used by the company, if any

# Periods

**[14] Periods**

- Number to reference the current period the model is in, which is equal to the previous value plus 1 with the first column starting at 0

**[15] Period From:**

- This row is used to determine the start date for the each period in the model
- First period:
- =IF(C12="","",C12)
  i. IF [6] Model Starting Date is blank
  ii. Then [15] is left blank
  iii. Otherwise 15 is = [7] Model Starting Date
- The formula first checks If [6] Model Starting Date has a value, if it does the first cell in the row inputs the starting date
- Later periods:
- =IF(OR($C$12="",I24=""),"",IF((EDATE(I24,12/$C$11)-$C$14-1)>=$C$15,"",(EDATE(I24,12/$C$11)-$C$14)))
  i. IF [6] Model Starting Date OR preceding [15] is blank
  ii. Then current cell [15] is blank
  iii. Otherwise IF the end date of (the preceding [15] and 12 / [5] Compounding Frequency) – [8] End of Month? – 1 is Greater Than or Equal to [9] Model Ending Date

iv. Then the current cell in [15] is blank
v. Otherwise the current cell is equal to the end date of (the preceding [15] + 12 / [5] Compounding Frequency) – [8] End of Month?

- Formula first checks if [6] Model Starting Date or the preceding cell has a value. It then checks if the preceding date plus 12 months is greater than [9] Model Ending Date which if true makes the cell blank. Otherwise it takes the proceeding date and adds 12 months in order to get the next period starting date

**[16] Period To:**

- This row is used to determine the end date for each period in the model
- First period:
- =IF(C12="","",I24-1)
  i. IF [6] Model Starting Date is blank
  ii. Then [16] is left blank
  iii. Otherwise [15] Periods From – 1
- This formula first checks if there is a value in [6] Model Starting Date and if there is, takes the first starting period in [15] Period From and subtracts 1 to get one month prior
- Later periods:
- =IF(I24="","",EDATE(H25,12/$C$11))
  i. IF current [15] Periods From is blank
  ii. Then current [16] Periods To is left blank
  iii. Otherwise take the end date of (preceding [16] Periods To and 12 / [5] Compounding Frequency)
- Formula first checks if the [15] Period From date has a value. If yes, take the preceding [16] End Period and add 12 months divided by the [5] Compounding Frequency

**[17] No. Days**

- Row counts the number of days in each period between [15] Period From and [16] Period To
- =IF(I24="","",I25-I24+1)
  i. IF [15] Periods From is blank
  ii. Then [17] is left blank
  iii. Otherwise [16] Period To – [15] Period From + 1
- This formula subtracts the date in [16] Period To with the date in [15] Period From and adds 1 to get the number of days for that period in the model

**[18] Model Period Starts Here:**

- Row outputs a true or false value based on whether or not the model starts in that column
- =IF(I$25="","",AND($C$12>=I$24,$C$12<=I$25))
  i. IF [16] Period To is blank
  ii. Then [18] is blank
  iii. Otherwise IF [6] Model Starting Date is Greater Than or Equal To [15] Period From AND [6] Model Starting Date is Less Than or Equal to [16] Period To
  iv. Then [18] is = True
  v. Otherwise [18] is = False

**[19] Model Periods Started:**

- Row outputs a true or false value based on whether the periods of the model have started
- First period:
- =IF(H$25="","",AND($C$12>=H$24,$C$12<=H$25))
    i. IF [16] Period To is blank
    ii. Then [19] is blank
    iii. Otherwise IF [6] Model Starting Date is Greater Than or Equal To [15] Period From AND [6] Model Starting Date is Less Than or Equal to [16] Period To
    iv. Then [19] is = True
    v. Otherwise [19] is = False
- Later periods:
- =IF(I25="","",OR(H28,I27))
    i. IF [16] Period To is blank
    ii. Then [19] is blank
    iii. Otherwise IF preceding [19] OR [18] Model Period Starts Here is = True
    iv. Then [19] is = True
    v. Otherwise [19] is = False

**[20] Model Period Ends Here:**

- Row outputs a true or false value based on whether or not the periods of the model end in that column
- =IF(I$25="","",AND($C$15>=I$24,$C$15<=I$25))
    i. IF [16] Period To is blank
    ii. Then [20] is blank
    iii. Otherwise IF [9] Model Ending Date is Greater Than or Equal To [15] Period From AND [6] Model Starting Date is Less Than or Equal to [16] Period To
    iv. Then [20] is = True
    v. Otherwise [20] is = False

**[21] Model Period Ended:**

- Row outputs a true or false value based on whether the periods of the model have ended
- First period:
- =IF(H$25="","",AND($C$15>=H$24,$C$15<=H$25))
    i. IF [16] Period To is blank
    ii. Then [19] is blank
    iii. Otherwise IF [9] Model Ending Date is Greater Than or Equal To [15] Period From AND [6] Model Starting Date is Less Than or Equal to [16] Period To
    iv. Then [21] is = True
    v. Otherwise [21] is = False
- Later periods:
- =IF(I25="","",OR(H30,H29))
    i. IF [16] Period To is blank
    ii. Then [21] is blank

iii. Otherwise IF preceding [21] Model Periods Ended OR [20] Model Period Ends Here is = True
iv. Then [21] is = True
v. Otherwise [21] is = False

**[22] Active Integrated Model Period:**

- Row outputs a "1" or "0" based on whether the current period is part of the active integrated model
- =IF(I25="","",IF(AND(I28=TRUE,I30=FALSE),1,0))
  i. IF [16] Period To is blank
  ii. Then [22] is blank
  iii. Otherwise IF [19] Model Period Started is = True AND [21] Model Period Ended is = False
  iv. Then [22] is = 1
  v. Otherwise [22] is = 0

# Part 2: Macroeconomic Assumptions

## Indexes

## Inflation

**[23] Inflation Index %**

- Calculates the inflation rate for every period in the model
- First cell in the row is an input for the opening rate of inflation
- Later periods:
- =IF(I$25="","",$H$40+I41)
  i. IF [16] Period To is blank
  ii. Then [23] is left bank
  iii. Otherwise [23] is = the preceding inflation in [23] + [24] Inflation Adjustment
- This formula first checks if [16] Period To is blank; if true then [23] Inflation Index is blank, otherwise take the starting inflation and add [24] Inflation Adjustment

**[24] Inflation Adjustment**

- Manual input for percentage increase or decrease in inflation each period

**[25] Inflation End Period**

- Takes an initial input for inflation at the end of the period and increments it by 1 + the percentage change in inflation each period
- =H42*(1+I40)
  i. Preceding cell in [25] Inflation End Period * ( 1 + [23] Inflation Index % )

**[26] Inflation Mid Period**

- Takes an initial input for inflation at the end of the period and increments it by 1 + the percentage change in inflation each period divided by 2 to get the mid-year inflation increment
- =(H42+I42)/2

i. (Preceding cell in [25] Inflation End Period * ( 1 + [23] Inflation Index % )) / 2

**[27] Inflation Index**

- Takes the values from [26] Inflation Mid Period and divides by 100 to get the percentage for [26] Inflation Mid Period
- =I43/100
  i. [26] Inflation Mid Period / 100

# Rates

## Interest Rates

**[28] Libor**

- Calculates the assumed Libor rate for every period in the model based on an initial input and percentage change input for each period
- First cell in the row is an input for the opening rate of Libor
- Later periods:
- =$H$53+I54
  i. Preceding [28] Libor plus % increment for each period

## Exchange Rates

**[29] EUR/R$**

- Requires an input for the initial exchange rate of [12] Foreign Currency 1 for [11] Home Currency and a percentage change for each period
- =(H59*(1+I60))^(1/$C$11)
  i. (Preceding [29] * (1 + the exchange percent change) ^ of 1 / [5] Compounding Frequency
- This formula takes the preceding exchange rate, increases/decreases the rate based on the manual input change in the exchange rate and exponentially increases it by 1 / [5] Compounding Frequency

**[30] USD/R$**

- Requires an input for the initial exchange rate of [13] Foreign Currency 2 for [11] Home Currency and a percentage change for each period
- =(H62*(1+I63))^(1/$C$11)
  i. (Preceding [30] * (1 + the exchange percent change each period) ^ of 1 / [5] Compounding Frequency
- This formula takes the preceding exchange rate, increases/decreases the rate based on the manual input change in the exchange rate and exponentially increases it by 1 / [5] Compounding Frequency

# Part 3: Operating Expenditures

# Traffic Assumptions

## Network

*Note: Headings change based on [33] Data Is*

**[31] Length of Network in Use**

- Manual input for length of track in km for each period of the model

**[32] Staff**

- Manual input for the number of employees in each period of the model

**[33] Data Is**

- Drop down menu with two options: "External" and "Internal"
- Based on this input, the other network and traffic assumptions and calculation sections will have either an external or internal heading. This signals whether external or internal data should be entered for that section

## External/Internal

**[34] Freight Traffic Volumes**

- Manual input for freight traffic volume in gross ton-km

**[35] Electric Traction Share of Freight Traffic**

- Requires the original input for year 1, then adds [36] Change in Electric Traction Share of Total Freight Traffic for each period of the model

**[36] Enter Change in Electric Traction Share of Total Freight Traffic**

- Manual input for change in electric traction share of total freight traffic (%) in each period of the model

**[37] Diesel Traction Share of Freight Traffic Volume**

- Determines the diesel traction share by subtracting [35] Electric Traction Share of Freight Traffic from 100%
- =1-J77
    i. 1 – [35] Election Traction Share of Freight Traffic

**[38] Passenger Traffic Volume**

- Manual input for passenger traffic volume

**[39] Electric Traction Share of Passenger Volume**

- Requires the original input for year 1, then adds [40] Change in Electric Traction Share of Passenger Volume for each period of the model

**[40] Enter Change of Electric Traction Share of Passenger Traffic**

- Manual input for change in electric traction share of passenger traffic in each period of the model

**[41] Diesel Share of Passenger traffic Volume**

- Determines the diesel traction share by subtracting [39] Electric Traction Share of Passenger Traffic from 100%
- =1-J82
    i. 1 – [39] Electric Traction Share of Passenger Volume

## External/Internal

**[42] Freight Traffic Volumes**

- Manual input for freight traffic volume in gross ton-km

**[43] Electric Traction Share of Freight Traffic**

- Requires the original input for year 1, then adds [44] Change is Electric Traction Share of Total Freight Traffic for each period of the model

**[44] Enter Change is Electric Traction Share of Total Freight Traffic**

- Manual input for change in electric traction share of total freight traffic (%) in each period of the model

**[45] Diesel Traction Share of Freight Traffic Volume**

- Determines the diesel traction share by subtracting [43] Electric Traction Share of Freight Traffic from 100%
- =1-J88
    i. 1 – [43] Electric Traction Traffic Share of Freight Traffic

**[46] Passenger Traffic Volume**

- Manual input for passenger traffic volume

**[47] Electric Traction Share of Passenger Volume**

- Requires the original input for year 1, then adds [48] Change is Electric Traction Share of Passenger Volume for each period of the model

**[48] Enter Change of Electric Traction Share of Passenger Traffic**

- Manual input for change in electric traction share of passenger traffic in each period of the model

**[49] Diesel Share of Passenger Traffic Volume**

- Determines the diesel traction share by subtracting [47] Electric Traction Share of Passenger Traffic from 100%
- =1-J93
    i. 1 – [47] Electric Traction Share of Passenger Volume

## Operational Benchmark

**[50] Freight 1000000s () Per Staff**

- Manual benchmark input for freight per staff (in millions)

**[51] Freight 1000000s Per GTK-Freight**

- Manual benchmark input for freight per GTK-Freight

**[52] Staff Per GTK-Freight**

- Manual benchmark input for staff per GTK-Freight

**[53] Average Electric Traction Share of Freight Traffic**

- Requires the internal [35] Electric Traction Share of Freight Traffic and the external [43] Electric Traction Share of Freight Traffic
- =AVERAGE(I77,I88)
    i. Returns the average of the internal [35] Electric Traction Share of Freight Traffic and the external [43] Electric Traction Share of Freight Traffic

**[54] Average Electric Traction Share of Passenger Traffic**

- Requires the internal [39] Electric Tractions Share of Passenger Volume and the external [47] Electric Tractions Share of Passenger Volume
- =AVERAGE(I82,I93)
    i. Returns the average of internal [39] Electric Tractions Share of Passenger Volume and [47] Electric Tractions Share of Passenger Volume

# External/Internal Freight Traffic Assumptions

*Note: Headings change based on [33] Data Is and [55] Data In*

**[55] Data in Net Ton-Kilometres or Tons (Millions)**

- Drop down menu which indicates if given data is in net ton-km or tons (millions)
- Two options: "Net Ton-Km (millions)" and "Tons"

**[56] Average Length of Cargo Haul**

- Manual input for the average length of cargo haul in km

**[57] Enter Weight of Train Load (net)**

- Manual input for the weight of train load (net, tons)

**[58] Name of Traffic Flow 1**

- Manual input (text) for names of the traffic flows

**[59] Implied Gross Ton-Km/Net Ton-Km Ratio**

- Calculates the ratio of gross ton-km (GTK) to net ton-km (NTK)
- Requires an input from [55] Data in Net Ton-Kilometres or Tons, [56] Average Length of Cargo haul, and [62] Commodity 1 Annual Traffic Volume Net Ton-Km (Millions)
- First period:
- =IF(SUM(I130:I139)=0,0,IF(I76=0,0,IF(F109="Net ton-km (millions)",I76/(SUM(I130:I139)),I76/(G111*SUM(I130:I139)))))
    i. IF the sum of all the values of [62] Annual Traffic Volume is 0, output 0
    ii. Otherwise IF [34] Freight Traffic Volume is 0, output 0
    iii. Otherwise IF [55] Data in Net Ton-Kilometers or Tons is "Net Ton-km"
    iv. Then divide [34] Freight Traffic Volume by the sum of [62] Commodity 1 Annual Traffic Volume
    v. Otherwise divide [34] Freight Traffic Volume by (the sum of [62] Commodity 1 Annual Traffic Volume multiplied by [56] Average Length of Cargo Haul)
- Later periods:

- =I125*(1+J126)
    i. Previous year [59] Implied Gross Ton-km/Net Ton-Km Ratio * (1 + [60] Change in GTK/NTK Ratio)
- Increased/decreased based on the GTK/NTK ratio change percentage each period

**[60] Enter Change in GTK/NTK ratio**

- Manual input for percent change in GTK/NTK ratio

**[61] Check**

- Row checks to ensure the [59] Implied Gross Ton-Km/ Net Ton-km Ratio is not less than one which would indicate a problem with the calculation
- Requires [59] Implied Gross Ton-Km/net Ton-Km ratio
- =IF(K125<1,1,0)
    i. IF [59] Implied Gross Ton-Km/Net Ton-Km Ratio is less than 1
    ii. Then [61] is = 1
    iii. Otherwise [61] is = 0
- IF the [59] Implied Gross Ton-Km/Net Ton-Km ratio is below 1, there is a problem with the ratio, which will cause this formula to equal 1, changing the Check cell from "OK" to "WARNING: IMPLIED RATIO CANNOT BE BELOW 1"

**[62] Commodity 1 Annual Traffic Volume Net Ton-Km (Millions) / Tons (Millions)**

- Manual input for commodity 1 annual traffic volume in net ton-km (millions) or tons (millions) depending on [55] Data In

# External/Internal Passenger Traffic Assumptions

*Note: Headings change based on [33] Data Is and [63] Traffic Data In*

**[63] Traffic Data in Passenger – Km (Millions) or Number of Trips**

- Manual input for traffic data in passenger – km (millions) or number of trips
- Options are: "Passenger – Km (Millions)" and "Number of Trips"

**[64] Enter Average Length of Passenger Trip**

- Manual input for average length of passenger trip (in km)

**[65] Name of Traffic Flow 1**

- Manual input for name of traffic flow 1

**[66] Implied Gross Ton-Km/Passenger – Km ratio**

- Row calculates ratio of GTK to passenger-km. This ratio is used to predict annual traffic volume of different traffic flows (GTK) given passenger-km of each traffic flow
- Requires [38] Passenger Traffic Volume, [63] Traffic Data in Passenger – Km (Millions) or Number of Trips, [64] Enter Average Length of Passenger Trip and [68], [70] and [72] Annual Traffic Volume
- First period:
- =IF(SUM(I159,I157,I155)=0,0,IF(F144=G144,I81/(SUM(I155,I157,I159))*(1+I153),I81/(G146*(SUM(I155,I157,I159)))))

i. IF the sum of [68] Annual Traffic Volume, [70] Annual Traffic Volume and [72] Annual Traffic Volume is 0
ii. Then [66] is = 0. This prevents a #DIV/0 error
iii. Otherwise IF[63] Traffic Data is in "Passenger-Km"
iv. Then divide [38] Passenger Traffic Volume by the sum of [68], [70] and [72] Annual Traffic Volume (Passenger - km) * (1 + [67] Change in GTK/NTK Ratio)
v. Otherwise divide [38] Passenger Traffic Volume by the product of (the sum of [68], [70], and [72] Annual Traffic Volume (Passenger -Km) and [64] Average length of Passenger Trip)

- Following periods:
- =I152*(1+J153)
  i. Previous year [66] Implied Gross Ton-Km/Passenger – Km Ratio multiplied by (1 + [67] Change in GTK/NTK Ratio)

**[67] Enter change in GTK/NTK ratio**

- Manual input for change in GTK/NTK ratio during each period of the model

**[68] Annual Traffic Volume Passenger – Km (Millions)**

- Manual input for annual traffic volume of passengers in km (millions) or number of trips

**[69] Annual Traffic Volume Train – Km (Millions)**

- Manual input for annual traffic volume of train km

**[70] Annual Traffic Volume Passenger – Km (Millions)**

- Manual input for annual traffic volume of passengers in km (millions) or number of trips

**[71] Annual Traffic Volume Train – Km (Millions)**

- Manual input for annual traffic volume of train km

**[72] Annual Traffic Volume Passenger – Km (Millions)**

- Manual input for annual traffic volume of passengers in km (millions) or number of trips

**[73] Annual Traffic Volume Train – Km (Millions)**

- Manual input for annual traffic volume of train km

# External/Internal Freight Traffic Assumptions

*Note: Headings change based on [33] Data Is and [74] Data In*

**[74] Data in Net Ton-Kilometers or Tons (Millions)**

- Dropdown menu which indicates if given data is in net-ton kilometers or tons
- Two options: "Net-Ton Kilometers" or "Tons"

**[75] Average Length of Cargo Haul**

- Manual input for average length of cargo haul

**[76] Enter Weight of Train Load (net)**

- Manual input for weight of train load in tons

**[77] Name of Traffic Flow**

- Manual input for name of traffic flow (text)

**[78] Implied Gross Ton-Km/Net Ton-Km Ratio**

- This row calculates ratio of GTK to NTK
- This ratio is used to predict annual traffic volume of different traffic flows (GTK) given NTK of each traffic flow
- Requires an input from [81] Data In Net Ton-Kilometres or Tons, [42] Freight Traffic Volume, [75] Average Length of Cargo Haul, and [81] Annual Traffic Volume Net Ton-Km (Millions)
- First period:
- =IF(SUM(I186:I195)=0,0,IF(I87=0,0,IF(F165="Net ton-km (millions)",I87/(SUM(I186:I195)),I87/(G167*SUM(I186:I195)))))
    i. IF the sum of all the values of [81] Annual Traffic Volume are 0
    ii. Then [78] is = 0
    iii. Otherwise IF [42] Freight Traffic Volume is 0
    iv. Then [78] is = 0
    v. Otherwise IF [74] Data in Net Ton-Kilometers or Tons is "Net Ton-km"
    vi. Then divide [42] Freight Traffic Volume by the sum of [81] Annual Traffic Volume
    vii. Otherwise divide [42] Freight Traffic Volume by (the sum of [81] Annual Traffic Volume multiplied by [75] Average Length of Cargo Haul)
- Later periods:
- =I181*(1+J182)
    i. Previous year Implied Gross Ton-km [78] multiplied by ( 1 + [79]Change in GTK/NTK Ratio )
- Increased/decreased based on the GTK/NTK ratio change percentage each period

**[79] Enter change in GTK/NTK Ratio**

- Manual input for change in GTK/NTK ratio during each period of the model

**[80] Check**

- Row checks to ensure the [78] Implied Gross Ton-Km/Net Ton-Km Ratio is not less than 1 which would indicate a problem with the calculation
- Requires [78] Implied Gross Ton-Km/Net Ton-Km Ratio
- =IF(K181<1,1,0)
    i. IF [78] Implied Gross Ton-Km/Net Ton-Km Ratio is less than 1
    ii. [80] is = 1
    iii. Otherwise [80] is = 0
- If the [78] Implied Gross Ton-Km/Net Ton-Km Ratio is below 1, there is a problem with the ratio which will cause [80] to equal 1 and change the check cell from "OK" to "WARNING: IMPLIED RATIO CANNOT BE BELOW 1"

**[81] Annual Traffic Volume Net Ton-Km (Millions) or Tons (Millions)**

- Manual input for annual traffic volume in either net ton-km (millions) or tons (millions) depending on [74] Data In

# External/Internal Passenger Traffic Assumptions

*Note: Headings change based on [33] Data Is and [82] Passenger Data In*

**[82] Traffic Data in Passenger – Km (Millions) or Number of Trips**

- Drop down menu which indicates if the data is in passenger – km (millions) or number of trips
- Two options: "Passenger – Km (Millions)" or "Number of Trips"

**[83] Enter Average Length of Passenger Trip**

- Manual input for average length of passenger trip (in km)

**[84] Name of Traffic Flow**

- Manual input for name of traffic flow 1

**[85] Implied Gross Ton-Km/Passenger- Km Ratio**

- Row calculates ratio of GTK to Passenger-Km
- This ratio is used to predict annual traffic volume of different traffic flows (GTK) given passenger-km of each traffic flow
- Requires [46] Passenger Traffic Volume, [82] Traffic Data in Passenger – Km (Millions) or Number of Trips, [83] Enter Average Length of Passenger Trip and [87], [89] and [91] Annual Traffic Volume
- First period:
- =IF(SUM(I211,I213,I215)=0,0,IF(F200=G200,I92/(SUM(I211,I213,I215))*(1+I209),I92/(G202*(SUM(I211,I213,I215)))))
    i. IF the sum of [87] Annual Traffic Volume, [89] Annual Traffic Volume and [91] Annual Traffic Volume is 0
    ii. Then [85] is = 0. This prevents a #DIV/0 error
    iii. Otherwise IF [82] Traffic Data is in "Passenger-Km"
    iv. Then divide [46] Passenger Traffic Volume by the sum of [87], [89] and [91] Annual Traffic Volume (Passenger - Km)
    v. Otherwise divide [46] Passenger Traffic Volume by the product of (the sum of [87], [89] and [91] Annual Traffic Volume (Passenger - Km) and [83] Average Length of Passenger Trip)
- Following periods:
- =I208*(1+J209)
    i. Previous year [85] Implied Gross Ton-Km/Passenger- Km Ratio multiplied by (1 plus [86] Change in GTK/NTK Ratio)

**[86] Enter Change in GTK/NTK Ratio**

- Manual input for change in GTK/NTK ratio during each period of the model

**[87] Annual Traffic Volume Passenger – Km (Millions)**

- Manual input for annual traffic volume of passengers in km (millions) or number of trips

**[88] Annual Traffic Volume Train – Km (Millions)**

- Manual input for annual traffic volume of train km

**[89] Annual Traffic Volume Passenger – Km (Millions)**

- Manual input for annual traffic volume of passengers in km (millions) or number of trips

**[90] Annual Traffic Volume Train – Km (Millions)**

- Manual input for annual traffic volume of trains km

**[91] Annual Traffic Volume Passenger – Km (Millions)**

- Manual input for annual traffic volume of passengers in km (millions) or number of trips

**[92] Annual Traffic Volume Train – Km (Millions)**

- Manual input for annual traffic volume of train km

# Traffic Calculations

## External/Internal Freight Traffic Calculation

*Note: Headings change based on [33] Data Is and [55] Data In*

**[93] External/Internal Freight Traffic Multiplier Enabled?**

- Checks if the external/internal traffic multiplier is enabled within the sensitivity analysis. If it is on, this cell returns 1, enabling the multiplier, otherwise this cell returns 2, disabling the multiplier
- =IF($F$74=$G$74,IF(OR($I$1491="No",$C$1488="No"),2,1),IF(OR($C$1488="No",$K$1491="No"),2,1))
    i. IF [33] Data Is = "Internal"
    ii. Then IF [441] Scenario Analysis On? OR [448] Internal Freight Traffic Multiplier are = "No"
    iii. Then [93] is = 2
    iv. Otherwise [93] is = 1
    v. Otherwise IF [441] Scenario Analysis On? OR [450] External Freight Traffic Multiplier are = "No"
    vi. Then [93] is = 2
    vii. Otherwise [93] is = 1
- This formula first checks if the data is external or internal. It then looks to the sensitivity analysis table to see if scenario analysis is enabled and whether the traffic multiplier is also enabled. Both must be set to "Yes" to run a multiplier

**[94] External/Internal Freight Traffic Multiplier**

- Outputs a freight traffic multiplier used in calculations further down if scenario analysis is enabled
- =IF($F$74=$G$74,IF(E224=2,1,$I$1493),IF(E224=2,1,$K$1493))
    i. IF [33] Data Is = "Internal"
    ii. Then IF [93] External/Internal Freight Traffic Multiplier enabled? = 2
    iii. Then [94] is = 1
    iv. Otherwise [94] is = the input multiplier from [448] Internal Freight Traffic Multiplier
    v. Otherwise IF [93] External/Internal Freight Traffic Multiplier Enabled? = 2
    vi. Then [94] is = 1
    vii. Otherwise [94] is = the input multiplier from [450] External Freight Traffic Multiplier

- Formula checks if [93] External/Internal Freight Traffic Multiplier is enabled. If it is enabled (=1), the cell takes the multiplier from [450]/[448] External/Internal Freight Traffic Multiplier, if disabled (=2) the formula inputs 1 indicating no multiplier

**[95] Annual Traffic Volumes of Commodity 1 Net Ton-Km (Millions)/Tons (Millions)**

- Row is used to calculate the annual traffic volume of train km multiplied by the freight traffic multiplier
- Output is either in "Tons (Millions)" or "Net Ton-Km (Millions)". It will be the *same* as [55] Data In Net Ton-Kilometres or Tons (Millions)
- =I130*$E$225
    i. [62] Annual Traffic Volume of Commodity 1 – Net Km (Millions)/Tons (Millions) * [94] External/ Internal Freight Traffic Multiplier

**[96] Annual Traffic Volumes of Commodity 1 Tons (Millions)/Net Ton-Km (Millions)**

- Row is used to calculate the annual traffic volume of Commodity 1 multiplied by the freight traffic multiplier
- Output is either in "Tons (Millions)" or "Net Ton-Km (Millions)". It will be the *opposite* of [55] Data In Net Ton-Kilometres (Millions) or Tons (Millions)
- =IF($E$109=1,I228/$G$111,I228*$G$111)
    i. IF [55] Data In is set to “Net Ton-Km”
    ii. Then [96] is =[95] Annual Traffic Volume of Commodity / [56] Average Length of Cargo Haul
    iii. Otherwise IF [55] Data In is set to “Tons”
    iv. [96] is = [95] Annual Traffic Volume of Commodity * [56] Average Length of Cargo Haul

**[97] Annual Traffic Volumes of Commodity 1 Train-Km (Millions)**

- Row calculates the annual traffic volume of commodity 1 train-km (millions) – a measure of the distance the freight travels
- =IF($E$109=1,I228/$G$112,I228*$G$111/$G$112)
    i. IF [55] Data In is set to “Net Ton-Km”
    ii. Then [97] is = [95] Annual Traffic Volume of Commodity (Ton-Km) / [57] Enter Weight of Train Load (Net)
    iii. Otherwise IF [55] Data In is set to “Tons”
    iv. Then [97] is = [95] Annual Traffic Volume of Commodity (Tons) * [56] Average Length of Cargo Haul / [57] Enter Weight of Train Load (Net)

**[98] Annual Traffic Volumes of Commodity 1 GTK (Millions)**

- Row calculates GTK by multiplying NTK by the GTK/NTK Ratio
- =IF($E$109=1,I$125*I228,$G$111*I228*I$125)
    i. IF [55] Data In is set to “Net Ton-Km”
    ii. Then [98] is = [95] Annual Traffic Volumes of Commodity 1 NTK (Ton-Km) * [59] Implied GTK/NTK ratio
    iii. Otherwise [55] Data In is set to “Tons”
    iv. Then [98] is = [56] Average Length of Cargo Haul (Km) * [95] Annual Traffic Volumes of Commodity 1 (Tons) * [59] Implied gross Ton-Km/Net Ton-Km Ratio

**[99] Diesel Traffic Volume of Commodity 1 GTK (Millions)**

- Row calculates the commodity GTK that is diesel traffic
- =I265*I$79
    i. [98] Annual Traffic Volumes of Commodity 1 - GTK (Millions) * [37] Diesel Share of Freight Traffic Volume

**[100] Electric Traffic Volume of Commodity 1 GTK (Millions)**

- Row is used to calculate the amount of GTK that is electric traffic
- =I264-I276
    i. [98] Annual Traffic Volumes of Commodity 1- GTK (Millions) – [99] Diesel Traffic Volume of Commodity 1- GTK (Millions)
- Formula calculates electric traffic as the remainder left of total traffic after diesel traffic is accounted for

# External/Internal Passenger Traffic Calculation

*Note: Headings change based on [33] Data Is and [63] Traffic Data In*

**[101] External/Internal Passenger Traffic Multiplier Enabled?**

- Checks if the external/internal passenger multiplier is enabled within the sensitivity analysis. If it is on, this cell returns 1, enabling the multiplier, if not this cell returns 2, disabling the multiplier
- =IF($F$74=$G$74,IF(OR($J$1491="No",$C$1488="No"),2,1),IF(OR($C$1488="No",$L$1491="No"),2,1))
    i. IF [33] Data Is = “Internal”
    ii. Then IF [441] Scenario Analysis on OR [449] Internal Passenger Traffic Multiplier are = “No”
    iii. Then [101] External/Internal Passenger Traffic Multiplier is = 2
    iv. Otherwise [101] is = 1
    v. Otherwise IF [441] Scenario Analysis is On OR [451] External Passenger Traffic Multiplier are = “No”
    vi. Then [101] is = 2
    vii. Otherwise [101] is = 1
- This formula first checks if the data is external or internal. It then looks to the sensitivity analysis table to see if scenario analysis is enabled and whether the traffic multiplier is also enabled. Both must be set to “Yes” to run a multiplier

**[102] External/Internal Passenger Traffic Multiplier**

- Outputs a passenger traffic multiplier used in calculations further down if scenario analysis is enabled
- =IF($F$74=$G$74,IF(E304=2,1,$J$1493),IF(E304=2,1,$L$1493))
    i. IF [33] Data Is = “Internal”
    ii. Then IF [101] Internal Passenger Traffic multiplier Enabled? = 2
    iii. Then [102] is = 1
    iv. Otherwise [102] is = the input multiplier from [449] Internal Passenger Traffic Multiplier

v. Otherwise IF [101] External Passenger Traffic Multiplier Enabled? = 2
vi. Then [102] is = 1
vii. Otherwise [102] is = the input multiplier from [451] External Passenger Traffic Multiplier

- Cell checks if [101] External/Internal Freight Traffic Multiplier is enabled. If it is enabled (=1), the cell takes the multiplier from [451]/[449] External/Internal Passenger Traffic Multiplier, if disabled (=2) the formula inputs 1 indicating no multiplier

**[103] Annual Traffic Volume of Passenger – Km (Millions)**

- Row used to calculate the annual traffic volume of passenger multiplied by the passenger traffic multiplier
- =IF($F$144=$G$144,I155*$E$305,I155*$G$146*$E$305)
  i. IF [63] Traffic Data in Passenger – Km (Millions) = Passenger Km (Millions)
  ii. Then [68] Annual Traffic Volume – Passenger Km (Millions) * [102] External/Internal Passenger Traffic Multiplier
  iii. Otherwise [68] Annual Traffic Volume – Passenger Km (Millions) * [64] Average Length of Passenger Trip * [102] External/Internal Passenger Traffic Multiplier
- First checks whether the data is in passenger km millions. If true, the formula takes the product of [68] Annual Traffic Volume – Passenger Km (Millions) and the multiplier in [102]. If not true the formula also takes the product of [68] Annual Traffic Volume – Passenger Km (Millions), the multiplier in [102] and [64] Average Length of Passenger Trip. This is done to find the annual traffic volume taking into account the potential multiplier

**[104] Annual Traffic Volume Train – Km (Millions)**

- Row is used to calculate the annual traffic volume of train km multiplied by the passenger traffic multiplier
- =I156*$E$305
  i. [69] Annual Traffic Volume of Train – Km (Millions) * [102] External/Internal Passenger Traffic Multiplier

**[105] Annual Traffic Volume of – GTK (Millions)**

- Row calculates the annual traffic volume of gross ton kilometers (GTK) – a measure of the gross weight of a train multiplied by kilometres traveled
- =I308*I$152
  i. [103] Annual Traffic Volume of Passenger – Km (Millions) * [66] Implied Gross Ton-Km/ Passenger – Km Ratio
- Formula calculates GTK by taking the passenger km and multiplying it by the implied gross tons per km

**[106] Diesel Traffic Volume of – GTK (Millions)**

- Row is used to calculate the amount of GTK that is diesel traffic
- =I318*I$84
  i. [105] Annual Traffic Volumes of – GTK (Millions) * [41] Diesel Share of Passenger Traffic Volume

**[107] Electric Traffic Volume of – GTK (Millions)**

- Row is used to calculate the amount of GTK that is electric traffic

- =I318-I323
    i. [105] Annual Traffic Volumes of – GTK (Millions) – [106] Diesel Traffic Volume of – GTK (Millions)
- Formula calculates electric traffic which is the remainder left of total traffic after diesel traffic is accounted for

# External/Internal Freight Traffic Calculation

*Note: Headings change based on [33] Data Is and [74] Data In*

**[108] External/Internal Freight Traffic Multiplier Enabled?**

- Checks if the external/internal traffic multiplier is enabled within the sensitivity analysis. If true returns 1, enabling the multiplier, otherwise returns 2, disabling the multiplier
- =IF($F$74=$G$74,IF(OR($C$1488="No",$K$1491="No"),2,1),IF(OR($I$1491="No",$C$1488="No"),2,1))
    i. IF [33] Data Is = "Internal"
    ii. Then IF [441] Scenario Analysis On? OR [448] Internal Freight Traffic Multiplier are "No"
    iii. Then [108] is = 2
    iv. Otherwise [108] is = 1
    v. Otherwise IF [441] Scenario Analysis On OR [450] External Freight Traffic Multiplier are "No"
    vi. Then [108] is = 2
    vii. Otherwise [108] is = 1
- This formula first checks if the data is external or internal. It then looks to the sensitivity analysis table to see if scenario analysis is enabled and whether the traffic multiplier is also enabled. Both must be set to "Yes" to run a multiplier

**[109] External/Internal Freight Traffic multiplier**

- Outputs a freight traffic multiplier used in calculations further down if scenario analysis is enabled
- =IF($F$74=$G$74,IF(E337=2,1,$I$1493),IF(E337=2,1,$K$1493))
    i. IF [33] Data Is = "Internal"
    ii. Then IF [108] Internal Freight Traffic Multiplier Enabled? = 2
    iii. Then [109] is = 1
    iv. Otherwise [109] is = the input multiplier from [448] Internal Freight Traffic Multiplier
    v. Otherwise IF [108] External Freight Traffic Multiplier Enabled? = 2
    vi. Then [109] is = 1
    vii. Otherwise [109] is = the input multiplier from [450] External Freight Traffic Multiplier
- Cell checks if [108] External/Internal Freight Traffic Multiplier is enabled. If it is enabled (=1), the cell takes the multiplier from [450]/[448] External/Internal Freight Traffic Multiplier, if disabled (=2) the formula inputs 1 indicating no multiplier

**[110] Annual Traffic Volumes of Net Ton-Km (Millions) / Tons (Millions)**

- Row is used to calculate the annual traffic volume of net ton-km or tons multiplied by the external/internal freight traffic multiplier
- =I186*$E$338
    i. [81] Annual Traffic Volume of Net – Km (Millions) / Tons (Millions) * [109] External/Internal Freight Traffic Multiplier

**[111] Annual Traffic Volumes of - Ton (Millions) / Net Ton-Km**

- Row first checks if the data is in net ton-km or tons and then converts [110] Annual Traffic Volumes of Net Ton-Km into tons or vice versa
- =IF($E$165=1,I341/$G$167,I341*$G$167)
    i. IF [74] Data in Net Ton-Km or Tons = 1
    ii. Then [110] Annual Traffic Volumes / [75] Average Length of Cargo Haul
    iii. Otherwise [110] Annual Traffic Volumes * [75] Average Length of Cargo Haul
- Formula first checks what units the data is in and then converts it into millions of tons or net ton km for each period

**[112] Annual Traffic Volumes of - Train-Km (Millions)**

- Row calculates the annual traffic volume in train-km (millions) – a measure of the distance the freight travels
- =IF($E$165=1,I341/$G$168,I341*$G$167/$G$168)
    i. IF [74] Data In is set to "Net Ton-Km"
    ii. Then [112] is = [110] Annual Traffic Volume of Commodity (Ton-Km) / [76] Enter Weight of Train Load (Net)
    iii. Otherwise IF [74] Data In is set to "Tons"
    iv. Then [112] is = [110] Annual Traffic Volume of Commodity (Tons) * [75] Average Length of Cargo Haul / [76] Enter Weight of Train Load (Net)

**[113] Annual Traffic Volumes of - GTK (Millions)**

- Row calculates the annual traffic volume of gross ton kilometers (GTK) – a measure of the gross weight of a train multiplied by kilometres traveled
- =IF($E$165=1,I$181*I341,$G$167*I341*I$181)
    i. IF [74] Data In Net Ton-Km or Tons = 1
    ii. Then [110] Annual Traffic Volumes of Net Ton-Km (Millions) * [78] Implied Gross Ton-Km/Net Ton-Km Ratio
    iii. Otherwise [110] Annual Traffic Volumes of Net Ton-Km (Millions) * [78] Implied Gross Ton-Km/Net Ton-Km Ratio * [75] Average Length of Cargo Haul
- Formula first checks the units of the data, then either converts it to GTK by multiplying the volume of Net Ton-Km by the implied tons for the period

**[114] Diesel Traffic Volume of - GTK (Millions**

- Row is used to calculate the amount of GTK that is diesel traffic
- =I378*I$90
    i. [113] Annual Traffic Volumes of – GTK (Millions) * [45] Diesel Share of Passenger Traffic Volume

**[115] Electric Traffic Volume of - GTK (Millions)**

- Row is used to calculate the amount of GTK that is electric traffic
- =I377-I389
    i. [113] Annual Traffic Volumes of – GTK (Millions) – [114] Diesel Traffic Volume of – GTK (Millions)
- Formula calculates electric traffic which is the remainder left of total traffic after diesel traffic is accounted for

# External/Internal Passenger Traffic Calculations

*Note: Headings change based on [33] Data Is and [82] Traffic Data In*

**[116] External/Internal Passenger Traffic Multiplier Enabled?**

- Checks if the external/internal passenger multiplier is enabled within the sensitivity analysis. If it is on, this cell returns 1, enabling the multiplier, if not this cell returns 2, disabling the multiplier
- =IF($F$74=$G$74,IF(OR($C$1488="No",$L$1491="No"),2,1),IF(OR($J$1491="No",$C$1488="No"),2,1))
    i. IF [33] Data Is = “Internal”
    ii. Then IF [441] Scenario Analysis On? OR [449] Internal Passenger Traffic Multiplier are = “No”
    iii. Then [116] is = 2
    iv. Otherwise [116] is = 1
    v. Otherwise IF [441] Scenario Analysis On? OR [451] External Passenger Traffic Multiplier are = “No”
    vi. Then [116] is = 2
    vii. Otherwise [116] is = 1
- This formula first checks if the data is external or internal. It then looks to the sensitivity analysis table to see if scenario analysis is enabled and whether the traffic multiplier is also enabled. Both must be set to “Yes” to run a multiplier

**[117] External/Internal Passenger Traffic Multiplier**

- Outputs a passenger traffic multiplier used in calculations further down if scenario analysis is enabled
- =IF($F$74=$G$74,IF(E417=2,1,$J$1493),IF(E417=2,1,$L$1493))
    i. IF [33] Data Is = “Internal”
    ii. Then IF [116] Internal Passenger Traffic Multiplier Enabled? = 2
    iii. Then [117] is = 1
    iv. Otherwise [117] is = the input multiplier from [449] Internal Passenger Traffic Multiplier
    v. Otherwise IF [116] External Passenger Traffic Multiplier Enabled? = 2
    vi. Then [117] is = 1
    vii. Otherwise [117] is = the input multiplier from [451] External Passenger Traffic Multiplier
- Cell checks if [116] External/Internal Freight Traffic Multiplier is enabled. If it is enabled (=1), the cell takes the multiplier from [451]/[449] External/Internal Passenger Traffic Multiplier, if disabled (=2) the formula inputs 1 indicating no multiplier

**[118] Annual Traffic Volumes of - Passenger Km (Millions)**

- Row used to calculate the annual traffic volume of passenger multiplied by the passenger traffic multiplier
- =IF($F$200=$G$200,I211*$E$418,I211*$G$202*$E$418)
    i. IF [82] Traffic data in Passenger – Km (Millions) = Passenger Km (Millions)
    ii. Then [87] Annual Traffic Volume – Passenger Km (Millions) * [117] External/Internal Passenger Traffic Multiplier
    iii. Otherwise [87] Annual Traffic Volume – Passenger Km (Millions) * [83] Average Length of Passenger Trip * [117] External/Internal Passenger Traffic Multiplier
- First checks whether the data is in passenger traffic millions. If it is, the formula takes the product of [87] Annual Traffic Volume – Passenger Km (Millions) and the multiplier in [117] External/Internal Passenger Traffic Multiplier. If not the formula takes the product of [87] Annual Traffic Volume – Passenger Km (Millions), the multiplier in [117] External/Internal Passenger Traffic Multiplier and [83] Average Length of Passenger Trip. This is done to find the annual traffic volume taking into account the potential multiplier

**[119] Annual Traffic Volumes of – Train Km (Millions)**

- Row is used to calculate the annual traffic volume of train km multiplied by the passenger traffic multiplier
- =I212*$E$418
    i. [88] Annual Traffic Volume of Train – Km (Millions) * [117] External/Internal Passenger Traffic Multiplier

**[120] Annual Traffic Volumes of - GTK (Millions)**

- Row calculates the annual traffic volume of gross ton kilometers (GTK) – a measure of the gross weight of a train multiplied by kilometres traveled
- =I421*I$208
    i. [118] Annual Traffic Volume of Passenger – Km (Millions) * [85] Implied Gross Ton-Km/ Passenger – Km ratio
- Formula calculates GTK by taking the passenger km and multiplying it by the implied gross tons per km

**[121] Diesel Traffic Volume of - GTK (Millions**

- Row is used to calculate the amount of GTK that is diesel traffic
- =I432*I$95
    i. [120] Annual Traffic Volumes of – GTK (Millions) * [49] Diesel Share of Passenger Traffic Volume

**[122] Electric Traffic Volume of - GTK (Millions)**

- Row is used to calculate the amount of GTK that is electric traffic
- =I431-I436
    i. [120] Annual Traffic Volumes of – GTK (Millions) – [121] Diesel Traffic Volume of – GTK (Millions)
- Formula calculates electric traffic is remainder left of total traffic after diesel traffic is accounted for

## Total Traffic Data

**[123] Total Freight Traffic**

- Sums together the[97] and [112] Total Train-Km of freight traffic from the previous traffic calculations

**[124] Total Passenger Traffic**

- Sums together the [104] and [119] Total Train-Km of passenger traffic from the previous traffic calculations

**[125] Total Freight Traffic**

- Sums together the [98] and [113] Total GTK of the freight traffic from the previous traffic calculations

**[126] Total Passenger Traffic**

- Sums together the[105] and [120] Total GTK of the passenger traffic from the previous traffic calculations

# Public Subsidy Assumptions

## Operational Subsidy

**[127] Is Public Subsidy Available?**

- Drop down menu with options "Yes" or "No". Used for the input of whether there is a public subsidy available for the model

**[128] Subsidy in First Year**

- Manual input for the starting value of the subsidy in the first year

**[129] Model Calculate or Manual**

- Drop down menu with options "Model" or "Manual". Used to input whether the subsidy will be manually inputted or calculated by the model

**[130] If Calculate, Grow Subsidy by Inflation?**

- Drop down menu with options "Yes" or "No". Used for whether or not the model calculated subsidy will grow with inflation

**[131] If Yes What Proportion of Inflation?**

- Manual input for the proportion that the subsidy will grow by inflation if that option was selected

**[132] Enter Additional Annual Change**

- Manual input for any additional percentage change of subsidy each period

**[133] Manual Input**

- Row to manually input subsidy if that option is chosen

## Capital Subsidy

*Note: As all input rows other than amortization are equivalent between operational and capital subsidy, the preceding explanations in operational subsidy can be applied to capital subsidy*

**[134] Amortization in First Year**

- Manual input for amount of amortization of the capital subsidy in the first year

# Public Subsidy Calculations


# Public Subsidy Calculations


**[135] Operational Subsidy**

- Row calculates the initial subsidy and future period based on the inputs selected in Operational Subsidy
- =IF($H$457=0,0,IF($H$459=0,J$463,IF($H$460=0,I480*(1+J462),I480*(1+J462)*(1+(J$40)))))
    i. IF [127] Public Subsidy Available? is = 0
    ii. Then [135] = 0
    iii. Otherwise IF [129] Model Calculate or Manual? is = 0
    iv. Then [135] = [133] Manual Input
    v. Otherwise IF [130] Grow Subsidy by Inflation? = 0
    vi. Then [135] is = [128] Subsidy in First Year * (1 + [132] Additional Change)
    vii. Otherwise [135] is = [128] Subsidy in First Year * (1 + [23] Inflation Index) * (1 + [132] Additional Change)
- Formula first checks if a subsidy is available and whether it is a manual or model calculated input. Finally it checks if the subsidy will grow by inflation and then based on those parameters calculates the subsidy each period

**[136] Capital Subsidy**

- Row calculates the initial and future period subsidy based on the inputs selected in Capital Subsidy
- =IF($H$467=0,0,IF($H$470=0,J474,IF($H$471=0,I481*(1+J473),(I481*(1+J473)*(1+(J40))))))
    i. IF [127] Public Subsidy Available? is = 0
    ii. Then [136] = 0
    iii. Otherwise IF [129] Model Calculate or Manual? is = 0
    iv. Then [136] = [133] Manual Input
    v. Otherwise IF [130] Grow Subsidy by Inflation = 0
    vi. Then [136] is = [128] Subsidy in First Year * (1 + [132] Additional Change)
    vii. Otherwise [135] is = [128] Subsidy in First Year * (1 + [23] Inflation Index) * (1 + [132] Additional Change)
- Formula first checks if a subsidy is available, then whether it is a manual or model calculated input. Finally it checks if the subsidy will grow by inflation and then based on those parameters calculates the subsidy each period

**[137] Amortization of Capital Subsidy**

- Calculates the amortization of the capital subsidy each period based on a ratio of the initial subsidy to initial depreciation and the ratio of additional capital subsidy to additional capital expenditures. Outputs the amount that should be shown under capital subsidy amortization each period
- =IF($I$482=0,0,($I$482/$I$842)*(SUM(J891,J907,J923,J939,J955,J971))+(SUM($I481:J481)/SUM($H833:J833))*(SUM(J898,J914,J930,J946,J962,J978)))
    i. IF [134] Amortization in First Year is = 0
    ii. Then [137] = 0
    iii. Otherwise ( [134] Amortization in First Year / [254] Depreciation Expense in First Year ) * (the Sum of all the [262] Depreciation of Existing Assets) + (Sum of [136] Capital Subsidy Each Period / Sum of [251] Total Capital Expenditures) * (the Sum of all the [268] Depreciation of New Assets)
- This formula first checks if there is any amortization of the capital subsidy, then takes a ratio of first year amortization to initial depreciation multiplied by the sum of the depreciation of all existing assets. Finally it then takes a ratio of the total capital subsidy each period to the capital expenditures each period multiplied by the sum of all the depreciation of the new assets

**[138] Total Subsidy (including amortization)**

- Gives the total amount of operational and capital subsidies plus the capital subsidy amortization for each period

# Operating Revenue

## Tariff

**[139] Grow Tariff by Inflation in Forecast Period?**

- Drop down input with options “Yes” or “No” to calculate whether tariffs will grow by inflation

**[140] Tariff in Forecast Period**

- Row begins columns for tariffs in forecast with headings showing the $ per ton, % proportion of inflation and additional changes in the tariff

**[141] Commodity 1 (3 Columns)**

- Manual input row of average $ per ton, % proportion of inflation and additional changes in the tariff

**[142] Tariff Multiplier Enabled**

- Check if scenario analysis is on and whether a tariff multiplier will run with the scenario analysis
- =IF(OR(C1491="No",C1488="No"),0,1)
    i. IF [441] Scenario Analysis On? OR [442] Tariff Multiplier is = “No”
    ii. Then [142] is = 0
    iii. Otherwise [142] is = 1

**[143] Tariff Multiplier From Scenario Analysis**

- Cell checks whether a tariff multiplier is engaged and if yes, uses the value set out in scenario analysis

- =IF(F473=0,1,C1493)
    i. IF [142] Tariff Multiplier Enabled = 0
    ii. Then [143] is = 1
    iii. Otherwise [143] is = [442] Tariff Multiplier

**[144] Tariff Growth Rate Enabled**

- Check if scenario analysis is on and whether a tariff growth rate will run with the scenario analysis
- =IF(OR(C1488="No",D1491="No"),0,1)
    i. IF [441] Scenario Analysis On? OR [443] Tariff Growth Rate is = "No"
    ii. Then [144] is = 0
    iii. Otherwise [144] is = 1

**[145] Tariff Growth Rate From Scenario Analysis**

- Cell checks whether a tariff growth rate is engaged and if yes, uses the value set out in scenario analysis
- =IF(F509=0,0,D1493)
    i. IF[144] Tariff Growth Rate Enabled = 0
    ii. Then [145] is = 1
    iii. Otherwise [145] is = [443] Tariff Growth Rate

**[146] Commodity 1 Per-Unit Tariff – R$ Per Ton-Km**

- Calculates the per unit tariff or the $ per Ton-Km for each commodity
- =IF($H$490=0,I513*$F$508*(1+$F$510+J494),I513*$F$508*(1+$F$510+J494)*(1+$F494*(J$40)))
    i. IF [139] Grow Tariff by Inflation is = 0
    ii. Then ([141] Tariff on Commodity * [143] Tariff Multiplier ) * (1 + [145] Tariff Growth Rate + [141] Additional Change in Tariff)
    iii. Otherwise ([141] Tariff on Commodity * [143] Tariff Multiplier) * (1 + [145] Tariff Growth Rate + [141] Additional Change In Tariff) * ( 1 + [141] Proportion of inflation + [23] Inflation Index %
- Formula first check if the tariff will grow by inflation, if no then [146] is equal to the tariff multiplied by the multiplier multiplied by the growth rate and additional changes in the tariff. If the tariff will grow by inflation, [146] is equal to the tariff multiplied by the multiplier multiplied by the growth rate and additional changes in the tariff multiplied by the proportion and rate of inflation

**[147] Average Tariff**

- Calculates the average tariff for all the commodities

**[148] Commodity 1 Revenue – R$ Millions**

- Calculates the freight revenue in $ Millions
- =IF($F$74=$G$74,IF($E$165=1,I513*I341,I513*I353),IF($E$109=1,I513*I228,I513*I240))
    i. IF [33] Data Is = "Internal"
    ii. Then IF [74] Data In = 1

iii. Then [148] is = [146] Commodity 1 Per-Unit Tariff $ Per Ton-Km * [110] Annual Traffic Volume of Net Ton-Km (Millions)
iv. Otherwise [148] is = [146] Commodity 1 Per-Unit Tariff $ Per Ton-Km * [111] Annual Traffic Volume of Net Ton-Km (Millions)
v. Otherwise IF [55]Data In = 1
vi. Then [148] is = [146] Commodity 1 Per-Unit Tariff $ Per Ton-Km * [95] Annual Traffic Volume of Commodity Net Ton-Km (Millions)
vii. Otherwise [148] is = [146] Commodity 1 Per-Unit Tariff $ Per Ton-Km * [96] Annual Traffic Volume of Commodity Net Ton-Km (Millions)

- Formula first checks where to source the external data based on [33] Data Is, then based on [55] or [74] Data In, multiplies the net ton-km section from either [95], [96], [110] or [111] Annual Traffic Volume of Net Ton-Km (Millions) by [146] Commodity 1 Per-Unit Tariff $ Per Ton-Km

# Passenger Fares

**[149] Grow Fares by Inflation in Forecast Period?**

- Drop down input with options “Yes” or “No” to calculate whether fares will grow by inflation

**[150] Fare Multiplier Enabled**

- Check if scenario analysis is on and whether a fare multiplier will run with the scenario analysis
- =IF(OR(G1491="No",C1488="No"),0,1)
  i. IF [441] Scenario Analysis On? OR [446] Fare Multiplier is = “No”
  ii. Then [150] is = 0
  iii. Otherwise [150] is = 1

**[151] Fare Multiplier From Scenario Analysis**

- Cell checks whether a fare multiplier is engaged and if yes, uses the value set out in scenario analysis
- =IF(F509=0,1,G1493)
  i. IF[150] Tariff Multiplier Enabled = 0
  ii. Then [151] is = 1
  iii. Otherwise [151] is = [446] Fare Multiplier

**[152] Fare Growth Rate Enabled**

- Check if scenario analysis is on and whether a fare growth rate will run with the scenario analysis
- =IF(OR(H1491="No",C1488="No"),0,1)
  i. IF [441] Scenario Analysis On? OR [447] Fare Growth Rate is = “No”
  ii. Then [152] is = 0
  iii. Otherwise [152] is = 1

**[153] Fare Growth Rate From Scenario Analysis**

- Cell checks whether a fare growth rate is engaged and if yes, uses the value set out in scenario analysis
- =IF(F545=0,0,H1493)

i. IF[152] Fare Growth Rate Enabled = 0
ii. Then [153] is = 1
iii. Otherwise [153] is = [447] Tariff Growth Rate

**[154] Fares in Forecast Period**

- Rows contains the heading for starting value which begins the per unit fares

**[155] Per Unit Fare**

- Calculates the fare per unit each period
- First period:
- =H550*F544
  i. Starting per fare value input * [151] Fare Multiplier From Scenario Analysis
- Later periods:
- =IF($H$540=0,(I550*$F$544)*(1+$F$546)*(1+J551),(I550*$F$544)*(1+$F$546)*(1+J551)*(1+J$40))
  i. IF [149] Grow Fare by Inflation is = 0
  ii. Then (preceding [155] Per Unit Fare * [151] Fare Multiplier From Scenario Analysis) * (1 + [153] Fare Growth Rate) * (1+ [155] Additional change in Fare)
  iii. Otherwise ([155] Preceding Per Unit Fare *[151] Fare Multiplier from Scenario Analysis) * (1 + [153] Fare Growth Rate * (1+ [156] Manual Change in Per Unit Fare) * (1+ [23] Inflation Index %)
- Formula first check if the fare will grow by inflation, if no then [155] is equal to the previous fare multiplied by the multiplier, growth rate and additional changes in the fare. If the fare will grow by inflation, [155] is equal to the previous fare multiplied by the multiplier, growth rate, additional changes in the fare and the rate of inflation

**[156] Manual Change in Per Unit Fare**

- Manual input for manual % change in per-unit fare

**[157] – Revenue R$ Millions**

- Calculates the passenger revenue for each forecast fare
- =IF($F$74=$G$74,I550*I421,I550*I308)
  i. IF [33] Data Is = “Internal”
  ii. Then [157] is = [155] Per Unit Fare * [118] Annual Traffic Volume of Passenger – Km (millions)
  iii. Otherwise [157] is = [155] Per Unit Fare * [103] Annual Traffic Volume of Passenger – Km
- Formula first checks where to source the external data based on [33] Data Is, then multiplies either [103] or [118] Annual Traffic Volume of Passenger – Km (millions) by [155] Per Unit Fare

**[158] Total R$ Millions**

- Total [157] Revenue $ For each fare

# Other Operating Revenue

**[159] Annual Amount**

- Manual input for starting amount of other operating revenue which changes by [160] Change in Other Operating Revenue each period

**[160] Change in Other Operating Revenue**

- Manual input for the change in [159] Annual Amount of other operating revenue each period

# Non-Operating Revenue

**[161] Grow Non-Operating Revenue by Inflation in Forecast Period?**

- Drop down input with options "Yes" or "No" to calculate whether fares will grow by inflation

**[162] Name of Non-Operating Revenue 1**

- Manual input for the name of the non-operating revenue

**[163] Total Revenue in First Year**

- Manual input for $ amount of non-operating revenue in the first period

**[164] Quantity (Physical Revenue Driver)**

- Initial input for the quantity of the physical driver of non-operating revenue. This is then adjusted each period depending on [165] Change in Quantity
- =I574*(1+J575)
    i. Previous [164] Quantity * (1 + [165] % Change in Quantity )

**[165] Change in Quantity**

- Manual input for the % change in quantity of the [164] Physical Revenue Driver

**[166] Variability with Inflation**

- Manual input for the % variability the non-operating revenue changes by inflation

**[167] Annual Unit Revenue**

- Calculates the revenue per unit each period
- First period:
- =(I573/I574)*(1+I579)
    i. ([163] Total Revenue / [164] Quantity) * (1 + [168] Additional Annual Change )
- Later periods:
- =IF($I$570=0,I578*(1+J579),I578*(1+J579)*(1+$I$577*J$40))
    i. IF [161] Grow Non-Operating Revenue by Inflation is = 0
    ii. Then preceding [167] Annual Unit Revenue * (1 + [168] Additional Annual Change)
    ii. Otherwise preceding [167] Annual Unit Revenue * (1 + [168] Additional Annual Change) * (1 + [166] Variability with Inflation * [23] Inflation Index %
- Formula first check if the non-operating revenue will grow by inflation, if no then [167] is equal to the previous non-operating revenue multiplied by the additional changes in the non-operating revenue. If the non-operating revenue will grow by inflation, [167] is equal to the previous non-operating revenue additional changes in the fare multiplied by the proportion and rate of inflation

**[168] Additional Annual Change**

- Manual input for any additional % change in the non-operating revenue per unit

**[169] Total Non-Operating**

- Sum of the [164] Quantity * [167] Annual Unit Revenue for all the non-operating revenues

# Operating Expenses

## Traffic Access Charge Assumptions

*Note: Headings change based on [33] Data Is*

**[170] Track Access Multiplier From Scenario Analysis Enabled**

- Check if scenario analysis is on and whether a track access multiplier will run with the scenario analysis
- =IF(OR(C1488="No",E1491="No"),0,1)
  i. IF [441] Scenario Analysis On? OR [444] Track Access Multiplier is = "No"
  ii. Then [170] is = 0
  iii. Otherwise [170] is = 1

**[171] Track Access Charge Multiplier**

- Cell checks whether a track access multiplier is engaged and if yes, uses the value set out in scenario analysis
- =IF(F611=0,1,E1493)
  i. IF[170] Track Access Multiplier Enabled = 0
  ii. Then [171] is = 1
  iii. Otherwise [171] is = [444] Track Access Multiplier

**[172] Track Access Growth From Scenario Analysis Enabled**

- Check if scenario analysis is on and whether a track access growth rate will run with the scenario analysis
- =IF(OR(C1488="No",F1491="No"),0,1)
  i. IF [441] Scenario Analysis On? OR [445] Track Access Growth Rate is = "No"
  ii. Then [172] is = 0
  iii. Otherwise [172] is = 1

**[173] Track Access Charge Growth Rate**

- Cell checks whether a track access growth rate is engaged and if yes, uses the value set out in scenario analysis
- =IF(F613=0,0,F1493)
  i. IF[172] Track Access Growth Rate Enabled = 0
  ii. Then [173] is = 1
  iii. Otherwise [173] is = [445] Track Access Growth Rate

**[174] Freight Track Access Charge First Year R$ Per GTK**

- Manual input for the freight $ per GTK in the first year of the model

**[175] Freight Track Access Charge in First Year R$/Train-Km**

- Manual input for the freight $ per train-km in the first year of the model

**[176] Passenger Track Access Charge in First Year R$ Per GTK**

- Manual input for the passenger $ per GTK in the first year of the model

**[177] Passenger Track Access Charge in First Year R$/Train-Km**

- Manual input for the passenger $ per train-km in the first year of the model

**[178] Grow Freight Track Access by Inflation?**

- Drop down menu with options "Yes" or "No" used to determine whether freight traffic access will grow by inflation

**[179] Proportion of Inflation**

- Manual input for the % proportion of inflation the track access fees will grow by

**[180] Freight Access Charges Per GTK**

- Calculates the freight access fee per GTK each period
- First period:
- =H617*(1+I625)*F612
    i. [74] Freight Track Access Charge in First Year * (1+ [181] Additional Change) * [171] Track Access Multiplier from Scenario Analysis
- Later periods:
- =IF($H$621=0,I624*(1+J625)*(1+$F614)*$F612,I624*(1+J625)*(1+$F614)*$F612*(1+$H623*J40))
    i. IF [178] Grow Track Access by Inflation is = 0
    ii. Then preceding [180] Per GTK Track Access Fee * (1 + [181] Additional Change) * (1+ [173] Track Access Growth Rate) * [171] Track Access Multiplier Charge
    iii. Otherwise preceding [180] Per GTK track Access Fee * (1 + [181] Additional Change) * (1+ [173] Track Access Growth Rate) * [171] Track Access Multiplier Charge * (1 + [179] Proportion of Inflation * [23] Inflation Index %)
- Formula first check if the track access fees will grow by inflation, if no then [180] is equal to the previous track access fee multiplied by the growth rate and additional changes. If the track access fee will grow by inflation, [180] is equal to the previous access fee multiplied by the growth rate and additional changes multiplied by the rate and proportion of inflation

**[181] Additional Change**

- Manual input for any additional % change in freight $ per GTK

**[182] Freight Access Charge Per Train-Km**

- Calculates the freight track access fee per train-km each period
- First period:
- =H618*(1+I627)*F612
    i. [175] Freight Track Access Charge in First Year * (1+ [183] Additional Change) * [171] Track Access Multiplier From Scenario Analysis
- Later periods:
- =IF($H$621=0,I626*(1+J627)*(1+$F614)*$F612,I626*(1+J627)*(1+$F614)*$F612*(1+$H623*J40))
    i. IF [178] Grow Track Access by Inflation is = 0
    ii. Then preceding [182] Per GTK Track Access Fee * (1 + [183] Additional Change) * (1+ [173] Track Access Growth Rate) * [171] Track Access Multiplier Charge

iii. Otherwise preceding [182] Per GTK Track Access Fee * (1 + [183] Additional Change) * (1+ [173] Track Access Growth Rate) * [171] Track Access Multiplier Charge * (1 + [179] Proportion of Inflation * [23] Inflation Index % )

- Formula first check if the track access fees will grow by inflation, if no then [182] is equal to the previous track access fee multiplied by the growth rate and additional changes. If the track access fee will grow by inflation, [182] is equal to the previous access fee multiplied by the growth rate and additional changes multiplied by the rate and proportion of inflation

**[183] Additional Change**

- Manual input for any additional % change in freight $ per train-km

**[184] Passenger Track Access Charge Per GTK**

- Calculates the passenger access fee per GTK each period
- First period:
- =H$619*F$612*(1+I$629)
  i. [176] Passenger Access Charge in First Year * (1 + [185] Additional Change) * [171] Track Access Multiplier
- Later periods:
- =IF($H$621=1,(I$628*$F$612)*(1+J$629)*(1+$F$614+$H$623*J$40),(I$628*$F$612)*(1+J$629)*(1+$F$614))
  i. IF [178] Grow Track Access by Inflation is = 1
  ii. Then (preceding [184] Per GTK Track Access Fee * [171] Track Access Multiplier) * (1 + [185] Additional Change) * (1+ [173] Track Access Growth Rate) * (1 + [179] Proportion of Inflation * [23] Inflation Index %)
  iii. Otherwise (preceding [184] Per GTK track access fee * [171] Track Access Multiplier) * (1 + [185] Additional Change) * (1+ [173] Track Access Growth Rate)
- Formula first check if the track access fees will grow by inflation, if yes then [184] is equal to the previous track access fee multiplied by the growth rate and additional changes multiplied by the rate and proportion of inflation. If the track access fee will not grow by inflation, [184] is equal to the previous access fee multiplied by the growth rate and additional changes

**[185] Additional Change**

- Manual input for any additional % change in passenger $ per GTK

**[186] Passenger Access Charge Per Train-km**

- Calculates the passenger access fee per train-km each period
- First period:
- =H$620*F$612*(1+I$631)
  i. [177] Passenger Track Access Charge in First Year * (1+ [187] Additional Change) * [171] Track Access Multiplier
- Later periods:
- =IF($H$621=1,(I$630*$F$612)*(1+J$631)*(1+$F$614+$H$623*J$40),(I$630*$F$612)*(1+J$631)*(1+$F$614))
  i. IF [178] Grow Track Access by Inflation is = 1

ii. Then (preceding [186] Per Train-Km Track Access Fee * [171] Track Access Multiplier) * (1 + [187] Additional Change) * (1+ [173] Track Access Growth Rate) * (1 + [179] Proportion of Inflation * [23] Inflation Index % )

iii. Otherwise (preceding [186] Per Train-km Track Access Fee * [171] Track Access Multiplier) * (1 + [187] Additional Change) * (1+ [173] Track Access Growth Rate)

- Formula first check if the track access fees will grow by inflation, if yes then [186] is equal to the previous track access fee multiplied by the growth rate and additional changes multiplied by the rate and proportion of inflation. If the track access fee will not grow by inflation, [186] is equal to the previous access fee multiplied by the growth rate and additional changes

**[187] Additional Change**

- Manual input for any additional % change in passenger $ per train-km

**[188] External/Internal Freight Access Charge for GTK**

- Calculates the external/internal freight access charge revenue for each forecast fee per GTK
- =I624*I274
  i. [180] Freight Access Charge Per GTK * [98] Total External/Internal Annual Traffic Volume of Commodities 1-10 GTK (millions)

**[189] External/Internal Freight Access Charge for Train-Km**

- Calculates the external/internal freight access charge revenue for each forecast fee per train-km
- =I626*I262
  i. [182] Freight Access Charge Per Train-Km * [97] Total External/Internal Annual Traffic Volume of Commodities 1-10 Train-Km (Millions)

**[190] External/Internal Passenger Access Charge for GTK**

- Calculates the external/internal passenger access charge revenue for each forecast fee per GTK
- =I594*I311
  i. [184] Passenger Access Charge Per GTK * [105] Total External/Internal Annual Passenger Traffic Volume of GTK (Millions)

**[191] External/Internal Passenger Access Charge for Train-Km**

- Calculates the external/Internal passenger access charge revenue for each forecast fee per train-km
- =I630*I316
  i. [186] Passenger Access Charge Per GTK * [104] Total External/Internal Annual Passenger Traffic Volume of GTK (Millions)

**[192] Total External/Internal Freight and Passenger Access Charge**

- Sum of all external/Internal traffic access charges in $ millions

**[193] External/Internal Freight Access Charge for GTK**

- Calculates the external/internal freight access charge revenue for each forecast fee per GTK
- =I624*I387
  i. [180] Freight Access Charge Per GTK * [113] Total External/Internal Annual Freight Traffic Volume GTK (Millions)

**[194] External/Internal Freight Access Charge for Train-Km**

- Calculates the external/internal freight access charge revenue for each forecast fee per train-km

- =I626*I375
    i. [182] Freight Access Charge Per GTK * [112] Total External/Internal Annual Freight Traffic Volume - Train-Km (Millions)

**[195] External/Internal Passenger Access Charge for GTK**

- Calculates the external/internal passenger access charge revenue for each forecast fee per GTK
- =I628*I434
    i. [184] Passenger Access Charge Per GTK * [120] Total Internal Annual Passenger Traffic Volume of GTK (Millions)

**[196] External/Internal Passenger Access Charge for Train-Km**

- Calculates the external/internal passenger access charge revenue for each forecast fee per train-km
- =I630*I429
    i. [186] Passenger Access Charge Per GTK * [119] Total Internal Annual Passenger Traffic Volume – Train-Km (Millions)

**[197] Total Internal Freight and Passenger Access Charge**

- Sum of all internal traffic access charges in $ millions

**[198] Track Access Revenue**

- Row checks for the type of model being used based on the number in [7] Type of Model (Number) with 1 = “Freight”, 2 = “Passenger” or 3 = “Infrastructure”. If model is “Infrastructure”, the total amounts in [192] External Freight and [197] Internal Freight are added as revenue. Otherwise [198] Track Access Revenue is 0
- =IF($C$13=3,I$638+I$645,0)
    i. IF [7] Type of Model (Number) is = 3 or “Infrastructure”
    ii. Then [198] is = [192] External Freight + [197] Internal Freight
    iii. Otherwise [198] is = 0

**[199] Track Access Operating Cost**

- Row checks for the type of model being used based on the number in [7] Type of Model (Number) with 1 = “Freight”, 2 = “Passenger” or 3 = “Infrastructure”. If the model is “Passenger” or “Freight”, the total amounts in [192] External Freight and [197] Internal Freight are added as track operating costs. Otherwise [199] Track Access Operating Cost is 0
- =IF($C$13=3,0,I638+I645)
    i. IF [7] Type of Model (Number) is = 3 or “Infrastructure”
    ii. Then [199] is = 0
    iii. Otherwise [199] is = [192] External Freight + [197] Internal Freight

# Operating Costs

**[200] Grow Operating Costs by Inflation**

- Manual input to choose if operating costs should be adjusted for inflation
- If enabled, formulas will increase costs by [23] Inflation Rate

**[201] Staff Multiplier Enabled**

- Check if scenario analysis is on and whether a Staff multiplier will run with the scenario analysis
- =IF(OR(M1491="No",C1488="No"),0,1)
    i. IF [441] Scenario Analysis On? OR [452] Staff Multiplier is = “No”
    ii. Then [201] is = 0
    iii. Otherwise [201] is = 1

**[202] Staff Multiplier From Scenario Analysis**

- Checks whether a staff multiplier is engaged and if yes, uses the value set out in scenario analysis
- =IF(F656=0,1,M1493)
    i. IF[201] Staff Multiplier Enabled = 0
    ii. Then [202] is = 1
    iii. Otherwise [202] is = [452] Staff Multiplier

**[203] Name of Operating Expense 1**

- Manual input for name of the first operating expense

**[204] Total Cost in First Year**

- Manual input for total cost of the operating expense in the first year

**[205] Variability with Unit Staff Cost**

- Manual input for the % variability of the operating expense

**[206] Staff Physical Cost Driver**

- Returns number of staff adjusted with the staff multiplier
- =I73*$F$657
    i. [32] Staff Count * [202] Staff Multiplier from scenario analysis

**[207] Variability with Inflation**

- Manual input for staff cost variability with inflation

**[208] Per Staff Cost**

- Returns average cost per staff member
- First period:
- =I660/I663*J15*(1+I667)
    i. [204] Total cost / [206] Staff Count * 1000000 * (1 + percentage from [209] Annual Additional Change)
- Later periods:
- =IF($H$653=0,I666*(1+J667),I666*(1+J667)*(1+ $I$665*J40))
    i. IF [200] is = 0
    ii. Then [208] is = preceding [208] * (1 + [209] Annual Additional Change)
    iii. Otherwise [208] is = preceding [208] * (1 + [209] Annual Additional Change) * (1 + [207] Variability with Inflation * [23] Inflation Index)

**[209] Annual Additional Change**

- Manual input for additional change in [208] Per Staff Cost during the model

**[210] Total Costs for Forecast**

- Returns the total operating expense for the period as the physical cost driver multiplied by the per unit cost

- =I666*I663/J15
    i. ([208] Per Staff Cost * [206] Staff Physical Cost Driver) / 1000000

# Non-Operating Costs

**[211] Grow Non-Operating Costs by Inflation?**
- Manual input to adjust non-operating expenses by inflation

**[212] Name of Non-Operating Expense 1**
- Manual input for name of non-operating expense 1

**[213] Total Cost in First Year**
- Manual input for the total cost of operating expense 1 in the first Year

**[214] Quantity (Physical Cost Driver)**
- First period:
    i. Manual input
- Following periods:
- =I731*(1+J732)
    i. Preceding [214] Quantity * (1 + [215] Change in Quantity)

**[215] Enter Change in Quantity**
- Manual input for percent change in quantity which adjusts [214] Quantity

**[216] Variability with Inflation**
- Manual input for the percentage [217] Annual Unit Cost changes with inflation

**[217] Annual Unit Cost**
- Annual unit cost for the non-operating expense
- First period:
- =I730/I731*J15*(1+I736)
    i. [213] Total Cost in year 1 / [214] Quantity * ( 1 + [218] Additional Annual Change)
- Following periods:
- =IF($H$727=0,I735*(1+J736),I735*(1+J736)*(1+$I734*J$40))
    i. IF [211] Grow Non-Operating Costs by Inflation? is “No” ($H$693 = 0)
    ii. Then [217] is = preceding [217] Annual Unit Cost * [218] Additional Annual Change
    iii. Otherwise [217] is = preceding [217] Annual Unit Cost * [218] Additional Annual Change * (1 + [216] Variability with Inflation * [23] Inflation Index)

**[218] Additional Annual Change**
- Manual input for additional annual change of [217] Annual Unit Cost

**[219] Total Annual Non-Operating Cost**
- Returns total annual cost for each non-operating expense
- =I735*I731/$J$15
    i. Multiplies [217] Annual Unit Cost by [214] Quantity / 1000000
- Division component of formula adjusts units from ‘$’ into ‘$ Millions’ or equivalent

# Working Capital Assumptions

# Working Capital Assumptions

**[220] Accounts Receivable in First Year**

- Manual input for accounts receivable in the first year of the model

**[221] Days in Accounts Receivable**

- Calculates days of accounts receivable during the model
- First period:
- =IF(I766=0,0,I766*365/(I1365-I1364))
    i. IF[220] Accounts Receivable in first year is zero, return zero
    ii. Otherwise multiply [220] Accounts Receivable by 365 days then divides by [368] Total Revenue (not including [367] Other Sources of Revenue)
- Following periods:
- =I767+J768
    i. Add previous year's [221] Days in Accounts Receivable to [222] Change in Accounts Receivable

**[222] Change in Accounts Receivable**

- Manual input for change in days of accounts receivable
- Added to [221] Days in Accounts Receivable after the first period

**[223] Inventory in First Year**

- Manual input for inventory in the first year of the model

**[224] Days in Inventory**

- Calculates days in inventory for each period of the model
- First period:
- =IF(I770=0,0,I770*365/(I718+I719))
    i. IF[223] Inventory in First Year is zero, return zero
    ii. Otherwise multiply [223] Inventory by 365 days then divides by sum of [210] Total Costs of Materials and Diesel Fuel
- Following periods:
- =I771+J772
    i. Adds previous year's [224] Days in Inventory to [225] Change in Inventory

**[225] Change in Inventory**

- Manual input for the change in inventory each period
- Added to [224] Days in Inventory after the first period

**[226] Other Receivables in First Year**

- Manual input for other receivables in the first year of the model

**[227] Days in Other Receivables**

- Calculates the days in other receivables for each period of the model
- First period:
- =IF(I774=0,0,I774*365/(I591+I582+I573+I564))
    i. IF[226] Other Receivables in First Year is zero, return zero

ii. Otherwise multiply [226] Other Receivables in First Year by 365 days and divide by the sum of [159] Annual Amount of Other Operating Income and [163] Total Revenue in First Year (for each non-operating revenue)

- Following periods:
- =I775+J776
  i. Adds previous period's [227] Days in Other Receivables to [228] Change in Other Receivables

**[228] Change in Other Receivables**

- Manual input for change in other receivables each period
- Added to [227] Days in Other Receivables after the first period

**[229] Accounts Payable in First Year**

- Manual input for accounts payable in the first year of the model

**[230] Days in Accounts Payable**

- Calculates days in accounts payable for each period of the model
- First period:
- =IF($I$778=0,0,$I$778*365/(SUM(I717:I722)+I648))
  i. IF[229] Accounts Payable in first year is zero, return zero
  ii. Otherwise multiply [229] Accounts Payable in First Year by 365 days and divide by the sum of [210] Total Costs for Forecast and [199] Track Operating Costs
- Following periods:
- =I779+J780
  i. Adds previous year's [230] Days in Accounts Payable to [231] Change in Accounts Payable

**[231] Change in Accounts Payables**

- Manual input for change in accounts payables each period
- Added to [230] Days in Accounts Payable after the first period

**[232] Other Payables in First Year**

- Manual input for other payables in the first year of the model

**[233] Days in Other Payables**

- Calculates the days in other payables for each period of the model
- First period:
- =IF(I782=0,0,I782*365/I760)
  i. IF [232] Other Payables in First Year is = 0, return 0
  ii. Otherwise multiply [232] Other Payables in First Year by 365 days and divide by the sum of [219] Total Annual Non-Operating Costs
- Following periods:
- =I783+J784
  i. Adds previous year's [233] Days in Other payables to [234] Change in Other Payables

**[234] Change in Other Payables**

- Manual input for change in other payables
- Added to [234] Days in Other Payables

**[235] Ending Cash Balances in First Year**

- Manual input for ending cash balances in the first year of the model

**[236] Earn Interest on Cash Balances?**

- Drop down menu of whether to earn interest on cash balances during the model
- "TRUE" sets [236] = 1
- "FALSE" sets [236] = 0

**[237] Margin Over Libor**

- Manual input for cash interest margin over the Libor rate during the model

# Working Capital Calculations

# Working Capital Calculations

**[238] Cash and Cash Equivalent**

- Links to [385] Cash and Cash Equivalents

**[239] Accounts Receivable**

- First period:
    i. Links to [220] Accounts Receivable in First Year
- Following periods:
- =IF((J1365-J1364)>0,J767/365*(J1365-J1364),0)
    i. IF[368] Total Operating Revenues (not including [367] Other Operating Revenues) is positive
    ii. Then divide [221] Days in Accounts Receivable by 365 days and multiply by [368] Total Operating Revenues (not including [367] Other Operating Revenues)
    iii. Otherwise [239] is = 0

**[240] Inventory**

- First period:
    i. Links to [223] Inventory in First Year
- Following periods:
- =IF((J718+J719)>0,J771/365*(J718+J719),0)
    i. IF [210] Total Costs of Diesel Fuel + Materials is Greater Than 0
    ii. Then Divide [224] Days in Inventory by 365 and multiply by sum of [210] Total Costs of Diesel Fuel and Materials
    iii. Otherwise [240] is = 0

**[241] Other Receivables**

- This row calculates other receivables by dividing days in other receivables by 365 days and multiplying by other operating revenues + total non-operating revenue
- First period:
    i. Links to [226] Other Receivables in First Year
- Following periods:
- =IF((J1364-J482+J603)>0,J775/365*(J1364-J482+J603),0)

i. IF ( [367] Other Operating Revenues (incl. subsidy amortization) – [137] Amortization of Capital Subsidy + [169] Total Non-Operating Revenue) is Greater Than 0
ii. Then [241] is = [227] Days in Other Receivables / 365 * ([367] Other Operating Revenues (incl. subsidy amortization) – [137] Amortization of Capital Subsidy + [169] Total Non-Operating Revenue)
iii. Otherwise [241] Other Receivables is = 0

**[242] Current Assets**

- Total current assets
- Sum of [238] Cash and Cash Equivalents, [239] Accounts Receivable, [240] Inventory and [241] Other Receivables

**[243] Accounts Payable**

- First period:
  i. Links to [229] Accounts Payable in first year
- Following periods:
- =IF((SUM(J717:J722)+J648)>0,J779/365*(SUM(J717:J722)+J648),0)
  i. IF the Sum of all [210] Total Costs for Forecast and [199] Track Access Operating Cost is Greater Than 0
  ii. Then divide [230] Days in Accounts Payable by 365 days and multiply by the sum of all [210] Total Costs Forecast and [199] Track Access Operating Cost
  iii. Otherwise [243] is = 0

**[244] Other Payables**

- First period:
  i. Link directly to [232] Other Payables in First Year
- Following periods:
- =IF(J760>0,J783/365*J760)
  i. If the sum of [219] Total Annual Non-Operating Costs is Greater Than 0
  ii. Then Divide [233] Days in Other Payables by 365 days and multiply by the sum of [219] Total Annual Non-Operating Costs
  iii. Otherwise [244] is = 0

**[245] Current Liabilities**

- Total current liabilities
- Sum [243] Accounts Payable and [244] Other Payables

**[246] Cash Ratio**

- Row calculates the cash to total current liability ratio for each period of the model
- =IF(I$802=0,"n/a",I794/I$802)
  i. IF [245] Current Liabilities equals 0
  ii. Then [246] is = “n/a”, which prevents a #DIV0! Error
  iii. Otherwise divide [238] Cash and Cash Equivalents by [245] Current Liabilities

**[247] Current Ratio**

- Row calculates the total current asset to total current liability ratio for each period of the model
- =IF(I$802=0,"n/a",I798/I$802)

i. IF [245] Current Liabilities equals 0,
ii. Then [247] is = “n/a”, which prevents a #DIV0! error
iii. Otherwise divide [242] Current Assets by [245] Current Liabilities

# Part 4: Fixed Asset Assumptions

# Fixed Asset Assumptions

## Fixed Asset Assumptions

**[248] Name of Fixed Asset Class 1**
- Manual input for the name of fixed asset class 1

**[249] Net Asset Value at End of First Year of Land**
- Manual input for the net asset value of land at end of the first year of the model

**[250] Annual Capital Expenditure on Land**
- Manual input for the annual capital expenditure on land for each period of the model

**[251] Total Capital Expenditure**
- Sum of [250] Annual Capital Expenditures for each period of the model

**[252] Annual Sale of Land**
- Manual input for the annual sale of land in each period of the model

**[253] Total Sale**
- Sum of [252] Annual Sales for all fixed assets

**[254] Depreciation Expense First Year (Total)**
- Manual input for depreciation (total) expense in the first year of the model

**[255] Let Model Calculate of Enter Manually?**
- Manual input to let model calculate depreciation using straight line method or to enter it manually
- Options: “Model” or “Manual”

**[256] If Manual Enter Depreciation**
- Manual input for depreciation in each period of the model

**[257] If Calculated Enter Average Remaining Life**
- Manual input for average remaining life of the assets in each period of the model

# Fixed Asset Calculations

## Fixed Asset Calculations

**[258] CAPEX Scenario Analysis Enabled?**
- Check if scenario analysis is enabled and whether a CAPEX multiplier will run with the scenario analysis
- =IF(OR(N1491="No",C1488="No"),0,1)

i. IF [441] Scenario Analysis On? OR [453] CAPEX Multiplier is = "No"
ii. Then [258] is = 0
iii. Otherwise [258] is = 1

**[259] CAPEX Multiplier**

- Check whether a track access multiplier is engaged and if yes, uses the value set out in scenario analysis
- =IF(F885=0,1,N1493)
  i. IF [258] CAPEX Multiplier Enabled = 0
  ii. Then [259] is = 1
  iii. Otherwise [259] is = [453] Track Access Multiplier

**[260] Starting Value of Existing Assets**

- Link to [264] Ending Value of Existing Assets from previous year

**[261] Less Sale of Assets**

- =MIN(J889,J835)
  i. Minimum of [260] Starting Value of Existing Assets and [252] Annual Sale of Asset

**[262] Less Depreciation of Existing Assets**

- Calculates the depreciation of new assets using straight line method: CAPEX – sale of assets / remaining life. If the depreciation amount is greater than the net book value, then the depreciation will equal the remaining balance
- =IF((J889-J890)>0,IF($I845=1,(MIN((J889-J890),(($I893-SUM($I890:J890))/$I847))),J846),0)
  i. Then IF [260] Starting Value of Existing Assets – [261] Sale of Assets is Greater Than 0
  ii. Then IF [255] is set to calculate (=1)
  iii. Then [262] is = the minimum of ( [260] Starting Value of Existing Assets - [261] Less Sale of Assets and [264] Ending Value of Existing Assets – the sum of all periods of [261] Less Sale of Assets ) / [257] Average Remaining Life
  iv. Otherwise [262] is = [256] If Manual Enter Depreciation
  v. Otherwise [262] is = 0

**[263] Accumulated Depreciation of Existing Assets**

- Sum of [262] Depreciation of Existing Assets from first period to current period

**[264] Ending Value of Existing Assets**

- Existing assets minus sales and depreciation
- First period:
  i. Link to [249] Net Asset Value at End of First Year
- Following periods:
  i. [260] Starting Value of Existing Assets less [261] Sale of Existing Assets less [262] Depreciation of Existing Assets

**[265] Starting Value of New Assets**

- Link to [270] Ending Value of New Assets from previous period

**[266] Add CAPEX**

- Link to [250] Annual Capital Expenditure on Land

**[267] Less Sale of Assets**

- =J835-J890
    i. [252] Annual Sale of Land less [261] Sale of Assets

**[268] Less Depreciation of New Assets**

- Calculates the depreciation of new assets using straight line method of CAPEX – sale of assets / remaining life. If the depreciation amount is greater than the net book value, then the depreciation will equal the remaining balance
- =IF($I$845=1,IF((J895-J897)>0,MIN((J895-J897),((SUM($I896:J896)-SUM($I897:J897))/$I847)),0),MIN((J895-J897),J846))
    i. IF [255] is set to calculate (=1)
    ii. Then IF [265] Starting Value of New Assets – [267] Sale of Assets is Greater Than 0
    iii. Then [268] is = the minimum of ( [265] Starting Value of New Assets – [267] Less Sale of Assets, and the sum of all periods of [266] CAPEX – the sum of all periods of [267] Less Sale of Assets ) / [257] Average Remaining Life
    iv. Otherwise [268] is = 0
    v. Otherwise [268] is = the minimum of ([265] Starting Value of New Assets – [267] Less Sale of Assets) and [256] Manual Depreciation

**[269] Accumulated Depreciation of New Assets**

- =SUM($I898:J898)
    i. Sum of all periods [268] Less Depreciation of New Assets

**[270] Ending**

- Calculates the ending balance of new assets
- =J895+J896-J897-J898
    i. [265] Starting Value of New Assets plus [266] Add CAPEX less [267] Sale of Assets less [268] Depreciation

**[271] Total Ending Net Asset Value**

- [270] Ending Value of New Assets plus [264] Ending Value of Existing Assets

**[272] Total CAPEX**

- Total capital expenditures for the period which is equal to the sum of all the [266] Add CAPEX under the fixed asset calculations

**[273] Total Depreciation**

- Total depreciation for the period
- First period:
    i. [273] is = [254] Depreciation Expense in First Year (Total)
- Following periods:
    i. Sum of all [262] Depreciation of Existing Assets and [268] Depreciation of New Assets

# Other Long-term assets

**[274] Other Long-Term Assets**

- Previous periods other long-term assets plus [275] Change in Other Long-Term Assets

**[275] Change in Other Long-Term Assets**

- Manual input for change in other long-term assets to adjust [274] Other Long-Term Assets

# Part 5: Financial Engineering

# Taxes and Dividends

## Taxes and Dividends

**[276] Corporate Income Tax Rate**

- Manual input for corporate income tax rate that will be used throughout the model

**[277] Required Debt Service Coverage Ratio (DSCR) Before Dividends Paid**

- Manual input for required debt service coverage ratio before dividends paid that will be used throughout the model

**[278] Annual Dividend After DSCR**

- Manual input for the annual dividend that will be paid after the DSCR is taken into account

## Dividends Calculation

**[279] Operating Cash Flow**

- Link to [418] Net Cash From Operating Activities

**[280] Debt Service**

- Link to [332] Total Debt Service

**[281] Actual DSCR**

- Calculates the debt service coverage ratio which is equal to cash flow divided by debt service
- =IF(OR(I1007=0,I1006=0),"N/A",I1006/I1007)
    i. IF [279] Operating Cash Flow or [280] Debt Service is equal 0
    ii. Then is [281] is = “N/A”
    iii. Otherwise divide [279] Operating Cash flow by [280] Debt Service

**[282] Required DSCR**

- Link to [277] Required Debt Service Coverage Ratio

**[283] Investing Cash Flow (After Subsidy and Loan Proceeds)**

- Calculates net cash inflow from investing activities including loans and capital subsidy
- =I1452+I1456+I1457
    i. [422] Net Cash From Investing Activities plus [424] Proceeds From Loans plus [425] Capital Subsidy

**[284] Cash Available for Dividends**

- =J1006-J1007+J1010
    i. [279] Operating Cash Flow – [280] Debt Service + [283] Investing Cash Flow

**[285] Annual Dividend**

- Calculates the annual dividend for each period of the model
- =IF(AND(I1008>I1009,I1011>0,I1008>0),I1011*$I1003,0)

i. IF [281] Actual DSCR is Greater Than [282] Required DSCR AND [284] Cash Available for Dividends is positive AND [281] Actual DSCR is positive
ii. Then [285] is = [284] Cash Available for Dividends multiplied by [278] Annual Dividend after DSCR
iii. Otherwise [285] is = 0

- IF the actual DSCR is positive and greater than required DSCR and cash available for dividends is positive, then calculate a dividend by multiplying the cash available by annual dividend after DSCR. Otherwise [285] is = 0

# Debt Financing

## Debt Financing Assumptions

### Existing Debt 1

**[286] Debt/Bond Funding Source (Name of Lender/Capital Markets)**
- Manual input for debt/bond funding source (name of lender/capital markets)

**[287] Currency**
- Drop down menu that is used to select currency that inputs for existing debt 1

**[288] Outstanding Amount at the Beginning of First Year**
- Manual input for outstanding amount of the debt at the beginning of the first year

**[289] Interest Expense in First Year**
- Manual input for the interest expense in first year

**[290] Principal Repayments (annual)**
- Manual input for the annual principal repayments throughout the model

**[291] Use Fixed or Variable Interest Rate**
- Drop down menu for fixed or variable interest rate
- Two options available: “Fixed” and “Variable”

**[292] If Fixed, Enter Interest Rate**
- Manual input for fixed interest rate

**[293] If Variable, Enter Margin on Libor**
- Manual input for margin on Libor of the existing debt

### New Debt 1

**[294] Debt/Bond Funding Source (Name of Lender/Capital Markets)**
- Manual input for debt/bond funding source (name of lender/capital markets)

**[295] First Year Disbursement**
- Manual input for first year disbursement of the new debt

**[296] Currency**
- Drop down menu that is used to select currency that inputs for new debt 1

**[297] Principal Amount in Issue Currency**

- Manual input for principal amount of the new debt in the issue currency

**[298] Drawdown Amounts (Annual)**

- Manual input for annual drawdown amounts of the new debt

**[299] Used Fixed or Variable Interest Rate?**

- Drop down menu for fixed or variable interest rate
- Two Options: : "Fixed" and "Variable"

**[300] If Fixed, Enter Interest Rate**

- Manual input for interest rate on the new debt

**[301] If Variable, Enter Margin on Libor**

- Manual input for margin on Libor of variable rate

**[302] Term**

- Manual input for term of the new debt

**[303] Grace Period**

- Manual input for the grace period in years for the new debt

**[304] Repayments Profile**

- Drop down menu input with "Bullet", "Equal Installment" and "Mortgage Style". Used to specify the type of repayment required on the loan

**[305] Front-End Fee**

- Manual input for the percentage front-end fee of the new debt

**[306] Commitment Fee**

- Manual input for the percentage commitment fee of the new debt

# Debt Financing Calculations

## Existing Debt

**[307] Existing Loan From Municipal Bank**

- Row used to show the period that the loan is outstanding

**[308] Interest Rate**

- Row calculates the interest rate on the existing debt based on whether it is fixed or variable
- =IF($I1026="Fixed",$I1028,$I1029+H$53)
    i. IF [291] Use Fixed or Variable Interest Rate is = "Fixed"
    ii. Then [308] is = [292] Fixed Input
    iii. Otherwise [308] is = [293] Margin on Libor + [28] Libor Interest Rate

**[309] Principal Outstanding at the Beginning of the Year**

- Shows outstanding principle amount of the existing debt at the beginning of the period
- First period:
    i. [309] is = [288] Outstanding Amount at the Beginning of First Year
- Following periods:
    i. [309] is = preceding [311] Principal Outstanding at the End of the Year

**[310] Repayment of Principal**

- Shows the amount of principal paid in each period the loan is outstanding from the input in [290] Principal Repayments (Annual)

**[311] Principal Outstanding at the End of the Year**

- Calculates the amount of loan principal that is outstanding at the end of each period
- =H1132-H1133
    i. [309] Principal Outstanding at the Beginning of the Year – [310] Repayment of Principal

**[312] Interest Due at the End of the Year**

- Calculates the interest that is due at the end of each period based on an average of the beginning and ending principle balances
- First period: links to [289] Interest Expense in First Year
- Later periods:
- =I1131*((I1132+I1134)/2)
    i. [308] Interest Rate * (([309] Principal Outstanding at the Beginning of the Year + [311] Principal Outstanding at the End of the Year) / 2)

**[313] Total Debt Service**

- Calculates the total amount paid to service the debt each period by summing together [310] Repayment of Principal and [312] Interest Due at the End of the Year

**[314] Exchange Rate**

- Row checks if the debt is denominated in a foreign currency and if it is, outputs the exchange rate for that currency. Otherwise the rate is equal to 1, signalling no foreign currency exchange for that debt amount
- =IF(AND(H25="",I25=""),"",IF(I$25="",G1139,IF($I1021=$C$20,I$62,IF($I1021=$C$19,I$59,1))))
    i. IF next period [16] Period To and current [16] Period To are blank
    ii. Then [314] is = blank
    iii. Otherwise IF next period [16] Period To is blank
    iv. Then [314] is = preceding [314]
    v. Otherwise IF [287] Currency is = [13] Foreign Currency 2
    vi. Then [314] is = [30] USD/R$
    vii. Otherwise IF [287] Currency is = [12] Foreign Currency 1
    viii. Then [314] is = [29] EUR/R$
    ix. Otherwise [314] is = 1
- Formula checks if the model is in the final year which if true, outputs the preceding exchange rate. Otherwise the foreign exchange rate on the debt is compared with the foreign currencies listed which then outputs the correct exchange rate for that particular debt

## New Debt

**[315] Repayment Period**

- Calculates the current repayment period for each year in the model based on whether a principal amount was entered for the debt, when the debt principal becomes outstanding, and the grace period of the debt

- =IF($I1060=0,"",(IF(H1130<($I1057+$I1067),0,G1179+1)))
    i. IF [297] Principal Amount in Issue Currency is = 0
    ii. Then [315] is blank
    iii. Otherwise IF the period from [307] Existing Loan From Municipal Bank is Less Than [295] First Disbursement Year + [303] Grace Period
    iv. Then [315] is = 0
    v. Otherwise [315] is = preceding [315] + 1
- Formula first checks if there is a principal amount for the new debt, if true it checks whether the current period that was calculated in the existing loan section is less than the first disbursement year plus the grace period. This is done so the new loan will only have an outstanding period after the first year the principal is outstanding outside the grace period

**[316] Interest Rate**

- Row calculates the interest rate on the new debt based on whether it is fixed or variable
- =IF($I1062="Fixed",$I1064,$I1065+H$53)
    i. IF [299] Use Fixed or Variable Interest Rate is = “Fixed”
    ii. Then [316] is = [300] IF Fixed, Enter Interest Rate
    iii. Otherwise [316] is = [301] If Variable, Margin on Libor Input + [28] Libor Interest Rate

**[317] Principal Outstanding at the Beginning of the Year**

- Shows outstanding principle amount of the existing debt at the beginning of the period
- Is equal to an initial input for the first period and then to the preceding [325] Principal Outstanding at the end of the year for subsequent periods

**[318] Repayment of Principal**

- Row used to calculate the principal repayment of the new debt each period
- =IF($I$1060>0,IF($I$1068="Bullet",H1183,IF($I$1068="Equal Installment",H1184,IF($I$1068="MortgageStyle",IF(H1179=($I1066-$I1067),H1181,H1185),0))),0)
    i. IF [297] Principal Amount is Greater Than 0
    ii. Then IF [304] Repayment Profile is = “Bullet”
    iii. Then [318] is = [319] Bullet Principal
    iv. Otherwise IF [304] Repayment Profile is = “Equal Installment”
    v. Then [318] is = [320] Equal Installment Principal
    vi. Otherwise IF [304]Repayment Profile is = “Mortgage Style”
    vii. Then IF [315] Repayment Period is = [302] Term – [303] Grace Period
    viii. Then [318] is = [317] Principal Outstanding at Beginning of the Year
    ix. Otherwise [318] is = [321] Annuity Principal
    x. Otherwise [318] is = 0
    xi. Otherwise [318] is = 0
- Formula first checks if repayment should be 0 based on whether there is any principal outstanding initially. It then checks the repayment profile and inputs the correct principal repayment based on the [304] Repayment Profile input of “Bullet”, “Equal Installment” or “Mortgage Style”

**[319] Bullet Principal**

- Row used to calculate if there is a bullet payment on the new debt and when that principal repayment would occur
- =IF($I$1060>0,IF(AND($I$1068="Bullet",H1179=($I$1066-$I$1067)),$I$1060,0),0)
    i. IF [297] Principal Amount is Greater Than 0
    ii. Then IF [304] Repayment Profile is = "Bullet" AND [315] Repayment Period is = [302] Term – [303] Grace Period
    iii. Then [319] is = [297] Principal Amount,
    iv. Otherwise 0
    v. Otherwise 0
- Formula first checks if repayment should be 0 based on whether there is any principal outstanding initially. It then checks if the repayment profile is bullet and the repayment period is equal to the ending period of the term minus the grace period. If these are true then the full principal is paid off in that period of the model, otherwise it is equal to 0 for that period

**[320] Equal Installment Principal**

- Row used to calculate if there is an equal installment repayment schedule, what these payments will be, and when they will occur
- =IF($I$1060>0,IF(AND($I$1068="Equal Installment",H$1179>0,H$1179<=($I$1066-$I$1067)),$I$1060/($I$1066-$I$1067),0),0)
    i. IF [297] Principal Amount is Greater Than 0
    ii. Then IF [304] Repayment Profile is = "Equal Installment" AND [315] Repayment Period is greater than 0 AND [315] Repayment Period is Less Than or Equal to [302] Term – [303] Grace Period
    iii. Then [320] is equal [297] Principal Amount / [299] Term – [303] Grace Period
    iv. Otherwise 0
    v. Otherwise 0
- Formula first checks if repayment should be 0 based on whether there is any principal outstanding initially. It then checks if the repayment profile is equal installment, the repayment period is greater than zero and also less than or equal to the term of the loan minus the grace period. If it is all true then the repayment is equal amounts each period based on the principal amount and term of the loan

**[321] Annuity Principal**

- Row used to calculate if the new debt has a mortgage style repayment schedule, what these payments will be, and when they will occur
- =IF($I$1060>0,IF(AND($I$1068="mortgage Style",H1179>0,H1179<=($I$1066-$I$1067)),H1181*F1186/SUM(H1186:$BA1186)-H1187,0))
    i. IF [297] Principal Amount is Greater Than 0
    ii. Then IF [304] Repayment Profile is = "Mortgage Style" AND [315] Repayment Period is Greater Than 0 AND [315] Repayment Period is Less Than or Equal to [302] Term – [303] Grace Period

iii. Then [321] is = ([317] Principal Outstanding at the Beginning of the Year * initial [322] Annuity Discount Factor / the sum of [322] Annuity Discount Factor row) – [323] Annuity Interest
iv. Otherwise [321] is = 0
v. Otherwise [321] is = 0

- Formula first checks if repayment should be 0 based on whether there is any principal outstanding initially. It then checks if the repayment profile is mortgage style, the repayment period is greater than zero and also less than or equal to the term of the loan minus the grace period. If it is all true than the annuity principal repayment is equal to the initial principle multiplied by the annuity discount factor divided by the sum of the annuity discount row minus the annuity interest

**[322] Annuity Discount Factor**

- Row calculates the discount factor for new mortgage style repayment profile loans. This discount factor is used to calculate the principal due each period for mortgage style loans
- =IF($I$1060>0,IF(AND($I$1068="mortgage Style",H$1179<=($I$1066-$I$1067)),$F1186/(1+H1180),0),0)
  i. IF [297] Principal Amount is Greater Than 0
  ii. Then IF [304] Repayment Profile is = “Mortgage Style” AND [315] Repayment Period is Greater Than 0 AND [315] Repayment Period is Less Than or Equal to [302] Term – [303] Grace Period
  iii. Then [322] is = preceding [322] Annuity Discount Factor / (1 + [316] Interest Rate)
  iv. Otherwise [322] is = 0
  v. Otherwise [322] is = 0
- Formula first checks if repayment should be 0 based on whether there is any principal outstanding initially. It then checks if the repayment profile is mortgage style, the repayment period is greater than zero and also less than or equal to the term of the loan minus the grace period. If it is all true than the annuity principal repayment is equal to the preceding annuity discount factor divided by 1 plus the interest rate

**[323] Annuity Interest**

- Row used to calculate the annuity interest each period on new loans. This annuity interest is used on the calculation of the annuity principal amount
- =IF($I$1060>0,IF($I$1068="mortgage Style",H1181*H1180,0),0)
  i. IF [297] Principal Amount is Greater Than 0
  ii. Then IF [304] Repayment Profile is = “Mortgage Style”
  iii. Then [323] is = [317] Principal Outstanding at the Beginning of the Year * [316] Interest Rate
  iv. Otherwise [323] is = 0
  v. Otherwise [323] is = 0
- Formula first checks if repayment should be 0 based on whether there is any principal outstanding initially. It then checks if the repayment profile is mortgage style. If both these are

true the annuity interest is equal to the principal outstanding at the beginning of that period multiplied by the interest rate

**[324] Principal Received**

- Row used to show the amount and timing of when the principal is received from the new loan
- =IF($I$1060>0,I$1061,0)
    i. IF [297] Principal Amount is Greater Than 0
    ii. Then [324] is = [298] Drawdown Amounts
    iii. Otherwise [324] is = 0

**[325] Principal Outstanding at the End of the Year**

- Row calculates how much principal is outstanding at the end of each period based on the amount of principle that is repaid and received
- =H1181-H1182+H1188
    i. [317] Principal Outstanding at the Beginning of the Year – [318] Repayment of Principal + [324] Principal Received

**[326] Interest Due at the End of the Year**

- Row used to calculate the amount of interest that is due at the end of each period. This is based on the type of new loan that was initially entered
- IF($I$1060>0,IF(AND($I$1068="mortgage Style",H$1179>0),H1187,(H1180*(H1181+H1189)/2)),0)
    i. IF [297] Principal Amount is Greater Than 0
    ii. Then IF [304] Repayment Profile is = “Mortgage Style” AND [315] Repayment Period is greater Than 0
    iii. Then [326] is = [323] Annuity Interest
    iv. Otherwise [326] is = [316] Interest Rate * ([317] Principal Outstanding at the Beginning of the Year + [325] Principal Outstanding at the End of Each Year) / 2
    v. Otherwise [326] is = 0
- Formula first checks if repayment should be 0 based on whether there is any principal outstanding initially. It then checks if the repayment profile is mortgage style and whether the repayment period is greater than zero. If these are true than the interest due is equal to the annuity interest. Otherwise the interest due is equal to the interest rate multiplied by the average principal outstanding

**[327] Front-End Fee**

- Calculates the front end fee on new debt
- =IF($I$1060>0,IF($I$1057=I$22,$I$1060*$I$1070,0),0)
    i. IF [297] Principal Amount is Greater Than 0
    ii. Then IF [295] First Disbursement Year is = [14] Periods
    iii. Then [327] is = [297] Principal Amount * [305] Front End Fee
    iv. Otherwise [327] is = 0
    v. Otherwise [327] is = 0

**[328] Undisbursed Capital**

- Row is used to determine how much if any of a new loan remains undisbursed to the company

- =IF($I$1060>0,IF(AND(I$22<=($I$1067+$I$1057),I$22>=$I$1057),$I$1060-H1181-H1188,0),0)
    i. IF [297] Principal Amount is Greater Than 0
    ii. Then IF [14] Periods is Less Than or Equal to [295] First Disbursement Year + [303] Grace Period AND [14] Periods is Greater Than or Equal to [295] First Disbursement Year
    iii. Then [328] is = [297] Principal Amount – [317] Principal Outstanding at the Beginning of the Year – [324] Principal Received
    iv. Otherwise [328] is = 0
    v. Otherwise [328] is = 0
- Formula first checks if repayment should be 0 based on whether there is any principal outstanding initially. It then checks if the loan is outstanding during the model based on the first disbursement year. If these are true [328] Undisbursed Capital is equal to the initial principal minus the beginning principal balance minus the principal received

**[329] Commitment Fee**

- Row used to calculate the commitment fee for any undisbursed capital each period
    - =IF($I$1060>0,$I$1071*H1192,0)
        i. IF [297] Principal Amount is Greater Than 0
        ii. Then [306] Commitment Fee * [328] Undisbursed Capital

**[330] Total Debt Service**

- Total of all new debt service costs for the period
- =IF($I$1060>0,H1182+H1190+H1191+H1193,0)
    i. IF [297] Principal Amount is Greater Than 0
    ii. Then [318] Repayment of Principal + [326] Interest Due at the End of the Year + [327] Front End Fee + [329] Commitment Fee
    iii. Otherwise [330] is = 0

**[331] Net Financing Fees**

- Sum of all interest due, front end fees and commitment fees for all new and existing debt

**[332] Total Debt Service**

- Sum of [313] and [330] Total Debt Service multiplied by the exchange rate for all new and existing debt

# Other Long-Term Liabilities

## Other Long-Term Liabilities

**[333] Annual Amount**

- Manual input for the annual amount of other long term liabilities. Is adjusted each period based on [334] Change in Other Long-Term Liabilities

**[334] Change in Other Long-Term Liabilities**

- Manual input for any amount changes in [333] Annual Amount of Other Long-Term Liabilities

# Equity

# Equity Assumptions

**[335] Equity Funding Source**

- Manual input for the name of the source of equity funding

**[336] Ending Paid-In Capital in First Year**

- Manual input for the ending paid in capital for the first year

**[337] Enter Additions to Paid-In Capital**

- Manual input for additions to paid in capital each period

**[338] Ending Retained Earnings in First Year**

- Manual input for the ending retained earnings in the first year

**[339] Total Equity**

- Sum of [336] Ending Paid-In Capital in First Year and [338] Ending Retained Earnings in First Year to give the total equity for the first year

# Equity Calculations

**[340] Opening Paid-In Capital**

- Row is the opening balance of paid-in capital which is equal to the preceding [342] Ending Paid-In Capital each period

**[341] Change in Paid-In Capital**

- Row shows any changes in paid in capital each period which is equal to the [337] Additions to Paid-In Capital for each period

**[342] Ending Paid-In Capital**

- Row shows the ending paid-in capital which is equal to the input in [336] Ending Paid-In Capital in First Year for the initial period and the [340] Opening Paid-In Capital plus any additions from [341] Change in Paid-In Capital for subsequent periods

**[343] Opening Capital Subsidy**

- Row is the opening balance of the capital subsidy which is equal to the preceding [345] Ending Capital Subsidy

**[344] Change in Capital Subsidy less Amortization**

- Row shows any changes in the capital subsidy each period which is equal to the [136] Capital Subsidy minus the [137] Amortization of Capital Subsidy for each period

**[345] Ending Capital Subsidy**

- Rows shows the ending capital subsidy which is equal to the input in [128] Subsidy in First Year from the Capital Subsidy section for the initial period and the [343] Opening Capital Subsidy plus any additions from [344] Change in Capital Subsidy Less Amortization for subsequent periods

**[346] Retained Earnings Opening Balance**

- Row is the opening balance of retained earnings which is equal to the preceding [348] Retained Earnings Closing Balance each period

**[347] Change in Retained Earnings**

- Row shows any changes in the retained earnings for each period which is equal to the [384] Net Income minus the [429] Dividends Paid for each period

**[348] Retained Earnings Closing Balance**

- Rows shows the ending retained earnings which is equal to the input in [338] Ending Retained Earnings in First Year for the initial period and the [346] Retained Earnings Opening Balance plus any additions from [347] Change in Retained Earnings for subsequent periods

# Cash Calculations

**[349] Opening Cash Balance**

- Row is the opening balance of cash which is equal to the preceding [351] Ending Cash Balance each period

**[350] Net Change in Cash**

- Rows shows the net changes in cash which is equal to the [431] Net Change in Cash for each period

**[351] Ending Cash Balance**

- Row shows the ending cash balance which is equal to the input in [235] Ending Cash Balance in First Year and the [349] Opening Cash Balance plus any additions from [350] Net Change in Cash for subsequent periods

**[352] Interest Rate on Cash Balances**

- Row calculates the annual Interest rate that is earned on cash balances which is calculated as the [237] Margin Over Libor + [28] Libor for each period

**[353] Interest Amount of Cash Balances**

- Row calculates the annual amount that is earned on the [349] Opening Cash Balance each period
- =IF($I787=0,0,I1334*I1337)
    i. IF [236] Earn Interest on Cash Balances is = 0
    ii. Then [353] is = 0
    iii. Otherwise [353] is = [349] Opening Cash Balance * [352] Interest Rate on Cash Balances

**[354] Ending Cash Balance Non-Negative**

- Row shows whether or not the ending cash balance is positive or negative each period with 1 meaning “Positive” and 0 meaning “Negative”
- =IF(J1339>=0,1,0)
    i. IF [351] Ending Cash Balance is Greater Than or Equal To 0
    ii. Then [354] is = 1
    iii. Otherwise [354] is = 0

# Financial Results

# Financial Results

**[355] Net Income**

- Row shows the net income for each period which is equal to [384] Net Income

**[356] Total Revenue**

- Row shows the total revenue for each period which is equal to [368] Total Revenues

**[357] Net Profit Margin**

- Row calculates the net profit margin for each period which is equal to [355] Net Income / [356] Total Revenue

**[358] Average Equity**

- Row shows the average equity amount for each period which is equal to the first [405] Total Equity for the first period and the average of two periods [405] Total Equity amounts for subsequent periods

**[359] Return on Equity**

- Row calculates the average return on equity for each per which is equal to the [355] Net Income / [358] Average Equity

**[360] Average Assets**

- Row shows the average asset amount for each period which is equal to the first [393] Total Assets for the first period and the average of two periods [393] Total Asset amounts for subsequent periods

**[361] Return on Assets**

- Row calculates the average return on assets for each per which is equal to the [355] Net Income / [360] Average Assets

**[362] Working Ratio**

- Calculates the working ratio for each period which is equal to ([376] Total Operating Expenses minus [379] Depreciation) / [380] EBIT

# Part 6: Financial Statements

# Company Income Statement

## Operating Revenues

**[363] Freight Tariffs**

- Freight tariff revenues for the period which is equal to the sum of all the [148] Commodity Revenues

**[364] Passenger Fares**

- Passenger revenues for the period which is equal to [158] Total under Passenger Fares

**[365] Track Access Revenue**

- Track access revenues for the period which is equal to [198] Track Access Revenue

**[366] Operating Subsidy**

- Operating subsidy for the period which is equal to [135] Operational Subsidy

**[367] Other (Including Subsidy Amortization)**

- Other revenues for the period which is equal to the sum of [137] Amortization of Capital Subsidy and [159] Annual Amount under Other Operating Revenue

**[368] Total Revenues**

- Total revenues for the period which is equal to the sum of [363] Freight Tariffs, [364] Passenger Fares, [365] Track Access Revenue, [366] Operating Subsidy and [367] Other (Incl. Subsidy Amortization)

## Operating Expenses

**[369] Track Access Charge**

- Track access for the period which is equal to [199] Track Access Operating Cost

**[370] Staff**

- Staff costs for the period which is equal to the staff portion of [210] Total Costs for Forecast

**[371] Materials**

- Material costs for the period which is equal to the materials portion of [210] Total Costs for Forecast

**[372] Fuel**

- Fuel costs for the period which is equal to the diesel fuel portion of [210] Total Costs for Forecast

**[373] Electricity**

- Electricity costs for the period which is equal to the electricity portion of [210] Total Costs for Forecast

**[374] External Services**

- External service costs for the period which is equal to the external services portion of [210] Total Costs for Forecast

**[375] Other**

- Other operating expenses for the period which is equal to the other operating expenses portion of [210] Total Costs for Forecast

**[376] Total Operating Expenses**

- Total operating costs for the period which is equal to the sum of [369] Track Access Charge, [370] Staff, [371] Materials, [372] Fuel, [373] Electricity, [374] External Services and [375] Other

## Non-Operating Adjustments

**[377] Total Non-Operating Adjustments**

- Total of the non-operating adjustments for the period which is equal to [169] Total Non-Operating Revenue minus [219] Total Annual Non-Operating Costs

**[378] EBITDA**

- Earnings before interest, taxes, depreciation and amortization for the period which is equal to [368] Total Revenues minus [376] Total Operating Expenses plus [377] Total Non-Operating Adjustments

**[379] Depreciation**

- Depreciation for the period which is equal to the [273] Total Depreciation

**[380] EBIT**

- Earnings before interest and taxes for the period which is equal to [378] EBITDA minus [379] Depreciation

**[381] Net Finance Expenses**

- Net finance expenses for the period which is equal to [331] Net Financing Fees minus [353] Interest Amount of Cash Balance

**[382] EBT**

- Earnings before tax for the period which is equal to [380] EBIT minus [381] Net Finance Expenses

**[383] Income Tax**

- Income tax for the period which is equal to [382] EBT multiplied by [276] Corporate Income Tax Rate

**[384] Net Income**

- Net income for the period which is equal to [382] EBT minus [383] Income Tax

# Company Balance Sheet

## Assets

**[385] Cash and Cash Equivalents**

- Cash and equivalents at the end of the period which is equal to [351] Ending Cash Balance

**[386] Accounts Receivable**

- Accounts receivable at the end of the period which is equal to [239] Accounts Receivable

**[387] Inventory**

- Inventory at the end of the period which is equal to [240] Inventory

**[388] Other Receivables**

- Other receivables at the end of the period which is equal to [241] Other Receivables

**[389] Total Current Assets**

- Total current assets at the end of the period which is equal to the sum of [385] Cash and Cash Equivalents, [386] Accounts Receivable, [387] Inventory and [388] Other Receivables

**[390] Property, Plant and Equipment**

- Property, plant and equipment at the end of the period which is equal to the sum of all the [271] Total Ending Net Asset Value for all the assets in Fixed Asset Calculations

**[391] Other Long-Term Assets**

- Other long-term assets at the end of the period which is equal to [274] Other Long-Term Assets

**[392] Total Long-Term Assets**

- Total long-term assets at the end of the period which is equal to sum of [390] Property, Plant and Equipment and [391] Other Long-Term Assets

**[393] Total Assets**

- Total assets at the end of the period which is equal to the sum of [389] Total Current Assets and [392] Total Long-Term Assets

## Liabilities

**[394] Accounts Payable**

- Accounts payable at the end of the period which is equal to [243] Accounts Payable

**[395] Other Payables**

- Other payables at the end of the period which is equal to [244] Other Payables

**[396] Short-Term Loan Payables**

- Short-term payables at the end of the period which is equal to the sum of the ([310] Repayment of Principle multiplied by [314] Exchange Rate for all the new and existing debt under Debt Financing Calculations)

**[397] Total Current Liabilities**

- Total current liabilities at the end of the period which is equal to the sum of [394] Accounts Payable, [395] Other Payables and [396] Short-Term Loan Payables

**[398] Long-Term Loans**

- Long-term debt at the end of the period which is equal to the sum of (all the [311] Principle Outstanding at the End of the Period multiplied by [314] Exchange Rate under the Debt Financing Calculations section ) minus [396] Short-Term Loan Payables

**[399] Other Long-Term Liabilities**

- Other long-term liabilities at the end of the period which is equal to [333] Annual Amount under the Other Long-Term Liabilities section

**[400] Total Long-Term Liabilities**

- Total long-term liabilities at the end of the period which is equal to the sum of [398] Long-Term Loans and [399] Other Long-Term Liabilities

**[401] Total Liabilities**

- Total liabilities at the end of the period which is equal to the sum of [397] Total Current Liabilities and [400] Total Long-Term Liabilities

## Equity

**[402] Paid-In Capital**

- Paid in capital at the end of the period which is equal to [342] Ending Paid-In Capital

**[403] Capital Subsidy**

- Capital subsidy at the end of the period which is equal to [345] Ending Capital Subsidy

**[404] Retained Earnings**

- Retained earnings at the end of the period which is equal to [348] Retained Earnings Closing Balance

**[405] Total Equity**

- Total equity at the end of the period which is equal to the sum of [402] Paid-In Capital, [403] Capital Subsidy and [404] Retained Earnings

**[406] Total Liabilities and Equity**

- Total liabilities and equity at the end of the period which is equal to the sum of [401] Total Liabilities and [405] Total Equity

**[407] Balance?**

- Row checks if the balance sheet is balanced for each period by checking if the [393] Total Assets is equal to [406] Total Liabilities and Equity based on a small level of tolerance
- =IF((I1392-I1372)<(0.0001),"YES","NO")
    i. IF [406] Total Liabilities and Equity – [393] Total Assets is Less Than 0.0001
    ii. Then [407] is = "Yes"
    iii. Otherwise [407] is = "No"

# Cash Flow Statement

## Operating Activities

**[408] Net Income**

- Net income for the period which is equal to [384] Net Income

**[409] Add Interest and Finance Expenses**

- Adding back net finance expense and interest earned on cash balances which is equal to the sum of [381] Net Finance Expenses and [353] Interest Amount on Cash Balance

**[410] Depreciation**

- Depreciation amount for the period which is equal to [379] Depreciation

**[411] Amortization of Capital Subsidy**

- Amortization of the capital subsidy each period which is equal to [137] Amortization of Capital Subsidy

**[412] Accounts Receivable**

- Change in accounts receivable each period which is equal to current [386] Accounts Receivable minus preceding [386] Accounts Receivable

**[413] Inventory**

- Change in inventory each period which is equal to current [387] Inventory minus preceding [387] Inventory

**[414] Other Receivables**

- Change in other receivables each period which is equal to current [388] Other Receivables minus preceding [388] Other Receivables

**[415] Accounts Payable**

- Change in accounts payable each period which is equal to current [394] Accounts Payable minus preceding [394] Accounts Payable

**[416] Other Payables**

- Change in other payables each period which is equal to current [395] Other Payables minus preceding [395] Other Payables

**[417] Total Change in Working Capital**

- Total change is working capital for the period which is equal to [415] Accounts Payable plus [416] Other Payables minus [412] Accounts Receivable minus [413] Inventory minus [414] Other Receivables

**[418] Net Cash From Operating Activities**

- Total cash generated or used by operating activities for the period which is equal to [408] Net Income plus [409] Add Interest and Finance Expenses plus [410] Depreciation minus [411] Amortization of Capital Subsidy + [417] Total Change in Working Capital

## Investing Activities

**[419] Acquisition of Property, Plant and Equipment**

- Acquisition of property, plant and equipment for the period which is equal to [272] Total CAPEX

**[420] Sale of Property, Plant and Equipment**

- Sales of property, plant and equipment for the period which is equal to [253] Total Sales under Fixed Asset Assumptions

**[421] Other Long Term Assets**

- Net acquisition or disposition of other long term assets for the period which is equal to [391] Other Long Term Assets minus preceding [391] Other Long Term Assets

**[422] Net Cash From Investing Activities**

- Total cash generated or used from investing activities which is equal to [419] Acquisition of Property, Plant and Equipment plus [420] Sale of Property, Plant and Equipment minus [421] Other Long Term Assets

## Financing Activities

**[423] Repayment of Loans**

- Repayment of loans outstanding during the period which is equal to the sum of (all the [310] Repayment of Principal multiplied by [314] Exchange Rate in the Debt Financing Calculations)

**[424] Proceeds From Loans**

- Proceeds from loans the period which is equal to the sum of (all the [324] Principal Received from each new loan multiplied by [314] Exchange Rate for new debt in the Debt Financing Calculations)

**[425] Capital Subsidy**

- Capital subsidy for the period which is equal to [136] Capital Subsidy

**[426] Change in Other Long-Term Liabilities**

- Change in other long-term liabilities each period which is equal to current [399] Other Long-Term Liabilities minus preceding [399] Other Long-Term Liabilities

**[427] Change in Paid-In Capital**

- Change in paid-in capital each period which is equal to current [402] Paid-In Capital minus preceding [402] Paid-In Capital

**[428] Interest and Finance Expenses**

- Interest and finance expenses for the period which is equal to [409] Add Interest and Finance Expenses

**[429] Dividends Paid**

- Dividends paid during the period which is equal to [285] Annual Dividend

**[430] Net Cash From Financing Activities**

- Total cash generated or used from financing activities each period which is equal to [424] Proceeds From Loans plus [425] Capital Subsidy plus [426] Change in Other Long-Term Liabilities plus [427] Change in Paid-In Capital minus [424] Repayment of Loans minus [428] Interest and Finance Expenses minus [429] Dividends Paid

**[431] Net Change in Cash**

- Net change in cash for each period which is equal to the sum of [418] Net Cash From Operating Activities plus [422] Net Cash From Investing Activities plus [430] Net Cash From Financing Activities

**[432] Cash Balance at Beginning of Year**

- Total cash balance at the beginning of the year which is equal to [433] Cash Balance at End of the Year for the first period and preceding [385] Cash and Equivalents for subsequent periods

**[433] Cash Balance at End of Year**

- Total cash balance at the end of the year which is equal to [385] Cash and Equivalents for each period

**[434] Check**

- Row checks if the cash balance is correct for each period by checking if the [433] Cash Balance at End of Year minus [432] Cash Balance at Beginning of Year minus [431] Net Change in Cash is close to 0 based on a small level of tolerance
- =IF(((J1468-J1467)-J1465)<(0.00001),"YES","NO")
    i. IF [433] Cash Balance at End of Year – [432] Cash Balance at Beginning of Year – [431] Net Change in Cash is Less Than 0.0001
    ii. Then [434] is = “Yes”
    iii. Otherwise [434] is = “No”

# Part 7: Scenario Analysis

## Control Panel

**[435] Start Date**

- Manual input for the start period of the scenario analysis

**[436] End Date**

- Manual input for the end date of the scenario analysis

**[437] Model Number of Years**

- Total number of years in the model which is equal to [4] Number of Years

**[438] End Scenario Year**

- Formula used to check if the model number of years or end date is larger than the end scenario year under the Consolidated Model which then uses whichever is larger for the scenario analysis
- =IF(MIN($C$1481:$C$1482)>'Consolidated Model'!$C$433,MIN($C$1481:$C$1482),'Consolidated Model'!$C$433)

i. IF the minimum of [436] End Date to [437] Model Number of Years is Greater Than the Consolidated Model [438] End Scenario Year
ii. Then [438] is = the minimum of [436] End Date to [437] Model Number of Years
iii. Otherwise [438] is = Consolidated Model [438] End Scenario Year

- Formula checks if the lower of the [436] End Date or [437] Model Number of Years is greater than the [438] End Scenario Year from the Consolidated Model. If it is the minimum of either the [436] End Date or [437] Model Number of Years is used. Otherwise the Consolidated Model [438] End Scenario Year is used

**[439] Summary Page On?**

- Drop down menu with "True" or "False" used as an input on whether or not to run the summary page

# Scenario Analysis

**[440] Run Scenario Analysis?**

- Drop down menu with "Yes" or "No" that is used as an input on whether to run any scenario analysis

**[441] Scenario Analysis On?**

- Formula to check if either the scenario analysis for the current model or consolidated model is set to "Yes" which will trigger the scenario analysis for the current model to run
- =IF(OR(C1487="Yes",'Consolidated Model'!C437="Yes"),"Yes","No")
  i. IF [440] Run Scenario Analysis? Is = "Yes" OR the Consolidated Model [630] Run Consolidated Scenario Analysis? is = "Yes"
  ii. Then [441] is = "Yes"
  iii. Otherwise [441] is = "No"

**[442] Tariff Multiplier (x) (1 Column by 4 Rows)**

- Column to calculate a scenario analysis based on an implied tariff multiplier
- Row 1 uses a drop down menu with "Yes" or "No" as an input for whether to run that particular scenario analysis within the current model
- Row 2 uses formula to decide if scenario analysis will be run based on the Row 1 input or the 'Run Scenario Analysis' input from the Consolidated model
- =IF(OR(C1490="Yes",'Consolidated Model'!C439="Yes"),"Yes","No")
  i. IF Row 1 Run Scenario Analysis? Is = "Yes" OR the Consolidated Model [631] Tariff Multiplier (x) Row 1 is = "Yes"
  ii. Then [442] is = "Yes"
  iii. Otherwise [442] is = "No"
- Row 3 is the input of what the variable for the current model will be set to in the scenario analysis
- Row 4 uses a formula to override the current Row 3 multiplier input from the current model and replaces it with the input from the Consolidated Model if the scenario analysis from the Consolidated Model is set to run

- =IF(AND('Consolidated Model'!$C$437="Yes",'Consolidated Model'!C439="Yes"),'Consolidated Model'!C440,'Freight Model'!C1458)
    i. IF [630] Run Consolidated Scenario Analysis? is = "Yes" AND [631] Tariff Multiplier (x) Row 1 is = "Yes"
    ii. Then Row 4 is = Row 2 of [631] Consolidated Model Tariff Multiplier (x) entered for the scenario analysis
    iii. Otherwise Row 4 is = The Row 3 input entered for the current model scenario analysis

*Note: Indexes [443] to [453] all contain the same 4 rows as [442] and all formulas applied to [442] are also be applied to [443] to [453]*

**[443] Tariff Growth Rate (%)**
- Column to calculate a scenario analysis based on an implied tariff growth rate

**[444] Track Access Multiplier**
- Column to calculate a scenario analysis based on an implied track access multiplier

**[445] Track Access Growth Rate**
- Column to calculate a scenario analysis based on an implied track access growth rate

**[446] Fare Multiplier**
- Column to calculate a scenario analysis based on an implied fare multiplier

**[447] Fare Growth Rate**
- Column to calculate a scenario analysis based on an implied fare growth rate

**[448] Internal Freight Traffic Multiplier**
- Column to calculate a scenario analysis based on an implied Internal freight tariff multiplier

**[449] Internal Passenger Traffic Multiplier (x)**
- Column to calculate a scenario analysis based on an implied Internal passenger traffic multiplier

**[450] External Freight Traffic Multiplier (x)**
- Column to calculate a scenario analysis based on an implied external freight traffic multiplier

**[451] External Passenger Traffic Multiplier (x)**
- Column to calculate a scenario analysis based on an implied external passenger traffic multiplier

**[452] Staff Multiplier (x)**
- Column to calculate a scenario analysis based on an implied staff multiplier

**[453] CAPEX Multiplier (x)**
- Column to calculate a scenario analysis based on an implied CAPEX multiplier

## Summary Pages

*Note: Repeating Formulas are only explained once to avoid redundancy*

# Operational

**[454] Average Total Freight Traffic Trains-Km (Millions)**

- Formula calculates the average of total freight traffic train-km for the Summary Pages based on the inputs [435] Start Date and [438] End Scenario Year
- =IF(C1484="False ","-",AVERAGE(OFFSET($BX$1680,0,0,$C$1483-$C$1480+1,1)))
    i. IF [439] Summary Page On? is = "False"
    ii. Then [454] is = "-"
    iii. Otherwise [454] is = the average of the total freight traffic train-km (millions) from Summary and Chart Data using the number of rows in the column as set by [438] End Scenario Year – [435] Start Date
- Formula first checks if the Summary Pages are set to be displayed. If true, the formula takes an average of the total freight traffic train-km by using the offset function to first select the column required from Summary and Chart Data. It then uses the fourth argument of offset to select the entire number of years set out in [438] End Scenario Year and [435] Start Date from the control panel. An average is then taken of the rows selected in the total freight traffic trains-km column

**[455] Average Total Passenger Traffic Train – Km (Millions)**

- Formula calculates the average of total passenger traffic train-km for the Summary Pages based on the inputs [435] Start Date and [438] End Scenario Year

**[456] Average Annual Staff Count**

- Formula calculates the average of annual staff count for the Summary Pages based on the inputs [435] Start Date and [438] End Scenario Year

**[457] Average Electric Traction Share of Freight Traffic**

- Formula calculates the average electric traction share of freight traffic for the Summary Pages based on the inputs [435] Start Date and [438] End Scenario Year

**[458] Average Electric Traction Share of Passenger Traffic**

- Formula calculates the average electric share of passenger traffic for the Summary Pages based on the inputs [435] Start Date and [438] End Scenario Year

**[459] Initial Total Freight Traffic (GTK Millions)**

- Formula calculates the initial total freight traffic for the Summary Pages
- =IF($C$1484="False ","-",$BL$1680)
    i. IF [439] Summary Page On? is = "False"
    ii. Then [459] is = "-"
    iii. Otherwise [459] is = starting value in the total freight traffic column of Summary and Chart Data

**[460] Initial Total Freight Traffic (GTK Millions) Compound Annual Growth Rate (CAGR)**

- Formula used to calculate the CAGR of total freight traffic for the Summary Pages based on the inputs in [435] Start Date and [438] End Scenario Year
- =IF($C$1484="False ","-",IF(BL1680=0,0,((OFFSET($BL$1680,$C$1483-$C$1480,0)/$BL$1680)^(1/($C$1483-$C$1480+1)))-1))
    i. IF [439] Summary Page On? is = "False"
    ii. Then [460] is = "-"
    iii. Otherwise IF the starting value in the total freight traffic column from Summary and Chart Data is 0

iv. Then [460] is = 0
v. Otherwise (the ending value in the total freight traffic column / starting value in the total freight traffic column) ^ (1 / [438] End Scenario Year – [435] Start Date + 1) – 1

- This formula first checks if the Summary Pages are set to be shown and whether the initial value of the total freight traffic column is 0. If the pages are set to run and the initial value is not 0, a compound annual growth rate is calculated by using offset to get the ending value of the total freight traffic column divided by the initial value in that column. This value then has the exponent of 1 divided by total years of Summary Pages set out in [435] Start Date and [438] End Scenario year in the control panel. Finally after this is calculated, the 1 is subtracted from the value to get the percent CAGR rate for the total freight traffic Column

**[461] Initial Total Passenger Traffic (GTK Millions)**

- Formula calculates the initial total passenger traffic for the Summary Pages

**[462] Initial Total Passenger Traffic (GTK Millions) (CAGR)**

- Formula used to calculate the CAGR of total passenger traffic for the Summary Pages based on the inputs in [435] Start Date and [438] End Scenario Year

# Tariffs, Track Access Charges and Subsidies (2 Columns)

**[463] Average Tariff**

- The first formula calculates the initial total freight traffic for the Summary Pages
- =IF(C1484="False ","-",$CD$1680)
  i. IF [439] Summary Page On? is = “False”
  ii. Then [463] is = “-“
  iii. Otherwise [463] is equal to the starting value in the average tariff column of Summary and Chart Data
- The second formula is used to calculate the compound annual growth rate of average tariffs for the Summary Pages based on the inputs in [435] Start Date and [438] End Scenario Year
- =IF(C1484="False ","-",IF(CD1680=0,0,((OFFSET($CD$1680,$C$1483-$C$1480,0)/$CD$1680)^(1/($C$1483-$C$1480+1)))-1))
  i. IF [439] Summary Page On? is = “False”
  ii. Then [463] is = “-“
  iii. Otherwise IF the starting value in the average tariff column is 0
  iv. Then [463] is = 0
  v. Otherwise (the ending value in the Average Tariff column / starting value in the Average Tariff column) ^ (1 / [438] End Scenario Year – [435] Start Date + 1) – 1
- This formula first checks if the Summary Pages are set to be shown and whether the initial value of the average tariff column is 0. If the pages are set to run and the initial value is not 0, a CAGR is calculated by using offset to get the ending value of the average tariff column divided by the initial value in that column. This value then has the exponent of 1 divided by total years of Summary Pages set out in [435] Start Date and [438] End Scenario year set out in the control

panel. Finally after this is calculated, 1 is subtracted from the value to get the percent CAGR rate for the average tariff column

**[464] Freight Access Charge Per GTK**

- First formula calculates the initial freight access charge per GTK for the Summary Pages
- Second formula used to calculate the compound annual growth rate of initial freight access charge per GTK for the Summary Pages based on the inputs in [435] Start Date and [438] End Scenario Year

**[465] Freight Access Charge Per Train-Km**

- First formula calculated the initial freight access charge per train-km for the Summary Pages
- Second formula used to calculate the compound annual growth rate of freight access charges per train-km for the Summary Pages based on the inputs in [435] Start Date and [438] End Scenario Year

**[466] Passenger Track Access Charge Per GTK**

- First formula calculates the initial passenger track access charge per GTK for the Summary Pages
- Second formula used to calculate the compound annual growth rate of passenger track access charge per GTK for the Summary Pages based on the inputs in [435] Start Date and [438] End Scenario Year

**[467] Passenger Access Charge Per Train-Km**

- First formula calculates the initial passenger access charge per train-km for the Summary Pages
- Second formula used to calculate the compound annual growth rate of passenger access charge per train-km for the Summary Pages based on the inputs in [435] Start Date and [438] End Scenario Year

**[468] Total Subsidy (Including Amortization)**

- First formula calculates the initial total subsidy for the Summary Pages
- Second formula used to calculate the compound annual growth rate of the total subsidy for the Summary Pages based on the inputs in [435] Start Date and [438] End Scenario Year

# Capital Structure (2 Columns)

**[469] Debt**

- First formula calculates the initial value of debt for the Summary Pages
- =IF(C1450="False ","-",$T$1680)
    i. IF [439] Summary Page On? Is = “False”
    ii. Then [469] is = “-“
    iii. Otherwise [469] is equal to the starting value in the total debt column of Summary and Chart Data
- Second formula calculates the ending value of debt for the Summary Pages
- =IF(C1484="False ","-",OFFSET($T$1680,$C$1483-$C$1480,0))
    i. IF [439] Summary Page On? Is = “False”
    ii. Then [469] is = “-“

iii. Otherwise [469] is = to the ending value of the total debt column based on the [438] End Scenario Year – [435] Start Date

- Formula first checks if the Summary Pages are set to be displayed. If true, the formula uses the offset function to move to the ending value in the total debt column by taking the [438] End Scenario Year – [435] Start Date

**[470] Equity**

- First formula calculates the initial value of equity for the Summary Pages
- Second formula calculates the ending value of equity for the Summary Pages

# Working Capital Assumptions

**[471] Days in Accounts Receivable**

- Formula calculates the average days in accounts receivable for the Summary Pages
- =IF(C1484="False ","-",AVERAGE(OFFSET($CR$1680,0,0,$C$1483-$C$1480+1,1)))
  i. IF [439] Summary Page On? Is = "False"
  ii. Then [471] is = "-"
  iii. Otherwise [471] is = the average of the days in accounts receivable from Summary and Chart Data using the number of rows in the column as set by [438] End Scenario Year – [435] Start Date
- Formula first checks if the Summary Pages are set to be displayed. If true, the formula takes an average of the days in accounts receivable by using the offset function to first select the column required from Summary and Chart Data. It then uses the fourth argument of offset to select the entire number of years set out in [438] End Scenario Year and [435] Start date from the control panel. An average is then taken of the rows selected in the days in accounts receivable column

**[472] Days in Inventory**

- Formula calculates the average days in inventory for the Summary Pages

**[473] Days in Other Receivables**

- Formula calculates the average days in other receivables for the Summary Pages

**[474] Days in Accounts Payable**

- Formula calculates the average days in accounts payable for the Summary Pages

**[475] Days in Other Payables**

- Formula calculates the average days in other payables for the Summary Pages

# Total Capital Expenditure

**[476] Average Land**

- Formula calculates the average capital expenditure on land for the Summary Pages
- =IF(C1484="False ","-",AVERAGE(OFFSET($CK$1680,0,0,$C$1483-$C$1480+1,1)))
  i. IF [439] Summary Page On? is = "False"
  ii. Then [476] is = "-"

iii. Otherwise [476] is = the average value of land from Summary and Chart Data using the number of rows in the column as set by [438] End Scenario Year – [435] Start Date

- Formula first checks if the Summary Pages are set to be displayed. If true, the formula takes an average value of land by using the offset function to first select the column required from Summary and Chart Data. It then uses the fourth argument of offset to select the entire number of years set out in [438] End Scenario Year and [435] Start Date from the control panel. An average is then taken of the rows selected in the land column

**[477] Average Buildings and Structures**

- Formula calculates the average capital expenditure on buildings and structures for the Summary Pages

**[478] Average Track and Infrastructure**

- Formula calculates the average capital expenditure on track and infrastructure for the Summary Pages

**[479] Average Locomotives and Railway Cars**

- Formula calculates the average capital expenditure on locomotives and railway cars for the Summary Pages

**[480] Average Machines, Equipment and Spare Parts**

- Formula calculates the average capital expenditure on machines, equipment and spare parts for the Summary Pages

**[481] Average Others**

- Formula calculates the average capital expenditure on other assets for the Summary Pages

**[482] Total**

- Sum of all the average capital expenditures used in the Summary Pages

# Operating and Non-Operating Expense (2 Columns)

**[483] Staff**

- First formula calculates the initial staff expense for the Summary Pages
- =IF(C1450="False ","-",$CX$1680)
  i. IF [439] Summary Page On? Is = “False”
  ii. Then [483] is = “-“
  iii. Otherwise [483] is =starting value in the staff column of Summary and Chart Data
- Second formula used to calculate the compound annual growth rate of staff expenses for the Summary Pages based on the inputs in [435] Start Date and [438] End Scenario Year
- =IF(C1484="False ","-",((OFFSET($CX$1680,$C$1483-$C$1480,0)/$CX$1680)^(1/($C$1483-$C$1480+1)))-1)
  i. IF [439] Summary Page On? Is = “False”
  ii. Then [483] is = “-“
  iii. Otherwise (the ending value in the staff column / starting value in the staff column) ^ (1 / [438] End Scenario Year – [435] Start Date + 1) – 1

- This formula first checks if the Summary Pages are set to be shown and whether the initial value of the Staff Column is 0. If the pages are set to run and the initial value is not 0, a CAGR is calculated by using offset to get the ending value of the staff column divided by the initial value in that column. This value then has the exponent of 1 divided by total years of Summary Pages set out in [435] Start Date and [438] End Scenario year set out in the control panel. Finally after this is calculated, the 1 is subtracted from the value to get the percent CAGR rate for the staff expense column

**[484] Materials**

- First formula calculates the initial material expense for the Summary Pages
- Second formula used to calculate the compound annual growth rate of material expenses for the Summary Pages based on the inputs in [435] Start Date and [438] End Scenario Year

**[485] Diesel Fuel**

- First formula calculates the initial diesel fuel expense for the Summary Pages
- Second formula used to calculate the compound annual growth rate of diesel fuel expenses for the Summary Pages based on the inputs in [435] Start Date and [438] End Scenario Year

**[486] Electricity**

- First formula calculates the initial electricity expense for the Summary Pages
- Second formula used to calculate the compound annual growth rate of electricity expenses for the Summary Pages based on the inputs in [435] Start Date and [438] End Scenario Year

**[487] External Services**

- First formula calculates the initial external services expense for the Summary Pages
- Second formula used to calculate the compound annual growth rate of external service expenses for the Summary Pages based on the inputs in [435] Start Date and [438] End Scenario Year

**[488] Other Operating Expenses**

- First formula calculates the initial other operating expenses for the Summary Pages
- Second formula used to calculate the compound annual growth rate of other operating expenses for the Summary Pages based on the inputs in [435] Start Date and [438] End Scenario Year

**[489] Total Non-Operating Adjustments**

- First formula calculates the initial total non-operating adjustments expense for the Summary Pages
- Second formula used to calculate the compound annual growth rate of total non-operating adjustment expenses for the Summary Pages based on the inputs in [435] Start Date and [438] End Scenario Year

# Financing

**[490] New Financing**

- Row shows the source of new financing for the company which is equal to [294] Debt/Bond Funding Source

**[491] First Modeling Year**

- Row shows the first year in which the new debt in used in the model which is equal to [295] First Disbursement Year

**[492] Principal Amount**

- Row shows the amount of principal for the new debt which is equal to [297] Principal Amount in Issue Currency

**[493] Currency**

- Row used to show the currency denomination of the new debt which is equal to [296] Currency

**[494] Fixed/Variable**

- Row used to show whether the new debt has a fixed or variable interest rate which is equal to [299] Used Fixed or Variable Interest Rate

**[495] Interest Rate/Margin**

- Row shows the interest rate or margin from base rate that is required for the new debt which is equal to the sum of the rates used in [300] If Fixed, Enter Interest Rate and [301] If Variable, Enter Margin on Libor

**[496] Term**

- Row shows the term the new debt is outstanding for which is equal to [302] Term

**[497] Grace Period**

- Row shows the grace period for the new debt which is equal to [303] Grace Period

**[498] Repayment Profile**

- Row shows the type of repayment that is required for the new debt which is equal to [304] Repayment Profile

**[499] Front-End Fee**

- Row shows the percentage front end fee that will be charged for the new debt which is equal to [305] Front End Fee

**[500] Commitment Fee**

- Row shows the percentage commitment fee that will be charged for the new debt which is equal to [306] Commitment Fee

# Ratios

**[501] Operating Profit (3 Rows, 2 Columns)**

- Minimum row calculates the minimum operating profit for the Summary Pages
- =IF(C1484="False ","-",MIN(OFFSET($F$1680,0,0,$C$1483-$C$1480+1,1)))
    i. IF [439] Summary Page On? Is = “False”
    ii. Then [501] is = “-“
    iii. Otherwise [501] is = the minimum value of operating profit from the Summary and Chart Data using the number of rows in the column as set by [438] End Scenario Year – [435] Start Date
- Formula first checks if the Summary Pages are set to be displayed. If true, the formula takes the minimum value of operating profit by using the offset function to first select the column

required from Summary and Chart Data. It then uses the fourth argument of offset to select the entire number of years set out in [438] End Scenario Year and [435] Start Date from the control panel. The minimum is then taken of the rows selected in the operating profit column

- Maximum row calculates the maximum operating profit for the Summary Pages
- =IF(C1484="False ","-",MAX(OFFSET($F$1680,0,0,$C$1483-$C$1480+1,1)))
    i. IF [439] Summary Page On? Is = "False"
    ii. Then [501] is = "-"
    iii. Otherwise [501] is = the maximum value of operating profit from the Summary and Chart Data using the number of rows in the column as set by [438] End Scenario Year – [435] Start Date
- Formula first checks if the Summary Pages are set to be displayed. If true, the formula takes the maximum value of operating profit by using the offset function to first select the column required from Summary and Chart Data. It then uses the fourth argument of offset to select the entire number of years set out in [438] End Scenario Year and [435] Start date from the control panel. The maximum is then taken of the rows selected in the operating profit column
- Average row calculates the average operating profit for the Summary Pages
- =IF(C1484="False ","-",AVERAGE(OFFSET($F$1680,0,0,$C$1483-$C$1480+1,1)))
    i. IF [439] Summary Page On? Is = "False"
    ii. Then [501] is = "-"
    iii. Otherwise [501] is = the average value of operating profit from the Summary and Chart Data using the number of rows in the column as set by [438] End Scenario Year – [435] Start Date
- Formula first checks if the Summary Pages are set to be displayed. If true, the formula takes the average value of operating profit by using the offset function to first select the column required from Summary and Chart Data. It then uses the fourth argument of offset to select the entire number of years set out in [438] End Scenario Year and [435] Start Date from the control panel. The average is then taken of the rows selected in the operating profit column
- Date column calculates the date under which either the minimum and maximum values occurred for operating profit
- =IF(C1484="False ","-",INDEX($B$1680:$B$1724,MATCH(N1547,$F$1680:$F$1724,0)))
    i. IF [439] Summary Page On? Is = "False"
    ii. Then [501] is = "-"
    iii. Otherwise [501] is = the date index from Period To of the Summary and Chart Data at the matched value of the minimum/maximum
- Formula first checks if the Summary Pages are set to be displayed. If true, the formula takes the Period To index from the Summary and Chart Data and selects the correct date based on a match to the correct minimum or maximum value calculated in the minimum row and the maximum row of operating profit

**[502] Operating Margin**

- Minimum row calculates the minimum operating margin for the Summary Pages
- Maximum row calculates the maximum operating margin for the Summary Pages

- Average row calculates the average operating margin for the Summary Pages
- Date column calculates the date under which the minimum and maximum values occurred for operating margin

**[503] Return on Equity (ROE)**

- Minimum row calculates the minimum ROE for the Summary Pages
- Maximum row calculates the maximum ROE for the Summary Pages
- Average row calculates the average ROE for the Summary Pages
- Date column calculates the date under which the minimum and maximum values occurred for ROE

**[504] Return on Assets (ROA)**

- Minimum row calculates the minimum ROA for the Summary Pages
- Maximum row calculates the maximum ROA for the Summary Pages
- Average row calculates the average ROA for the Summary Pages
- Date column calculates the date under which the minimum and maximum values occurred for ROA

**[505] Debt Service Coverage Ratio (DSCR)**

- Minimum row calculates the minimum DSCR for the Summary Pages
- Maximum row calculates the maximum DSCR for the Summary Pages
- Average row calculates the average DSCR for the Summary Pages
- Date column calculates the date under which the minimum and maximum values occurred for DSCR

**[506] Debt to Firm Value (D/D+E)**

- Minimum row calculates the minimum D/D+E for the Summary Pages
- Maximum row calculates the maximum D/D+E for the Summary Pages
- Average row calculates the average D/D+E for the Summary Pages
- Date column calculates the date under which the minimum and maximum values occurred for D/D+E

**[507] Current Ratio**

- Minimum row calculates the minimum current ratio for the Summary Pages
- Maximum row calculates the maximum current ratio for the Summary Pages
- Average row calculates the average current ratio for the Summary Pages
- Date column calculates the date under which the minimum and maximum values occurred for the current ratio

**[508] Cash Ratio**

- Minimum row calculates the minimum Cash Ratio for the Summary Pages
- Maximum row calculates the maximum Cash Ratio for the Summary Pages
- Average row calculates the average Cash Ratio for the Summary Pages
- Date column calculates the date under which the minimum and maximum values occurred for the cash ratio

# Checks

**[509] Balance Sheet Always Balanced?**

- Formula checks if the balance sheet is balanced throughout the entirety of the model
- =IF(COUNTIF(J1427:BC1427,"NO")>0,"NO","YES")
    i. IF the count of [407] Balance? that = “NO” is Greater Than 0
    ii. Then [509] is = “NO”
    iii. Otherwise [509] is =“YES”
- Counts if there are any “NO” values in [407] Balance?

**[510] Cash Balance Above Zero In All Years?**

- Formula checks if there is a positive cash balance throughout the entirety of the model
- =IF(COUNTIF(J1397:BC1397,"<0")>0,"NO","YES")
    i. IF the count of all the [385] Cash and Cash Equivalents cash balances Less Than 0 is Greater Than 0
    ii. Then [510] is = “No”
    iii. Otherwise [510] is = “Yes”

**[511] Cash on Cash Flow = Cash on Balance Sheet?**

- Formula checks if the ending cash balance on the cash flow statement is equal to the cash and cash equivalents value from the balance sheet for the entirety of the model
- =IF(((SUM(J1397:BC1397))-(SUM(J1468:BC1468)))>0.001,"NO","YES")
    i. IF (Sum of [385] Cash and Cash Equivalents) – (sum of [433] Cash Balance at End of Year) is Greater Than 0.001
    ii. Then [512] is = “No”
    iii. Otherwise [512] is = “Yes”
- IF the sum of [385] Cash and Cash Equivalents minus the sum of [433] Cash balance at End of Year is greater than 0.001, then the formula outputs “No” otherwise it outputs “Yes”

# Summary and Chart Data

*Note: Repeating Formulas are only explained once to avoid redundancy although the main headings from the Summary and Chart Data sections are shown*

- This section is used to construct the Summary Page including all the charts and summary assumptions shown from data calculated within the model

# Profitability

- Left most column contains numbers that are based on how long the scenario analysis is set to run
- Column 1:
- First cell in column 1:

- =IF(C1450="True ",IF(I23="","",C1446),"")
    i. IF [439] Summary Page On? Is = “True”
    ii. Then IF [16] Period To is blank
    iii. Then the first cell in the first column under Profitability is blank
    iv. Otherwise = [435] Start Date
    v. Otherwise the first cell in the first column under Profitability is blank
- Later cells in column 1:
- =IF(A1646="","",IF((A1646+1)<=$C$1449,(A1646+1),""))
    i. IF previous cell in column is blank
    ii. Then current cell is = blank
    iii. Otherwise IF the previous cell in the column + 1 is Less Than or Equal To [438] End Scenario Year
    iv. Then the current cell is = the previous cell + 1 (signalling the next period of the scenario analysis)
    v. Otherwise the current cell is = blank
- Other columns under profitability are Period To, Return on Equity, Total Operating Expenses, Total Revenues, EBIT and Operating margin
- Period To:
- =IF($A1649="",NA(),OFFSET($A$1,B$1644-1,$A$1645+$A1649))
    i. IF the left most column value is blank
    ii. Then the Period To column is = NA()
    iii. Otherwise the current cell in Period To is = offset from the top left most column of the model, down by the row number indicated at the top of the column - 1 and right by 7 + the period indicated in the left most column
- This formula uses the offset function to first find the row of the model the data is in and then based on the current period of the scenario analysis, selects the correct column for that period of data

# Cash Management

- Contains summary data columns for Net Cash from Operating Activities, Net Changes in Cash, Cash and Cash Equivalents, Return on Assets and Dividends Paid

# Liquidity and Stability

- Contains summary data columns for Current Assets, Current Liabilities, Current Ratio, Short Term Payables, Long-Term Loans, Total Debt, Actual DSCR, Total Equity, Firm Value, Debt to Firm Value and Repayment of Loans

# TARIFF

- Contains summary data columns for Commodity 1 to 10 Per Unit Tariff

## ANNUAL TRAFFIC

- Contains summary data columns of Annual Traffic Volume (GTK) for External and Internal Freight, External and Internal Passenger, Total Freight Traffic and Total Passenger Traffic

## Subsidies and Expenditures

- Contains summary data columns for Operational Subsidy, Capital Subsidy and Acquisition of Property, Plant and Equipment

## Operating Information

- Contains summary data columns for Working Ratio, Cash Ratio, Total Traffic (GTK), Annual Staff Cost, Traffic (GTK)/Annual Staff Count, Total Freight Traffic Train-Km (Millions), Total Passenger Traffic Train-Km (Millions), Traffic (GTK)/Traffic (Train-Km), Annual Staff Count / Traffic (Train-Km), Average Electric Traction Share of Passenger Traffic, Average Electric Traction Share of Freight Traffic, Average Tariff, Freight Access Charge per GTK, Freight Access Charge per Train-Km, Passenger Track Access Charge per GTK, Passenger Access Charge Per Train-Km and Total Subsidy (including amortization)

## CAPEX

- Contains summary data columns for Land, Buildings and Structures, Track and Infrastructure, Locomotives and Railway Cars, Machines, Equipment and Spare Parts and Others

## Working Capital

- Contains summary data columns for Days in Accounts Receivable, Days in Inventory, Days in Other Receivables, Days in Accounts Payable and Days in Other Payables

## Other Expenses

- Contains summary data columns for Staff, Materials, Diesel Fuel, Electricity, External Services, Other Operating Expenses and Total Non-Operating Adjustments

# Consolidated Sheet

## Part 1: Model Scope, Names, Dates and Timing

### Consolidate (4 Columns)

*Note: Repeating Formulas are only explained once per section to avoid redundancy*

**[512] Model Active?**

- Row checks each individual model to determine if that model is active for the segment
- Column 1:
- =IF(I26="",FALSE,TRUE)
    i. IF [16] Period To from the Consolidated Model is = blank
    ii. Then [512] is = FALSE
    iii. Otherwise [512] is = TRUE
- Formula first checks if there is a value in the Period To column and if there is outputs a TRUE value indicating the model is active
- Column 2: Checks if the Freight Model is active
- Column 3: Checks if the Passenger Model is active
- Column 4: Checks if the Infrastructure Model is active

**[513] Consolidate Model?**

- Drop down menu with options: "TRUE" or "FALSE" for each column
- Used in further calculations on whether or not that model is consolidated with the rest

**[514] Model Consolidated?**

- Checks both [512] and [513] to see if the particular model in that column is consolidated
- Column 1:
- =IF(OR(D38=FALSE,D37=FALSE),FALSE,TRUE)
    i. IF [512] Model Active? OR [513] Consolidated Model? is = FALSE
    ii. Then [514] is = FALSE
    iii. Otherwise [514] is = TRUE
- Column 2: Checks if the Freight Model is consolidated
- Column 3: Checks if the Passenger Model is consolidated
- Column 4: Checks if the Infrastructure Model is consolidated

**[515] Model Consolidated?**

- Based on whether or not each particular model is consolidated, outputs either a 1 or 0. This is used in other calculations within Consolidated Model on whether or not to include the data from a model
- =IF(D39=TRUE,1,0)
    i. IF [514] Model Consolidated? is = TRUE
    ii. Then [514] is = 1
    iii. Otherwise [514] is = 0
- Formula is same for column 2-4 with 2 being for the Freight Model, 3 being for the Passenger Model, and 4 being for the Infrastructure Model

# Part 3: Operating Expenditures (OPEX)

## Operating Costs

*Note: [206], [208] are un-indexed cells under consolidated sheet and refer to the same formulas within the segment models*

**[516] Total Additional Staff**

- Total additional staff cost from headquarters
- =IF($D$34=1,I92*I89,0)
  i. IF Column 1 of [515] Model Consolidated? is = 1
  ii. Then [516] is = un-indexed cell with same formula as [206] Staff Physical Cost Driver * un-indexed cell with same formula as [208] Per Staff Cost
  iii. Otherwise [518] is = 0

**[517] Total Additional Operating Expenses**

- Total additional operating expenses from headquarters
- =IF($D$40=1,I102*I99/$J$15,0)
  i. IF Column 1 of [515] Model Consolidated? is = 1
  ii. Then [517] is = (un-indexed cell with same formula as [206] Physical Cost Driver for additional operating expenses * un-indexed cell with same formula as [208] Per Unit Cost for additional operating expenses) / 1000000
  iii. Otherwise [519] is = 0

**[518] Staff Cost**

- Total staff costs for the Consolidated Model and each individual model if it is set to be consolidated in [515] Model Consolidated?
- =I106+IF($G$40=1,'Infrastructure Model'!I717,0)+IF($F$40=1,'Passenger Model'!I717,0)+IF($E$40=1,'Freight Model'!I717,0))
  i. [516] Total Additional Staff +
  ii. IF (Column 2 of [515] Model Consolidated? is = 1, Then [210] Staff Cost from the Freight Model, Otherwise 0) +
  iii. IF (Column 3 of [515] Model Consolidated? is = 1, Then [210] Staff Cost from the Passenger Model, Otherwise 0) +
  iv. IF (Column 4 of [515] Model Consolidated? Is = 1, Then [210] Staff Cost from the Infrastructure Model, Otherwise 0)
- Formula first adds any additional staff costs from the headquarters and then based on the output from [515] Model Consolidated?, adds the staff cost from each individual model

**[519] Materials Cost**

- Total material costs for the Consolidated Model and each individual model if it is set to be consolidated in [515] Model Consolidated?

**[520] Diesel Fuel Cost**

- Total diesel fuel costs from the Consolidated Model and each individual model if it is set to be consolidated in [515] Model Consolidated?

**[521] Electricity**

- Total electricity costs for the Consolidated Model and each individual model if it is set to be consolidated in [515] Model Consolidated?

**[522] External Services**

- Total external service costs for the Consolidated Model and each individual model if it is set to be consolidated in [515] Model Consolidated?

**[523] Other Operating Expenses**

- Total other operating expenses for the Consolidated Model and each individual model if it is set to be consolidated in [515] Model Consolidated?

## Total Non-Operating Adjustments

*Note: [169], [219] are un-indexed cells under consolidated sheet and refer to the same formulas within the segment models*

**[524] Non-Operating Revenue From Subsidiaries**

- Total of all the non-operating revenue from each individual model if they are set to be consolidated
- =IF($G$40=1,'Infrastructure Model'!I603,0)+IF($F$40=1,'Passenger Model'!I603,0)+IF($E$40=1,'Freight Model'!I603,0)
    i. IF (Column 2 of [515] Model Consolidated? is = 1, Then [169] Total Non-Operating revenues from the Freight Model, Otherwise 0) +
    ii. IF (Column 3 of [515] Model Consolidated? is = 1, Then [169] Total Non-Operating revenues from the Passenger Model, Otherwise 0) +
    iii. IF (Column 4 of [515] Model Consolidated? Is = 1, Then [169] Total Non-Operating revenues from the Infrastructure Model, Otherwise 0)
    iv. Formula checks each column from [515] Model Consolidated? and based on this, adds the non-operating revenue from each segment

**[525] Non-Operating Costs From Subsidiaries**

- Total of all non-operating costs from each individual model if they are set to be consolidated

**[526] Non-Operating Adjustments From Headquarters**

- Total non-operating adjustments from the Headquarters portion of the Consolidated Model
- =I155-I194
    i. Total of (un-indexed cell with same formula as [169] Non-Operating Revenues ) from Headquarters for the Consolidated Model – un-indexed cell with same formula as [219] Total Additional Annual Non-Operating Cost from headquarters for the Consolidated Model

**[527] Total**

- Total of all non-operating adjustments for the Consolidated Model

# Working Capital

## Working Capital Calculation

*Note: [219], [230] and [233] are un-indexed cells under consolidated sheet and refer to the same formulas within the segment models*

**[528] Additional Accounts Payable**

- Total additional accounts payable from headquarters
- =IF($D$40=1,I209*(I106+I107)/365,0)
    i. IF Column 1 of [515] Model Consolidated? is = 1
    ii. Then [528] is = (un-indexed cell with same formula as [230] Days in Accounts Payable * [516] Total Additional Staff + [517] Total Additional Operating Expenses) / 365
    iii. Otherwise [528] is = 0

**[529] Additional Other Payable**

- Total additional other payables from headquarters
- =IF($D$40=1,I213*I195/365,0)
    i. IF Column 1 of [515] Model Consolidated? is = 1
    ii. Then [529] is = (un-indexed cell with same formula as [233] Days in Accounts Payable * un-indexed cell with same formula as [219] Total Annual Non-Operating Costs for headquarters) / 365
    iii. Otherwise [529] is = 0

# Working Capital Calculation

**[530] Adjustment for Inter-Company Transactions**

- Adjusts the accounts receivable balance for intercompany transactions that occur within the Infrastructure Model
- =IF(I26="","",IF($G$40=1,IF('Infrastructure Model'!$F$74='Infrastructure Model'!$G$74,'Infrastructure Model'!I638/('Infrastructure Model'!I1362+'Infrastructure Model'!I1363)*'Infrastructure Model'!I795,'Infrastructure Model'!I645/('Infrastructure Model'!I1362+'Infrastructure Model'!I1363)*'Infrastructure Model'!I795),0))
    i. IF Column 4 of [515] Model Consolidated? Is = 1
    ii. Then IF [33] Data Is from the Infrastructure Model is = “Internal”
    iii. Then ([192] Total Internal Freight Access Charge from the Infrastructure Model / [365] Track Access Revenue from the Infrastructure Model) * [239] Accounts Receivable from the Infrastructure Model
    iv. Otherwise ([[19] Total Internal Freight Access Charge from the Infrastructure Model / [365] Track Access Revenue from the Infrastructure Model) * [239] Accounts Receivable from the Infrastructure Model
    v. Otherwise [530] is = 0
- If the Infrastructure Model is set to be consolidated, the formula takes the ratio of internal freight charged to total track access revenue multiplied by the amount of accounts receivable from the infrastructure model

**[531] Accounts Receivable**

- Total of all the accounts receivable from each individual model if they are set to be consolidated which is then adjusted for inter-company transactions
- =IF($G$40=1,'Infrastructure Model'!I795,0)+IF($F$40=1,'Passenger Model'!I795,0)+IF($E$40=1,'Freight Model'!I795,0)-I222
    i. IF (Column 2 of [515] Model Consolidated? is = 1, Then [239] Accounts Receivable from the Freight Model, Otherwise 0) +
    ii. IF (Column 3 of [515] Model Consolidated? is = 1, Then [239] Accounts Receivable from the Passenger Model, Otherwise 0) +
    iii. IF (Column 4 of [515] Model Consolidated? Is = 1, Then [239] Accounts Receivable from the Infrastructure Model, Otherwise 0)
    iv. Less [530] Adjustments for Inter-Company Transactions

**[532] Days in Accounts Receivable**

- Calculates the days in accounts receivable for the Consolidated Model
- =I224*365/(I315-I314)
    i. ([531] Accounts Receivable x 365) / ([563] Total Revenues – [562] Other)

**[533] Inventory**

- Total of all the inventory from each individual model if they are set to be consolidated
- =IF($G$40=1,'Infrastructure Model'!I796,0)+IF($F$40=1,'Passenger Model'!I796,0)+IF($E$40=1,'Freight Model'!I796,0)
    i. IF (Column 2 of [515] Model Consolidated? is = 1, Then [240] Inventory from the Freight Model, Otherwise 0) +
    ii. IF (Column 3 of [515] Model Consolidated? is = 1, Then [240] Inventory from the Passenger Model, Otherwise 0) +
    iii. IF (Column 4 of [515] Model Consolidated? Is = 1, Then [240] Inventory from the Infrastructure Model, Otherwise 0)

**[534] Days in Inventory**

- Calculates the days in inventory for the Consolidated Model
- =I226*365/(I111+I112)
    i. ([533] Inventory x 365) / ([519] Materials Cost + [520] Diesel Fuel Cost)

**[535] Other Receivables**

- Total of all the other receivables from each individual model if they are set to be consolidated

**[536] Days in Other Receivables**

- Calculates the days in other receivables for the Consolidated Model
- =I228*365/(I314)
    i. [535] Other Receivables * 365 / [562] Other

**[537] Adjustment for Inter-Company Transactions**

- Adjusts the accounts receivable balance for intercompany transactions that occur within the Infrastructure Model
- =IF($G$40=1,I223,0)
    i. IF Column 4 of [515] Model Consolidated? Is = 1
    ii. Then [537] is = [530] Adjustments for Inter-Company Transactions

iii. Otherwise [537] is = 0

**[538] Accounts Payables**

- Total of all the other accounts payable from each individual model if they are set to be consolidated which is then adjusted for inter-company transactions and additional accounts payable from the Consolidated Model
- =IF($G$40=1,'InfrastructureModel'!I800,0)+IF($F$40=1,'Passenger Model'!I800,0)+IF($E$40=1,'Freight Model'!I800)-I231+I217
  i. IF (Column 2 of [515] Model Consolidated? is = 1, Then [243] Accounts Payable from the Freight Model, Otherwise 0) +
  ii. IF (Column 3 of [515] Model Consolidated? is = 1, Then [243] Accounts Payable from the Passenger Model, Otherwise 0) +
  iii. IF (Column 4 of [515] Model Consolidated? Is = 1, Then [243] Accounts Payable from the Infrastructure Model, Otherwise 0)
  iv. Plus [528] Additional Accounts Payable
  v. Less [537] Adjustments for Inter-Company Transactions

**[539] Days in Account Payable**

- Calculates the days in accounts payable for the Consolidated Model
- =I232*365/SUM(I318:I324)
  i. [538] Accounts Payable * 365 / the sum of [571] Total Operating Expenses

**[540] Other Payables**

- Total of all the other payables from each individual model if they are set to be consolidated and any additional other payables from the Consolidated Model

**[541] Days in Other Payables**

- Calculates the days in other payables for the Consolidated Model
- =I234*365/I200+I201
  i. [540] Other Payables * 365 / [525] Non-Operating Costs From Subsidiaries + [526] Non-Operating Adjustments From Headquarters

# Part 4: Financial Engineering

# Equity

## Equity Calculations

**[542] Opening Paid-In Capital**

- Total opening balance of paid-in capital for the Consolidated Model using each individual model if they are set to be consolidated
- First period:
- =IF($G$40=1,'Infrastructure Model'!I1320,0)+IF($F$40=1,'Passenger Model'!I1320,0)+IF($E$40=1,'Freight Model'!I1320,0)
  i. IF (Column 2 of [515] Model Consolidated? is = 1, Then [340] Opening Paid-In Capital from the Freight Model, Otherwise 0) +

ii. IF (Column 3 of [515] Model Consolidated? is = 1, Then [340] Opening Paid-In Capital from the Passenger Model, Otherwise 0) +
iii. IF (Column 4 of [515] Model Consolidated? Is = 1, Then [340] Opening Paid-In Capital from the Infrastructure Model, Otherwise 0)

- Later periods:
- [542] is = preceding [544] Ending Paid-In Capital

**[543] Change in Paid-In Capital**

- Total change in paid-in capital for each period of the Consolidated Model
- =IF($G$40=1,'Infrastructure Model'!I1321,0)+IF($F$40=1,'Passenger Model'!I1321,0)+IF($E$40=1,'Freight Model'!I1321,0)
  i. IF (Column 2 of [515] Model Consolidated? is = 1, Then [341] Change in Paid-In Capital from the Freight Model, Otherwise 0) +
  ii. IF (Column 3 of [515] Model Consolidated? is = 1, Then [341] Change in Paid-In Capital from the Passenger Model, Otherwise 0) +
  iii. IF (Column 4 of [515] Model Consolidated? Is = 1, Then [341] Change in Paid-In Capital from the Infrastructure Model, Otherwise 0)

**[544] Ending Paid-In Capital**

- Total ending balance of paid-in capital for each period of the Consolidated Model
- First period:
- =IF($G$40=1,'Infrastructure Model'!I1322,0)+IF($F$40=1,'Passenger Model'!I1322,0)+IF($E$40=1,'Freight Model'!I1322,0)
  i. IF (Column 2 of [515] Model Consolidated? is = 1, Then [342] Ending Paid-In Capital from the Freight Model, Otherwise 0) +
  ii. IF (Column 3 of [515] Model Consolidated? is = 1, Then [342] Ending Paid-In Capital from the Passenger Model, Otherwise 0) +
  iii. IF (Column 4 of [515] Model Consolidated? Is = 1, Then [342] Ending Paid-In Capital from the Infrastructure Model, Otherwise 0)
- Later periods:
- =J244+J243
  i. [542] Opening Paid-In Capital + [543] Change in Paid-In Capital

**[545] Opening Capital Subsidy**

- Total opening capital subsidy for the Consolidated Model using the data from each individual model if they are set to be consolidated

**[546] Change in Capital Subsidy Less Amortization**

- Total change in the capital subsidy for the Consolidated Model using the data from each individual model if they are set to be consolidated

**[547] Ending Capital Subsidy**

- Total ending capital subsidy for the Consolidated Model using the data from each individual model if they are set to be consolidated

**[548] Retained Earnings Opening Balance**

- First period: Total opening balance of retained earnings for the Consolidated Model using the data from each individual model if they are set to be consolidated
- Later periods: [548] is = preceding [550] Retained Earnings Closing Balance

**[549] Change in Retained Earnings**

- First period: Total change in retained earnings for the Consolidated Model using the data from each individual model if they are set to be consolidated
- Later periods:
- =J340-J412
    i. [579] Net Income – [625] Dividends Paid

**[550] Retained Earnings Closing Balance**

- First period: Total closing balance of retained earnings for the Consolidated Model using the data from each individual model if they are set to be consolidated
- Later periods: [550] is = [549] Change in Retained Earnings + [548] Retained Earnings Opening Balance

**[551] Opening Other Reserves**

- Total opening balance for the other reserves in the Consolidated Model which is = a manual input in the first year and the preceding [553] Ending Balance of Other Reserves in later periods

**[552] Change in Other Reserves**

- Manual input for changes in other reserves for each period of the model

**[553] Ending Balance Other Reserves**

- Ending balance for the other reserves in the Consolidated Model which is equal to [551] Opening Other Reserves + [552] Change in Other Reserves

# Dividends

## Dividend Assumptions

*Note: [281], [282], [284], [278] are un-indexed cells under consolidated sheet and refer to the same formulas within the segment models*

**[554] Debt Service**

- Total debt service cost for the Consolidated Model using the data from each individual model if they are set to be consolidated
- =IF($G$40=1,'Infrastructure Model'!I1007,0)+IF($F$40=1,'Passenger Model'!I1007,0)+IF($E$40=1,'Freight Model'!I1007,0)
    i. IF (Column 2 of [515] Model Consolidated? is = 1, Then [280] Debt Service from the Freight Model, Otherwise 0) +
    ii. IF (Column 3 of [515] Model Consolidated? is = 1, Then [280] Debt Service from the Passenger Model, Otherwise 0) +
    iii. IF (Column 4 of [515] Model Consolidated? Is = 1, Then [280] Debt Service from the Infrastructure Model, Otherwise 0)

**[555] Annual Dividend**

- First period:
- =IF(AND(I269>I270,I272>0),I272*$I$264,0)
    i. IF [281] Actual DSCR is Greater Than [282] Required DSCR AND [284]Cash Available for Dividends is positive
    ii. Then [555] is = [284] Cash Available for Dividends multiplied by [278] Annual Dividend after DSCR
    iii. Otherwise [555] is = 0
- If the actual DSCR is positive and greater than required DSCR and cash available for dividends is also positive, then calculate a dividend by multiplying the cash available by annual dividend after DSCR. Otherwise [555] is = 0
- Later periods:
- Annual dividend for the Consolidated Model is calculated using the data from each individual model if they are set to be consolidated

# Cash Balance for

# Cash Balance

*Note: [350], [349] are un-indexed cells under consolidated sheet and refer to the same formulas within the segment models*

**[556] Additional Cash balance from Headquarters End Year 1**

- Manual input for any additional cash from the Headquarters in the first year of the model

**[557] Ending Cash Balance**

- Total debt service cost for the Consolidated Model using the data from each individual model if they are set to be consolidated and [556] Additional Cash Balance from Headquarters End Year 1
- First period:
- =IF(G40=1,'Infrastructure Model'!I1336,0)+IF(F40=1,'Passenger Model'!I1336,0)+IF(E40=1,'Freight Model'!I1336,0)+IF(D40=1,I283,0)
    i. IF (Column 2 of [515] Model Consolidated? is = 1, Then [351] Ending Cash Balance from the Freight Model, Otherwise 0) +
    ii. IF (Column 3 of [515] Model Consolidated? is = 1, Then [351] Ending Cash Balance from the Passenger Model, Otherwise 0) +
    iii. IF (Column 4 of [515] Model Consolidated? Is = 1, Then [351] Ending Cash Balance from the Infrastructure Model, Otherwise 0) +
    iv. IF (Column 1 of [515] Model Consolidated? is = 1, Then [556] Additional Cash Balance from Headquarters End Year 1
- Later periods: [557] is = the sum of [349] Opening Cash Balance and [350] Net Change in Cash which are un-indexed on the Consolidated Model

# Part 5: Financial Statements

## Consolidated Income Statement

### Operating Revenues

*Note: [279] and [353] are un-indexed cells under consolidated sheet and refers to the same formula within the segment models*

**[558] Freight Tariffs**

- Total freight tariff revenues for the Consolidated Model using the data from each individual model if they are set to be consolidated
- =IF($G$40=1,'Infrastructure Model'!I1360,0)+IF($F$40=1,'Passenger Model'!I1360,0)+IF($E$40=1,'Freight Model'!I1360,0)
    i. IF (Column 2 of [515] Model Consolidated? is = 1, Then [363] Freight Tariffs from the Freight Model, Otherwise 0) +
    ii. IF (Column 3 of [515] Model Consolidated? is = 1, Then [363] Freight Tariffs from the Passenger Model, Otherwise 0) +
    iii. IF (Column 4 of [515] Model Consolidated? Is = 1, Then [363] Freight Tariffs from the Infrastructure Model, Otherwise 0)

**[559] Passenger Fares**

- Total passenger fare revenues for the Consolidated Model using the data from each individual model if they are set to be consolidated

**[560] Track Access Revenue (External)**

- Total external track access revenues for the Consolidated Model using the data from each individual model if they are set to be consolidated
- =IF($G$40=0,0,IF('Infrastructure Model'!$F$74='Infrastructure Model'!$G$74,'Infrastructure Model'!I645+IF($F$40=0,'Infrastructure Model'!I637+'Infrastructure Model'!I636,0) + IF($E$40=0,'Infrastructure Model'!I635+'Infrastructure Model'!I634,0),'Infrastructure Model'!I638+IF($F$40=0,'Infrastructure Model'!I644+'Infrastructure Model'!I643,0) +IF($E$40=0,'Infrastructure Model'!I642+'Infrastructure Model'!I641,0)))
    i. IF (Column 4 of [515] Model Consolidated? Is = 0, Then [560] is = 0
    ii. Otherwise IF [33] Data Is from the Infrastructure Model is = “Internal”, Then [560] is = Infrastructure Model [197] Total External Freight and Passenger Access Charge +
    iii. IF (Column 3 of [515] Model Consolidated? is = 0, Then Infrastructure Model [191] Internal Passenger Access Charge for Train-Km + Infrastructure Model [190] Internal Passenger Access Charge for GTK, Otherwise 0) +
    iv. IF(Column 2 of [515] Model Consolidated? is = 0, Then Infrastructure Model [189] Internal Freight Access Charge for Train-Km + Infrastructure Model [188] Internal Freight Access Charge for GTK, Otherwise 0)

v. IF [33] Data Is from the Infrastructure Model is = "External", Then [560] is = Infrastructure Model [192] Total External Freight and Passenger Access Charge +

vi. IF (Column 3 of [515] Model Consolidated? is = 0, Then Infrastructure Model [196] Internal Passenger Access Charge for Train-Km + Infrastructure Model [195] Internal Passenger Access Charge for GTK, Otherwise 0) +

vii. IF(Column 2 of [515] Model Consolidated? is = 0, Then Infrastructure Model [194] Internal Freight Access Charge for Train-Km + Infrastructure Model [193] Internal Freight Access Charge for GTK, Otherwise 0)

- Formula first checks if the Infrastructure Model is set to be consolidated, if yes it uses [33] Data Is from the Infrastructure Model to obtain the total external freight and passenger access charges. The formula also only adds the internal freight and passenger revenue if the freight or passenger models are *not* set to be consolidated. This would make [560] Track Access Revenue include internally charged revenues if freight or passenger are not included in the Consolidated Model

**[561] Operating Subsidy**

- Total operating subsidy revenues for the Consolidated Model using the data from each individual model if they are set to be consolidated

**[562] Other (Incl. Subsidy Amortization)**

- Total other revenues for the Consolidated Model using the data from each individual model if they are set to be consolidated

**[563] Total Revenues**

- Total other revenues for the Consolidated Model which is equal to the sum of [558] to [562]

## Operating Expenses

**[564] Track Access Charge (Paid)**

- Total track access charge (paid) for the Consolidated Model using the data from each individual model if they are set to be consolidated
- =IF($G$40=1,0,IF($F$40=1,'Passenger Model'!I1368,0)+IF($E$40=1,'Freight Model'!I1368,0))

i. IF Column 4 of [515] Model Consolidated? is = 1, Then [564] is = 0

ii. Otherwise IF Column 3 of [515] Model Consolidated? is = 1, Then [369] Track Access Charge from the Passenger Model, Otherwise 0) +

iii. IF Column 2 of [515] Model Consolidated? is = 1, Then [369] Track Access Charge from the Freight Model, Otherwise 0)

- Formula outputs 0 if infrastructure is set to be consolidated due to charges from freight and passenger being charged internally to infrastructure

**[565] Staff**

- Staff cost for the Consolidated Model which is equal to [518] Staff Cost

**[566] Materials**

- Materials cost for the Consolidated Model which is equal [519] Materials Cost

**[567] Fuel**

- Fuel cost for the Consolidated Model which is equal [520] Fuel Cost

**[568] Electricity**

- Electricity cost for the Consolidated Model which is equal [521] Electricity Cost

**[569] External Services**

- External services cost for the Consolidated Model which is equal [522] External Services Cost

**[570] Other**

- Other operating costs for the Consolidated Model which is equal [523] Other Operating Expenses

**[571] Total Operating Expenses**

- Total operating expenses for the Consolidated Model which is equal to the sum of [564] to [570]

## Non-Operating Adjustments

**[572] Total Non-Operating Adjustments**

- Total non-operating adjustments for the consolidated model which is equal = [527] Total Non-Operating Adjustments

**[573] EBITDA**

- Calculates consolidated EBITDA as consolidated revenue – operating expenses + non-operating adjustments
- =I315-I325+I328
    i. [563] Total revenues – [571] Total operating expenses + [572] Total non-operating adjustments

**[574] Depreciation**

- Total depreciation for the Consolidated Model using the data from each individual model if they are set to be consolidated

**[575] EBIT**

- Calculates EBIT as EBITDA - depreciation
- = I331-I333
    i. [573] EBITDA – [574] Depreciation

**[576] Net Finance Expenses**

- Total net finance expenses for the Consolidated Model using the data from each individual model if they are set to be consolidated minus the interest amount on cash balances
- =IF($G$40=1,'Infrastructure Model'!I1386+'Infrastructure Model'!I1338,0)+IF($F$40=1,'Passenger Model'!I1386+'Passenger Model'!I1338,0)+IF($E$40=1,'Freight Model'!I1386+'Freight Model'!I1338,0)-I289
    i. IF (Column 2 of [515] Model Consolidated? is = 1, Then [381] Net Finance Expenses + [353] Interest amount on cash balances from the Freight Model, Otherwise 0) +
    ii. IF (Column 3 of [515] Model Consolidated? is = 1, Then [381] Net Finance Expenses + [353] Interest amount on cash balances from the Passenger Model, Otherwise 0) +
    iii. IF (Column 4 of [515] Model Consolidated? is = 1, Then [381] Net Finance Expenses +[353] Interest amount on cash balances from the Infrastructure Model, Otherwise 0)
    iv. – (un-indexed on Consolidated Model [353] Interest Amount on Cash Balances)

**[577] EBT**

- EBT calculated as EBIT – financing expenses
- =I335-I336
    i. [575] EBIT – [576] Net Finance Expenses

**[578] Income Tax**

- Calculates income tax expense based on EBT
- =I337*$I$260
- [577] EBT * (un-indexed on consolidated model [276] Corporate Income Tax Rate)

**[579] Net Income**

- Calculates net income as EBT – Income Tax
- =I337-I338
    i. [577] EBT – [578] Income tax

# Consolidated Balance Sheet

## Assets

**[580] Cash and Cash Equivalents**

- Calculates the cash for the period as previous period's cash plus change in cash
- First period:
    i. [580] is = [557] Ending cash balance
- Following periods:
- I347+J416
    i. [580] Cash and Cash Equivalents (previous period) + [627] Net Change in Cash

**[581] Accounts Receivable**

- Accounts receivable for the consolidated model which is equal [531] Accounts Receivable

**[582] Inventory**

- Inventory for the consolidated model which is equal [533] Inventory

**[583] Other Receivables**

- Other receivables for the consolidated model which is equal [535] Other Receivables

**[584] Total Current Assets**

- Current assets for the Consolidated Model is equal to the sum of [580] to [583]

**[585] Property, Plant And Equipment**

- Property, plant and equipment for the Consolidated Model using the data from each individual model if they are set to be consolidated

**[586] Other Long-Term Assets**

- Other long-term assets for the Consolidated Model using the data from each individual model if they are set to be consolidated

**[587] Total Long-Term Assets**

- Calculates total long-term assets as the sum of property, plant and equipment and other long-term Assets
- = SUM(I353:I354)

i. [585] Property, Plant and Equipment + [586] Other Long-Term Assets

**[588] Total Assets**

- Calculates total assets for the consolidated model as long-term assets plus current assets
- =I355+I351
    i. [587] Total Long-Term Assets + [584] Total Current Assets

## Liabilities

**[589] Accounts Payable**

- Accounts payable for the consolidated model which is equal [538] Accounts Payable

**[590] Other Payables**

- Other payables for the consolidated model which is equal [540] Other Payables

**[591] Short-Term Loan Payables**

- Total short-term loan payables for the Consolidated Model using the data from each individual model if they are set to be consolidated

**[592] Total Current Liabilities**

- Total current liabilities for the Consolidated Model which is equal to the sum of [589] to [591]

**[593] Long-Term Loans**

- Total Long-term loans for the Consolidated Model using the data from each individual model if they are set to be consolidated

**[594] Other Long-Term Liabilities**

- Total other long-term liabilities for the Consolidated Model using the data from each individual model if they are set to be consolidated

**[595] Total Long-Term Liabilities**

- Total Long-Term Liabilities for the Consolidated Model is equal to the sum of [593] to [594]

**[596] Total Liabilities**

- Calculates total liabilities as long-term liabilities + current liabilities
- =I368+I364
    i. [595] Total Long-Term Liabilities + [592] Total Current Liabilities

## Equity

**[597] Paid-In Capital**

- Paid-in capital for the consolidated model which is equal [544] Ending Paid-In Capital

**[598] Capital Subsidy**

- Capital subsidy for the consolidated model which is equal [547] Ending Capital Subsidy

**[599] Retained Earnings**

- Retained earnings for the consolidated model which is equal [550] Retained Earnings Closing Balance

**[600] Other Reserves**

- Other reserves for the consolidated model which is equal [553] Ending Balance Other Reserves

**[601] Total Equity**

- Total equity is equal to the sum of [597] to [600]

**[602] Total Liabilities and Equity**

- Calculates total liabilities and equity as total equity plus total liabilities
- =I376+I369
    i. [601] Total Equity + [596] Total Liabilities

**[603] Balance?**

- Checks if total liabilities and equity are equal to total assets
- =IF((I377-I356)<(0.0001),"YES","NO"))
    i. IF [602] Total Liabilities and Equity – [588] Total Assets is Less than 0.0001
    ii. Then [603] is = “YES”
    iii. Otherwise [603] is = “NO”

# Consolidated Cash Flow Statement

## Operating Activities

**[604] Net Income**

- Net income for the consolidated model which is equal [579] Net Income

**[605] Add Interest and Finance Expenses**

- Total Interest and finance expenses for the Consolidated Model using the data from each individual model if they are set to be consolidated
- =IF($G$40=1,'Infrastructure Model'!J1386+'Infrastructure Model'!J1338,0)+IF($F$40=1,'Passenger Model'!J1386+'Passenger Model'!J1338,0)+IF($E$40=1,'Freight Model'!J1386+'Freight Model'!J1338,0)
    i. IF (Column 2 of [515] Model Consolidated? is = 1, Then [381] Net Finance Expenses + [353] Interest Amount On Cash Balances from the Freight Model, Otherwise 0) +
    ii. IF (Column 3 of [515] Model Consolidated? is = 1, Then [381] Net Finance Expenses + [353] Interest Amount On Cash Balances from the Passenger Model, Otherwise 0) +
    iii. IF (Column 4 of [515] Model Consolidated? is = 1, Then [381] Net Finance Expenses +[353] Interest Amount On Cash Balances from the Infrastructure Model, Otherwise 0)

**[606] Depreciation**

- Depreciation for the consolidated model which is equal [574] Depreciation

**[607] Amortization of Capital Subsidy**

- Amortization of capital subsidy for the Consolidated Model using the data from each individual model if they are set to be consolidated

**[608] Change in Accounts Receivable**

- Change in accounts receivable for the consolidated model
- =J348-I348
    i. [581] Accounts Receivable (current period) – [581] Accounts Receivable (previous period)

**[609] Change in Inventory**

- Change in inventory for the consolidated model which is equal to [582] Inventory (current period) – [582] Inventory (previous period)

**[610] Change in Other Receivables**

- Change in inventory for the consolidated model which is equal to [583] Other Receivables (current period) – [583] Other Receivables (previous period)

**[611] Change in Accounts Payable**

- Change in accounts payables for the consolidated model which is equal to [589] Accounts Payable (current period) – [589] Accounts Payable (previous period)

**[612] Other Payables**

- Change in other payables for the consolidated model which is equal to [590] Other Payables (current period) – [590] Other Payables (previous period)

**[613] Total Change in Working Capital**

- Calculates the total change in working capital by subtracting sources of working capital and adding uses of working capital
- =-J390-J391-J392+J393+J394
    i. - [608] Accounts Receivable – [609] Inventory – [610] Other Receivables + [611] Accounts Payable +[ 699] Other Payables

**[614] Net Cash From Operating Activities**

- Calculates the total net cash from operating activities for the Consolidated Model
- = J384+J385+J387-J388+J395
    i. [604] Net Income + [605] Add Interest And Finance Expenses + [606] Depreciation - [607] Amortization of Capital Subsidy + [613] Total Change in Working Capital

## Investing Activities

**[615] Acquisition of Property, Plant and Equipment**

- Total acquisition of property, plant and equipment for the Consolidated Model using the data from each individual model if they are set to be consolidated

**[616] Sale of Property, Plant and Equipment**

- Total sale of property, plant and equipment for the Consolidated Model using the data from each individual model if they are set to be consolidated

**[617] Other Long-Term Assets**

- Total other long-term assets for the Consolidated Model using the data from each individual model if they are set to be consolidated

**[618] Net Cash From Investing Activities**

- Calculates net cash from investing activities as the difference between property, plant and equipment sold and acquired less net invested in other long-term assets
- =-J399+J400-J401
    i. - [615] Acquisition of PPE + [616] Sale of PPE – [617] Other Long-Term Assets

## Financing Activities

**[619] Repayment of Loans**

- Total repayment of loans for the Consolidated Model using the data from each individual model if they are set to be consolidated

**[620] Proceeds From Loans**

- Total proceeds from loans for the Consolidated Model using the data from each individual model if they are set to be consolidated

**[621] Capital Subsidy**

- Total capital subsidy for the Consolidated Model using the data from each individual model if they are set to be consolidated

**[622] Change in Other Long-Term Liabilities**

- Calculates the change in other long term liabilities from previous period to current period
- =J367-I367
    i. [594] Other Long-Term Liabilities (current period) – [594] Other Long-Term Liabilities (previous period)

**[623] Change in Paid-In Capital**

- Calculates the change in paid-in capital from previous period to current period
- =J372-I372
    i. [597] Paid-In Capital (current period) – [597] Paid-In Capital (previous period)

**[624] Interest and Finance Expenses**

- Interest and finance expenses for the Consolidated Model which is equal to [605] Add Interest and Finance Expenses

**[625] Dividends Paid**

- Dividends paid for the Consolidated Model which is equal to [555] Annual Dividend

**[626] Net Cash From Financing Activities**

- Total cash provided from financing activities for the consolidated model which is equal to the sum of [620], [621], [622] and [623] less [619], [624] and [625]

**[627] Net Change In Cash**

- Net change in cash for the Consolidated Model which is equal to the sum of cash from Financing Activities, Investing Activities and Operating Activities
- = J414+J403+J396
    i. [626] Net Cash From Financing Activities + [618] Net Cash From Investing Activities + [614] Net Cash From Operating Activities

**[628] Cash Balance at Beginning of Year**

- Total cash balance at the beginning of the year for the Consolidated Model which is equal to [629] Cash Balance at End of Year from previous period

**[629] Cash Balance at End of Year**

- Total cash balance at the end of the year for the Consolidated Model
- First period:
    i. [629] is = [557] Ending Cash Balance
- Following periods:
- =J418+J416

i. [628] Cash Balance at Beginning Of Year + [627] Net Change in Cash

**[630] Check**

- Row checks if the cash balance is correct for each period by checking if the [629] Cash Balance at End of Year minus [628] Cash Balance at Beginning of Year minus [627] Net Change in Cash is close to 0 based on a small level of tolerance
- =IF(J26="","",IF(((J419-J418)-J416)<(0.00001),"YES","NO"))
  i. IF [629] Cash Balance at End of Year – [628] Cash Balance at Beginning of Year – [627] Net Change in Cash is Less Than 0.0001
  ii. Then [630] is = "Yes"
  iii. Otherwise [630] is = "No"

# PART 6: SCENARIO ANALYSIS

## Scenario Analysis

**[631] Run Consolidated Scenario Analysis?**

- Yes: Allows scenario analysis for the consolidated entity, and overrides the values of scenario analysis on each individual sheet
- No: Scenario analysis is disabled but still possible on any individual sheet

**[632] Tariff Multiplier (x)**

- Column to calculate a scenario analysis based on an implied tariff multiplier
  i. Row 1 uses a drop down menu with "Yes" or "No" as an input for whether to run that particular scenario analysis within the current model
  ii. Row 2 is the input for what the variable in the model will be set to in the scenario analysis if activated ([631] and [632] Row 1 are set to "Yes"), it will override the value entered on each sheet

**[633] Tariff Growth Rate (%)**

- Column to calculate a scenario analysis based on an implied tariff growth rate

**[634] Track Access Multiplier**

- Column to calculate a scenario analysis based on an implied track access multiplier

**[635] Track Access Growth Rate**

- Column to calculate a scenario analysis based on an implied track access growth rate

**[636] Fare Multiplier**

- Column to calculate a scenario analysis based on an implied fare multiplier

**[637] Fare Growth Rate**

- Column to calculate a scenario analysis based on an implied fare growth rate

**[638] Internal Freight Traffic Multiplier (x)**

- Column to calculate a scenario analysis based on an implied internal freight traffic multiplier (x)

**[639] Internal Passenger Traffic Multiplier (x)**

- Column to calculate a scenario analysis based on an implied internal passenger traffic multiplier (x)

**[640] External Freight Traffic Multiplier (x)**

- Column to calculate a scenario analysis based on an implied external freight traffic multiplier (x)

**[641] External Passenger Traffic Multiplier (x)**

- Column to calculate a scenario analysis based on an implied external passenger traffic multiplier (x)

**[642] Staff Multiplier (x)**

- Column to calculate a scenario analysis based on an implied staff multiplier (x)

**[643] CAPEX Multiplier (x)**

- Column to calculate a scenario analysis based on an implied CAPEX Multiplier (x)

# Appendix

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| [2] | Operational Benchmark |
| [3] | Type Of Model |
| [4] | No. Years |
| [5] | Compounding Frequency |
| [6] | Model Starting Date |
| [7] | Type Of Model (Number) |
| [8] | End Of Month? |
| [9] | Model Ending Date |
| [10] | Units |
| [11] | Name Of Home Currency |
| [12] | Name Of Foreign Currency 1 |
| [13] | Name Of Foreign Currency 2 |
| [14] | Periods |
| [15] | Period From: |
| [16] | Period To: |
| [17] | No. Days |
| [18] | Model Period Starts Here: |
| [19] | Model Period Started: |
| [20] | Model Period Ends Here: |
| [21] | Model Period Ended: |
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| [23] | Inflation Index % |
| [24] | Inflation Adjustment |
| [25] | Inflation End Period |
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| [27] | Inflation Index |
| [28] | Libor |
| [29] | EUR\R$ |
| [30] | USD\R$ |
| [31] | Length Of Network In Use |
| [32] | Staff |
| [33] | Data Is |
| [34] | Freight Traffic Volume |
| [35] | Electric Traction Share Of Freight Traffic |
| [36] | Enter Change In Electric Traction Share Of Total Freight Traffic |
| [37] | Diesel Traction Share Of Freight Traffic Volume |
| [38] | Passenger Traffic Volume |

| | |
|---|---|
| [39] | Electric Traction Share Of Passenger Traffic |
| [40] | Enter Change Of Electric Traction Share Of Passenger Traffic |
| [41] | Diesel Share Of Passenger Traffic Volume |
| [42] | Freight Traffic Volume |
| [43] | Electric Traction Share Of Freight Traffic |
| [44] | Enter Change In Electric Traction Share Of Total Freight Traffic |
| [45] | Diesel Traction Share Of Freight Traffic Volume |
| [46] | Passenger Traffic Volume |
| [47] | Electric Traction Share Of Passenger Traffic |
| [48] | Enter Change Of Electric Traction Share Of Passenger Traffic |
| [49] | Diesel Share Of Passenger Traffic Volume |
| [50] | Freight 1000000s () Per Staff |
| [51] | Freight 1000000s () Per GTK-Freight |
| [52] | Staff Per GTK-Freight |
| [53] | Average Electric Traction Share Of Freight Traffic |
| [54] | Average Electric Traction Share Of Passenger Traffic |
| [55] | Data In Net Ton-Kilometers Or Tons |
| [56] | Average Length Of Cargo Haul |
| [57] | Enter Weight Of Train Load (Net) |
| [58] | Name Of Traffic Flow 1 |
| [59] | Implied Gross Ton-Km/ Net Ton-Km Ratio |
| [60] | Enter Change In GTK/NTK Ratio |
| [61] | Check |
| [62] | Commodity 1 Annual Traffic Volume |
| [63] | Traffic Data In Passenger - Km (Millions) Or Number Of Trips |
| [64] | Enter Average Length Of Passenger Trip |
| [65] | Name Of Traffic Flow 1 |
| [66] | Implied Gross Ton-Km/ Passenger - Km Ratio |
| [67] | Enter Change In GTK/NTK Ratio |
| [68] | Annual Traffic Volume for Traffic Flow 1 (Passenger-Km) |
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| [75] | Average Length Of Cargo Haul |
| [76] | Enter Weight Of Train Load (Net) |
| [77] | Name Of Traffic Flow 1 |
| [78] | Implied Gross Ton-Km/ Net Ton-Km Ratio |
| [79] | Enter Change In GTK/NTK Ratio |

| | |
|---|---|
| [80] | Check |
| [81] | Annual Traffic Volume |
| [82] | Traffic Data In Passenger - Km (Millions) Or Number Of Trips |
| [83] | Enter Average Length Of Passenger Trip |
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| [85] | Implied Gross Ton-Km/ Passenger - Km Ratio |
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| [90] | Annual Traffic Volume for Traffic Flow 2 (Train-Km) |
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| [92] | Annual Traffic Volume for Traffic Flow 3 (Train-Km) |
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| [94] | External Freight Traffic Multiplier |
| [95] | Annual Traffic Volume Of Commodity 1 |
| [96] | Annual Traffic Volume Of Commodity 1 |
| [97] | Annual Traffic Volume Of Commodity 1 |
| [98] | Annual Traffic Volume Of Commodity 1 |
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| [107] | Electric Traffic Volume of Traffic Flow |
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| [110] | Annual Traffic Volume of Traffic Flow (NTK) |
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| [117] | Internal Passenger Traffic Multiplier |
| [118] | Annual Traffic Volume of Traffic Flow (Passenger Km) |
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| | |
|---|---|
| [121] | Diesel Traffic Volume of Traffic Flow |
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| [163] | Total Revenue In First Year |
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| [199] | Track Access Operating Cost |
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| [201] | Staff Multiplier Enabled? (Yes=1,No=0) |
| [202] | Staff Multiplier From Scenario Analysis |

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| [205] | Variability With Unit Staff Cost |
| [206] | Staff Physical Cost Driver |
| [207] | Variability With Inflation |
| [208] | Per Staff Cost |
| [209] | Annual Additional Change |
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| [212] | Name Of Non-Operating Expense 1 |
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| [214] | Quantity (Physical Cost Driver) |
| [215] | Enter Change In Quantity |
| [216] | Variability With Inflation |
| [217] | Annual Unit Cost |
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| [219] | Total Annual Non-Operating Cost |
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| [224] | Days In Inventory |
| [225] | Change In Inventory |
| [226] | Other Receivables In First Year |
| [227] | Days In Other Receivables |
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|---|---|
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| [287] | Currency |
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| [297] | Principal Amount In Issue Currency |
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| [300] | If Fixed, Enter Interest Rate |
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| [303] | Grace Period |
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| [316] | Interest Rate |
| [317] | Principal Outstanding At The Beginning Of The Year |
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| [319] | Bullet Principal |
| [320] | Equal Installment Principal |
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| [324] | Principal Received |
| [325] | Principal Outstanding At The End Of The Year |

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| [445] | Track Access Growth Rate |
| [446] | Fare Multiplier |
| [447] | Fare Growth Rate |
| [448] | Internal Freight Traffic Multiplier |

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|---|---|
| [449] | Internal Passenger Traffic Multiplier |
| [450] | External Freight Traffic Multiplier |
| [451] | External Passenger Traffic Multiplier |
| [452] | Staff Multiplier |
| [453] | CAPEX Multiplier |
| [454] | Average Total Freight Traffic Train- Km(Millions) |
| [455] | Average Total Passenger Traffic Train- Km(Millions) |
| [456] | Average Annual Staff Count |
| [457] | Average Electric Traction Share Of Freight Traffic |
| [458] | Average Electric Traction Share Of Passenger Traffic |
| [459] | Initial Total Freight Traffic (GTK Millions) |
| [460] | Initial Total Freight Traffic (GTK Millions) (CAGR) |
| [461] | Initial Total Passenger Traffic (GTK Millions) |
| [462] | Initial Total Passenger Traffic (GTK Millions) (CAGR) |
| [463] | Average Tariff |
| [464] | Freight Access Charge Per GTK |
| [465] | Freight Access Charge Per Train-Km |
| [466] | Passenger Track Access Charge Per GTK |
| [467] | Passenger Access Charge Per Train-Km |
| [468] | Total Subsidy (Including Amortization) |
| [469] | Debt |
| [470] | Equity |
| [471] | Days In Accounts Receivable |
| [472] | Days In Inventory |
| [473] | Days In Other Receivables |
| [474] | Days In Accounts Payable |
| [475] | Days In Other Payables |
| [476] | Average Land |
| [477] | Average Buildings And Structures |
| [478] | Average Track And Infrastructure |
| [479] | Average Locomotives And Railway Cars |
| [480] | Average Machines, Equipment And Spare Parts |
| [481] | Average Others |
| [482] | Total |
| [483] | Staff |
| [484] | Materials |
| [485] | Diesel Fuel |
| [486] | Electricity |
| [487] | External Services |
| [488] | Other Operating Expenses |
| [489] | Total Non-Operating Adjustments |

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|---|---|
| [490] | New Financing |
| [491] | First Modeling Year |
| [492] | Principal Amount |
| [493] | Currency |
| [494] | Fixed/Variable |
| [495] | Interest Rate/Margin |
| [496] | Term |
| [497] | Grace Period |
| [498] | Repayment Profile |
| [499] | Front-End Fee |
| [500] | Commitment Fee |
| [501] | Operating Profit |
| [502] | Operating Margin |
| [503] | ROE |
| [504] | ROA |
| [505] | DSCR |
| [506] | D/D+E |
| [507] | Current Ratio |
| [508] | Cash Ratio |
| [509] | Balance Sheet Always Balanced? |
| [510] | Cash Balance Above Zero In All Years? |
| [511] | Cash On Cash Flow = Cash On Balance Sheet? |
| [512] | Model Active? |
| [513] | Consolidate Model? |
| [514] | Model Consolidated? |
| [515] | Model Consolidated? |
| [516] | Total Additional Staff |
| [517] | Total Additional Other Operating Expenses |
| [518] | Staff Cost |
| [519] | Materials Cost |
| [520] | Diesel Fuel Cost |
| [521] | Electricity |
| [522] | External Services |
| [523] | Other Operating Expenses |
| [524] | Non-Operating Revenue From Subsidiaries |
| [525] | Non-Operating Costs From Subsidiaries |
| [526] | Non-Operating Adjustments From Headquarters |
| [527] | Total |
| [528] | Additional Accounts Payable |
| [529] | Additional Other Payable |
| [530] | Adjustment For Inter-Company Transactions |

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|---|---|
| [531] | Accounts Receivable |
| [532] | Days In Accounts Receivable |
| [533] | Inventory |
| [534] | Days In Inventory |
| [535] | Other Receivables |
| [536] | Days In Other Receivables |
| [537] | Adjustment For Inter-Company Transactions |
| [538] | Accounts Payables |
| [539] | Days In Account Payable |
| [540] | Other Payables |
| [541] | Days In Other Payables |
| [542] | Opening Paid-In Capital |
| [543] | Change In Paid-In Capital |
| [544] | Ending Paid-In Capital |
| [545] | Opening Capital Subsidy |
| [546] | Change In Capital Subsidy Less Amortization |
| [547] | Ending Capital Subsidy |
| [548] | Retained Earnings Opening Balance |
| [549] | Change In Retained Earnings |
| [550] | Retained Earnings Closing Balance |
| [551] | Opening Other Reserves |
| [552] | Change In Other Reserves |
| [553] | Ending Balance Other Reserves |
| [554] | Debt Service |
| [555] | Annual Dividend |
| [556] | Additional Cash Balance From Headquarters End Year 1 |
| [557] | Ending Cash Balance |
| [558] | Freight Tariffs |
| [559] | Passenger Fares |
| [560] | Track Access Revenue (External) |
| [561] | Operating Subsidy |
| [562] | Other (Incl. Subsidy Amortization) |
| [563] | Total Revenues |
| [564] | Track Access Charge (Paid) |
| [565] | Staff |
| [566] | Materials |
| [567] | Fuel |
| [568] | Electricity |
| [569] | External Services |
| [570] | Other |
| [571] | Total Operating Expenses |

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|---|---|
| [572] | Total Non-Operating Adjustments |
| [573] | EBITDA |
| [574] | Depreciation |
| [575] | EBIT |
| [576] | Net Finance Expenses |
| [577] | EBT |
| [578] | Income Tax |
| [579] | Net Income |
| [580] | Cash And Cash Equivalents |
| [581] | Accounts Receivable |
| [582] | Inventory |
| [583] | Other Receivables |
| [584] | Total Current Assets |
| [585] | Property, Plant And Equipment |
| [586] | Other Long-Term Assets |
| [587] | Total Long-Term Assets |
| [588] | Total Assets |
| [589] | Accounts Payable |
| [590] | Other Payables |
| [591] | Short-Term Loan Payables |
| [592] | Total Current Liabilities |
| [593] | Long-Term Loans |
| [594] | Other Long-Term Liabilities |
| [595] | Total Long-Term Liabilities |
| [596] | Total Liabilities |
| [597] | Paid-In Capital |
| [598] | Capital Subsidy |
| [599] | Retained Earnings |
| [600] | Other Reserves |
| [601] | Total Equity |
| [602] | Total Liabilities And Equity |
| [603] | Balance? |
| [604] | Net Income |
| [605] | Add Interest And Finance Expenses |
| [606] | Depreciation |
| [607] | Amortization Of Capital Subsidy |
| [608] | Accounts Receivable |
| [609] | Inventory |
| [610] | Other Receivables |
| [611] | Accounts Payable |
| [612] | Other Payables |

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|---|---|
| [613] | Total Change In Working Capital |
| [614] | Net Cash From Operating Activities |
| [615] | Acquisition Of Property, Plant And Equipment |
| [616] | Sale Of Property, Plant And Equipment |
| [617] | Other Long-Term Assets |
| [618] | Net Cash From Investing Activities |
| [619] | Repayment Of Loans |
| [620] | Proceeds From Loans |
| [621] | Capital Subsidy |
| [622] | Change In Other Long-Term Liabilities |
| [623] | Change In Paid-In Capital |
| [624] | Interest And Finance Expenses |
| [625] | Dividends Paid |
| [626] | Net Cash From Financing Activities |
| [627] | Net Change In Cash |
| [628] | Cash Balance At Beginning Of Year |
| [629] | Cash Balance At End Of Year |
| [630] | Check |
| [631] | Tariff Multiplier |
| [632] | Tariff Growth Rate (%) |
| [633] | Track Access Multiplier |
| [634] | Track Access Growth Rate |
| [635] | Fare Multiplier |
| [636] | Fare Growth Rate |
| [637] | Internal Freight Traffic Multiplier |
| [638] | Internal Passenger Traffic Multiplier |
| [639] | External Freight Traffic Multiplier |
| [640] | External Passenger Traffic Multiplier |
| [641] | Staff Multiplier |
| [642] | CAPEX Multiplier |