



Needs Tailored Interoperable Railway Infrastructure

WP6 : Evaluation and decision support tools

NeTIRail-INFRA Final Conference, Ljubljana, Slovenia

UIC and WP6 partners



WP6 : EVALUATION & DECISION SUPPORT TOOLS



WP Leader





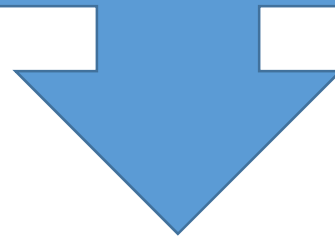
- 1. OVERVIEW OF THE WP6**
- 2. METHODOLOGY FOR THE INCORPORATION OF THE COST BENEFIT AND SOCIAL IMPACT ANALYSIS RESULTS INTO THE GIS TOOL**
- 3. FEATURES OF THE WEB APPLICATION**
- 4. PRESENTATION OF THE WEB APPLICATION**
- 5. DEMONSTRATION OF THE WEB APPLICATION**
- 6. QUESTIONS**



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WP6 Problematic :
Create an evaluation and decision support tool
(web application) for the innovations proposed
within the NeTIRail project



How did we do it?

HOW DID WE DO IT?



- **Engineer:** Airy MAGNIEN (UIC)
- **Social Scientist:** Elisa Orrù (ALU)
- **Railway specialist:** Miklavzin Vlasta (SZ)
- **Professional developpement:**
 - Lucian Emanuel ANGHEL (ADS)
 - Olivier BOUDOU (UIC)
- **Geomatician:** Kardelen KARATAS (UIC)

HOW DID WE DO IT?



- Setting a **groundwork for our work**
- **Actor:** Airy, Lucian, Olivier

HOW DID WE DO IT?



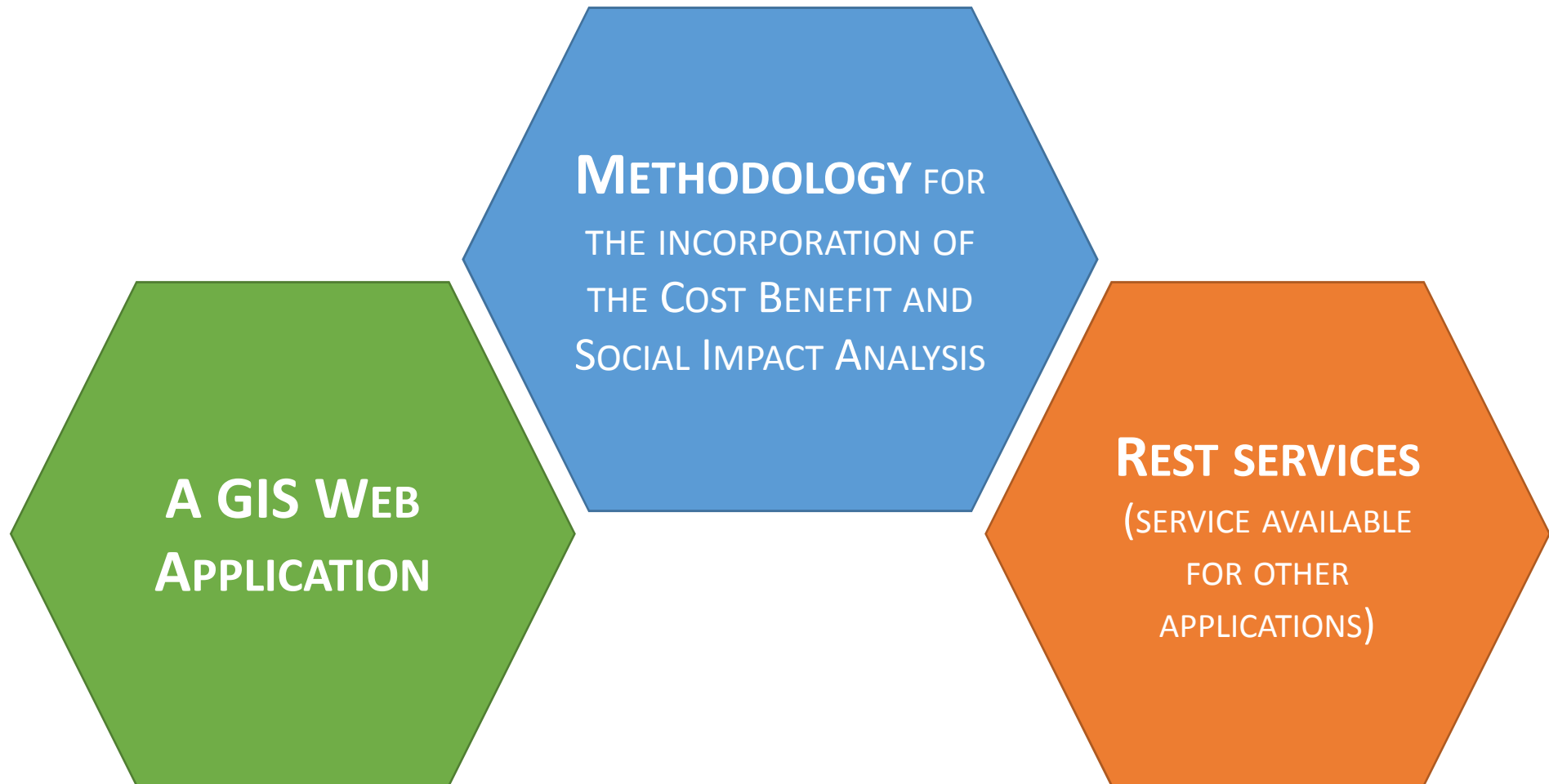
We undertook **two parallel works**:

- **Research of Methodology for the incorporation** of the Cost Benefit and Social Impact Analysis results into the GIS tool
 - **Input:** other WP
 - **Actor:** Airy, Elisa, Vlasta
 - **Deliverables:** D6.5 D6.6 D6.7
- **Imagine and specify a solution** that meets business demand
 - **Actor:** Lucian, Kardelen, Olivier
 - **Available:** D6.1 D6.2, D6.3

HOW DID WE DO IT?



- Refine the **specification**
 - **Actor:** Kardelen, Olivier
 - **Deliverable:** D6.4
- **Implement** the development:
 - **Actor:** Kardelen, Lucian, Olivier
 - **Deliverable:** Application





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Cost impacts



We care about **average maintenance costs**:

Estimated

- we care about **orders of magnitude**

Calculated

- Using a Log-Log functional form, with
- **Variables**: selected line parameters provided by RINF **or by the user**, and
- **Coefficients**: derived from various public sources
- **Function can be re-written** on the fly by advanced users

Stored

- by the web application

Compared

- with the same costs, **reduced by NeTIRail innovations**

Social impact analysis, generalization



Six relevant criteria

- Personal experience: Crowding, Comfort, Safety
- Service quality: Punctuality, Frequency, Journey time

Impact of innovation(s)

- Are not monetarized
- Cannot be generalized basing on questionnaires
- For each criterion, estimated benefits are input by users
- Results are compounded and **displayed on selected lines by color code**



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1 GIS-REST APPLICATION

- REST Services: access tools to filter GIS data for each layer
- REST Services: access tools to serialize layers
- Admin User: manage layers
- Admin User: manage GIS Data

2 Parameter and formula WEB-APPLICATION

3 GIS WEB APPLICATION



1 GIS-REST APPLICATION

2 Parameter and formula WEB-APPLICATION

- Admin User + REST Services: manage and **access infrastructure data**
- Admin User + REST Services: manage and **access NEW PARAMETER**
- Admin User + REST Services: manage, access and use **FORMULA based on value of parameter** (Infrastructure data Parameter and New Parameter)
- **3 GIS WEB APPLICATION**



1 GIS-REST APPLICATION

2 Parameter and formula WEB-APPLICATION

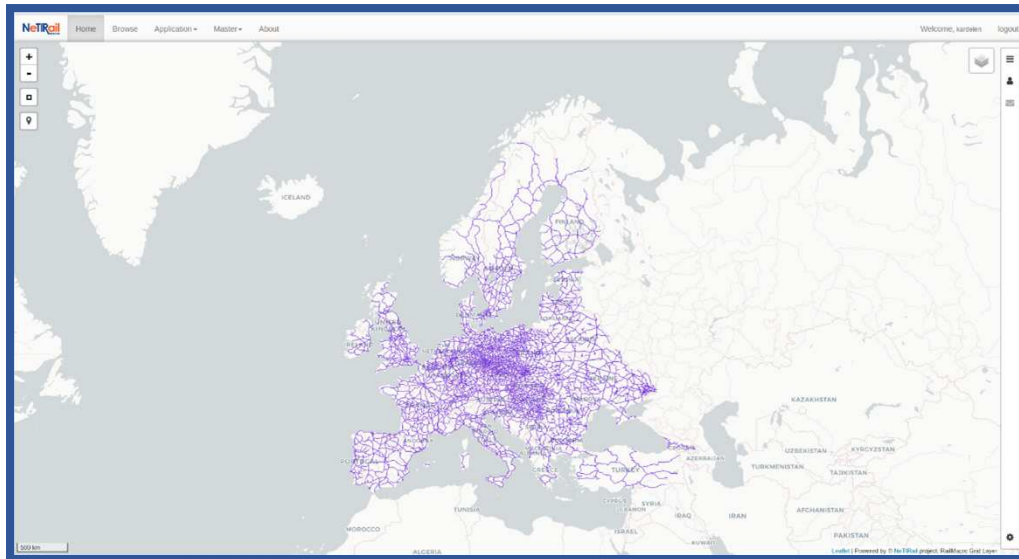
3 GIS WEB APPLICATION

- Final user : visualize a map of the railway network
- Final user : log in, navigate on the map
- Final user : select and save a set of data of SECTION OF LINE
- Final user : add value for NEW PARAMETER for SECTION OF LINE
- Final user : view information (parameter value / result formula) on a set of SECTION OF LINE

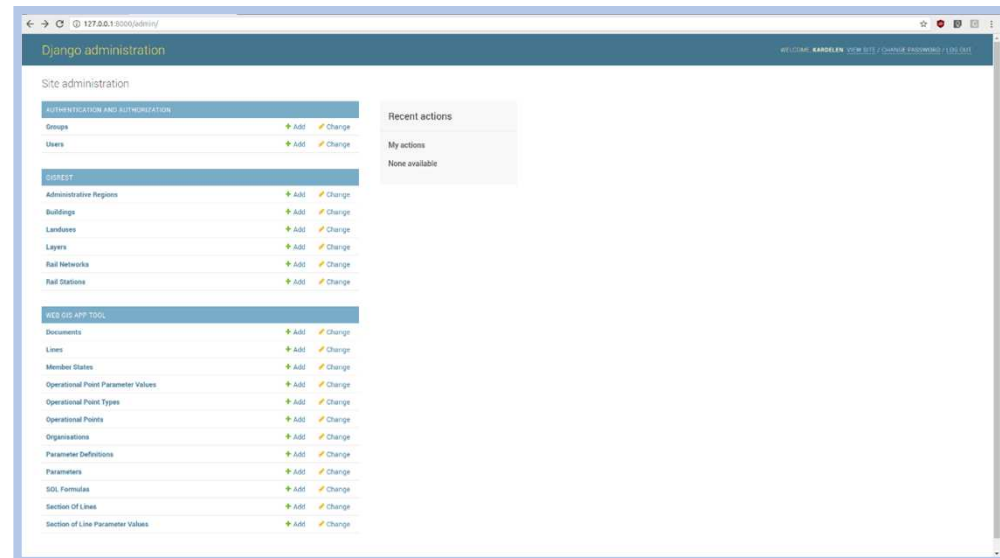


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WEB APPLICATION: REGULAR USER & ADMINISTRATOR INTERFACES



Regular User Interface



Administrator Interface

WEB APPLICATION: NAVIGATE GIS-BASED WEB APPLICATION



The screenshot displays the NetIRail web application interface. At the top, there is a navigation menu with links for Home, Browse, Application, Master, and About. The user is logged in as 'kardelen'. The main area features a satellite map of Europe with a dense network of purple lines representing rail lines. A legend on the right side of the map lists various layers: Street map, OpenStreet, Satellite, Points of Interest (Stations, Halts), and Economic layers (Population, GDP). The interface includes standard map controls like zoom in/out and a location pin. A scale bar at the bottom left indicates 500 km. The text 'Regular User Interface' is visible in the bottom right corner of the map area. The footer contains the text 'Leaflet | Powered by © NetIRail project, RailMacro Grid Layer'.

WEB APPLICATION: NAVIGATE GIS-BASED WEB APPLICATION



The screenshot displays the NetIRail web application interface. At the top, the browser address bar shows the URL `127.0.0.1:8000/#`. The application header includes the NetIRail logo, navigation links (Home, Browse, Application, Master, About), and a user greeting (Welcome, karden) with a logout option. The main content area features a map of Europe with a dense network of purple lines representing rail lines and orange circular markers indicating stations. The markers are labeled with numbers, such as 177, 291, 146, 24, 153, 377, 245, 111, 220, 85, 11, 790, 1981, 1157, 405, 270, 372, 619, 26, 6, 250, 62, 3494, 499, 450, 1222, 1226, 916, 280, 128, 678, 348, 64, 62, 91, 330, 576, 831, 217, 600, 554, 164, 600, 207, 422, 56, 91, 304, 309, 171, 155, 121, 14, 211, 9. The map includes a scale bar for 300 km and a legend on the right side. The legend is organized into three sections: 'Map style' with options for Street map (selected), OpenStreet, and Satellite; 'Points of Interest' with checkboxes for Stations (checked) and Halts; and 'Economic layers' with options for Population and GDP. The text 'Regular User Interface' is overlaid in the bottom right corner of the map area. At the very bottom, a footer reads 'Leaflet | Powered by © NetIRail project, RailMacro Grid Layer'.

WEB APPLICATION: NAVIGATE GIS-BASED WEB APPLICATION



The screenshot displays the NetIRail web application interface. The browser address bar shows the URL `127.0.0.1:8000/#`. The application header includes the NetIRail logo and navigation links: Home, Browse, Application, Master, and About. A user greeting "Welcome, kardelen" and a "logout" link are visible in the top right corner.

The main content area features a map of Europe with a rail network overlay. The map is color-coded by economic layers, with a legend on the right side. The legend includes the following sections:

- Map Style:** Street map (selected), OpenStreet, Satellite
- Points of Interest:** Stations, Halts
- Economic layers:** Population, GDP

The map shows a dense network of rail lines across Europe, with a 300 km scale bar in the bottom left corner. The text "Regular User Interface" is overlaid in red at the bottom right of the map area. The footer of the application reads "Leaflet | Powered by © NetIRail project, RailMacro Grid Layer".

WEB APPLICATION: NAVIGATE GIS-BASED WEB APPLICATION



The screenshot displays the NetIRail web application interface. At the top, there is a navigation menu with 'Home', 'Browse', 'Application', 'Master', and 'About'. The address bar shows '127.0.0.1:8000/#'. The main content area is a GIS map of Europe, showing a network of red dots representing stations and purple lines representing rail lines. The map is overlaid with various economic layers, including population and GDP. A legend on the right side of the map lists the following layers and controls:

- Street map (selected)
- OpenStreet
- Satellite
- Points of Interest
 - Stations (checked)
 - Halts
- Economic layers
 - Population
 - GDP

At the bottom right of the map, the text 'Regular User Interface' is displayed. The map also includes a scale bar (20 km) and a 'Powered by © NetIRail project' watermark.

WEB APPLICATION: NAVIGATE GIS-BASED WEB APPLICATION



The screenshot displays the NetIRail web application interface. At the top left, the NetIRail logo and a 'Home' button are visible. On the top right, the user is logged in as 'Lucian Emanuel Anghel lucian' with a 'logout' link. The main area is a map of the Paris region, showing various rail lines in purple and red. A popup window is open over a specific rail line, displaying the following metadata:

```
osm_id: 259738037,  
code: 6101,  
name: LGV Est européenne,  
fclass: rail,  
operator: SNCF Réseau,  
usage: main,  
highspeed: yes,  
maxspeed: 320,  
electrified: contact_line,  
voltage: 25000,  
frequency: 50,  
bridge: null,  
tunnel: null,  
z_order: 35,  
data_level: micro
```

The map includes standard navigation controls on the left (zoom in, zoom out, full screen, location) and a layer control on the right. A 2 km scale bar is located in the bottom left corner. The bottom right corner of the map area contains the text 'Leaflet | Powered by © NetIRail project'.

Regular User Interface

WEB APPLICATION: NAVIGATE GIS-BASED WEB APPLICATION



NetIRail Home Welcome, Lucian Emanuel Anghel lucian logout

osm_id: 3580945699,
code: 5601,
fclass: station,
name: Mitry-Claye

2 km

Leaflet | Powered by © NetIRail project

Regular User Interface

WEB APPLICATION: INFRASTRUCTURE DATA IMPORT



127.0.0.1:8000/admin/

Django administration WELCOME, KARDELEN [VIEW SITE](#) / [CHANGE PASSWORD](#) / [LOG OUT](#)

Site administration

AUTHENTICATION AND AUTHORIZATION

Groups	+ Add	Change
Users	+ Add	Change

GISREST

Administrative Regions	+ Add	Change
Buildings	+ Add	Change
Landuses	+ Add	Change
Layers	+ Add	Change
Rail Networks	+ Add	Change
Rail Stations	+ Add	Change

WEB GIS APP TOOL

Documents	+ Add	Change
Lines	+ Add	Change
Member States	+ Add	Change
Operational Point Parameter Values	+ Add	Change
Operational Point Types	+ Add	Change
Operational Points	+ Add	Change
Organisations	+ Add	Change
Parameter Definitions	+ Add	Change
Parameters	+ Add	Change
SOL Formulas	+ Add	Change
Section Of Lines	+ Add	Change
Section of Line Parameter Values	+ Add	Change

Recent actions

My actions

None available

127.0.0.1:8000/admin/gisweb/documents/

Administrator Interface

WEB APPLICATION: INFRASTRUCTURE DATA IMPORT



Django administration interface showing a list of existing RINF XML files. The table lists three files:

DOCUMENT URL	TYPE	UPLOADED BY
OP_france_Export20180518095952RINFDataformat.xml	RINF	lucian
OP_Slovenia_Export20180518104942RINFDataformat.xml	RINF	lucian
OP_Germany_Export20180518095154RINFDataformat_KtoX7tp.xml	RINF	lucian

Existing RINF XML files

Local files window showing a file explorer view with a file named "RINF_files" selected.

Local files

Django administration interface showing the 'Add Document' form. The 'Document url' field is highlighted, showing a file path: "OP_Finland_E_...format.xml".

Uploading XML file from local repository

WEB APPLICATION: INFRASTRUCTURE DATA IMPORT



127.0.0.1:8000/admin/gisweb/documents/

Django administration

WELCOME, KARDELEN. VIEW SITE / CHANGE PASSWORD / LOG OUT

Home » Web GIS App Tool » Documents

Select Document to change

ADD DOCUMENT +

Q | Search

Action: ----- Go 0 of 4 selected

Uploaded XML file and RINF data

DOCUMENT URL	TYPE	UPLOADED BY
<input checked="" type="checkbox"/> OP_Finland_Export20180518102531RINFDataformat.xml	RINF	kardelen
<input type="checkbox"/> OP_France_Export20180518095952RINFDataformat.xml	RINF	lucian
<input type="checkbox"/> OP_Slovenia_Export20180518104942RINFDataformat.xml	RINF	lucian
<input type="checkbox"/> OP_Germany_Export20180518095154RINFDataformat_KtoX7bp.xml	RINF	lucian

4 Documents

FILTER

By type

- All
- RINF
- MERITS

RINF Infrastructure data in XML file format are available on <https://rinf.era.europa.eu/rinf>

WEB APPLICATION: MANAGING FORMULAS



127.0.0.1:8000/admin/

Django administration WELCOME, KARDELEN [VIEW SITE](#) / [CHANGE PASSWORD](#) / [LOG OUT](#)

Site administration

AUTHENTICATION AND AUTHORIZATION

Groups	+ Add	Change
Users	+ Add	Change

GISREST

Administrative Regions	+ Add	Change
Buildings	+ Add	Change
Landuses	+ Add	Change
Layers	+ Add	Change
Rail Networks	+ Add	Change
Rail Stations	+ Add	Change

WEB GIS APP TOOL

Documents	+ Add	Change
Lines	+ Add	Change
Member States	+ Add	Change
Operational Point Parameter Values	+ Add	Change
Operational Point Types	+ Add	Change
Operational Points	+ Add	Change
Organisations	+ Add	Change
Parameter Definitions	+ Add	Change
Parameters	+ Add	Change
SOL Formulas	+ Add	Change
Section Of Lines	+ Add	Change
Section of Line Parameter Values	+ Add	Change

Recent actions

My actions

None available

127.0.0.1:8000/admin/gisweb/documents/

Administrator Interface

WEB APPLICATION: MANAGING FORMULAS



Change SOL Formula | Django site

127.0.0.1:8000/admin/gisweb/formula/2/change/

Django administration WELCOME, LUCIAN EMANUEL. VIEW SITE / CHANGE PASSWORD / LOG OUT

Home > Web GIS App Tool > SOL Formulas > 2

Change SOL Formula HISTORY

Formula Name:

Math Expression Of Formula:

`sum(1.2+Log(p1)+exp(p2))`

Formula

PARAMETERS OF FORMULAS

Parameters of Formula: 3 Delete

Parameter: Choice of infrastructure parameter

The parameter name in the formula:

Parameters of Formula: 4 Delete

Parameter:

The parameter name in the formula:

Parameters of Formula: 5 Delete



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Questions

NeTIRail



Thank you for your attention

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