7th INTERNATIONAL gvSIG CONFERENCE
30th november to 2nd december 2011
Centro de eventos. Feria Valencia (Spain)
conquering new areas
gvSIG association

Building business applications above gvSIG

A case study with a bus network management GIS for the Algerian Transport Minister

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Alkante
TECHNOLOGIES DE L'INFORMATION

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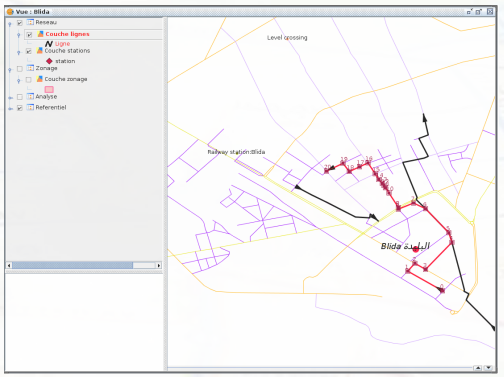
On the programme...

- Backgrounds...
- Why gvSIG ?
- Developing with gvSIG : feedback
- Overview of the *SIG Transport* application

Backgrounds



Transurb Technirail

gvSIG

Origins of the project

- **Project for the setting-up and the modernization of transport network in Algeria**
  - On the Algerian Transport Minister's initiative
  - Contract with the Belgian consulting company Transurb Technirail
- **Need for a first tool to map and study the bus networks**
  - Subcontract with the company Alkante

The needs

- **GIS functionalities…**
  - Mapping
    - Bus network
    - Cities base map (scanned map, road networks…)
  - Bus Network update
    - Drawing bus lines and bus stops
  - Map printing (pdf)
  - Making simple analysis in order qualify the socio-economic impact of the network
- **…for non GIS experts**

The *SIG-Transport* Application

+ Network creation and update module

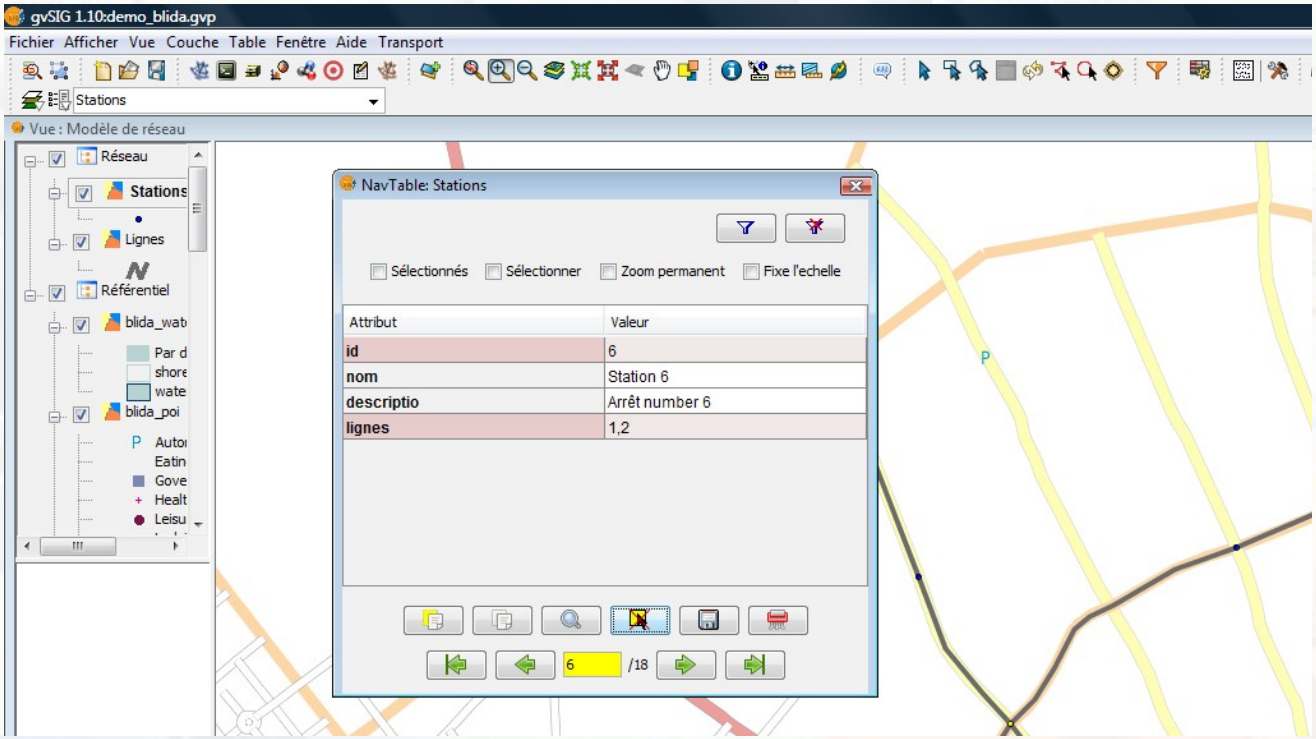
NavTable Extension

+ Network Socio-economic impact analysis module

sextante

Network creation/update Module

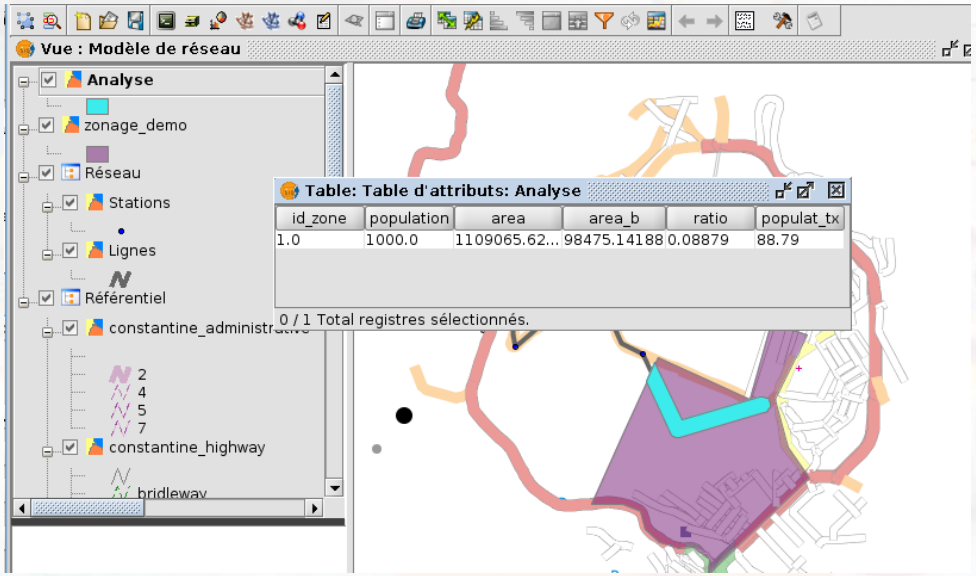
- **Drawing bus lines and bus stops**
  - Bus stops are linked to lines and *vice-versa*
  - Snapping on road network and on already drawn bus network



Network analysis module

- **Estimating the impact of network fragments on socio-economic areas**
  - Economic areas (populated areas) as an input layer
  - Based on a radius (ri) defined around bus lines/stops
  - Impact is defined as a area ratio

$$Tx(R,Z) = area(buffer(R,r_i) \wedge Z) / area(Z)$$



Currently...

- First user training in May 2011. Next user training next week (December 2011)
- Application installed in 13 Algerian cities and already used in real conditions
- Waiting for user comments (coming next week...)

Why gvSIG ?

Several reasons...

- **An adaptable GIS that fulfils the needs...**
  - Raster and vector data sources
  - Edition tools to create and update network
  - Advanced spatial analysis (Sextante)
  - Thematic mapping
  - Printing and export (pdf, paper printing)

Several reasons...

- **Freeware**
  - Client point of view : No initial cost for a GIS which has not been specialized and no extra cost for license
- **Open source (GNU GPL)**
  - Alkante point of view : guaranty the ability to develop business specific modules and to adapt the graphical user interface
- **JAVA (cross-platform)**
  - One development compatible with Linux and Windows (XP, Vista, 7...)

Several reasons...

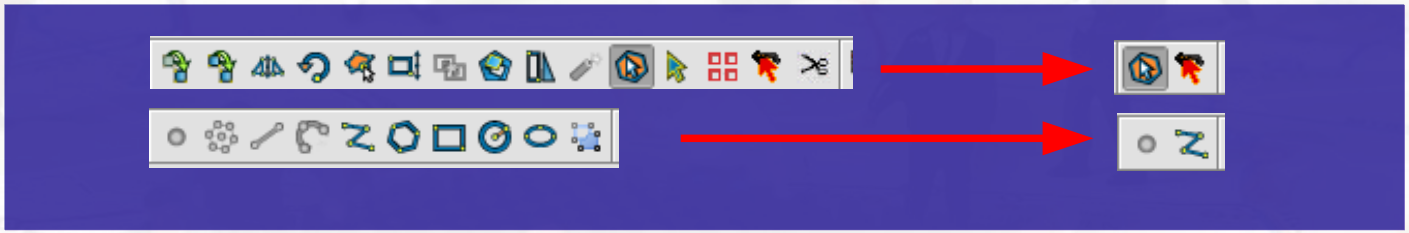
- **French translation of gvSIG available**
- **GvSIG : Mature and alive project**
  - Maturity (6 years)
  - Users community
  - Several plugins coming from various contributors

A user friendly GIS but...

- **Some adjustments necessary for non gis specialists**
  - Making editing and drawing toolbar simpler
  - Displaying attribute data in a form rather than in a table (*à la* navTable)
  - Making network analysis as automatic as possible

Editing toolbar simplified

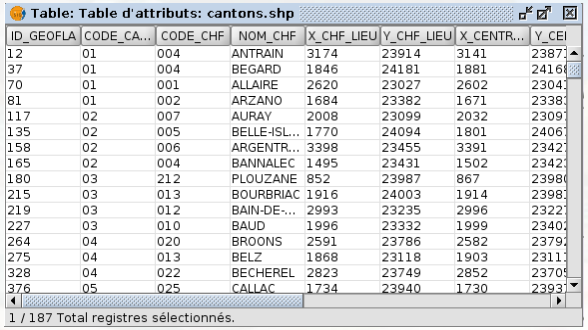
- **Less geometric edition tools**

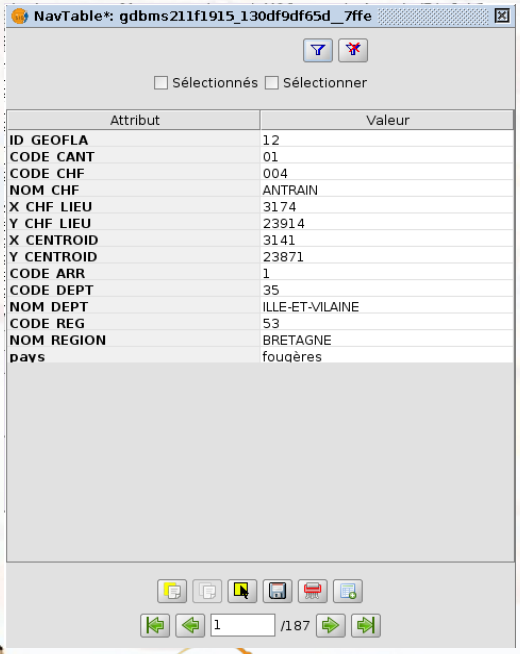


- **Vertices edition tools merged**

Form display of attribute data

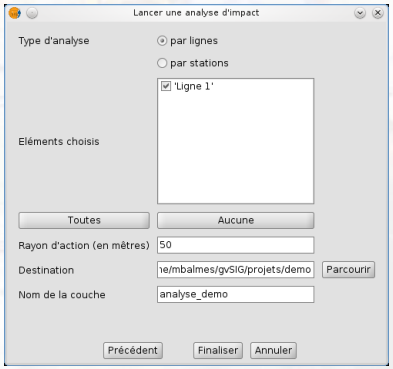
- **Use of the NavTable extension**
  - Synthetic view of attribute data for a particular feature
  - Fill and update of attribute data easier

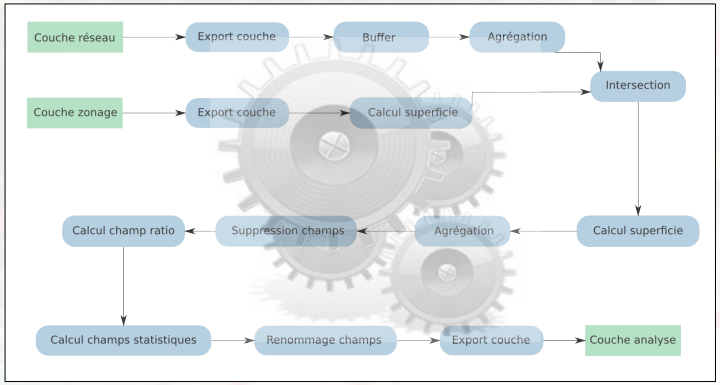


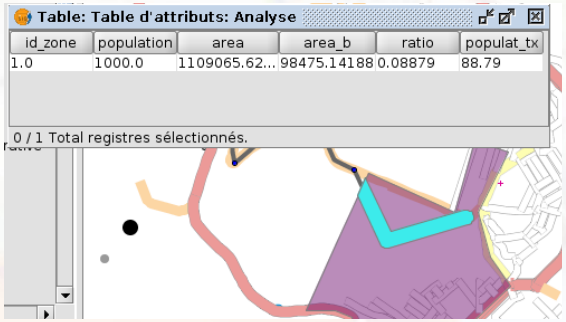


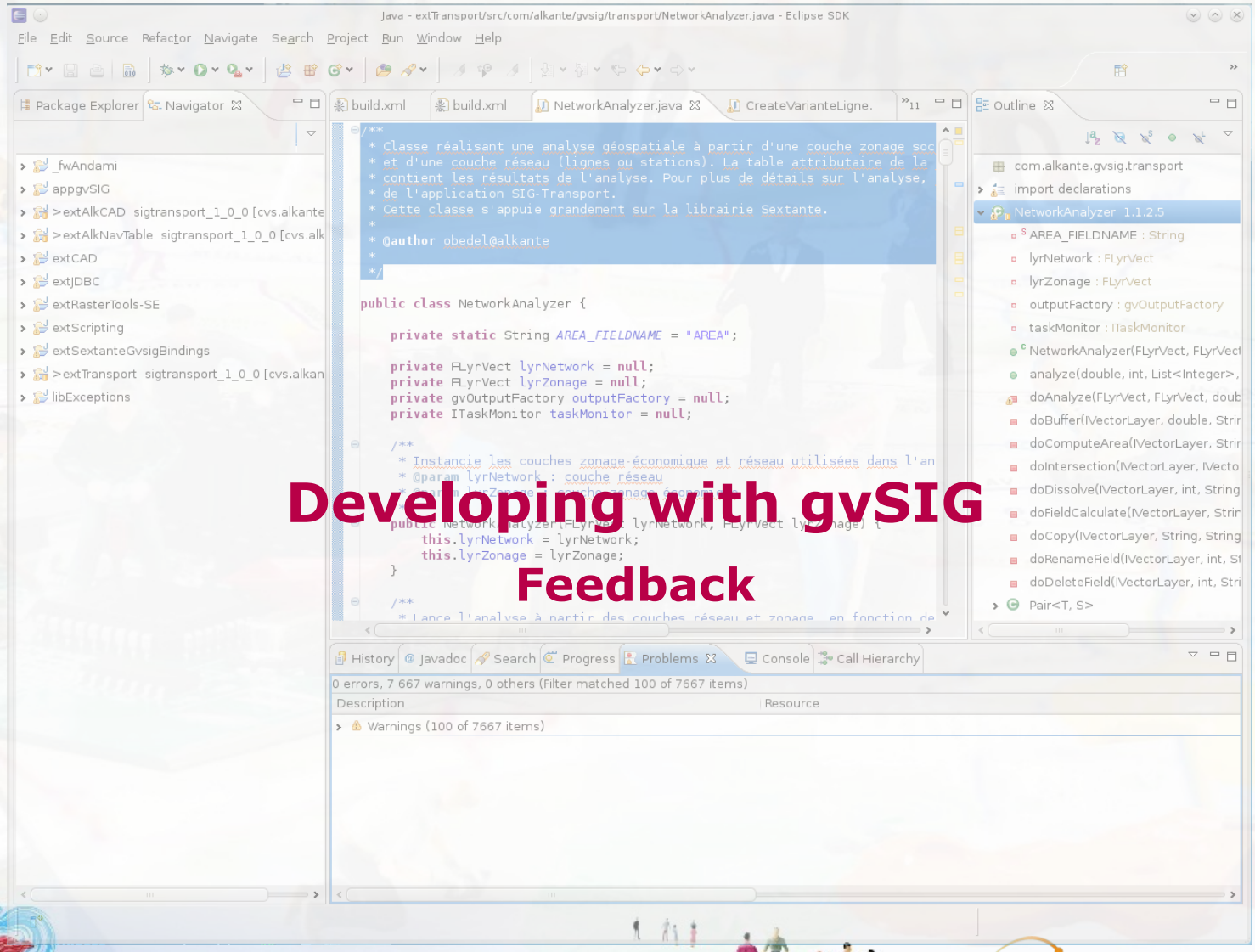
Automation of the analysis process

- Chaining Sextante algorithms to provide one specialized process









Developing with gvSIG

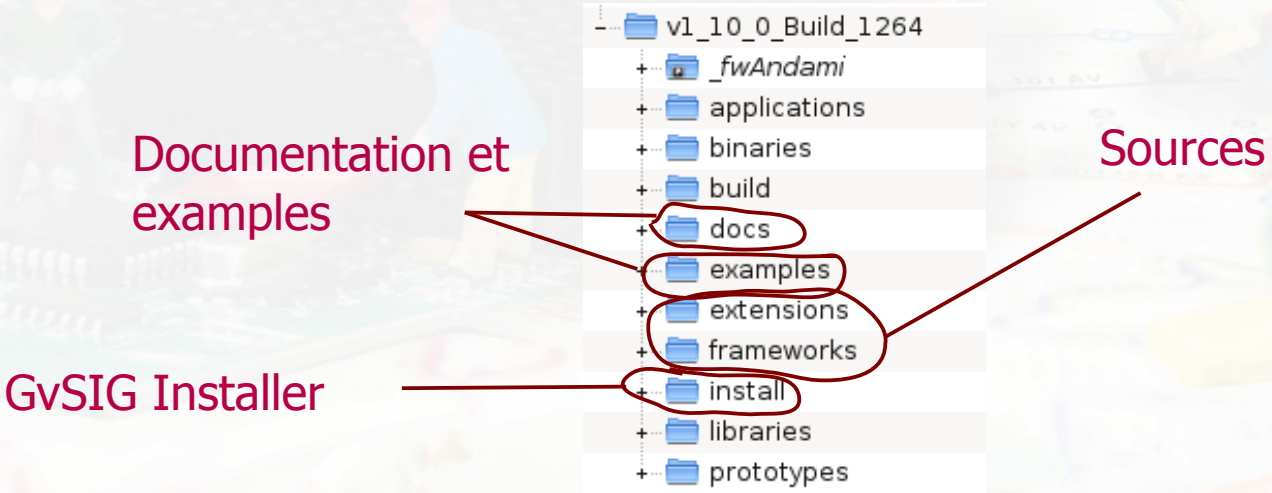
Feedback

Several aspects

- Developing a business extension
- Customizing the GUI of gvSIG
- Packaging an install of gvSIG including a business extension

To start with

- **GvSIG version 1.10 stable (build 1264)**
  - Sources available on gvsig.org (SVN repository)
  - Sextante included
  - NavTable sources installed manually



Positive points...

- gvSIG architecture based on extension make it quite easy to develop plugins
- Automatic procedure to set up Eclipse IDE fro gvSIG development
- Installer build script that can be easily modified

Negative points...

- **Source code documentation (Javadoc) old (and not up to date with the stable release) et written in Spanish (Why not English ?)**
- **Examples/tutorials available with source code, but not up to date and not working the latest releases**
- **Miss a real developer documentation or a developer resource center**
  - We have to mix several documents (data models, API diagrams) taken from several places on the web

Somes figures...

- **Developing time...**
  - 25 man-day (with no deep knowledge of gvSIG source code)
  - excluding specifications, tests, training and project management.

- **Size of the extension**
  - 10408 lines of Java
  - 2% of all gvSIG extensions size
  - 0,8% of gvSIG total code

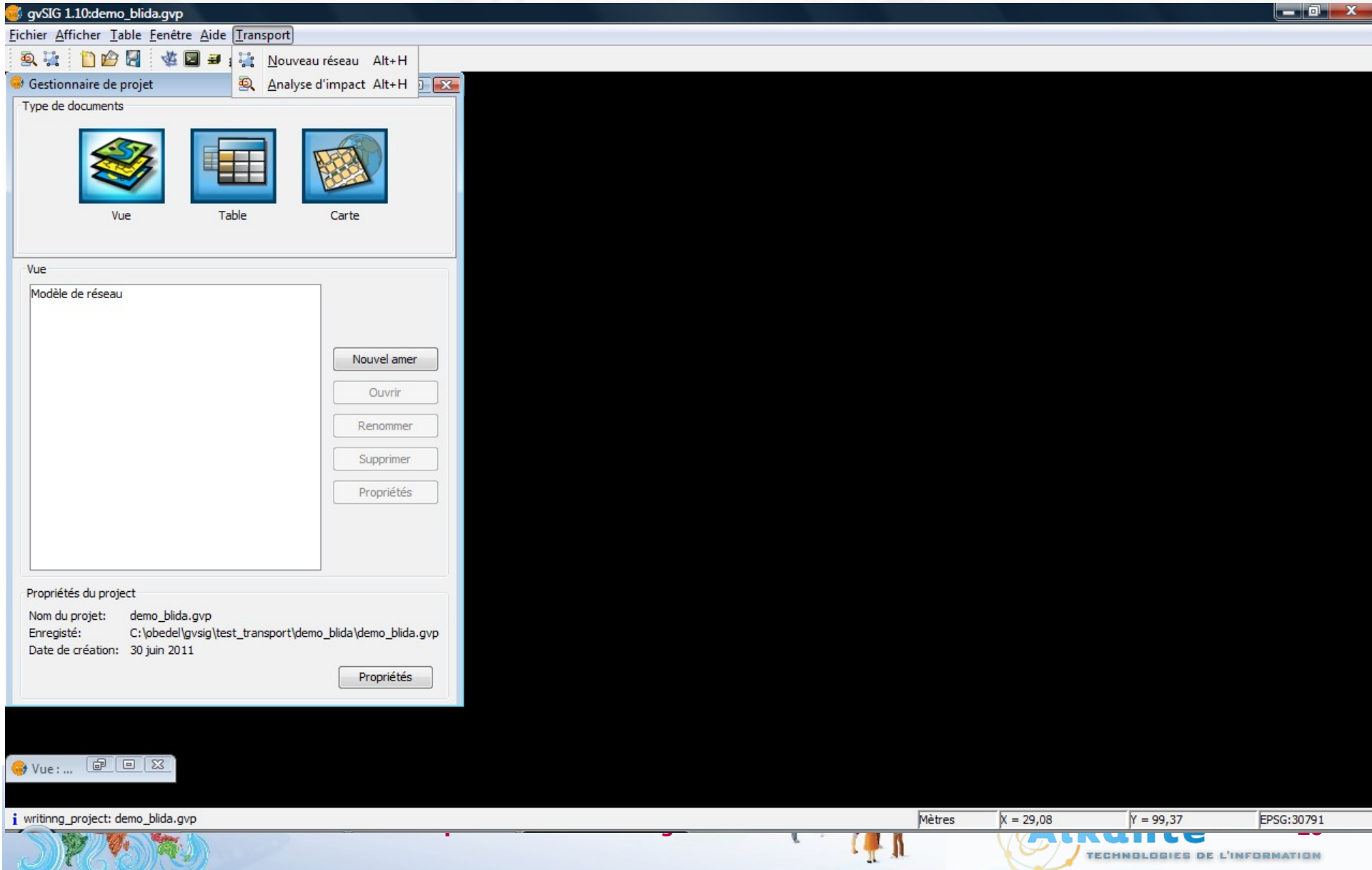
Conclusion concerning development

- First contact with gvSIG source code and gvSIG data Model should not be underestimated
- Minor bugs corrections (2)
- Developer list launched (since February) and quite active (>4 posts/day en May/June 2011)

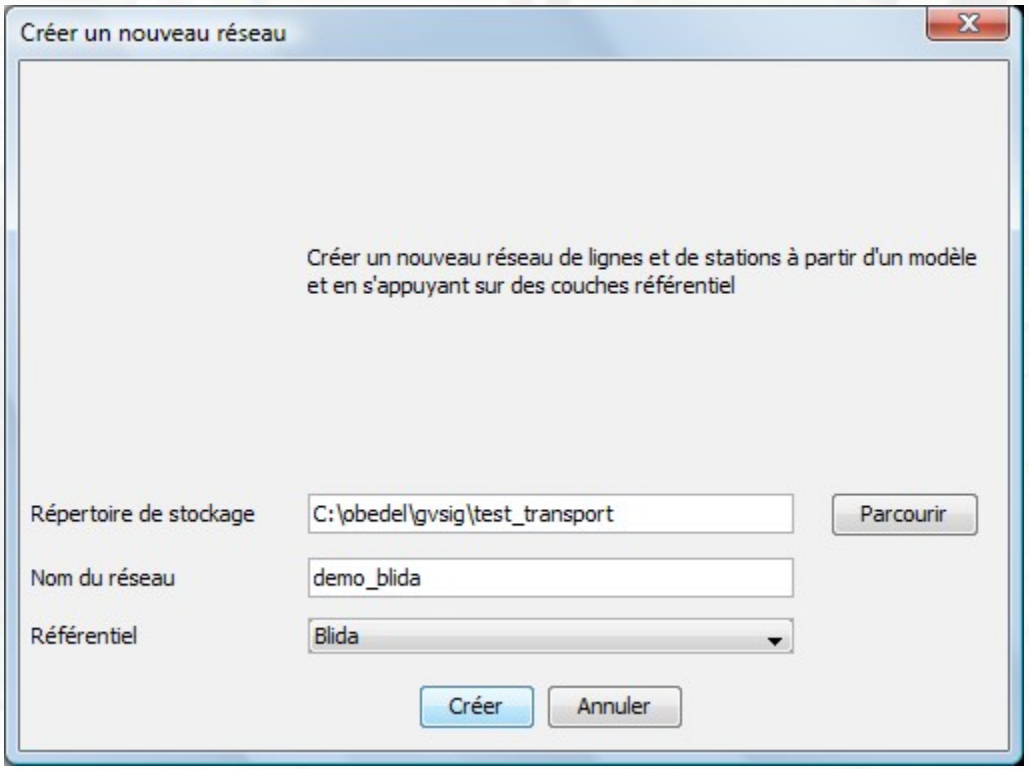
How does it look like and work ?

(Some screenshots...)

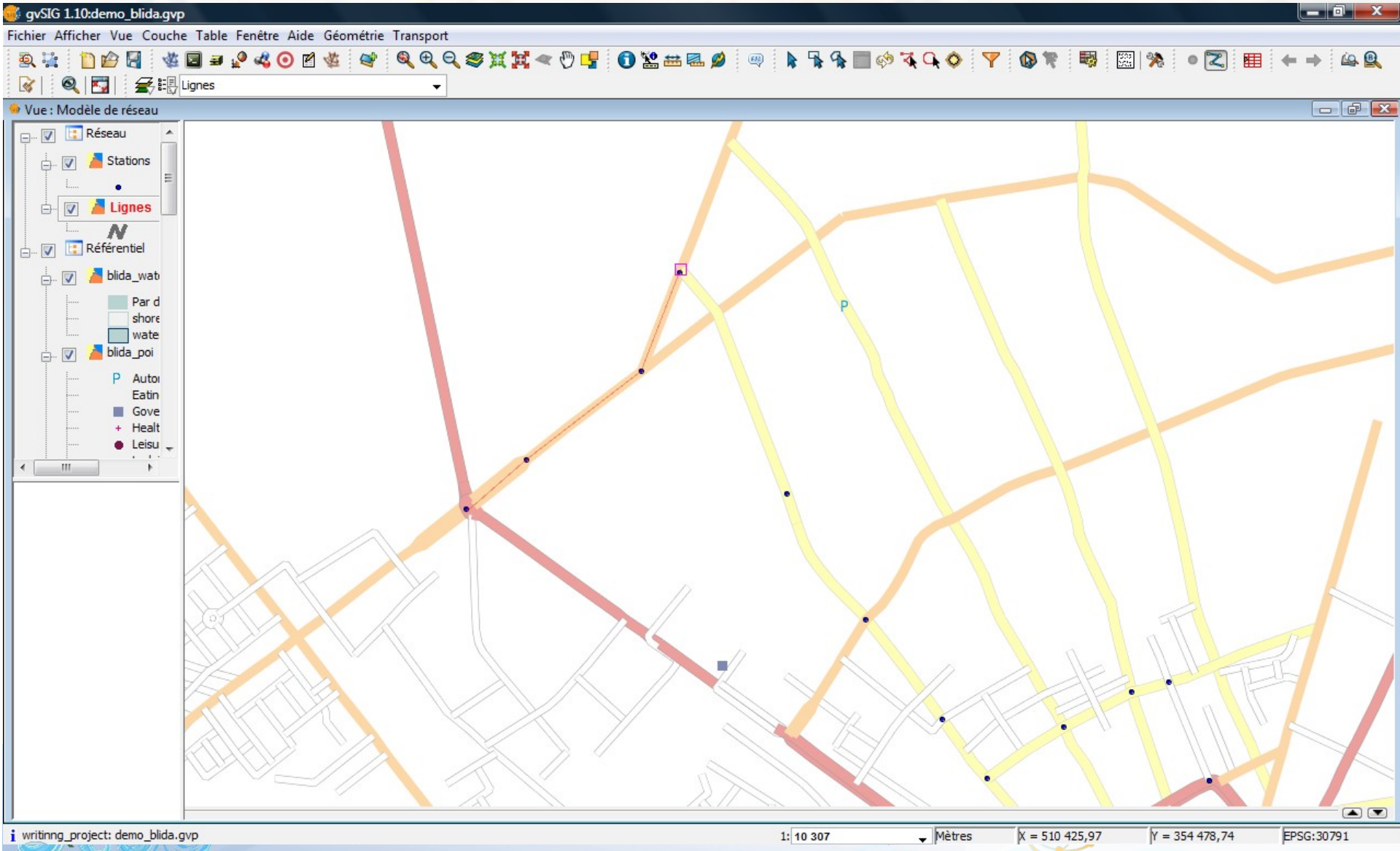
Transport Menu



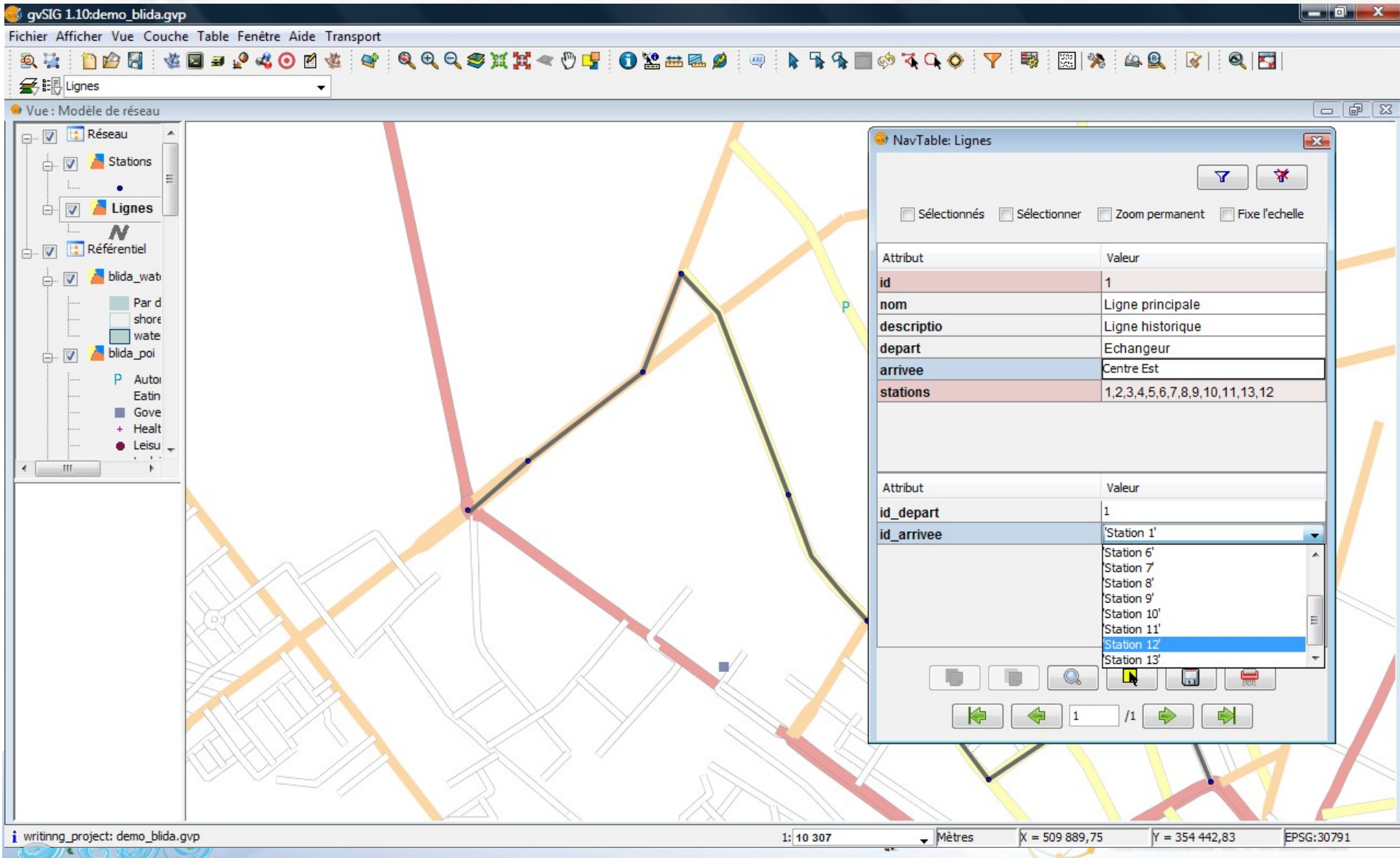
Creating a network



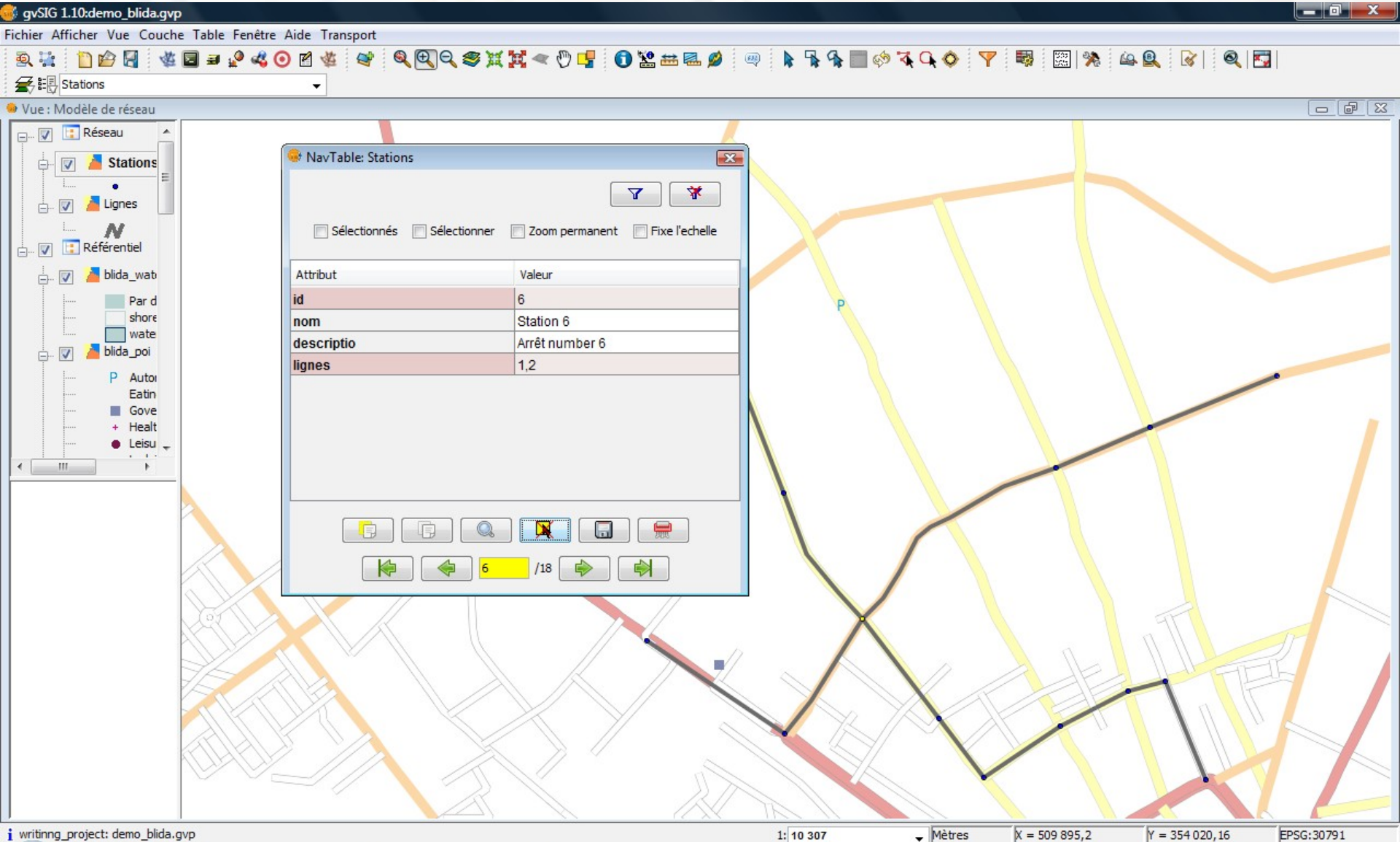
Drawing/Snapping



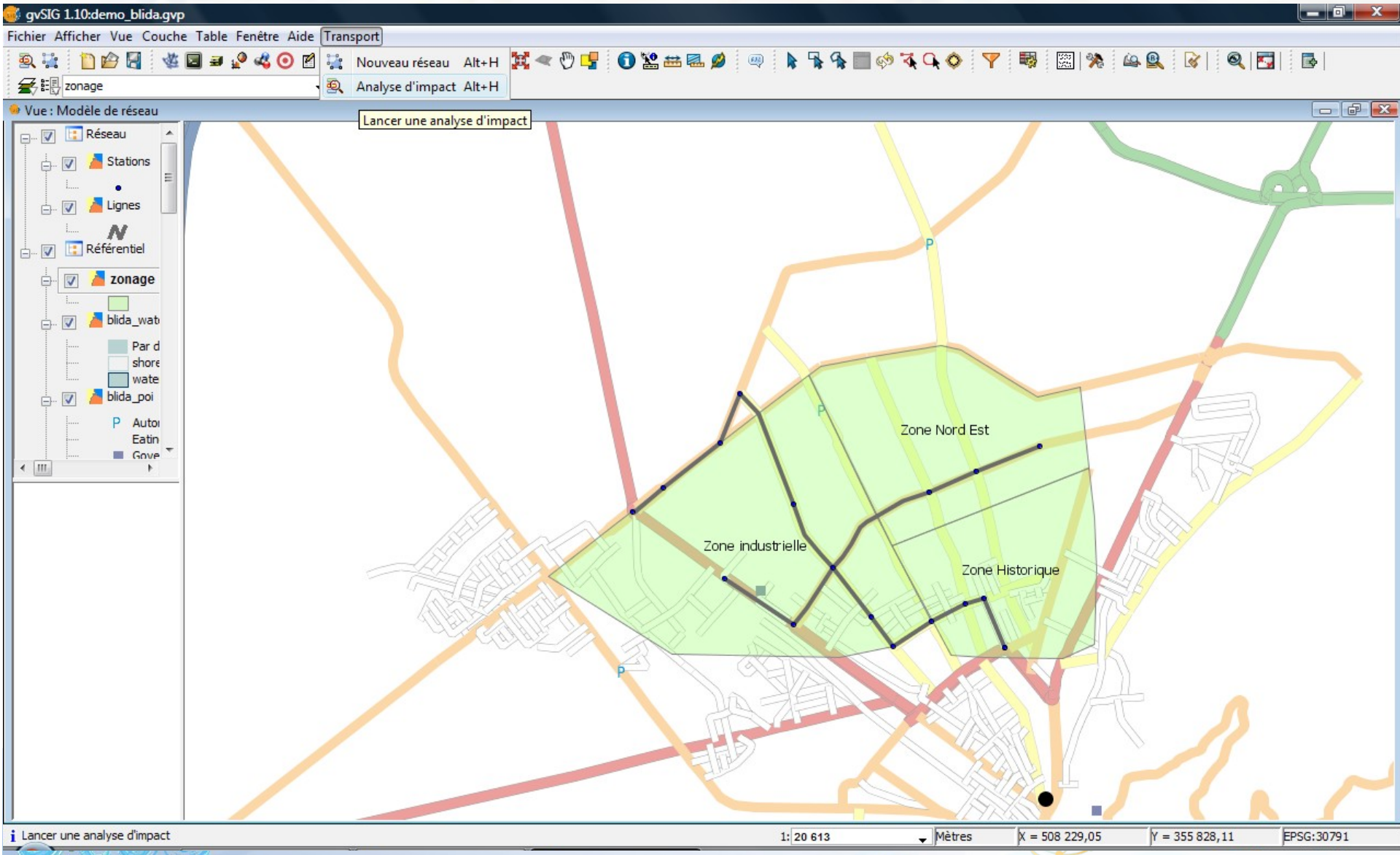
Filling properties



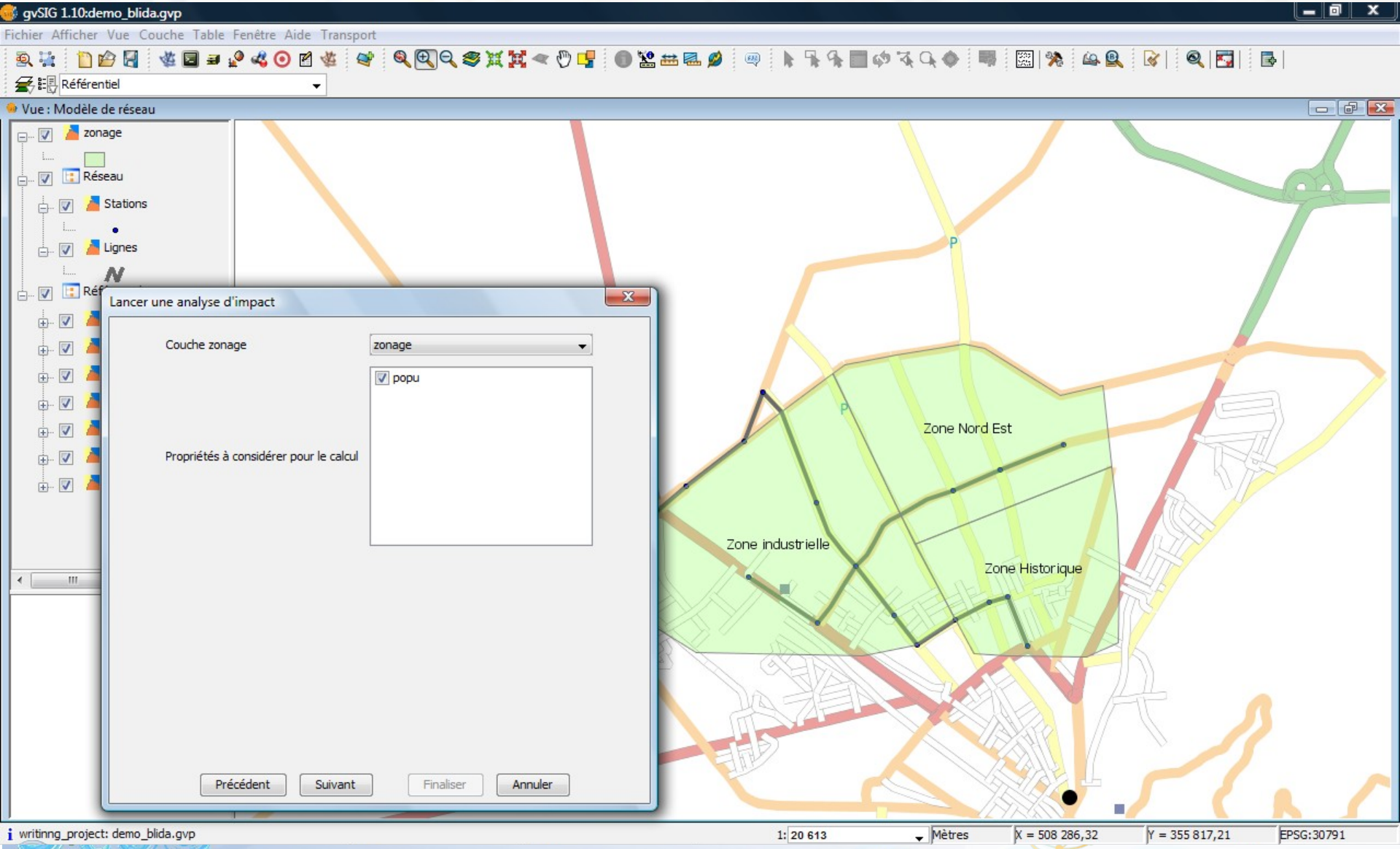
Synchronizing bus lines/bus stops



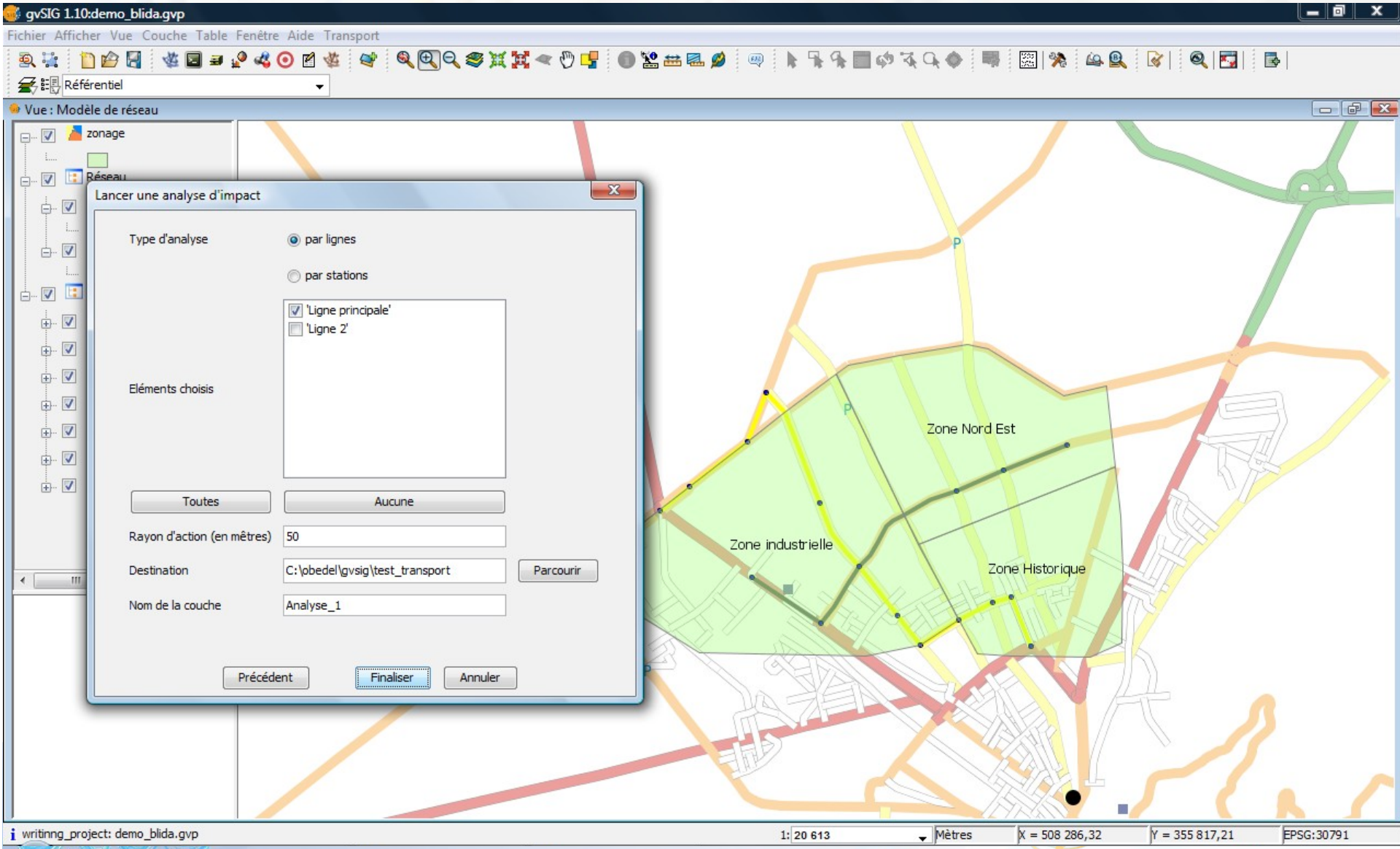
Area based impact analysis



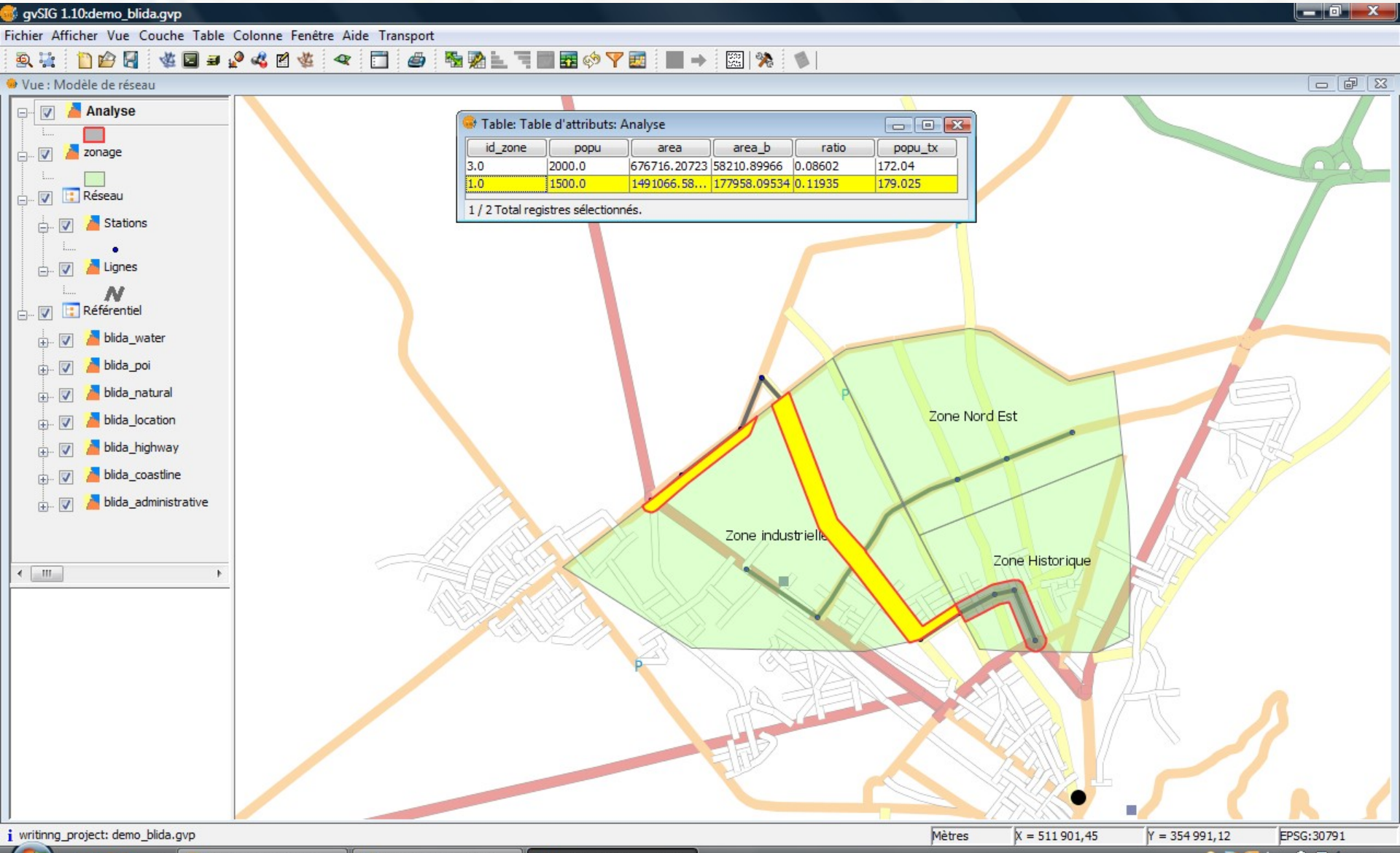
Analysis 1


gvSIG 1.10:demo_blida.gvp
Fichier Afficher Vue Couche Table Fenêtre Aide Transport
Référentiel
Vue : Modèle de réseau
zonage
Réseau
Stations
Lignes
Lancer une analyse d'impact
Couche zonage
zonage
popu
Propriétés à considérer pour le calcul
Précédent
Suivant
Finaliser
Annuler
Zone Nord Est
Zone industrielle
Zone Historique
writinng_project: demo_blida.gvp
1: 20 613
Mètres
X = 508 286,32
Y = 355 817,21
EPSG:30791

Analysis 2


gvSIG 1.10:demo_blida.gvp
Fichier Afficher Vue Couche Table Fenêtre Aide Transport
Référentiel
Vue : Modèle de réseau
zonage
Réseau
Lancer une analyse d'impact
Type d'analyse
par lignes
par stations
'Ligne principale'
'Ligne 2'
Eléments choisis
Toutes
Aucune
Rayon d'action (en mètres)
50
Destination
C:\obedel\gvsig\test_transport
Parcourir
Nom de la couche
Analyse_1
Précédent
Finaliser
Annuler
Zone Nord Est
Zone industrielle
Zone Historique
writinng_project: demo_blida.gvp
1: 20 613
Mètres
X = 508 286,32
Y = 355 817,21
EPSG:30791

Analysis 3


gvSIG 1.10:demo_blida.gvp
Fichier Afficher Vue Couche Table Colonne Fenêtre Aide Transport
Vue : Modèle de réseau
Analyse
zonage
Réseau
Stations
Lignes
Référentiel
blida_water
blida_poi
blida_natural
blida_location
blida_highway
blida_coastline
blida_administrative
Table: Table d'attributs: Analyse
id_zone popu area area_b ratio popu_tx
3.0 2000.0 676716.20723 58210.89966 0.08602 172.04
1.0 1500.0 1491066.58... 177958.09534 0.11935 179.025
1 / 2 Total registres sélectionnés.
Zone Nord Est
Zone industrielle
Zone Historique
writinng_project: demo_blida.gvp
Mètres
X = 511 901,45
Y = 354 991,12
EPSG:30791

Questions ?

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