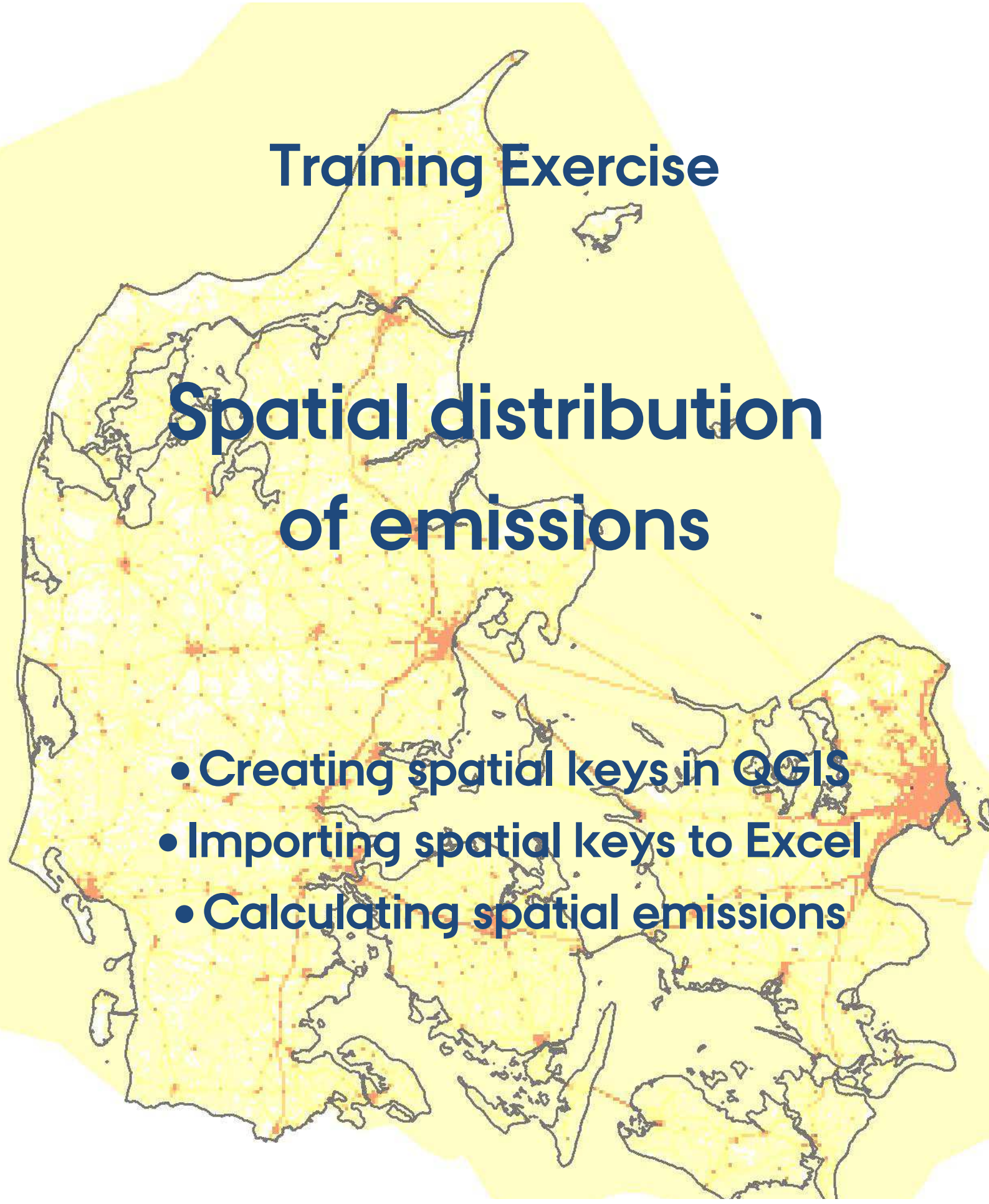
Training Exercise

Spatial distribution of emissions



- Creating spatial keys in QGIS
- Importing spatial keys to Excel
- Calculating spatial emissions

Table of Contents

Exercise 1: Find geographical coordinates for a new point source

A new power plant is built in the city of Ringe. The address of the new power plant is Krogagervej 10, 5750 Ringe, Denmark. The new point source has to be included in the emission inventory.

Part 1: Coordinate transformation (Franson CoordTrans)

1. Open Googe Earth and search for the first address. Read the coordinates in the bottom line. The format of the coordinates are degrees, minutes and seconds (DD°MM'SS.ss'').

   Hint: the coordinates changes when the cursor moves over the screen.

2. Search for the second site, point to the location, and read the coordinates in the bottom line.

3. Open the coordinate transformation program Franson CoordTrans and type in the first set of coordinates in the left side of the window. Make sure to select the right input type (Longitude/Latitude or Easting/Northing) and the right datum.

4. Use the button right to the datum field to browse for the right datum. Also make sure to select the right direction for longitude (east or west) and latitude (north or south)

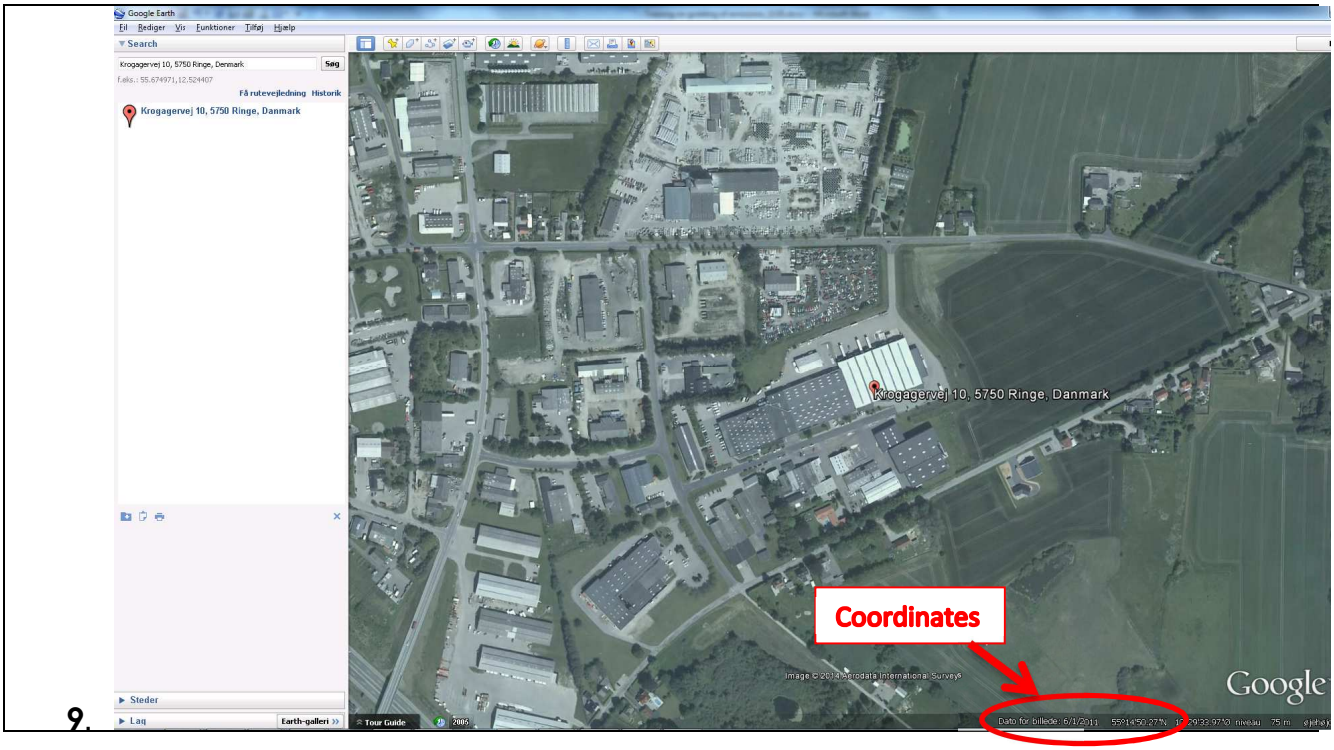
5. Change the settings for the output coordinates in the right side of the window. First select the output type. Select Longitude/Latitude, to get the output in meters.

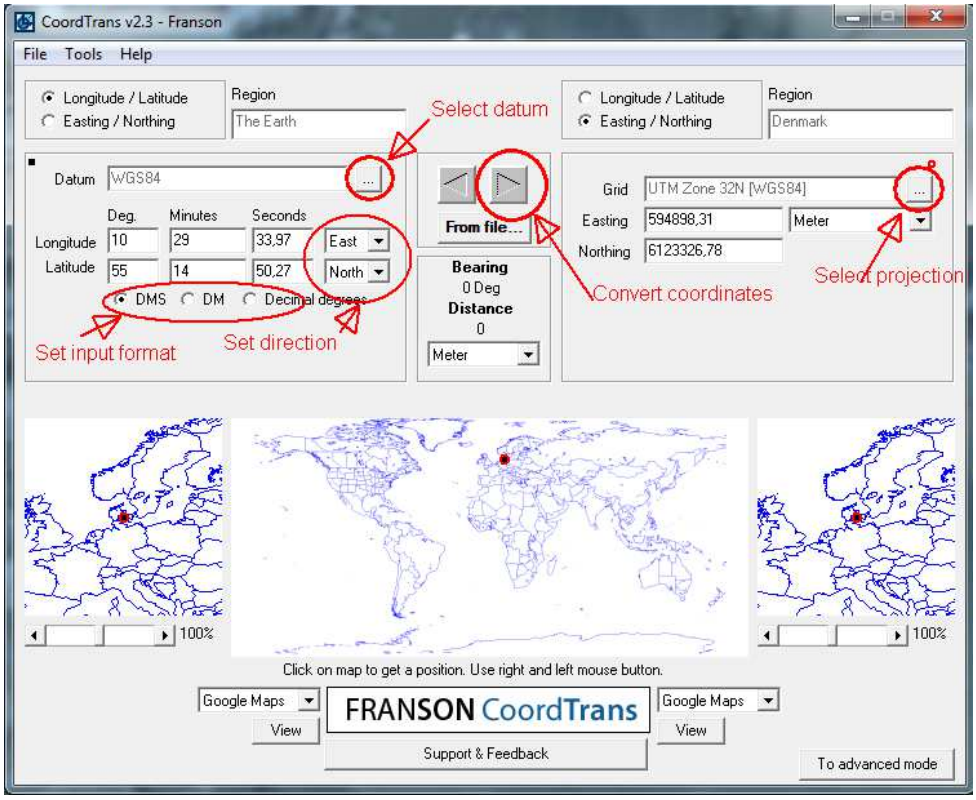
6. Set the output projection in the right side of the window (WGS84 UTM zone 32N). Use the button right to the grid field to change the selected grid.

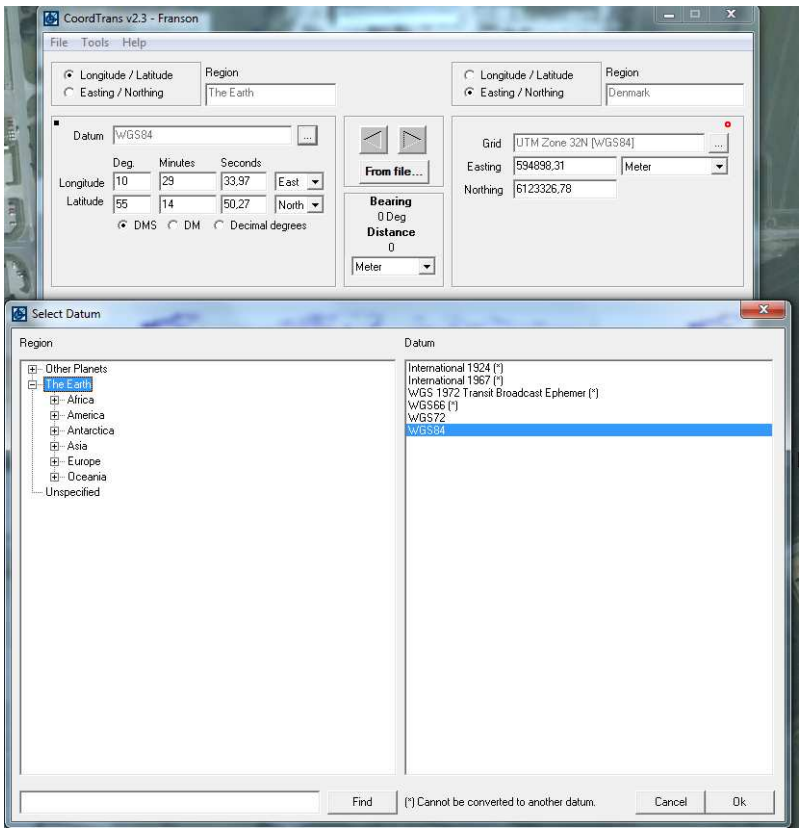
7. Click the arrow pointing to the right to convert the data in the left side of the window to the projection set in the right side of the window.

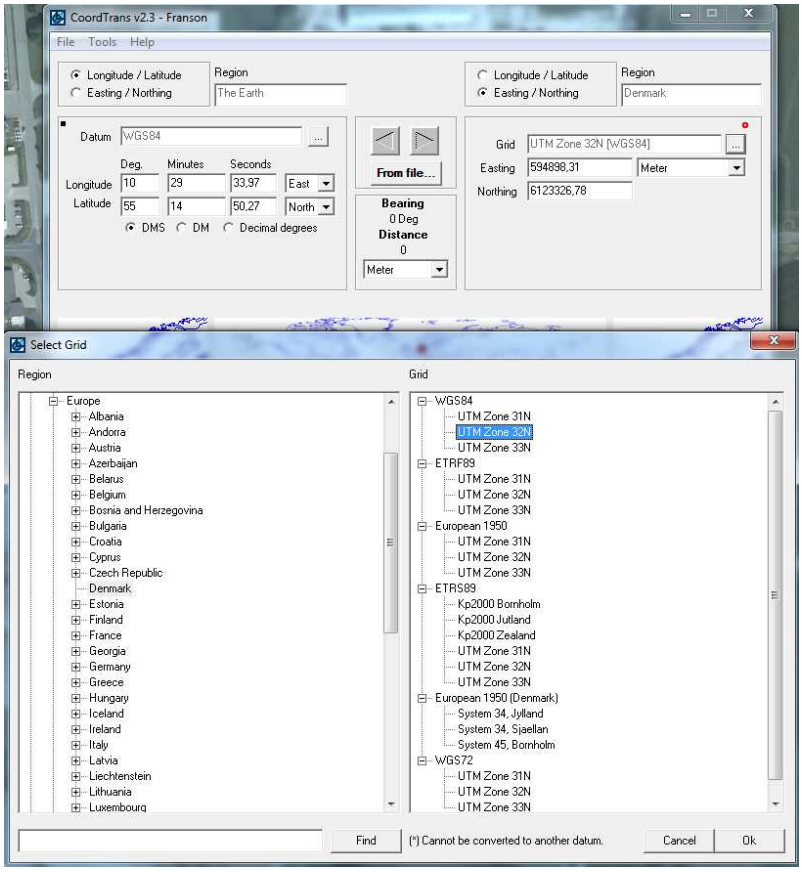
8. Transform the coordinates of the new refinery following the same steps.

   Hint: the red dot in the maps in the bottom of the window shows the location of the coordinates, and can be used to detect errors in the input coordinates

9. 


CoordTrans v2.3 - Franson
File Tools Help
Longitude / Latitude
Easting / Northing
Region
The Earth
Select datum
Datum
WGS84
Deg. Minutes Seconds
Longitude 10 29 33,97 East
Latitude 55 14 50,27 North
DMS DM Decimal degrees
Set input format
Set direction
From file...
Bearing
0 Deg
Distance
0
Meter
Grid
UTM Zone 32N [WGS84]
Easting
594898,31
Meter
Northing
6123326,78
Convert coordinates
Select projection
100%
Click on map to get a position. Use right and left mouse button.
Google Maps
View
FRANSON CoordTrans
Support & Feedback
To advanced mode


Select Datum
Region
Other Planets
The Earth
Africa
America
Antarctica
Asia
Europe
Oceania
Unspecified
Datum
International 1924 (*)
International 1967 (*)
WGS 1972 Transit Broadcast Ephemer (*)
WGS66 (*)
WGS72
WGS84
Find
(*) Cannot be converted to another datum.
Cancel
Ok


CoordTrans v2.3 - Franson
File Tools Help
Longitude / Latitude
Easting / Northing
Region
The Earth
Longitude / Latitude
Easting / Northing
Region
Denmark
Datum
WGS84
Deg. Minutes Seconds
Longitude 10 29 33,97 East
Latitude 55 14 50,27 North
DMS DM Decimal degrees
From file...
Bearing
0 Deg
Distance
0
Meter
Grid
UTM Zone 32N [WGS84]
Easting 594898,31 Meter
Northing 6123326,78
Select Grid
Region
Grid
Europe
Albania
Andorra
Austria
Azerbaijan
Belarus
Belgium
Bosnia and Herzegovina
Bulgaria
Croatia
Cyprus
Czech Republic
Denmark
Estonia
Finland
France
Georgia
Germany
Greece
Hungary
Iceland
Ireland
Italy
Latvia
Liechtenstein
Lithuania
Luxembourg
WGS84
UTM Zone 31N
UTM Zone 32N
UTM Zone 33N
ETRF89
UTM Zone 31N
UTM Zone 32N
UTM Zone 33N
European 1950
UTM Zone 31N
UTM Zone 32N
UTM Zone 33N
ETRS89
Kp2000 Bornholm
Kp2000 Jutland
Kp2000 Zealand
UTM Zone 31N
UTM Zone 32N
UTM Zone 33N
European 1950 (Denmark)
System 34, Jylland
System 34, Sjaellan
System 45, Bornholm
WGS72
UTM Zone 31N
UTM Zone 32N
UTM Zone 33N
Find
(*) Cannot be converted to another datum.
Cancel
Ok

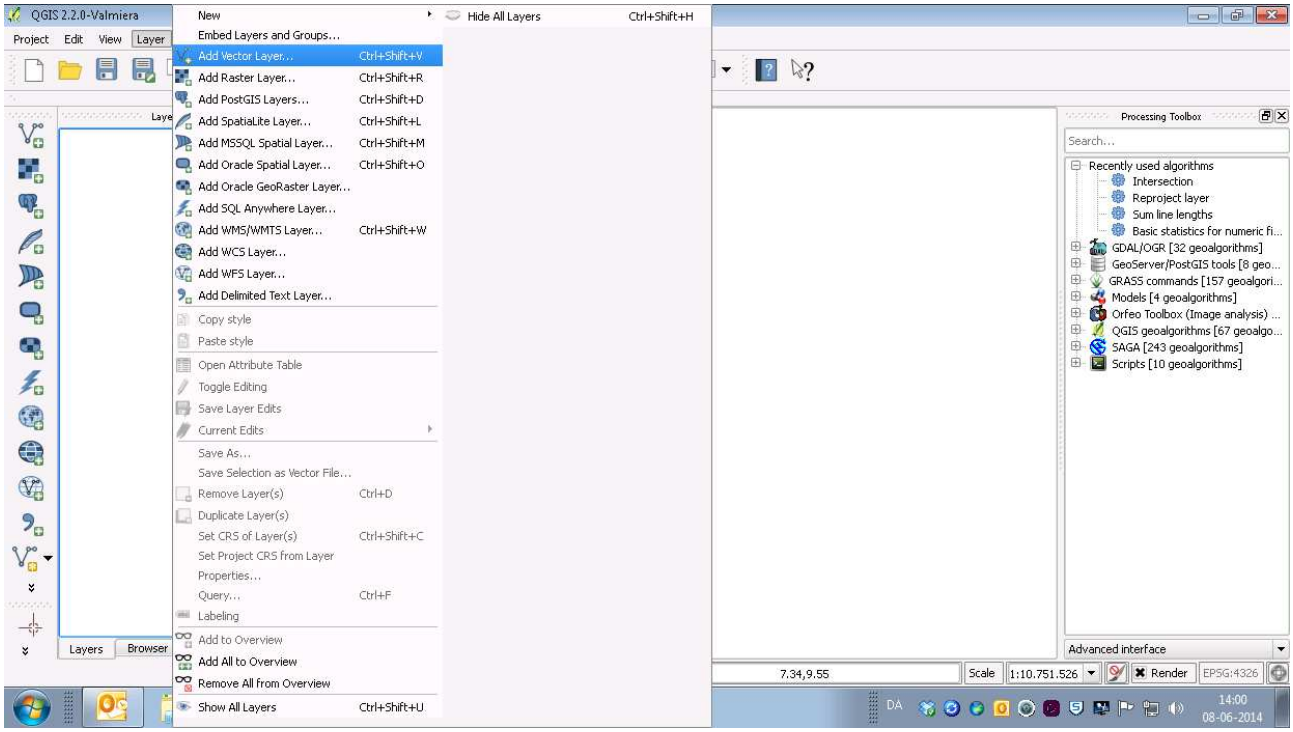
Exercise 2: Include a new spatial data set in the emission inventory

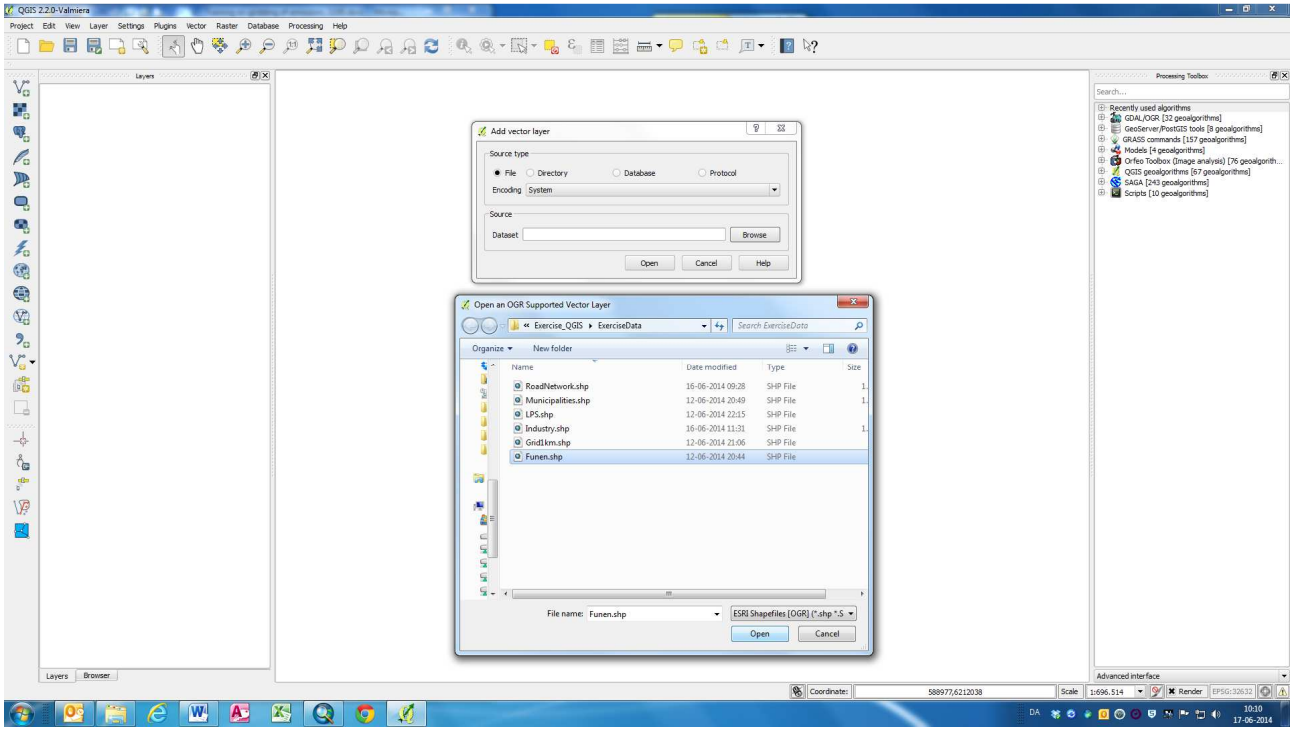
You have received a new spatial data set and want to include it in the spatial emission inventory. Your new data set is a railway network. Create a new spatial distribution key based on the railway network data set and include it in the calculation of spatial emissions.

Part 1: Basic tools in QGIS (add layer, symbology, zoom)

1. Open Quantum GIS (QGIS)

2. Add the shape file of case area to the QGIS project. Note that a shape file consist of six files. Select the file with the extension .shp to add the shape file to QGIS.
    a. Use Add vector layer in the Layer menu
    b. Browse to the file Exercise_QGIS\ExerciseData\Funen.shp


QGIS 2.2.0-Valmiera
Project Edit View Layer
New
Embed Layers and Groups...
Add Vector Layer... Ctrl+Shift+V
Add Raster Layer... Ctrl+Shift+R
Add PostGIS Layers... Ctrl+Shift+D
Add SpatiaLite Layer... Ctrl+Shift+L
Add MSSQL Spatial Layer... Ctrl+Shift+M
Add Oracle Spatial Layer... Ctrl+Shift+O
Add Oracle GeoRaster Layer...
Add SQL Anywhere Layer...
Add WMS/WMTS Layer... Ctrl+Shift+W
Add WCS Layer...
Add WFS Layer...
Add Delimited Text Layer...
Copy style
Paste style
Open Attribute Table
Toggle Editing
Save Layer Edits
Current Edits
Save As...
Save Selection as Vector File...
Remove Layer(s) Ctrl+D
Duplicate Layer(s)
Set CRS of Layer(s) Ctrl+Shift+C
Set Project CRS from Layer
Properties...
Query... Ctrl+F
Labeling
Add to Overview
Add All to Overview
Remove All from Overview
Show All Layers Ctrl+Shift+U
Hide All Layers Ctrl+Shift+H
Processing Toolbox
Search...
Recently used algorithms
Intersection
Reproject layer
Sum line lengths
Basic statistics for numeric fi...
GDAL/OGR [32 geoalgorithms]
GeoServer/PostGIS tools [8 geo...
GRASS commands [157 geoalgori...
Models [4 geoalgorithms]
Orfeo Toolbox (Image analysis) ...
QGIS geoalgorithms [67 geoalgo...
SAGA [243 geoalgorithms]
Scripts [10 geoalgorithms]
Advanced interface
Layers
Browser
7.34,9.55
Scale
1:10.751.526
Render
EPSG:4326
14:00
08-06-2014


QGIS 2.2.0-Valmiera
Add vector layer
Source type
File
Directory
Database
Protocol
Encoding
System
Source
Dataset
Browse
Open
Cancel
Help
Open an OGR Supported Vector Layer
Exercise_QGIS
ExerciseData
Search ExerciseData
Organize
New folder
Name
Date modified
Type
Size
RoadNetwork.shp
Municipalities.shp
LPS.shp
Industry.shp
Grid1km.shp
Funen.shp
SHP File
File name: Funen.shp
ESRI Shapefiles (OGR) (*.shp *.S
Open
Cancel
Processing Toolbox
Search...
Recently used algorithms
GDAL/OGR [32 geoalgorithms]
GeoServer/PostGIS tools [8 geoalgorithms]
GRASS commands [157 geoalgorithms]
Models [4 geoalgorithms]
Orfeo Toolbox (Image analysis) [76 geoalgorith...
QGIS geoalgorithms [67 geoalgorithms]
SAGA [243 geoalgorithms]
Scripts [10 geoalgorithms]
Advanced interface
Layers
Browser
Coordinate:
588977,6212038
Scale
1:696.514
Render
10:10
17-06-2014

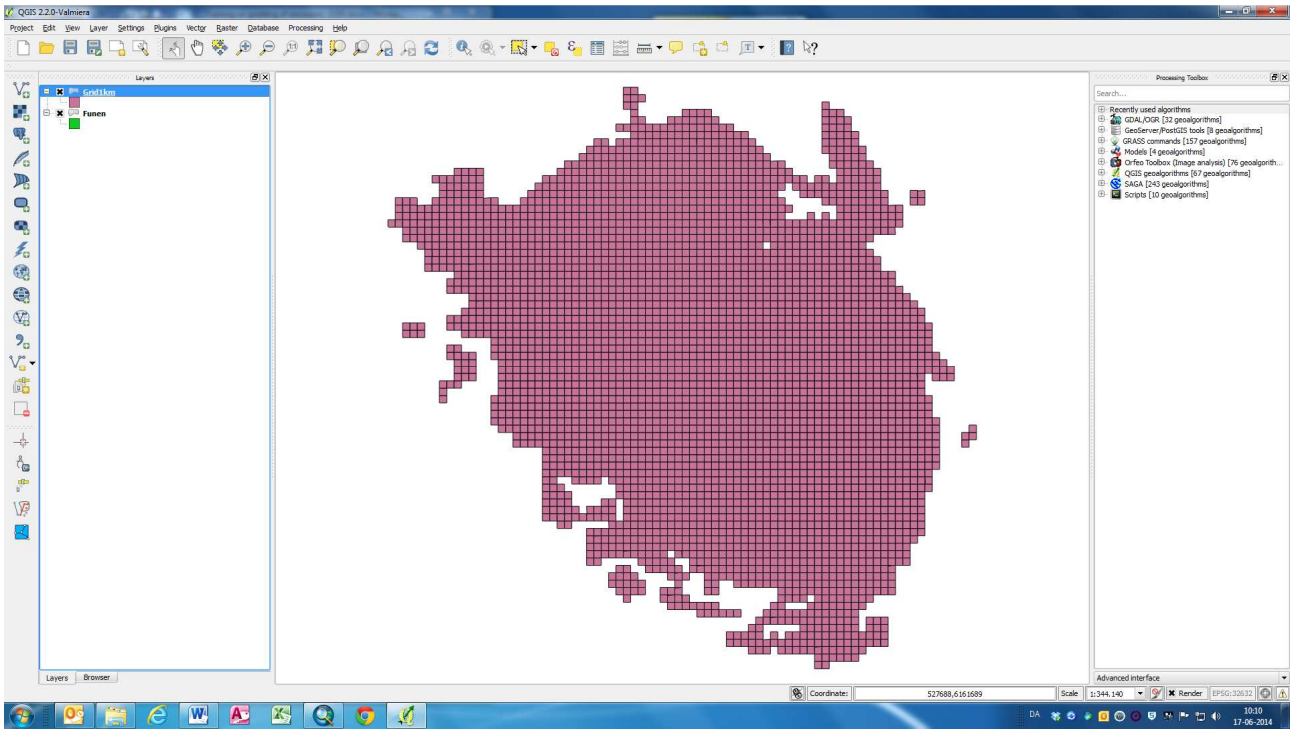
3. Save the QGIS project
    a. Use Save As in the Project menu

    b. Browse to the folder Exercise_QGIS\ExerciseResultFiles and save the file as QGISexercise.qgs

Hint: remember to save the QGIS project frequently during the exercise. Use Save in the Project menu

4. Add the shape file with the 1 km x 1 km grid for the case area (Exercise_QGIS\ExerciseData\Grid1km.shp).

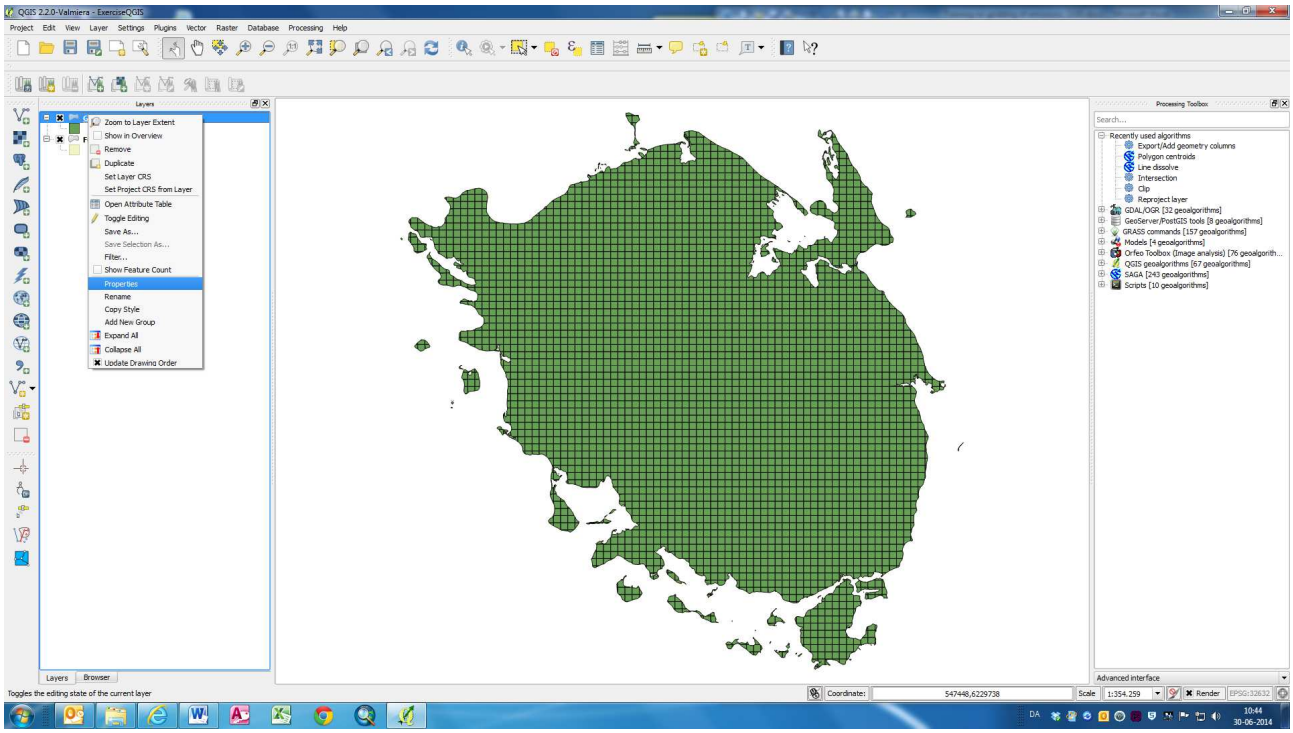
5. Zoom to full extend to see all added data
    a. Use Zoom Full in the View menu

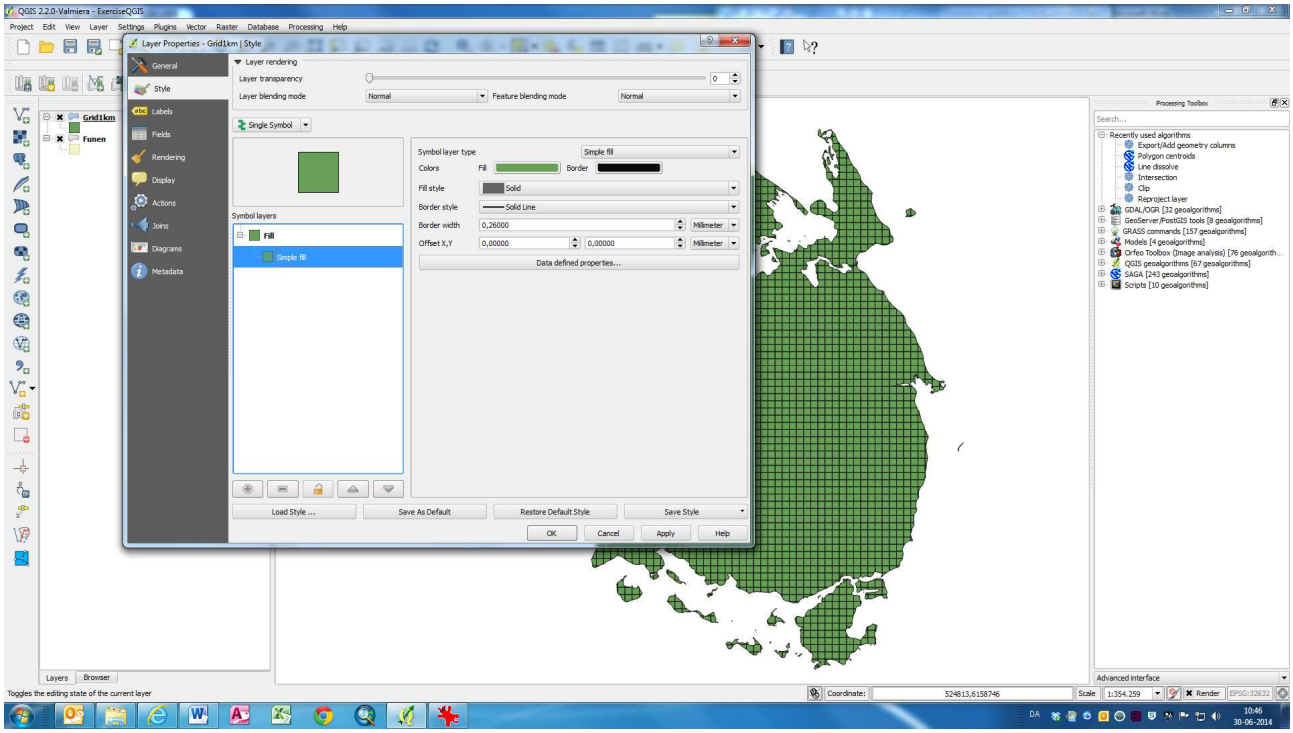


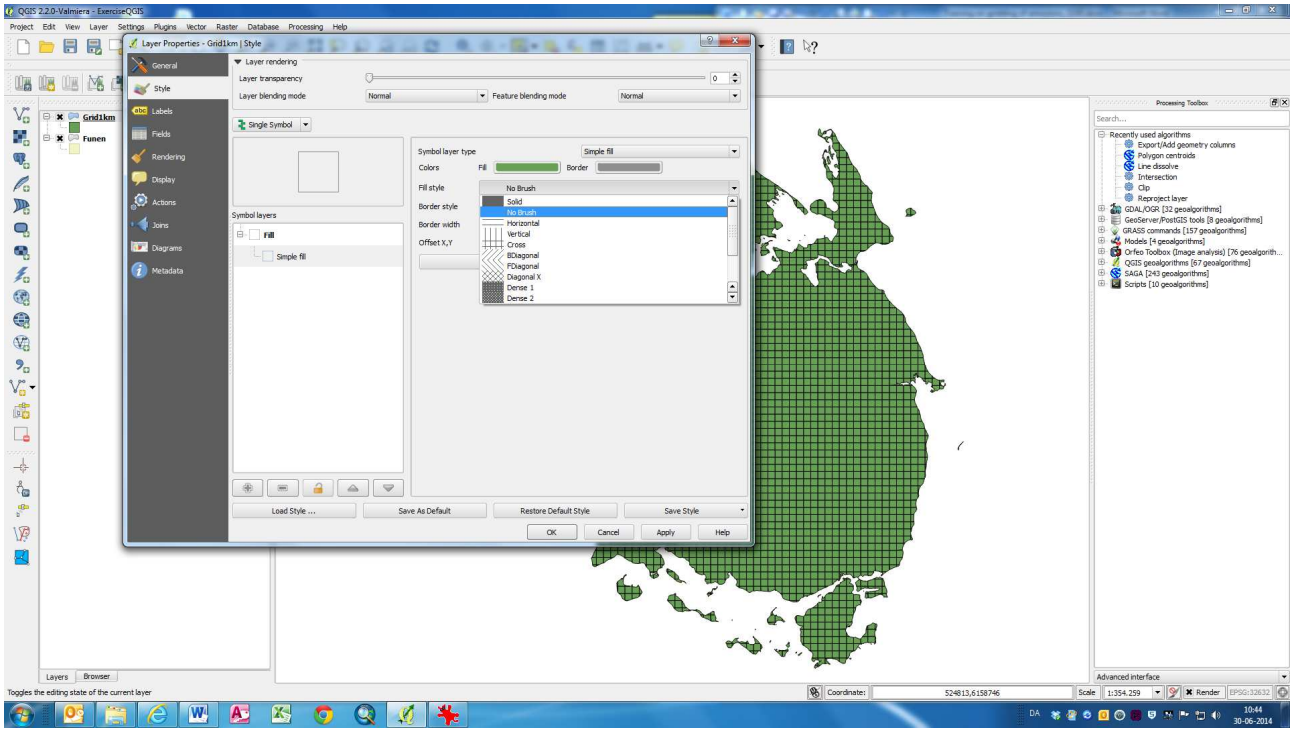
6. Change the symbology of the grid to make all layers visible on the map.

    a. Right click the Grid1km layer, select properties and go to the Style menu. Click the Simple fill symbol and change the Fill style to No brush.

    b. Change the colour of the Border to grey







7. Use the zoom tools in the View menu (Zoom in, Zoom out, Zoom full) to view the new symbology

   Hint: Find shortcuts to the zoom tools in the icon panel in top of the QGIS window

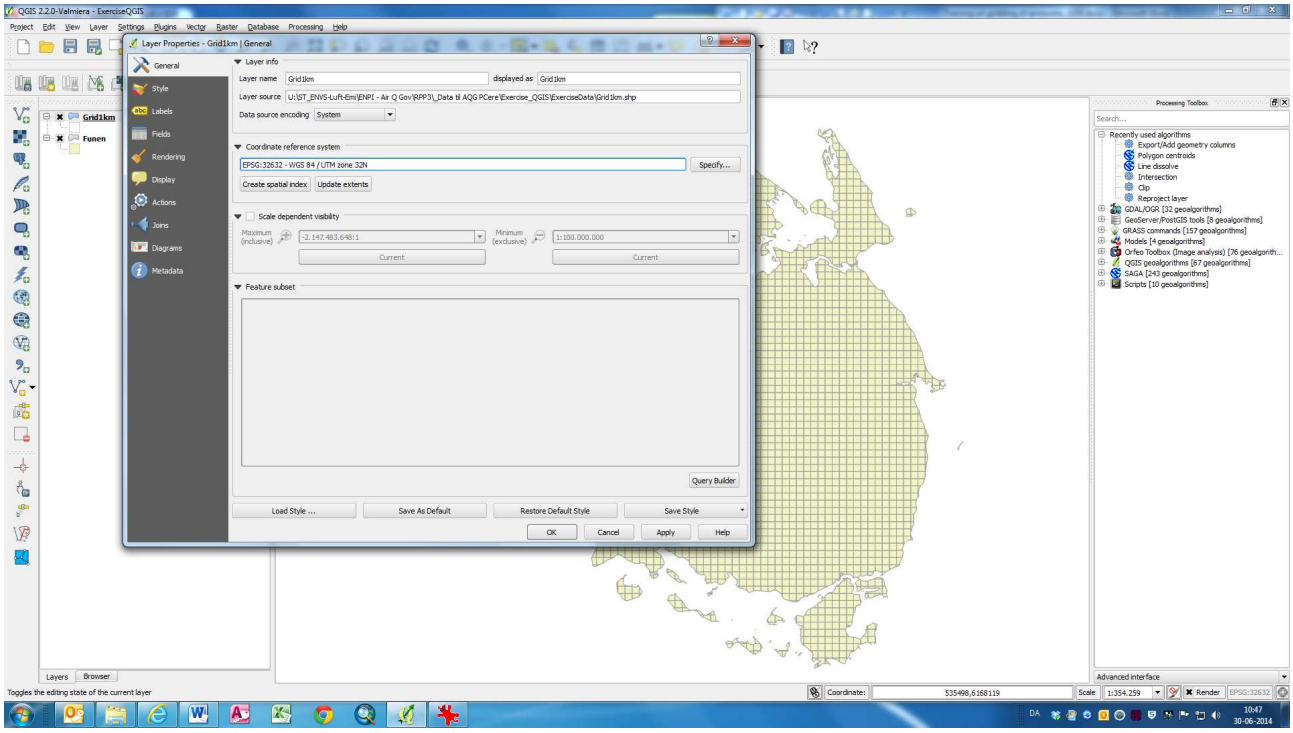
8. Check the properties of the grid, including the spatial reference.

   a. Right click Grid1km layer and select Properties to open the Layer properties menu.

   b. Find information on the Coordinate reference system (CRS) in the General tab

CRS for the layer Grid1km: _____

9. Save the QGIS project


QGIS 2.2.0-Valmiera - ExerciseQGIS
Layer Properties - Grid1km | General
General
Style
Labels
Fields
Rendering
Display
Actions
Joins
Diagrams
Metadata
Layer info
Layer name
Grid1km
displayed as
Grid1km
Layer source
U:\ST_ENVS-Luft-Emi\ENP1 - Air Q Gov\RPP3_Data til AQG PCere\Exercise_QGIS\ExerciseData\Grid1km.shp
Data source encoding
System
Coordinate reference system
EPSG:32632 - WGS 84 / UTM zone 32N
Specify...
Create spatial index
Update extents
Scale dependent visibility
Maximum (inclusive)
-2.147.483.648:1
Minimum (exclusive)
1:100.000.000
Current
Current
Feature subset
Query Builder
Load Style ...
Save As Default
Restore Default Style
Save Style
OK
Cancel
Apply
Help
Grid1km
Funen
Layers
Browser
Processing Toolbox
Recently used algorithms
Export/Add geometry columns
Polygon centroids
Line dissolve
Intersection
Clip
Reproject layer
GDAL/OGR [32 geoalgorithms]
GeoServer/PostGIS tools [8 geoalgorithms]
GRASS commands [157 geoalgorithms]
Models [4 geoalgorithms]
Orfeo Toolbox (image analysis) [76 geoalgorith...
QGIS geoalgorithms [67 geoalgorithms]
SAGA [243 geoalgorithms]
Scripts [10 geoalgorithms]
Advanced interface
Toggles the editing state of the current layer
Coordinate:
535498,6168119
Scale
1:354.259
Render
EPSG:32632
10:47
30-06-2014

Part 2: Working with projection (reproject)

10. Add the shape file with the railway network (Exercise_QGIS\ExerciseData\RailwayNetwork.shp)

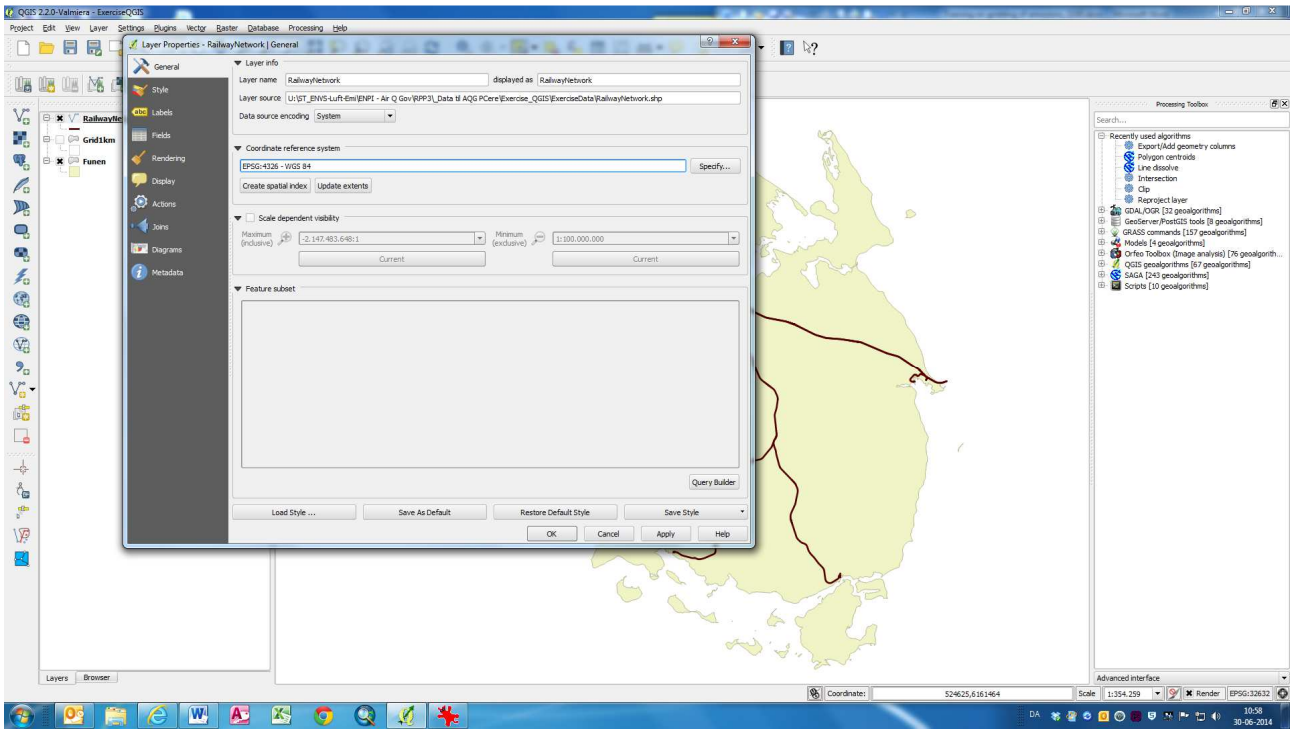
Hint: use Add vector layer in the Layer menu

11. Change the symbology if necessary

12. Check the spatial reference of the railway network

Hint: use Layer properties

CRS for the layer RailwayNetwork: _____



13. Change the spatial reference of RailwayNetwork.shp so that the railway network gets the same projection as Grid1km.shp

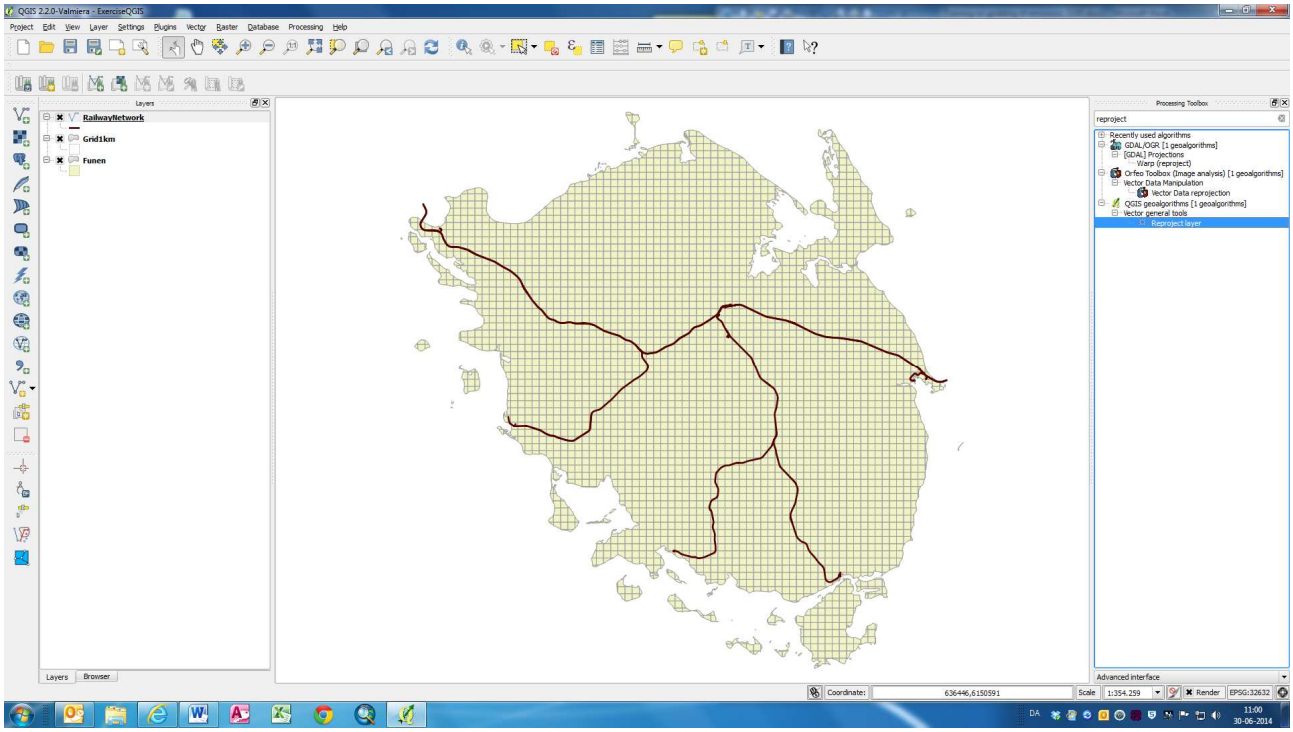
    a. Use the search tool in the Processing Toolbox in the panel in the right side of the QGIS window to find the reprojection tool

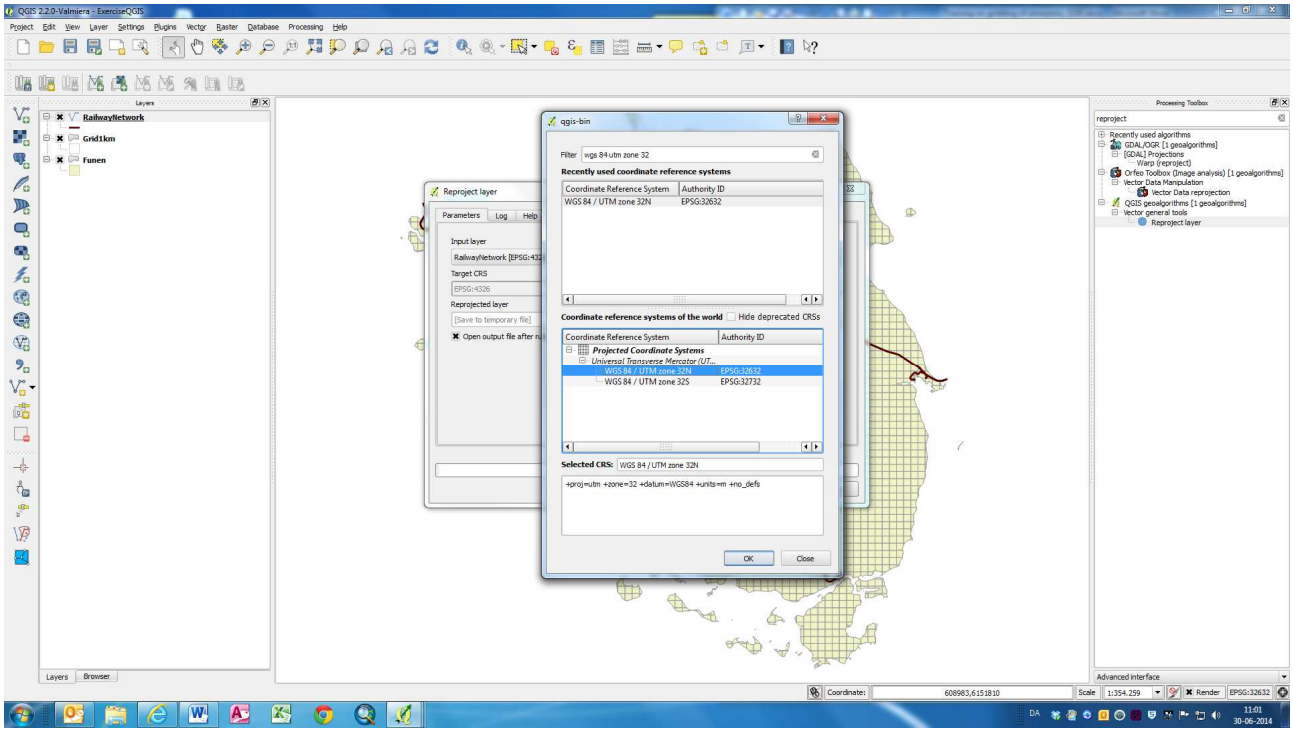
        Hint: if the Processing Toolbox panel is missing, select Toolbox in the Processing menu

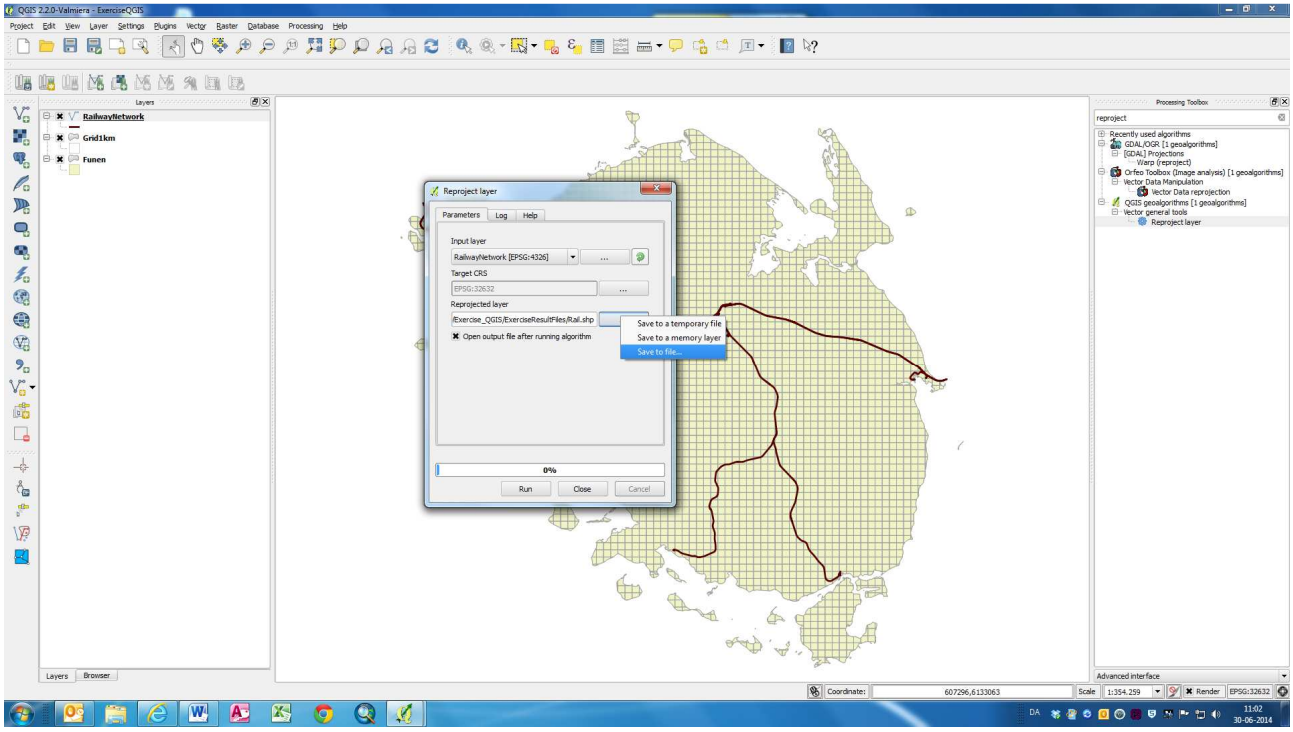
    b. Open the tool Reproject Layer in Vector general tools. Select RailwayNetwork as the input layer. Use the filter to find the target Coordinate Reference System CRS (the CRS of Grid1km.shp).

    c. Select to save the reprojected layer to a file. Browse to the folder Exercise_QGIS\ExerciseResultFiles\Shapefiles and save the reprojected layer as Rail.shp

        Hint: the reprojected layer will appear in the Layers menu as "Reprojected layer". To display the file name, go to the general tab in the Layer properties menu and change the Layer name



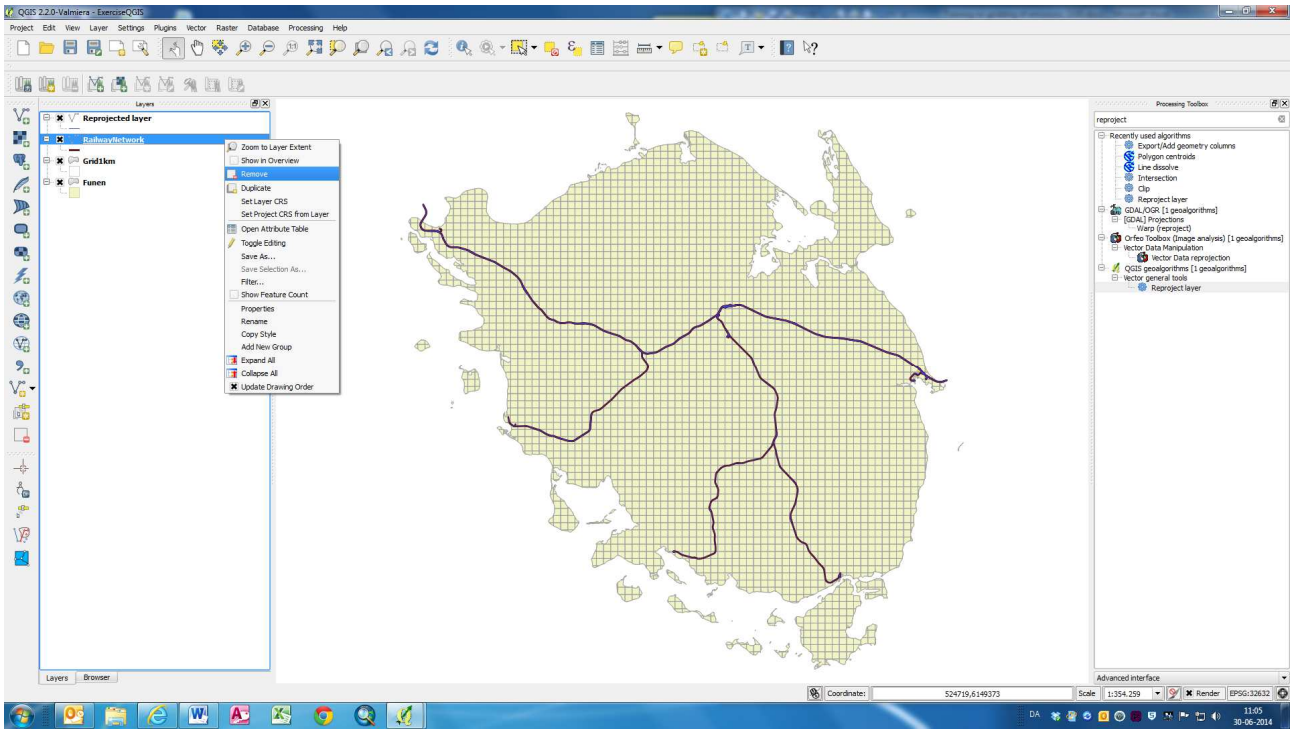

QGIS 2.2.0-Valmiera - ExerciseQGIS
RailwayNetwork
Grid1km
Funen
qgis-bin
Filter
wgs 84 utm zone 32
Recently used coordinate reference systems
Coordinate Reference System
Authority ID
WGS 84 / UTM zone 32N
EPSG:32632
Coordinate reference systems of the world
Hide deprecated CRSs
Projected Coordinate Systems
Universal Transverse Mercator (UT...
WGS 84 / UTM zone 32N
EPSG:32632
WGS 84 / UTM zone 32S
EPSG:32732
Selected CRS:
+proj=utm +zone=32 +datum=WGS84 +units=m +no_defs
OK
Close
Reproject layer
Parameters
Log
Help
Input layer
Target CRS
Reprojected layer
Open output file after ru
Processing Toolbox
reproject
Recently used algorithms
GDAL/OGR [1 geoalgorithms]
[GDAL] Projections
Warp (reproject)
OrfeoToolbox (Image analysis) [1 geoalgorithms]
Vector Data Manipulation
Vector Data reprojection
QGIS geoalgorithms [1 geoalgorithms]
Vector general tools
Reproject layer
Layers
Browser
Advanced interface
Coordinate:
608983,6151810
Scale
1:354,259
Render
EPSG:32632
11:01
30-06-2014


QGIS 2.2.0-Valmiera - ExerciseQGIS
RailwayNetwork
Grid1km
Funen
Reproject layer
Parameters
Log
Help
Input layer
RailwayNetwork [EPSG:4326]
Target CRS
EPSG:32632
Reprojected layer
/Exercise_QGIS/ExerciseResultFiles/Rail.shp
Open output file after running algorithm
Save to a temporary file
Save to a memory layer
Save to file...
0%
Run
Close
Cancel
Processing Toolbox
reproject
Recently used algorithms
GDAL/OGR [1 geoalgorithms]
[GDAL] Projections
Warp (reproject)
OrfeoToolbox (Image analysis) [1 geoalgorithms]
Vector Data Manipulation
Vector Data reprojection
QGIS geoalgorithms [1 geoalgorithms]
Vector general tools
Reproject layer
Layers
Browser
Advanced interface
Coordinate:
607296,6133063
Scale
1:354,259
Render
EPSG:32632
11:02
30-06-2014

14. Remove the old RailwayNetwork shapefile from the QGIS project

    a. Right click RailwayNetwork in the Layer menu and select Remove

15. Save the QGIS project



Part 3: Splitting features in one layer by features in another layer (intersection)

16. Split the reprojected railway network by the cells in Grid1km.shp.

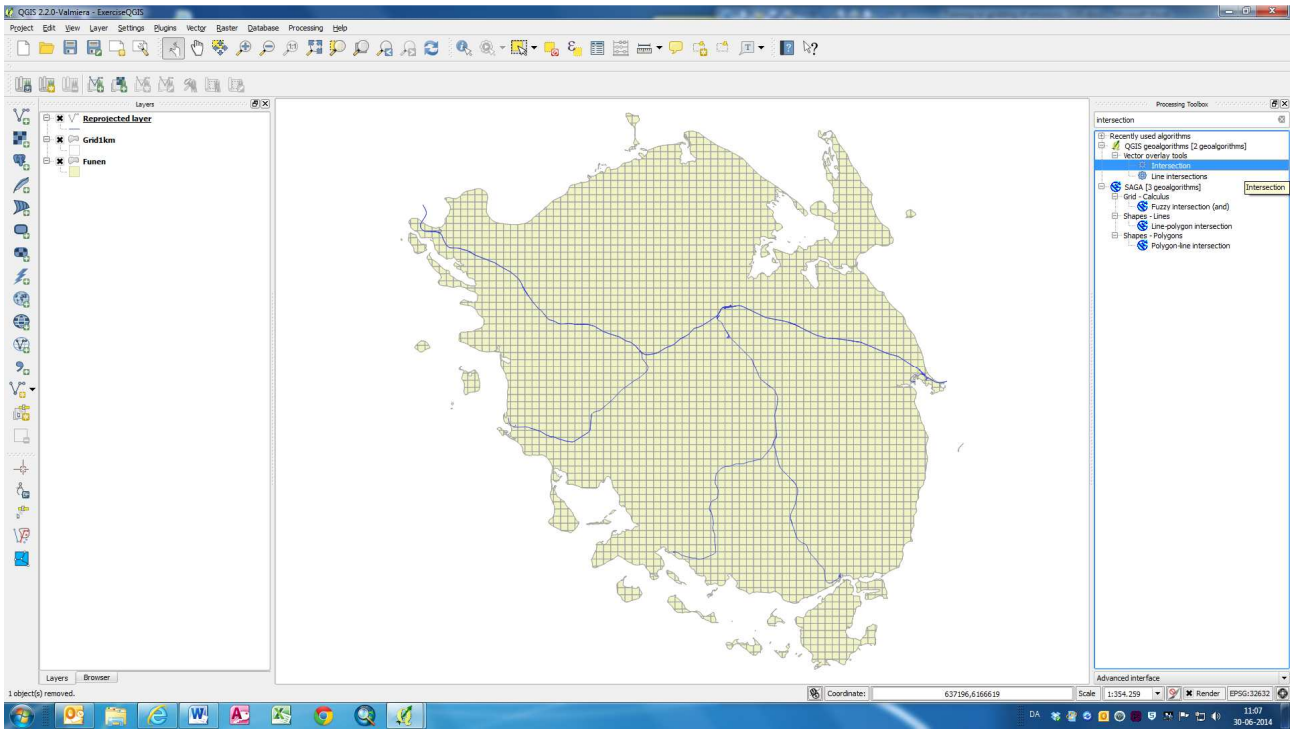
    a. Use the intersection tool

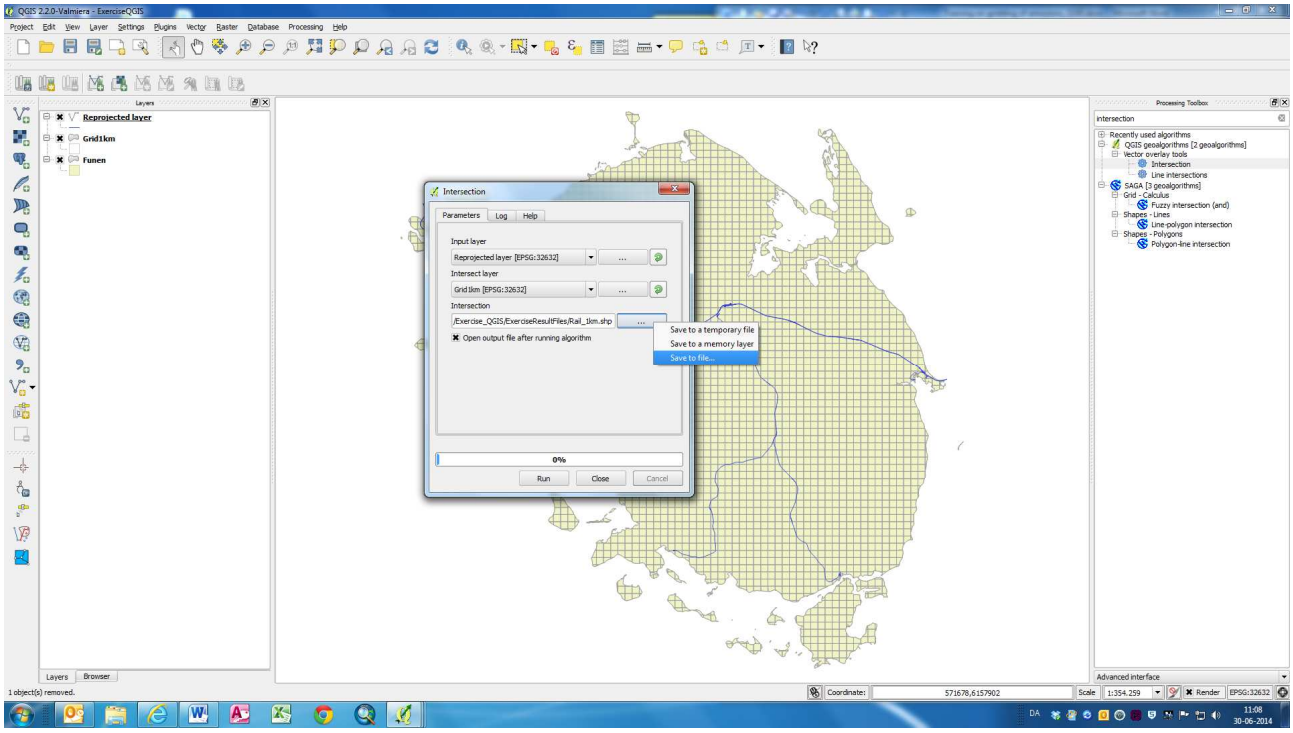
       Hint: use the search function in the Processing Toolbox

    b. Select the Reprojected layer (Rail if you renamed it earlier) as input layer and select Grid1km as Intersect layer.

    c. Save the result as Exercise_QGIS\ExerciseResultFiles\Shapefiles\Rail_1km.shp. The layer will appear as "Intersection" in the Layers menu

       Hint: To be able to import the file to Excel later in the exercise, the file name may consist of maximum 8 characters





17. Remove the reprojected railway layer and zoom in to a small area to view the new Intersection layer.

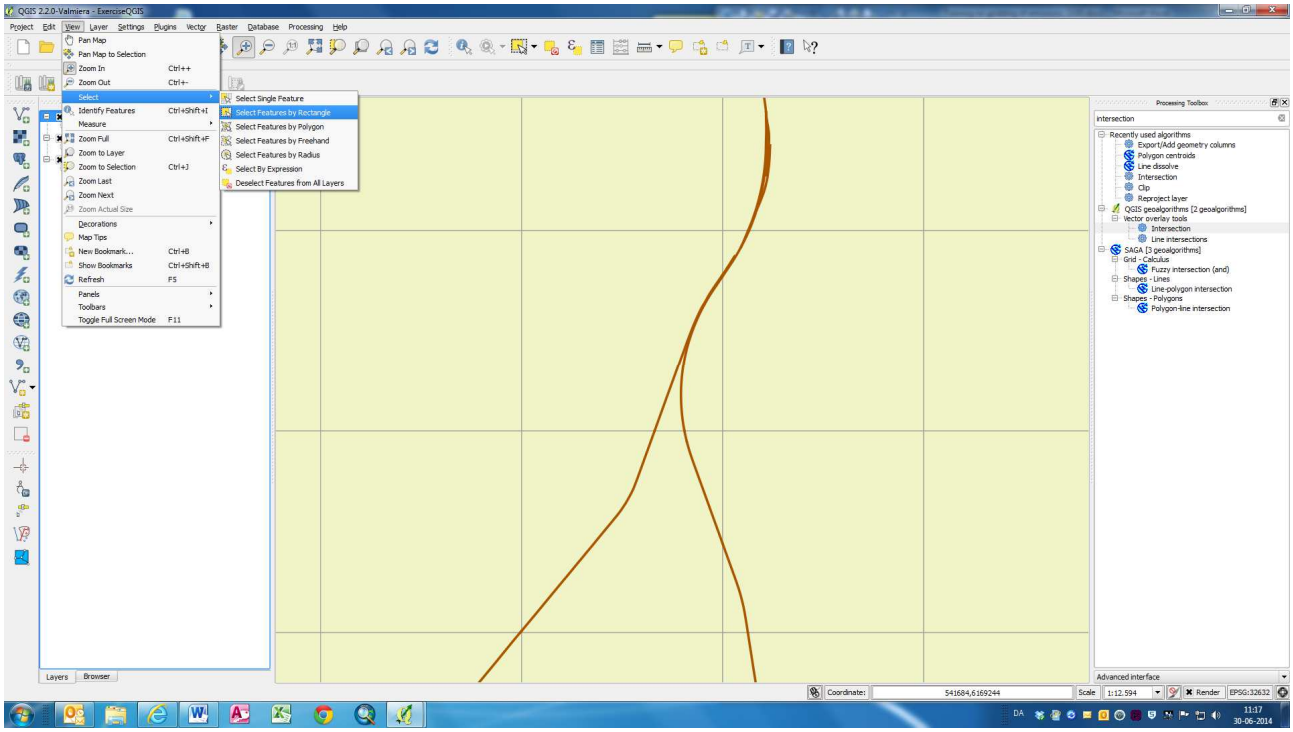
    a. Use the Select features by rectangle tool in the View menu (View\Select\Select features by rectangle). Now the railways are split to shorter lines by the grid.

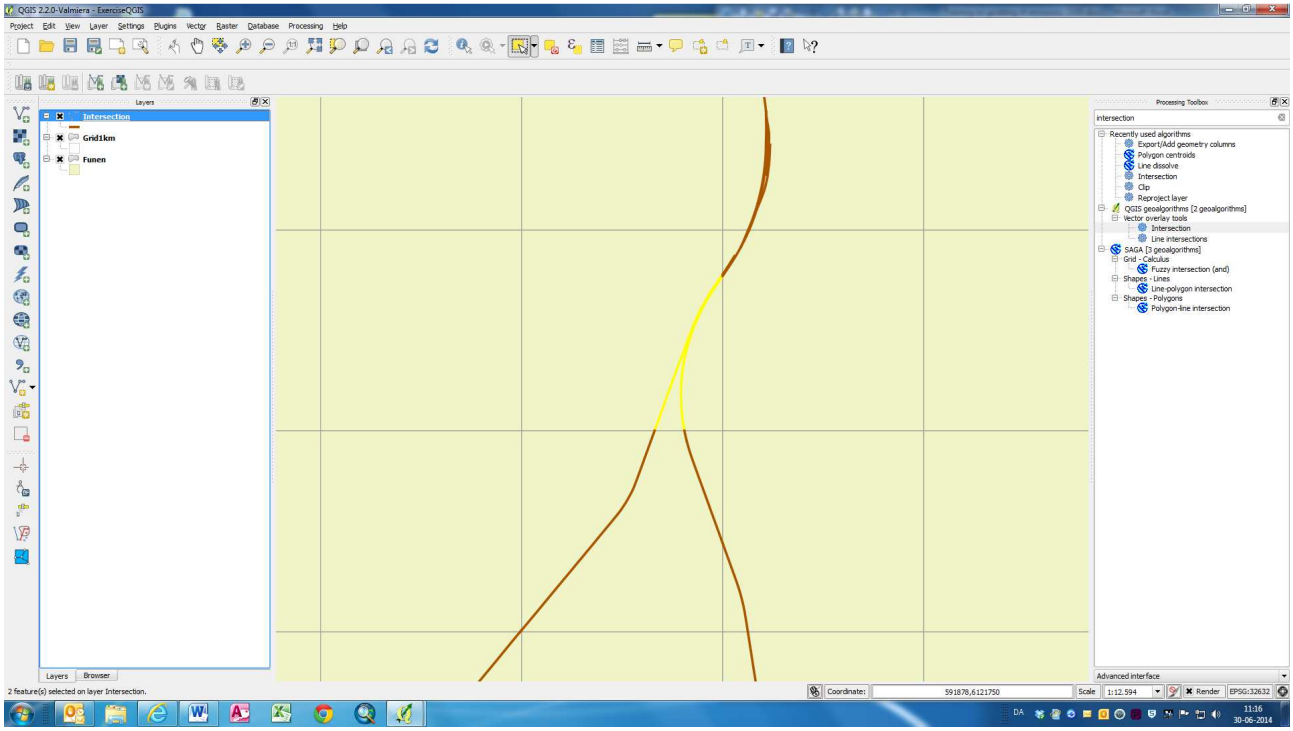
    Hint: find the zoom tools icon in the panel in the top of the project window

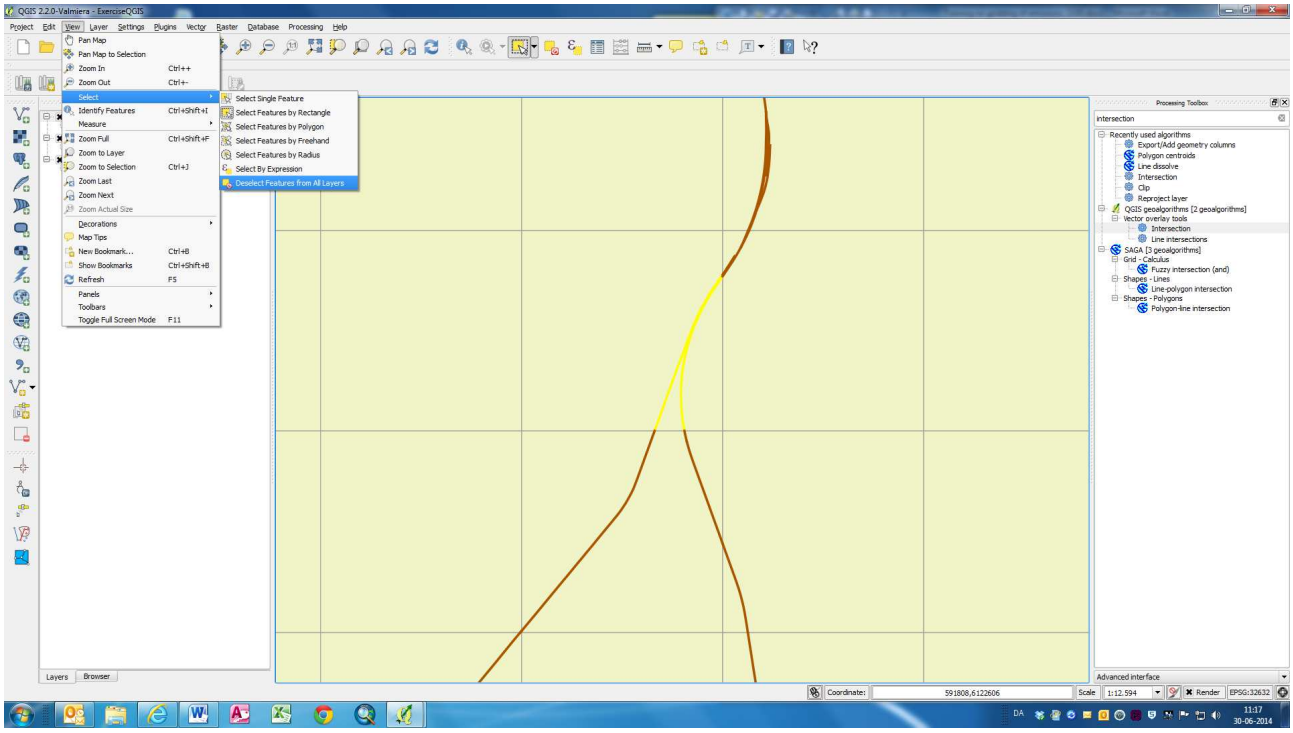
18. Deselect all features.

    a. Use Deselect Features from All Layers in the View\Select menu

19. Save the QGIS project


QGIS 2.2.0-Valmiera - ExerciseQGIS
Project Edit View Layer Settings Plugins Vector Raster Database Processing Help
Pan Map
Pan Map to Selection
Zoom In Ctrl++
Zoom Out Ctrl+-
Select
Identify Features Ctrl+Shift+I
Measure
Zoom Full Ctrl+Shift+F
Zoom to Layer
Zoom to Selection Ctrl+J
Zoom Last
Zoom Next
Zoom Actual Size
Decorations
Map Tips
New Bookmark... Ctrl+B
Show Bookmarks Ctrl+Shift+B
Refresh F5
Panels
Toolbars
Toggle Full Screen Mode F11
Select Single Feature
Select Features by Rectangle
Select Features by Polygon
Select Features by Freehand
Select Features by Radius
Select By Expression
Deselect Features from All Layers
Processing Toolbox
intersection
Recently used algorithms
Export/Add geometry columns
Polygon centroids
Line dissolve
Intersection
Clip
Reproject layer
QGIS geoalgorithms [2 geoalgorithms]
Vector overlay tools
Intersection
Line intersections
SAGA [3 geoalgorithms]
Grid - Calculus
Fuzzy intersection (and)
Shapes - Lines
Line-polygon intersection
Shapes - Polygons
Polygon-line intersection
Layers
Browser
Advanced interface
Coordinate: 541684,6169244
Scale 1:12.594
Render
EPSG:32632
11:17
30-06-2014


QGIS 2.2.0-Valmiera - ExerciseQGIS
Project Edit View Layer Settings Plugins Vector Raster Database Processing Help
Layers
Intersection
Grid1km
Funen
Processing Toolbox
intersection
Recently used algorithms
Export/Add geometry columns
Polygon centroids
Line dissolve
Intersection
Clip
Reproject layer
QGIS geoalgorithms [2 geoalgorithms]
Vector overlay tools
Intersection
Line intersections
SAGA [3 geoalgorithms]
Grid - Calculus
Fuzzy intersection (and)
Shapes - Lines
Line-polygon intersection
Shapes - Polygons
Polygon-line intersection
Layers
Browser
Advanced interface
2 feature(s) selected on layer Intersection.
Coordinate: 591878,6121750
Scale 1:12.594
Render
EPSG:32632
11:16
30-06-2014


QGIS 2.2.0-Valmiera - ExerciseQGIS
Project Edit View Layer Settings Plugins Vector Raster Database Processing Help
Pan Map
Pan Map to Selection
Zoom In Ctrl++
Zoom Out Ctrl+-
Select
Identify Features Ctrl+Shift+I
Measure
Zoom Full Ctrl+Shift+F
Zoom to Layer
Zoom to Selection Ctrl+J
Zoom Last
Zoom Next
Zoom Actual Size
Decorations
Map Tips
New Bookmark... Ctrl+B
Show Bookmarks Ctrl+Shift+B
Refresh F5
Panels
Toolbars
Toggle Full Screen Mode F11
Select Single Feature
Select Features by Rectangle
Select Features by Polygon
Select Features by Freehand
Select Features by Radius
Select By Expression
Deselect Features from All Layers
Layers
Browser
Processing Toolbox
intersection
Recently used algorithms
Export/Add geometry columns
Polygon centroids
Line dissolve
Intersection
Clip
Reproject layer
QGIS geoalgorithms [2 geoalgorithms]
Vector overlay tools
Intersection
Line intersections
SAGA [3 geoalgorithms]
Grid - Calculus
Fuzzy intersection (and)
Shapes - Lines
Line-polygon intersection
Shapes - Polygons
Polygon-line intersection
Advanced interface
Coordinate: 591808,6122606
Scale 1:12.594
Render
EPSG:32632
11:17
30-06-2014

Part 4: Calculate a distribution key (attribute table)

20. Calculate the distribution key (ShareOfLength) for the Intersection layer (Rail_1km.shp) in a new column in the attribute table

    a. Open the attribute table by right click on the layer name in the Layers panel in the left side of the project window

    b. Select Toggle Editing Mode

    Hint: Note that the symbology of the layer changes when it is in editing mode.

    c. Add a new column by using the New Column tool. Name the new column RailLength and select the data type Decimal number (real) and set the Width and Precision both to 9

    d. Calculate the length of the railway lines by using the $Length function in the field calculator

    e. Turn off the Toggle Editing Mode and save the changes

    f. Find the total railway length using the basic statistics tool in the Vector menu (Vector\Analysis Tools\Basic statistics). Select the Intersection layer (Rail_1km.shp) and the RailLength field

    g. Copy the results to clipboard (ctrl+C) and paste into a new Excel document, or write down the sum

    Total rail length: _____

    h. Go to the attribute table of the intersection layer (Rail_1km.shp), and turn on the Toggle Editing Mode

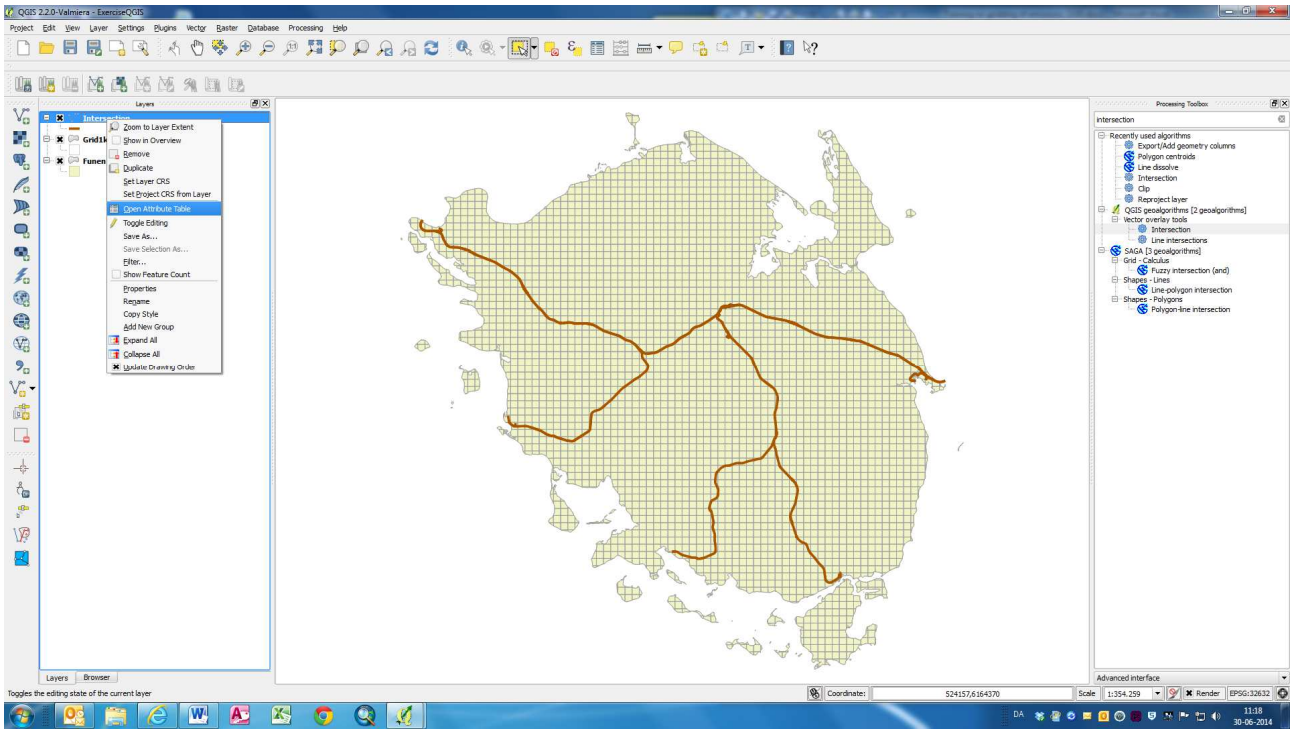
    i. Calculate the share of the total length for each line segment. Use the field calculator and select Create a new field.

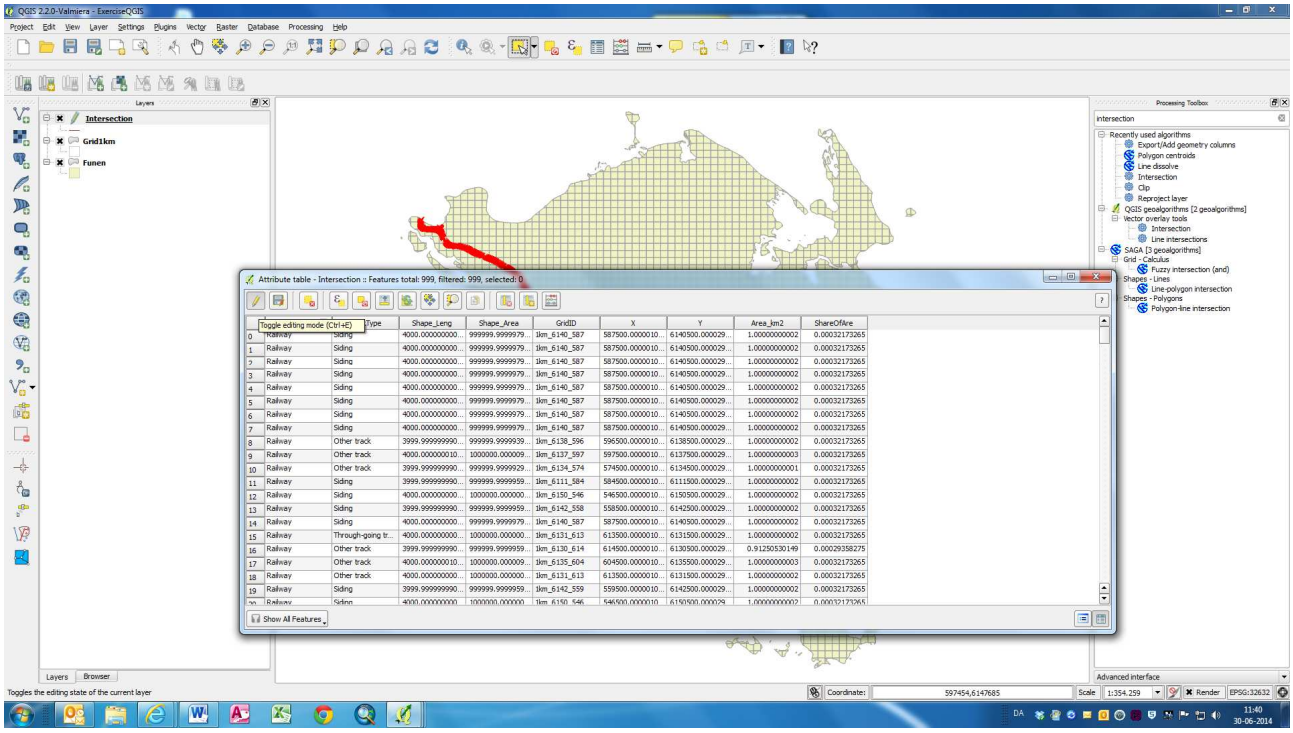
Specify the output field name (ShareOfLength), output field type (Decimal), with (9), and the precision (9).
Calculate the share as RailLength/Σ(RailLength). Expand Fields and Values in the Function list and double click RailLength to add it to the Expression. Click the / and paste or type in the total rail length from the basic statistics.

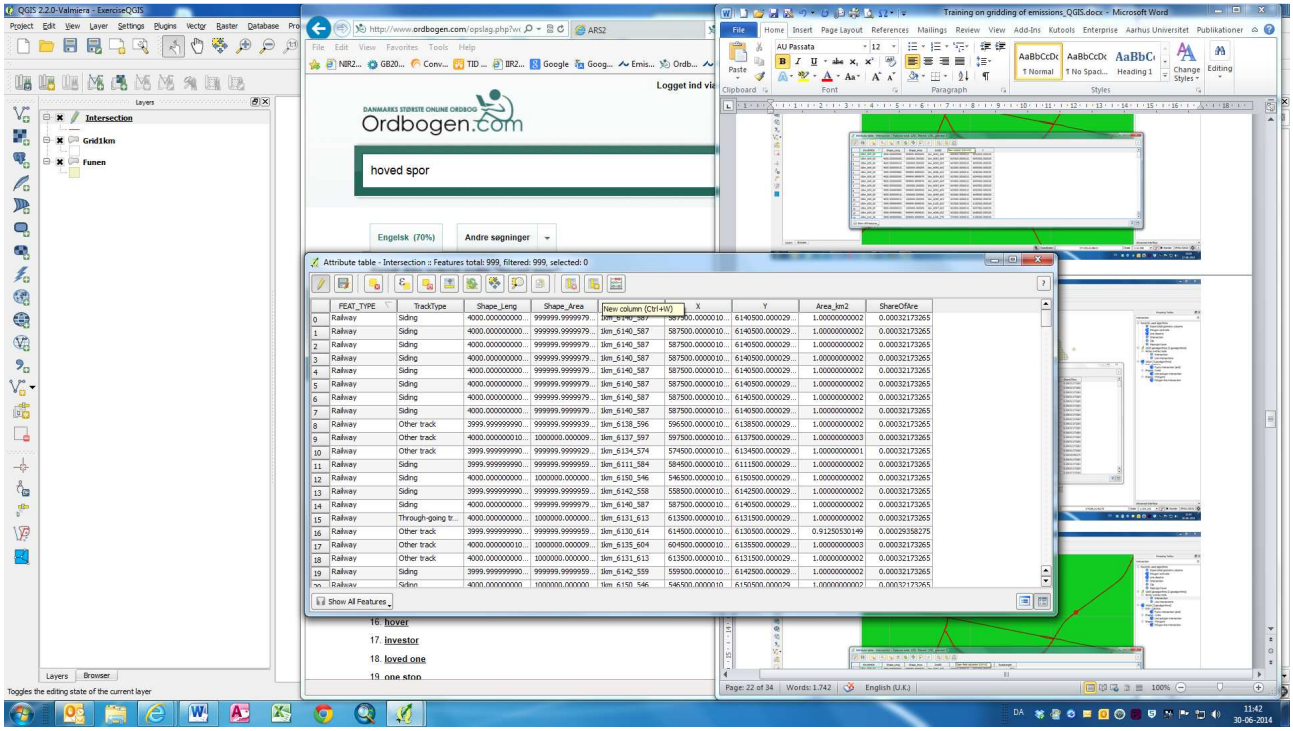
Hint: The expression should be
"RailLength" / 345391.403338

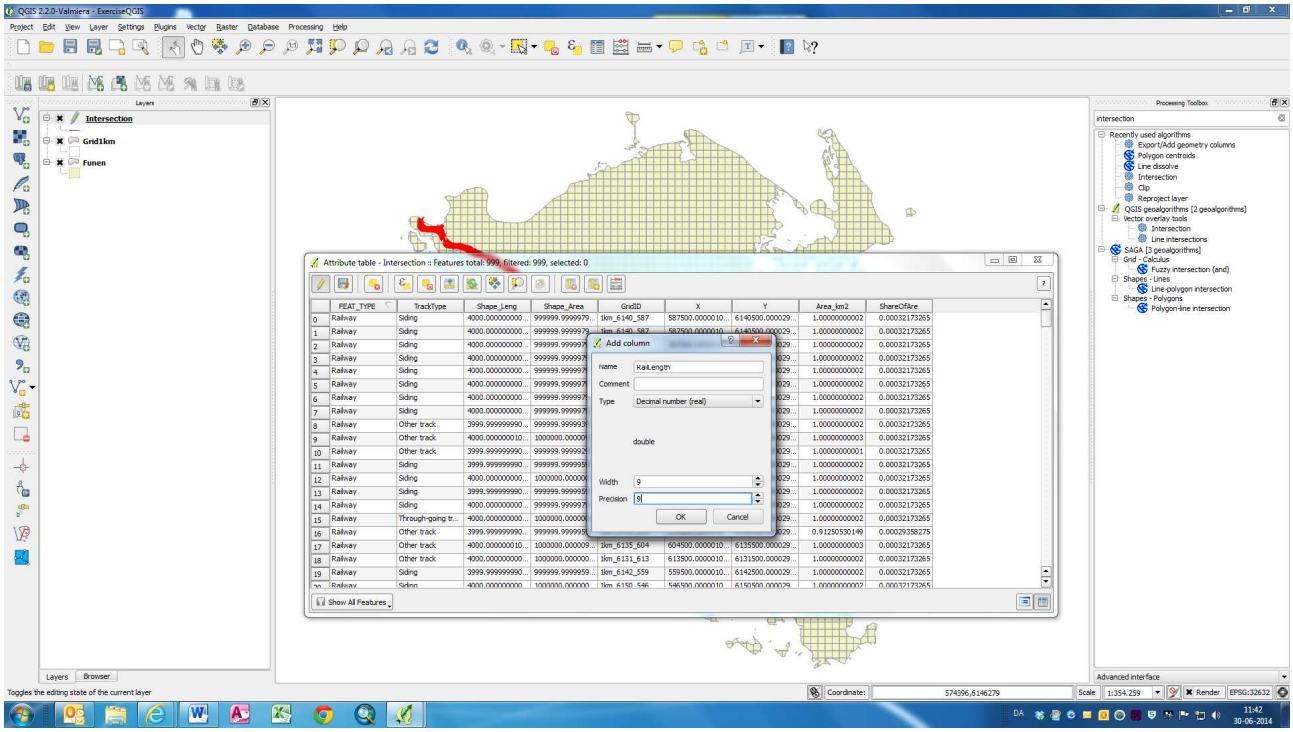
21. Turn off the Toggle Editing Mode, save the changes and close the attribute table

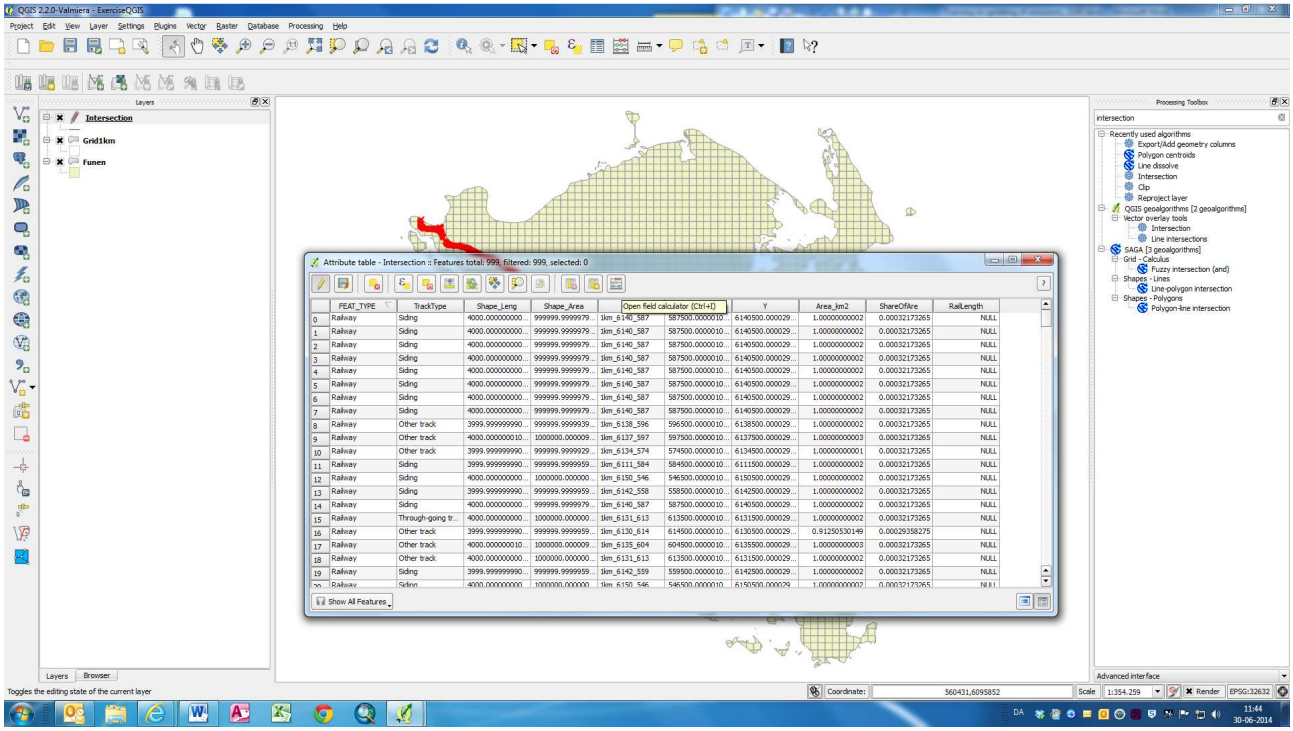
22. Save the QGIS project

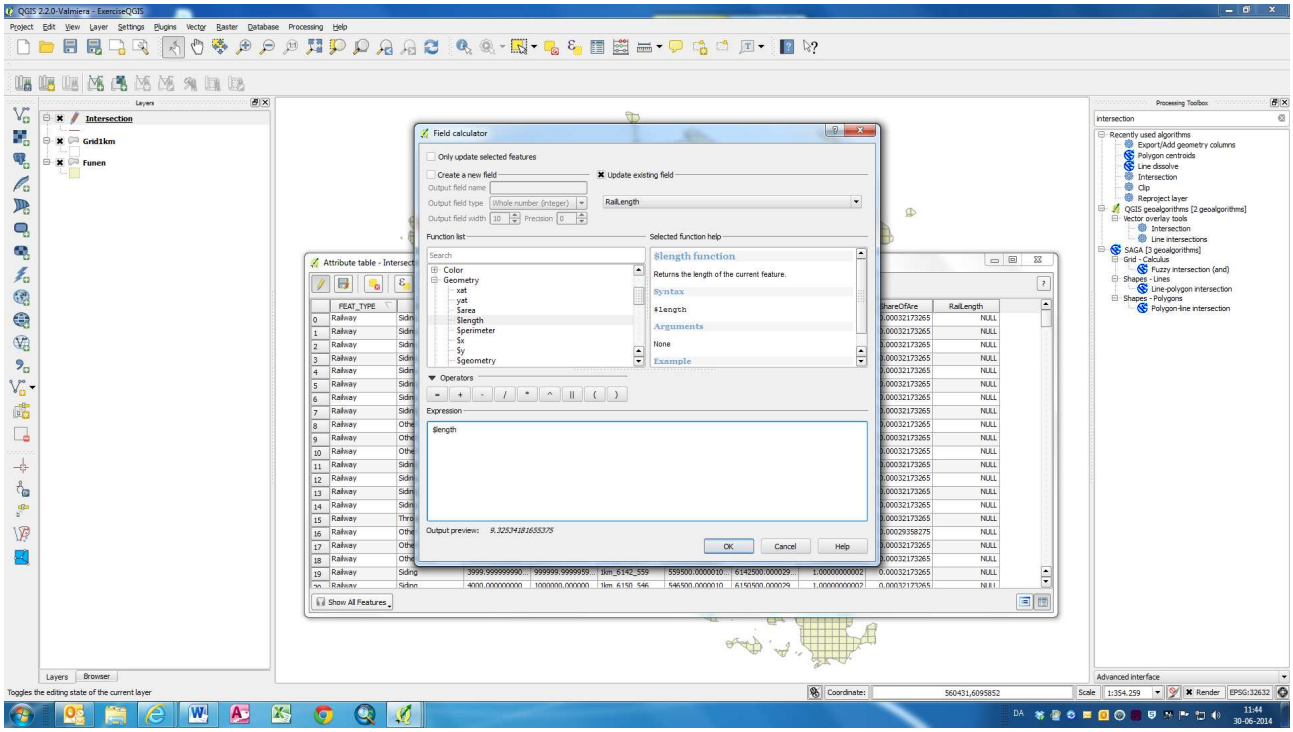


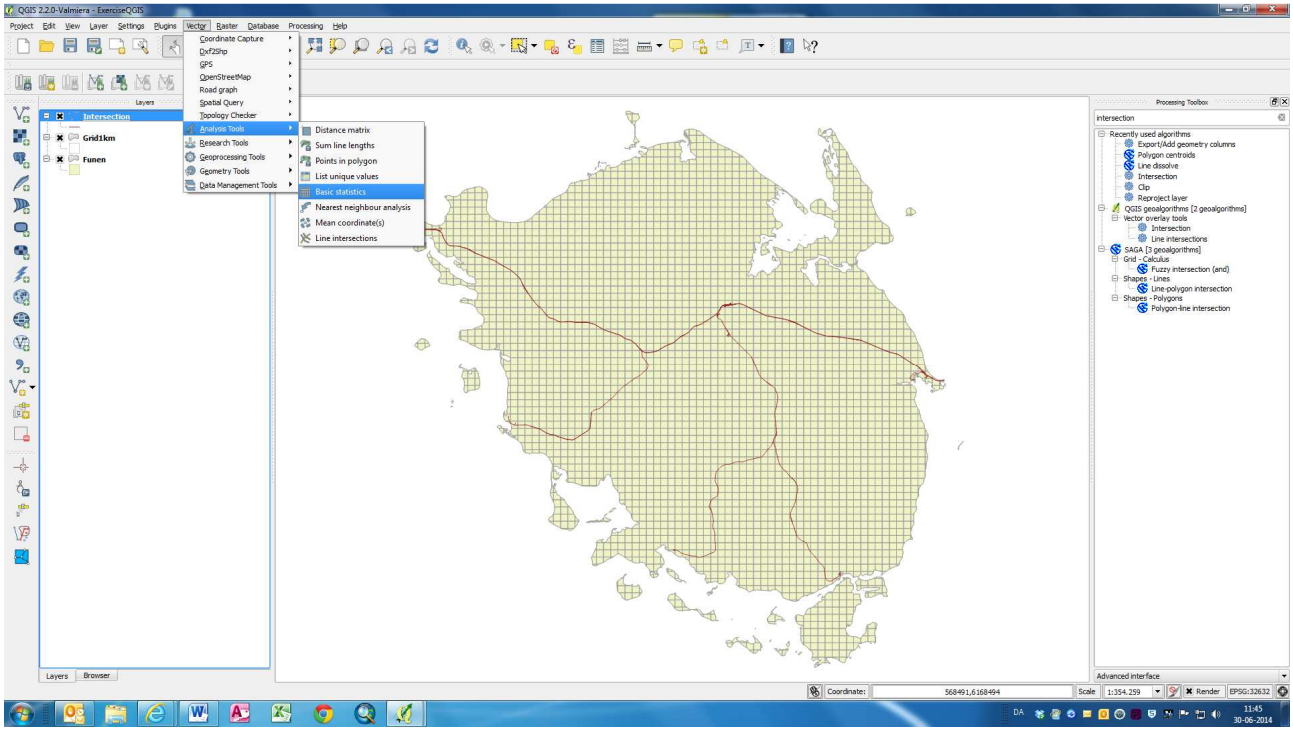

QGIS 2.2.0-Valmiera - ExerciseQGIS
Intersection
Grid1km
Funen
Attribute table - Intersection :: Features total: 999, filtered: 999, selected: 0
Toggle editing mode (Ctrl+E)
Show All Features
Processing Toolbox
intersection
Toggles the editing state of the current layer

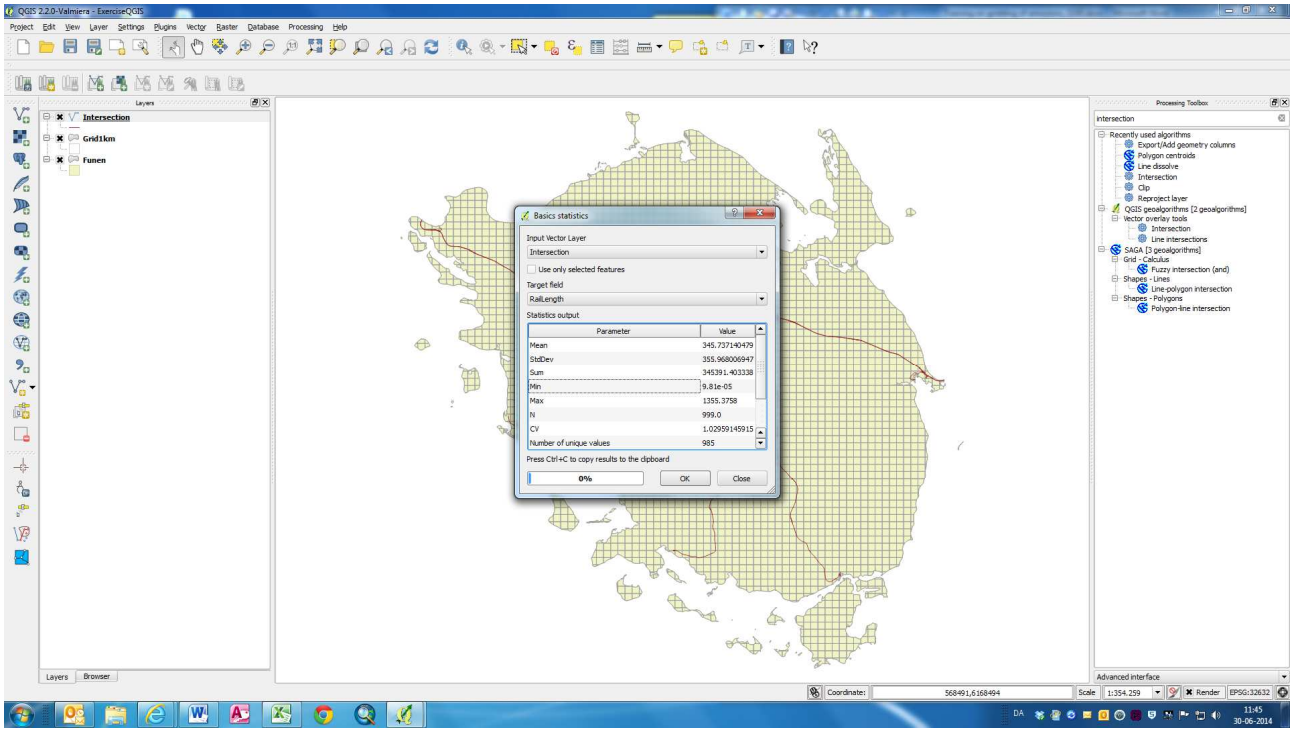

QGIS 2.2.0-Valmiera - ExerciseQGIS
Intersection
Grid1km
Funen
Ordbogen.com
hoved spor
Engelsk (70%)
Andre søgninger
Attribute table - Intersection :: Features total: 999, filtered: 999, selected: 0
New column (Ctrl+W)
Show All Features
16. hover
17. investor
18. loved one
19. one stop
Training on gridding of emissions_QGIS.docx - Microsoft Word
Toggles the editing state of the current layer

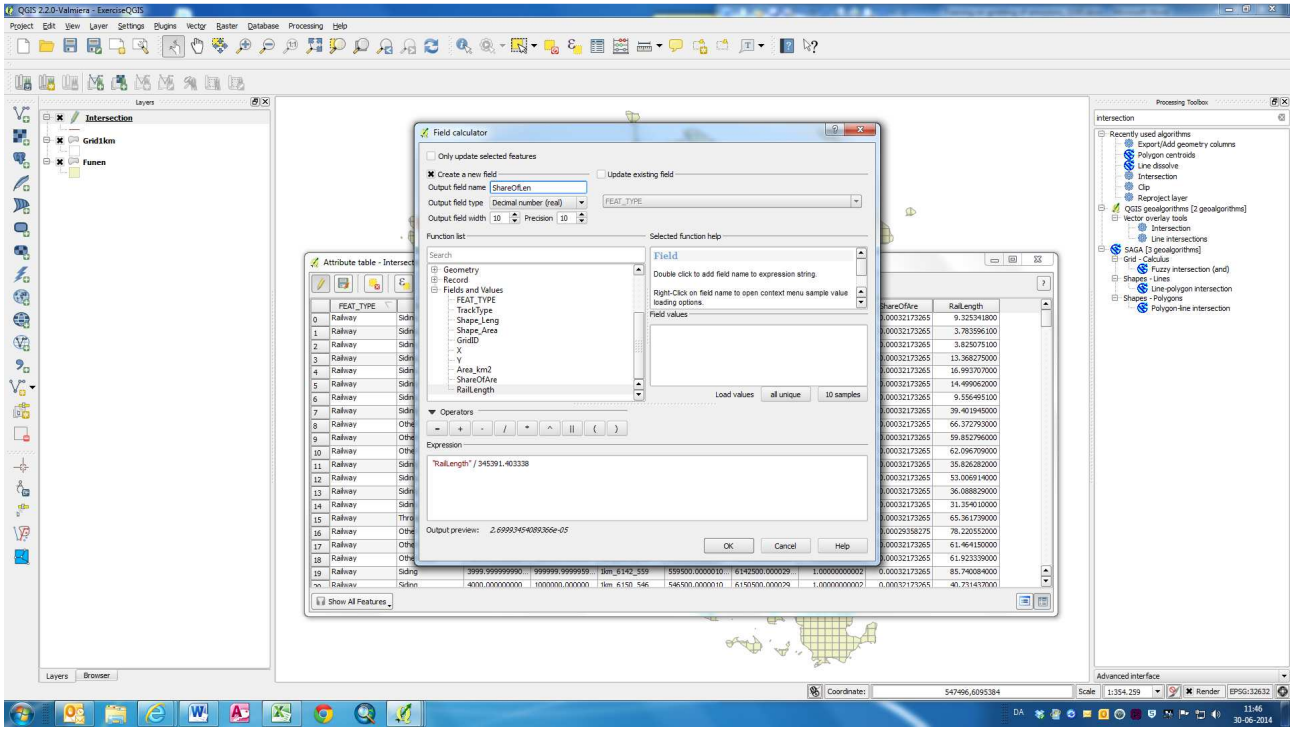

QGIS 2.2.0-Valmiera - ExerciseQGIS
Intersection
Grid1km
Funen
Attribute table - Intersection :: Features total: 999, filtered: 999, selected: 0
Add column
Name
KaiiLength
Comment
Type
Decimal number (real)
double
Width
9
Precision
9
OK
Cancel
Show All Features
Processing Toolbox
intersection
Coordinate:
574396,6146279
Scale
1:354.259
Render
EPSG:32632
11:42
30-06-2014


QGIS 2.2.0-Valmiera - ExerciseQGIS
Intersection
Grid1km
Funen
Attribute table - Intersection :: Features total: 999, filtered: 999, selected: 0
Open field calculator (Ctrl+I)
Show All Features
Processing Toolbox
intersection
Coordinate:
560431,6095852
Scale
1:354.259
Render
EPSG:32632
11:44
30-06-2014


QGIS 2.2.0-Valmiera - ExerciseQGIS
Intersection
Grid1km
Funen
Field calculator
Only update selected features
Create a new field
Update existing field
Function list
Selected function help
$length function
Returns the length of the current feature.
Syntax
$length
Arguments
None
Example
Operators
Expression
$length
Output preview:
OK
Cancel
Help
Attribute table - Intersection
Show All Features
Processing Toolbox
intersection
Recently used algorithms
Export/Add geometry columns
Polygon centroids
Line dissolve
Intersection
Clip
Reproject layer
QGIS geoalgorithms [2 geoalgorithms]
Vector overlay tools
Intersection
Line intersections
SAGA [3 geoalgorithms]
Grid - Calculus
Fuzzy intersection (and)
Shapes - Lines
Line-polygon intersection
Shapes - Polygons
Polygon-line intersection
Advanced interface
Toggles the editing state of the current layer
Coordinate:
560431,6095852
Scale
1:354.259
Render
EPSG:32632
11:44
30-06-2014


QGIS 2.2.0-Valmiera - ExerciseQGIS
Vector
Coordinate Capture
Dxf2Shp
GPS
OpenStreetMap
Road graph
Spatial Query
Topology Checker
Analysis Tools
Research Tools
Geoprocessing Tools
Geometry Tools
Data Management Tools
Distance matrix
Sum line lengths
Points in polygon
List unique values
Basic statistics
Nearest neighbour analysis
Mean coordinate(s)
Line intersections
Intersection
Grid1km
Funen
Processing Toolbox
intersection
Advanced interface
Coordinate:
568491,6168494
Scale
1:354.259
Render
EPSG:32632
11:45
30-06-2014


QGIS 2.2.0-Valmiera - ExerciseQGIS
Intersection
Grid1km
Funen
Basics statistics
Input Vector Layer
Intersection
Use only selected features
Target field
RailLength
Statistics output
Parameter
Value
Mean
345.737140479
StdDev
355.968006947
Sum
345391.403338
Min
9.81e-05
Max
1355.3758
N
999.0
CV
1.02959145915
Number of unique values
985
Press Ctrl+C to copy results to the clipboard
0%
OK
Close
Processing Toolbox
intersection
Coordinate:
Scale
Render


QGIS 2.2.0-Valmiera - ExerciseQGIS
Intersection
Grid1km
Funen
Field calculator
Only update selected features
Create a new field
Update existing field
Output field name
ShareOfLen
Output field type
Decimal number (real)
Output field width
Precision
Function list
Selected function help
Field
Geometry
Record
Fields and Values
FEAT_TYPE
TrackType
Shape_Leng
Shape_Area
GridID
X
Y
Area_km2
ShareOfAre
RailLength
Operators
Expression
"RailLength" / 345391.403338
Output preview:
OK
Cancel
Help
Attribute table - Intersec
Show All Features
Processing Toolbox
intersection
Coordinate:
Scale
Render

Part 5: Import a distribution key to Excel (pivot table)

23. Import the distribution key from the shape file to Excel 2013

    a. Open Excel and select Open in the File menu

    b. Browse to the folder Exercise_QGIS\ExerciseResultFiles\ShapeFiles. Set the file type to .dbf to be able to select the .dbf files. Select the file Rail_1km.dbf

       Hint: a shape file consists of a number of files, one being a database file with the extension .dbf

    c. Add a new sheet to the workbook

    d. Select Pivot Table in the Insert menu. Set the Table/Range to all cells holding data in the Rail_1km sheet. Chose to place the PivotTable in existing Worksheet in the cell A1

       Hint: click the button right to the Table/Range field to select the relevant data. It is possible to select data from another sheet in the workbook

    e. Add GridID to Row Labels and add ShareOfLength to Values

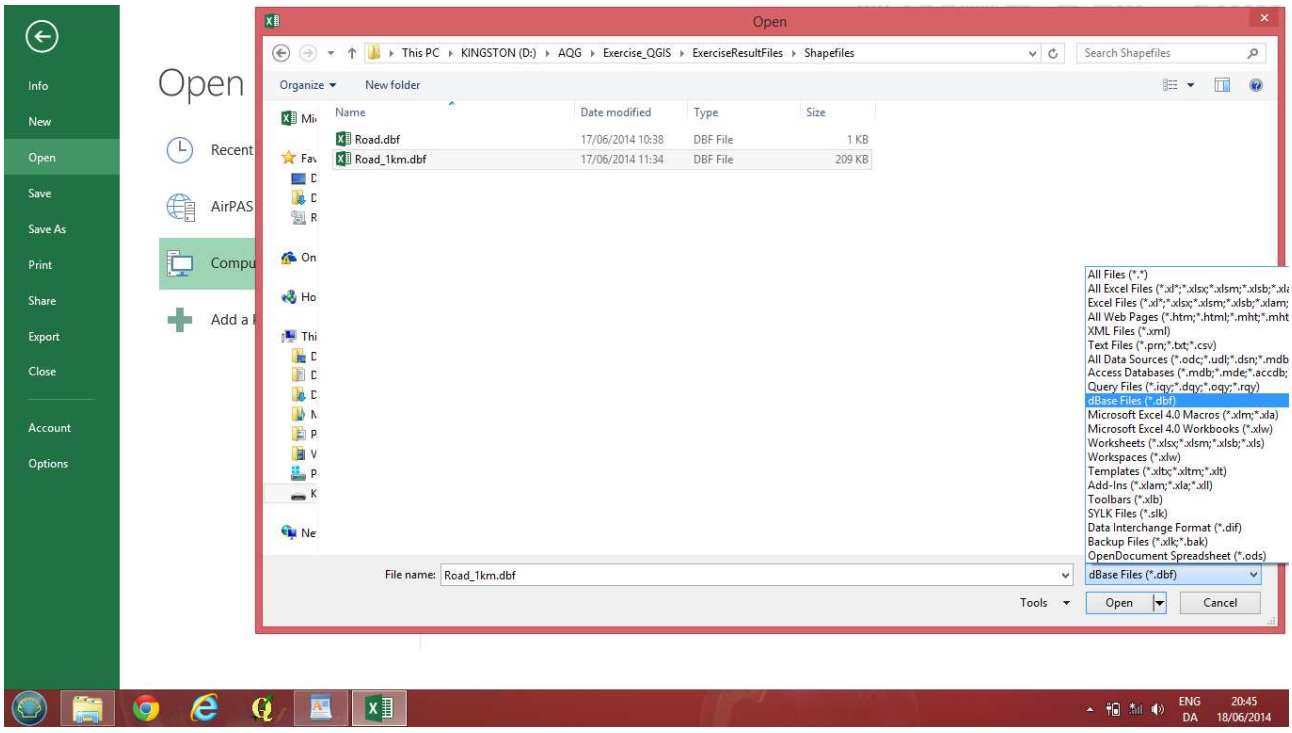
    f. Set the Values to use Sum by clicking the arrow next to ShareOfLength, select Value Field Settings and select Sum in the pop-up window

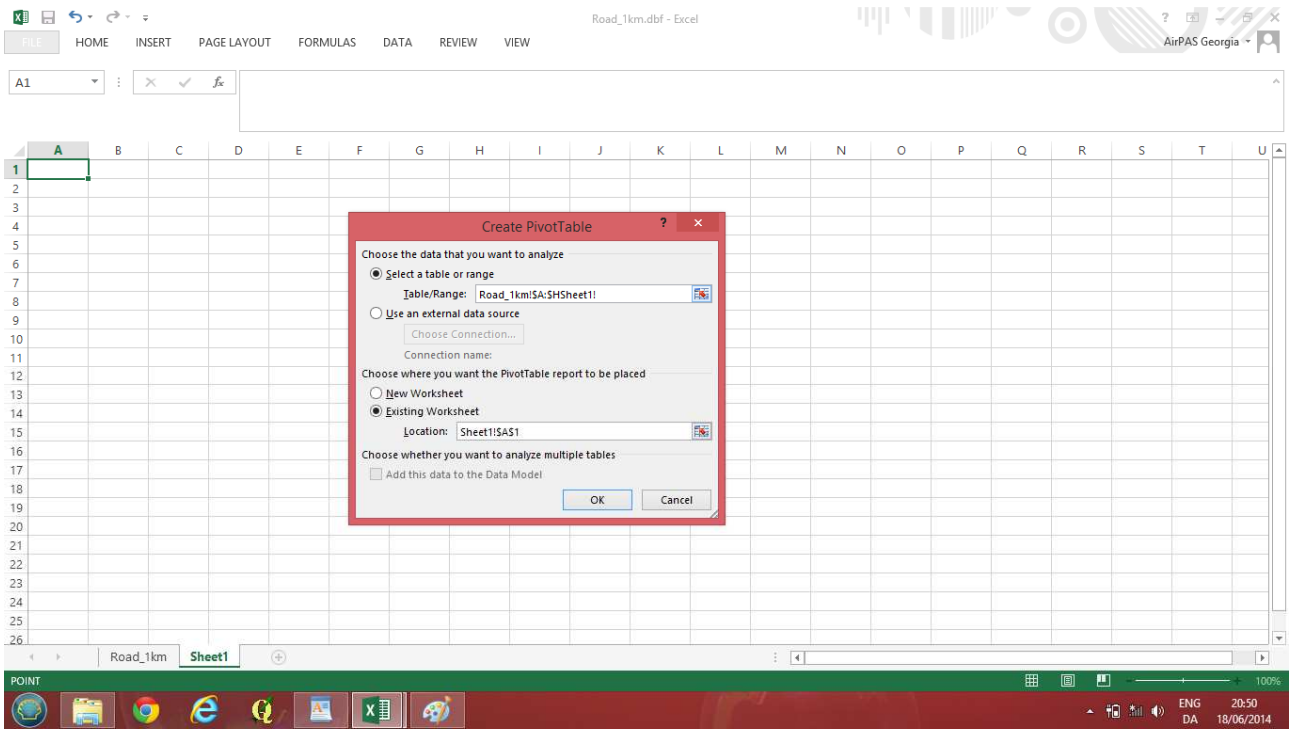
    g. Place the cursor in the pivot table and go to the Layout menu in the Design tab
        a. Select Do Not Show Subtotals in the Subtotals
        b. Select Off For Rows And Columns in the Grand Totals menu
        c. Select Show in Tabular Form in the Report Layout menu

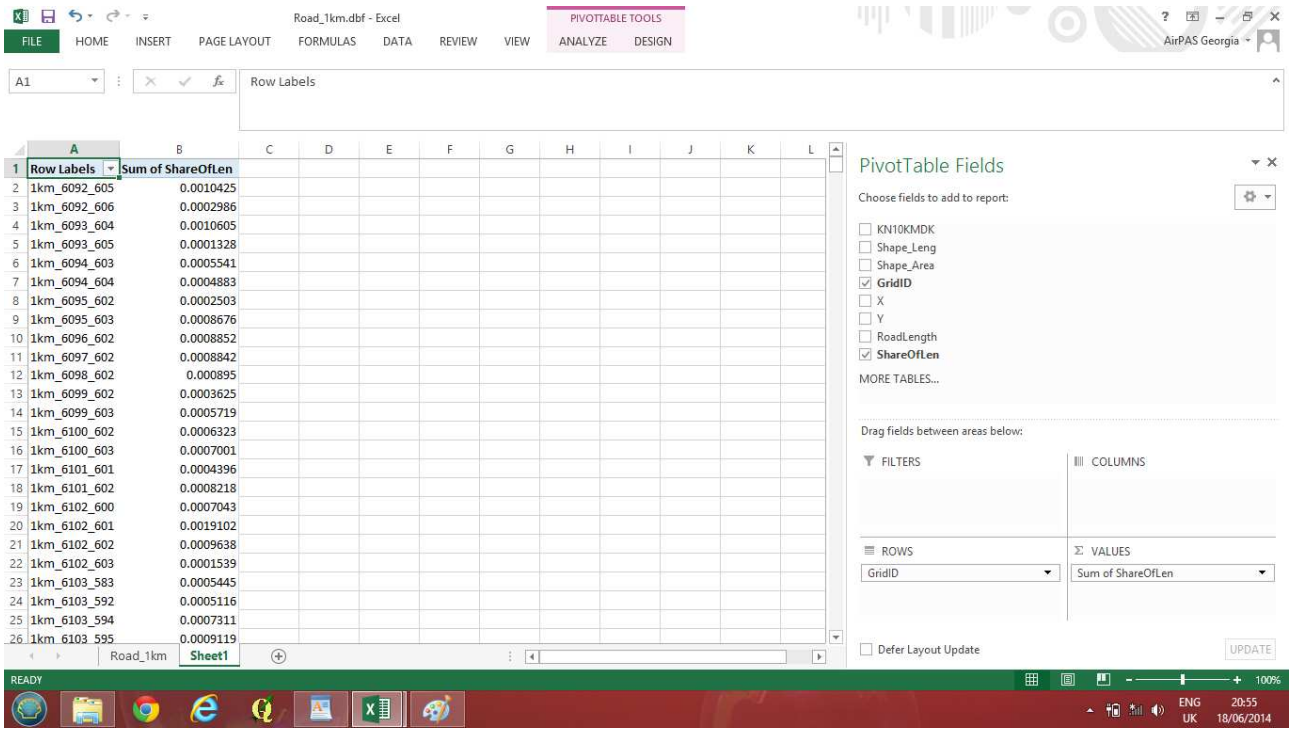
       Hint: Make sure that all values in the ShareOf column summarize to 1 (small discrepancies might occur due to rounding during the data processing). Select the column holding the ShareOf values in the Rail_key sheet and find the sum in the lower right of the Excel window.

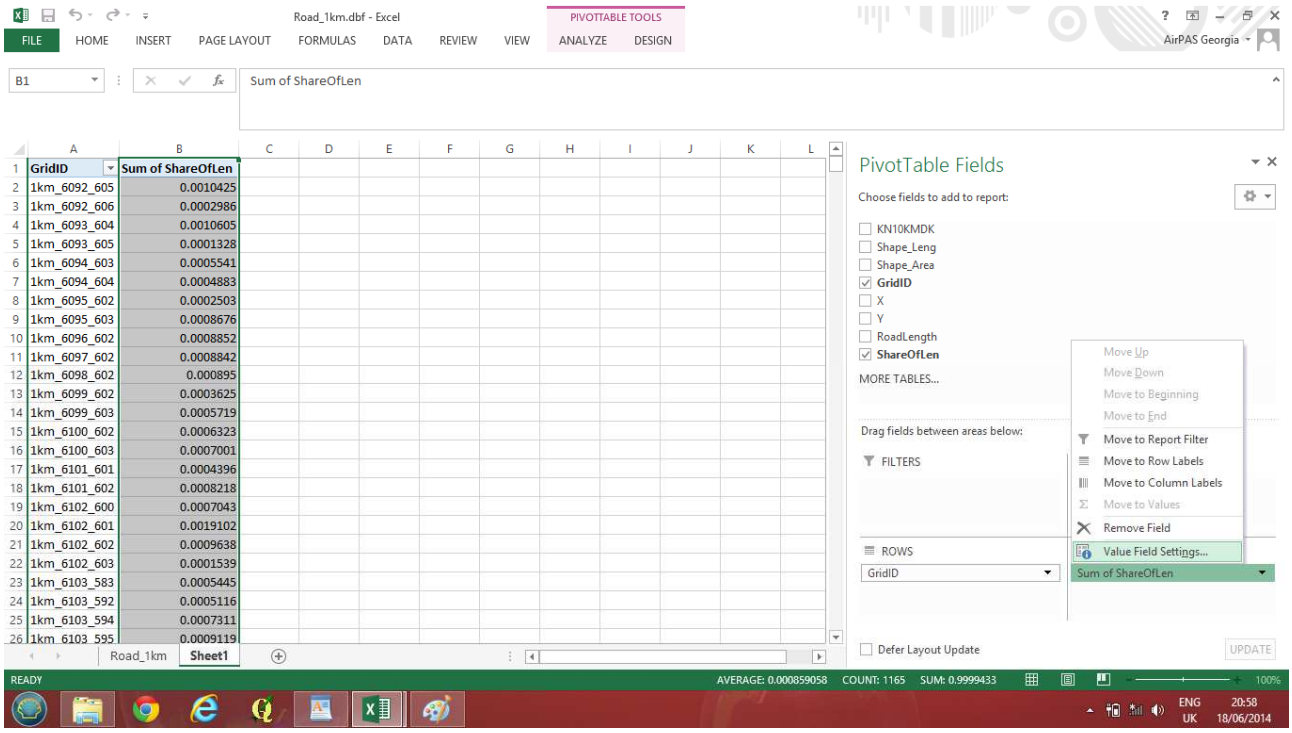
h. **Rename the new sheet (Sheet1) by double clicking the sheet name. Name the sheet Rail_key**

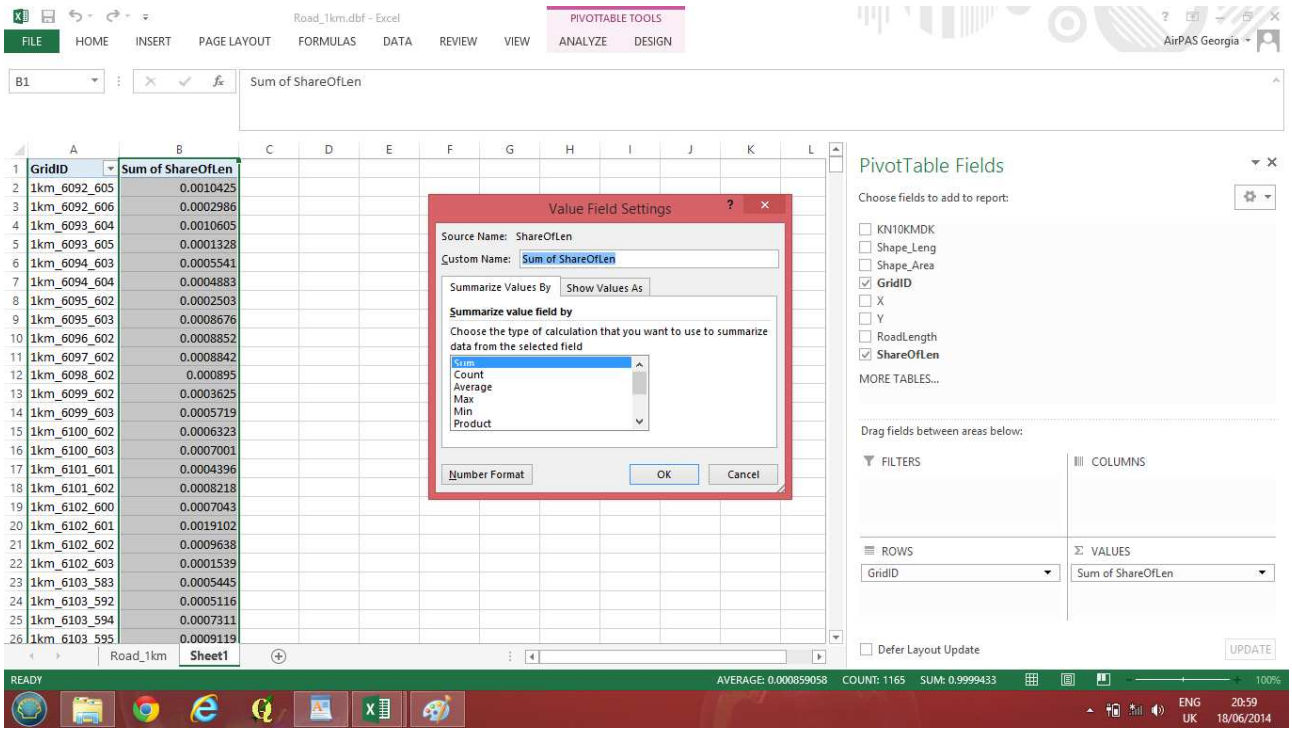
i. **Save the Excel file**

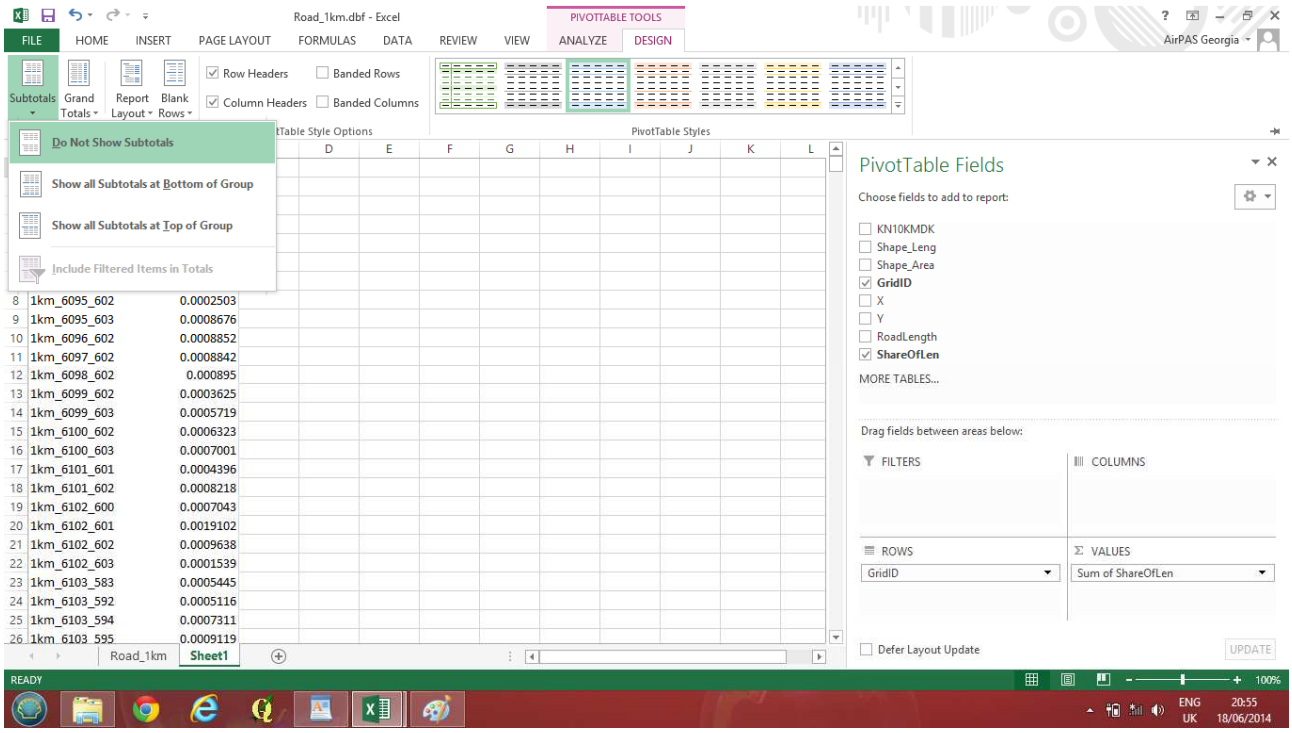


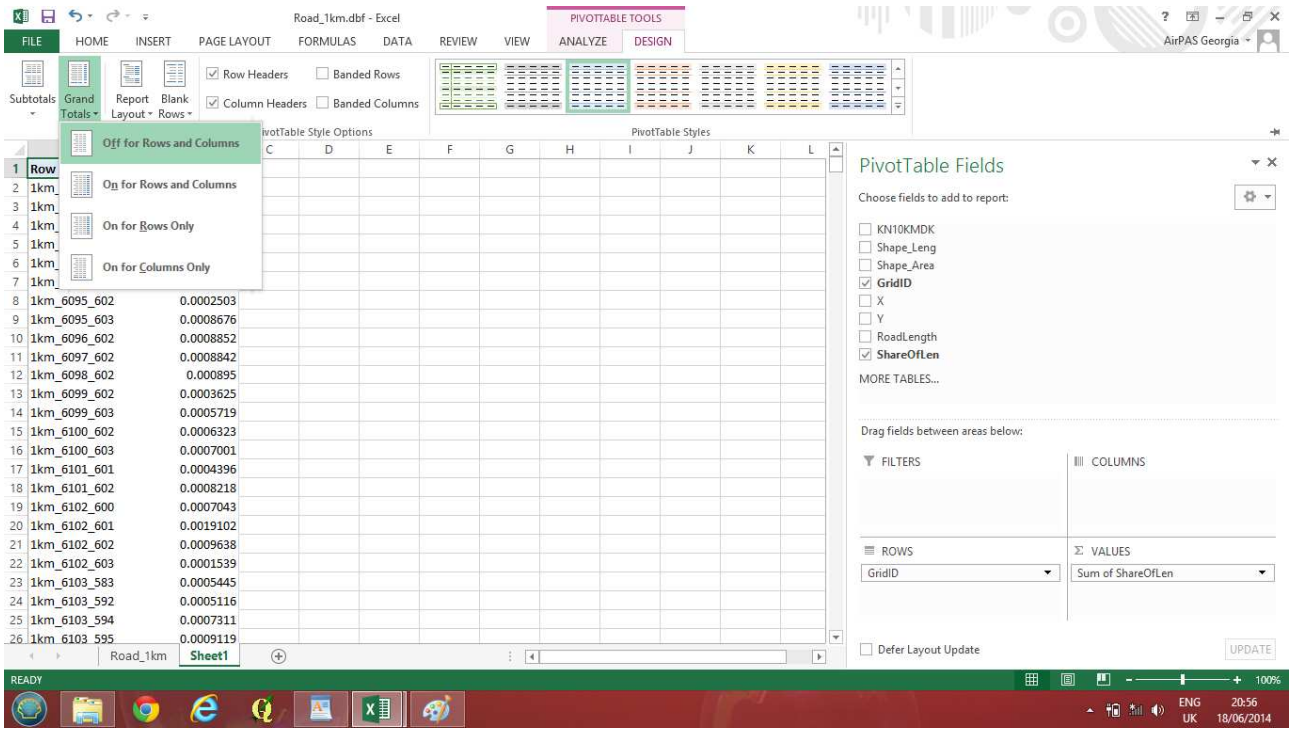


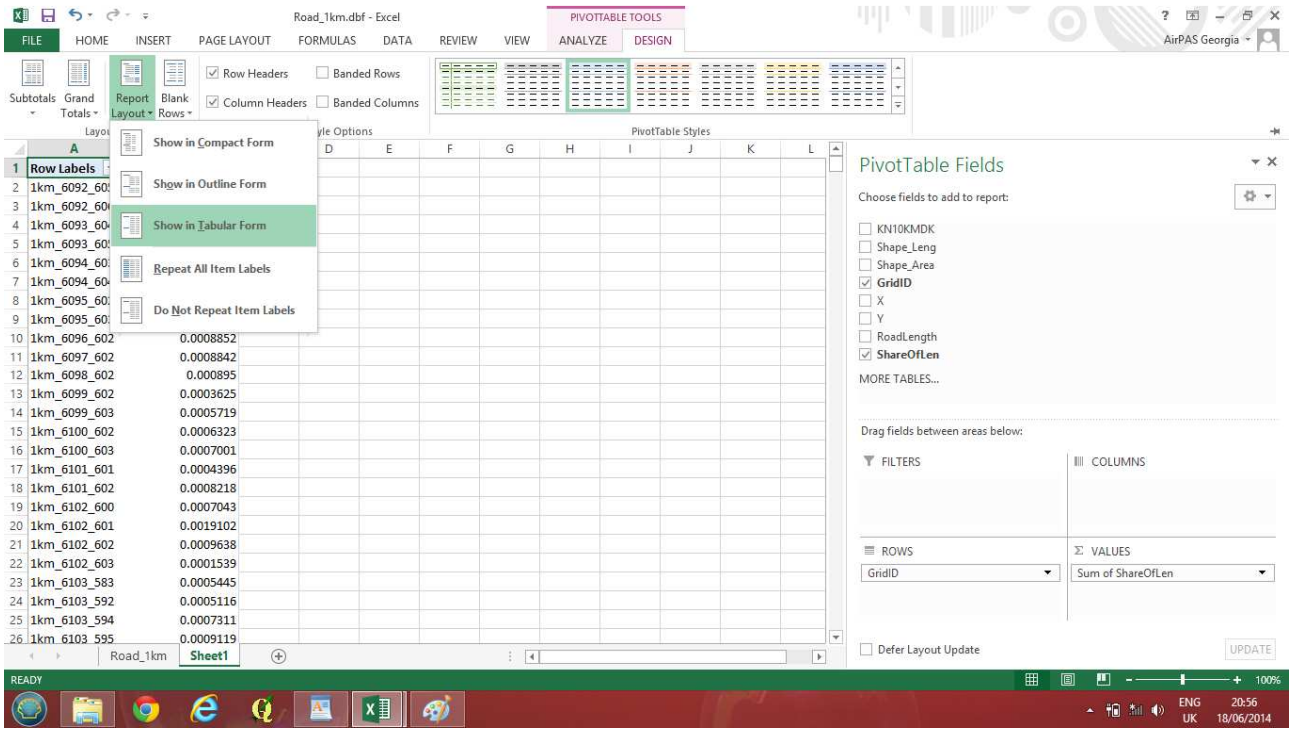

Road_1km.dbf - Excel
PIVOTTABLE TOOLS
FILE HOME INSERT PAGE LAYOUT FORMULAS DATA REVIEW VIEW ANALYZE DESIGN
AirPAS Georgia
A1
Row Labels
Row Labels Sum of ShareOfLen
1km_6092_605 0.0010425
1km_6092_606 0.0002986
1km_6093_604 0.0010605
1km_6093_605 0.0001328
1km_6094_603 0.0005541
1km_6094_604 0.0004883
1km_6095_602 0.0002503
1km_6095_603 0.0008676
1km_6096_602 0.0008852
1km_6097_602 0.0008842
1km_6098_602 0.000895
1km_6099_602 0.0003625
1km_6099_603 0.0005719
1km_6100_602 0.0006323
1km_6100_603 0.0007001
1km_6101_601 0.0004396
1km_6101_602 0.0008218
1km_6102_600 0.0007043
1km_6102_601 0.0019102
1km_6102_602 0.0009638
1km_6102_603 0.0001539
1km_6103_583 0.0005445
1km_6103_592 0.0005116
1km_6103_594 0.0007311
1km_6103_595 0.0009119
Road_1km
Sheet1
PivotTable Fields
Choose fields to add to report:
KN10KMDK
Shape_Leng
Shape_Area
GridID
X
Y
RoadLength
ShareOfLen
MORE TABLES...
Drag fields between areas below:
FILTERS
COLUMNS
ROWS
GridID
VALUES
Sum of ShareOfLen
Defer Layout Update
UPDATE
READY
100%
ENG
UK
20:55
18/06/2014

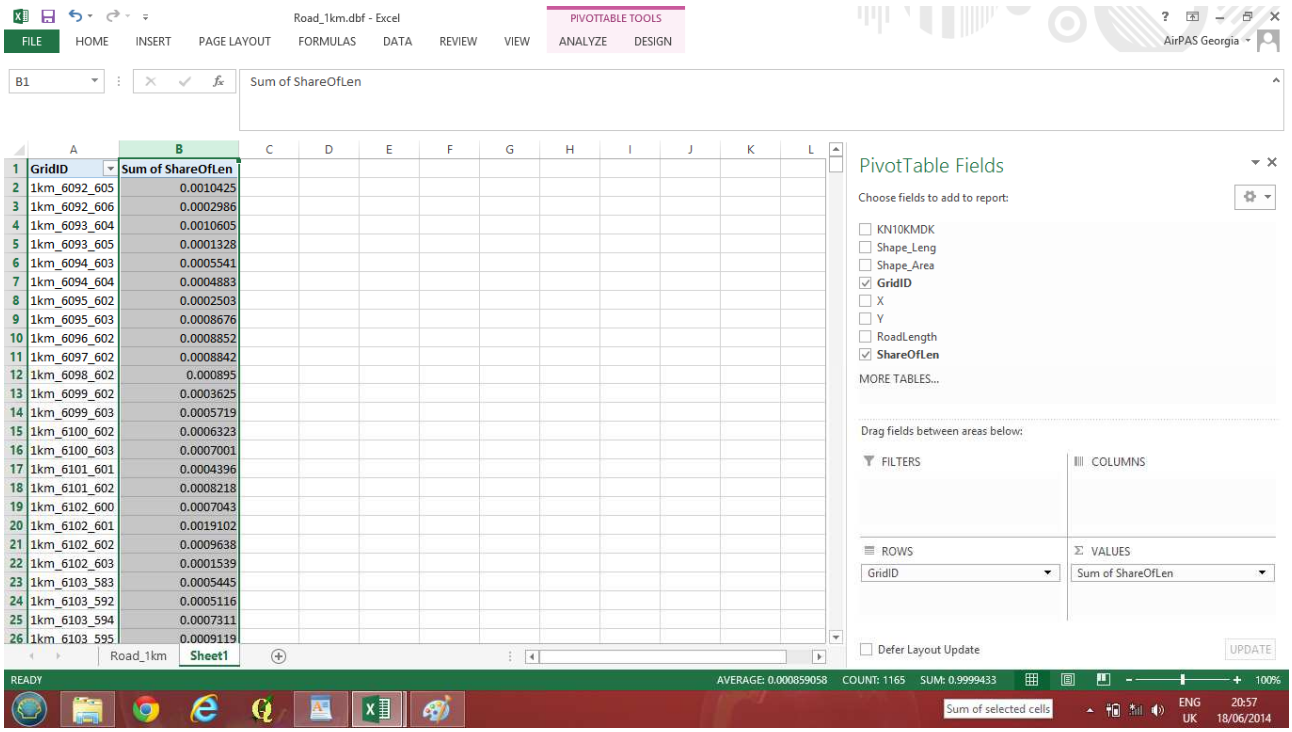

Road_1km.dbf - Excel
PIVOTTABLE TOOLS
FILE HOME INSERT PAGE LAYOUT FORMULAS DATA REVIEW VIEW ANALYZE DESIGN
AirPAS Georgia
B1
Sum of ShareOfLen
GridID Sum of ShareOfLen
1km_6092_605 0.0010425
1km_6092_606 0.0002986
1km_6093_604 0.0010605
1km_6093_605 0.0001328
1km_6094_603 0.0005541
1km_6094_604 0.0004883
1km_6095_602 0.0002503
1km_6095_603 0.0008676
1km_6096_602 0.0008852
1km_6097_602 0.0008842
1km_6098_602 0.000895
1km_6099_602 0.0003625
1km_6099_603 0.0005719
1km_6100_602 0.0006323
1km_6100_603 0.0007001
1km_6101_601 0.0004396
1km_6101_602 0.0008218
1km_6102_600 0.0007043
1km_6102_601 0.0019102
1km_6102_602 0.0009638
1km_6102_603 0.0001539
1km_6103_583 0.0005445
1km_6103_592 0.0005116
1km_6103_594 0.0007311
1km_6103_595 0.0009119
Road_1km
Sheet1
PivotTable Fields
Choose fields to add to report:
KN10KMDK
Shape_Leng
Shape_Area
GridID
X
Y
RoadLength
ShareOfLen
MORE TABLES...
Drag fields between areas below:
FILTERS
ROWS
GridID
Sum of ShareOfLen
Move Up
Move Down
Move to Beginning
Move to End
Move to Report Filter
Move to Row Labels
Move to Column Labels
Move to Values
Remove Field
Value Field Settings...
Defer Layout Update
UPDATE
READY
AVERAGE: 0.000859058
COUNT: 1165
SUM: 0.9999433
100%
ENG
UK
20:58
18/06/2014


Road_1km.dbf - Excel
PIVOTTABLE TOOLS
FILE HOME INSERT PAGE LAYOUT FORMULAS DATA REVIEW VIEW ANALYZE DESIGN
AirPAS Georgia
B1
Sum of ShareOfLen
GridID
Sum of ShareOfLen
1km_6092_605 0.0010425
1km_6092_606 0.0002986
1km_6093_604 0.0010605
1km_6093_605 0.0001328
1km_6094_603 0.0005541
1km_6094_604 0.0004883
1km_6095_602 0.0002503
1km_6095_603 0.0008676
1km_6096_602 0.0008852
1km_6097_602 0.0008842
1km_6098_602 0.000895
1km_6099_602 0.0003625
1km_6099_603 0.0005719
1km_6100_602 0.0006323
1km_6100_603 0.0007001
1km_6101_601 0.0004396
1km_6101_602 0.0008218
1km_6102_600 0.0007043
1km_6102_601 0.0019102
1km_6102_602 0.0009638
1km_6102_603 0.0001539
1km_6103_583 0.0005445
1km_6103_592 0.0005116
1km_6103_594 0.0007311
1km_6103_595 0.0009119
Value Field Settings
Source Name: ShareOfLen
Custom Name: Sum of ShareOfLen
Summarize Values By
Show Values As
Summarize value field by
Choose the type of calculation that you want to use to summarize data from the selected field
Sum
Count
Average
Max
Min
Product
Number Format
OK
Cancel
PivotTable Fields
Choose fields to add to report:
KN10KMDK
Shape_Leng
Shape_Area
GridID
X
Y
RoadLength
ShareOfLen
MORE TABLES...
Drag fields between areas below:
FILTERS
COLUMNS
ROWS
GridID
VALUES
Sum of ShareOfLen
Defer Layout Update
UPDATE
Road_1km
Sheet1
READY
AVERAGE: 0.000859058 COUNT: 1165 SUM: 0.9999433
100%
ENG UK 20:59 18/06/2014


Road_1km.dbf - Excel
PIVOTTABLE TOOLS
FILE HOME INSERT PAGE LAYOUT FORMULAS DATA REVIEW VIEW ANALYZE DESIGN
AirPAS Georgia
Subtotals
Grand Totals
Report Layout
Blank Rows
Row Headers
Column Headers
Banded Rows
Banded Columns
PivotTable Style Options
PivotTable Styles
Do Not Show Subtotals
Show all Subtotals at Bottom of Group
Show all Subtotals at Top of Group
Include Filtered Items in Totals
1km_6095_602 0.0002503
1km_6095_603 0.0008676
1km_6096_602 0.0008852
1km_6097_602 0.0008842
1km_6098_602 0.000895
1km_6099_602 0.0003625
1km_6099_603 0.0005719
1km_6100_602 0.0006323
1km_6100_603 0.0007001
1km_6101_601 0.0004396
1km_6101_602 0.0008218
1km_6102_600 0.0007043
1km_6102_601 0.0019102
1km_6102_602 0.0009638
1km_6102_603 0.0001539
1km_6103_583 0.0005445
1km_6103_592 0.0005116
1km_6103_594 0.0007311
1km_6103_595 0.0009119
PivotTable Fields
Choose fields to add to report:
KN10KMDK
Shape_Leng
Shape_Area
GridID
X
Y
RoadLength
ShareOfLen
MORE TABLES...
Drag fields between areas below:
FILTERS
COLUMNS
ROWS
GridID
VALUES
Sum of ShareOfLen
Defer Layout Update
UPDATE
Road_1km
Sheet1
READY
100%
ENG UK 20:55 18/06/2014


Road_1km.dbf - Excel
PIVOTTABLE TOOLS
FILE HOME INSERT PAGE LAYOUT FORMULAS DATA REVIEW VIEW ANALYZE DESIGN
AirPAS Georgia
Subtotals Grand Totals Report Layout Blank Rows
Row Headers Banded Rows
Column Headers Banded Columns
PivotTable Style Options
PivotTable Styles
Off for Rows and Columns
On for Rows and Columns
On for Rows Only
On for Columns Only
Row
1km_6095_602 0.0002503
1km_6095_603 0.0008676
1km_6096_602 0.0008852
1km_6097_602 0.0008842
1km_6098_602 0.000895
1km_6099_602 0.0003625
1km_6099_603 0.0005719
1km_6100_602 0.0006323
1km_6100_603 0.0007001
1km_6101_601 0.0004396
1km_6101_602 0.0008218
1km_6102_600 0.0007043
1km_6102_601 0.0019102
1km_6102_602 0.0009638
1km_6102_603 0.0001539
1km_6103_583 0.0005445
1km_6103_592 0.0005116
1km_6103_594 0.0007311
1km_6103_595 0.0009119
Road_1km
Sheet1
PivotTable Fields
Choose fields to add to report:
KN10KMDK
Shape_Leng
Shape_Area
GridID
X
Y
RoadLength
ShareOfLen
MORE TABLES...
Drag fields between areas below:
FILTERS
COLUMNS
ROWS
VALUES
GridID
Sum of ShareOfLen
Defer Layout Update
UPDATE
READY
100%
ENG
UK
20:56
18/06/2014


Road_1km.dbf - Excel
PIVOTTABLE TOOLS
FILE HOME INSERT PAGE LAYOUT FORMULAS DATA REVIEW VIEW ANALYZE DESIGN
AirPAS Georgia
Subtotals Grand Totals Report Layout Blank Rows
Row Headers Banded Rows
Column Headers Banded Columns
PivotTable Styles
Show in Compact Form
Show in Outline Form
Show in Tabular Form
Repeat All Item Labels
Do Not Repeat Item Labels
Row Labels
1km_6096_602 0.0008852
1km_6097_602 0.0008842
1km_6098_602 0.000895
1km_6099_602 0.0003625
1km_6099_603 0.0005719
1km_6100_602 0.0006323
1km_6100_603 0.0007001
1km_6101_601 0.0004396
1km_6101_602 0.0008218
1km_6102_600 0.0007043
1km_6102_601 0.0019102
1km_6102_602 0.0009638
1km_6102_603 0.0001539
1km_6103_583 0.0005445
1km_6103_592 0.0005116
1km_6103_594 0.0007311
1km_6103_595 0.0009119
Road_1km
Sheet1
PivotTable Fields
Choose fields to add to report:
KN10KMDK
Shape_Leng
Shape_Area
GridID
X
Y
RoadLength
ShareOfLen
MORE TABLES...
Drag fields between areas below:
FILTERS
COLUMNS
ROWS
VALUES
GridID
Sum of ShareOfLen
Defer Layout Update
UPDATE
READY
100%
ENG
UK
20:56
18/06/2014



	A	B
1	GridID	Sum of ShareOfLen
2	1km_6092_605	0.0010425
3	1km_6092_606	0.0002986
4	1km_6093_604	0.0010605
5	1km_6093_605	0.0001328
6	1km_6094_603	0.0005541
7	1km_6094_604	0.0004883
8	1km_6095_602	0.0002503
9	1km_6095_603	0.0008676
10	1km_6096_602	0.0008852
11	1km_6097_602	0.0008842
12	1km_6098_602	0.000895
13	1km_6099_602	0.0003625
14	1km_6099_603	0.0005719
15	1km_6100_602	0.0006323
16	1km_6100_603	0.0007001
17	1km_6101_601	0.0004396
18	1km_6101_602	0.0008218
19	1km_6102_600	0.0007043
20	1km_6102_601	0.0019102
21	1km_6102_602	0.0009638
22	1km_6102_603	0.0001539
23	1km_6103_583	0.0005445
24	1km_6103_592	0.0005116
25	1km_6103_594	0.0007311
26	1km_6103_595	0.0009119