Economic and Social Council

Economic Commission for Europe

Inland Transport Committee

Working Party on Transport Trends and Economics

Thirty-fifth session
Geneva, 5–7 September 2022
Item 4 (a) of the provisional agenda
Transport infrastructure data:
International Transport Infrastructure Observatory

International Transport Infrastructure Observatory – A user manual and user experience survey

Note by the secretariat

I. Introduction

1.   Under the auspices of the Working Party on Transport Trends and Economics (WP.5), an ECE-led International Transport Infrastructure Observatory (ITIO) has been established in cooperation with the United Nations Economic and Social Commission for Western Asia (ESCWA), the Economic Cooperation Organization secretariat, and the Centre for Transportation Studies for the Western Mediterranean (CETMO). ITIO which has been funded through the Islamic Development Bank (IsDB) is available at https://ITIO-GIS.org.

2.   ITIO offers a Geographic Information System (GIS) platform hosting data on transport infrastructure networks and nodes across different modes including road, rail, inland waterways, ports, airports, intermodal terminals, logistics centres and border crossing points from across the Europe, Asia, Middle East, Western Mediterranean and North Africa regions. It operates as a virtual marketplace for financing transport infrastructure by providing an electronic interface between Multilateral Development Banks and Government and it promotes regional and inter-regional cooperation between and among transport infrastructure initiatives.

3.   The Inland Transport Committee at its eighty-fourth session in February 2022 noted with appreciation the ITIO launch and encouraged ECE member States and multilateral development banks operating in the ECE region to join the test phase which had been launched in autumn 2021 and is to continue until the end of 2022. In this regard, the Committee requested the secretariat to continue to provide necessary assistance to national delegates and representatives of other stakeholder entities in conducting these tests, including through providing dedicated accounts for testing. It also requested the secretariat to inform the ITC Bureau and the Committee on the development of ITIO and possible outcomes of the tests once they are finalised.

4.   The present document responds to these requests by ITC as it contains a user manual explaining step by step how to operate and navigate ITIO and edit existing data on transport infrastructure networks. In Annex I, the document contains a user experience survey also

available electronically at: https://www.surveymonkey.com/r/QV327KH. Respondents are encouraged to use the electronic version of the survey to give their feedback. Following up to the request by ITC to provide interested national stakeholders with dedicated accounts for testing, the ECE secretariat has purchased 30 ArcGIS Enterprise Editor Licenses for the next three years.

5. The present document, which, in part, builds further on document ECE/TRANS/2022/20 submitted to ITC this year contains many figures and maps directly derived from the ITIO platform. Any user of ITIO needs to acknowledge the following disclaimer before being able to enter it: "The boundaries and names shown, and the designations used on this map do not imply official endorsement or acceptance by the United Nations." This disclaimer also applies to the figures contained in this document.

II. ITIO user manual

A. User categories, profiles, and functionalities

6. Four user groups are foreseen in the observatory:

(a) Governments;

(b) Multilateral Development Banks (MDBs);

(c) Regional Cooperation Organizations (RCOs);

(d) The wider public.

7. Each of these user groups have access to a distinct set of functionalities, services, and possibilities. For Governments, MDBs and RCOs access will be granted to officially nominated/ accredited representatives only. A username and password will be provided only after receipt of nominations by the secretariat. The public, academia, private sector, independent experts, and others will not have to register but will only have access to high-level data and information. Upon entering ITIO, they may be invited through an optional online survey to provide some background and profile information for statistical purposes (reasons for using the observatory, their location, professional affiliation etc.).

B. Navigate to the ITIO home page[1]

8. Access the ITIO home page:

• Web address: https://gis.unece.org/portal/apps/sites/#/international-transport-infrastructure-observatory;
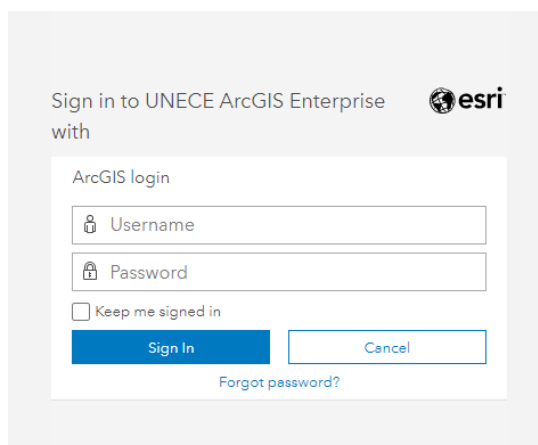
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[1] The design and layout of ITIO has undergone further improvements since its initial presentation at the thirty-fourth session of the Working Party on Transport Trends and Economics (WP.5) in September 2021.
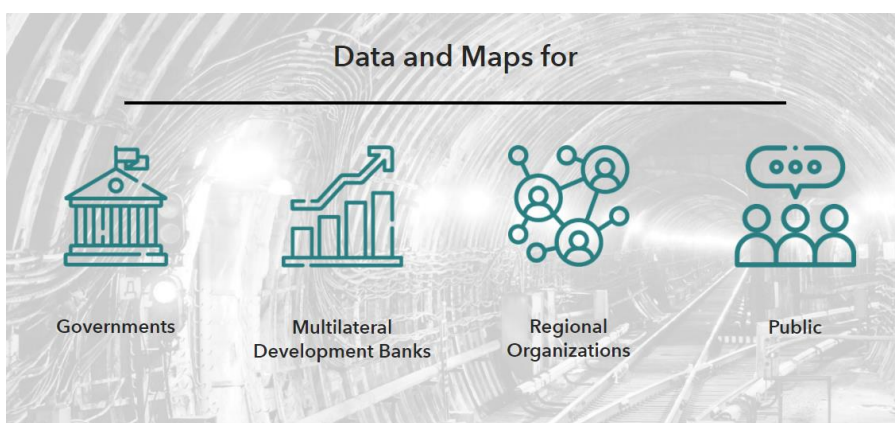
Figure 1
ITIO Home page

Source: ECE

  • Sign in (right upper corner) with the credentials you received from the ECE secretariat.

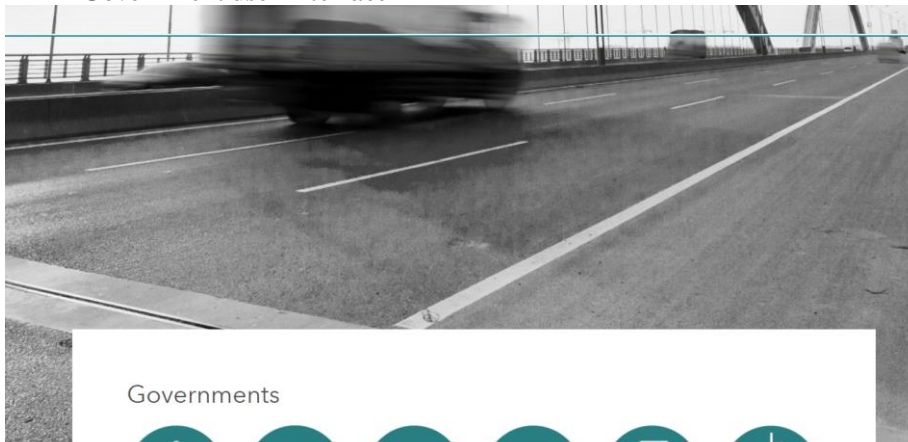9.   Access the data and maps relevant to your user profile:

Figure 2
Illustration of ITIO interface and visualization of the four user groups

Source: ECE

C. Government users

Figure 3
Government user interface

Source: ECE

10. Government users include accredited representatives from Government agencies (e.g. Ministries of Transport, Infrastructure, Public Works and/ or Investment Agencies). Only accredited Government representatives/ national focal points are granted access to the observatory with a username / password.

11. Government users benefit from the following functionalities:

1. Access and edit national data

• Step 1: select the transport networks and nodes button.

• Step 2: a map is automatically generated which visualises a large variety of transport infrastructure networks and nodes across different modes including road, rail, inland waterways, ports, airports, intermodal terminals**,** logistics centres and border crossing points in the Euro-Asian region, the Middle East and North Africa.
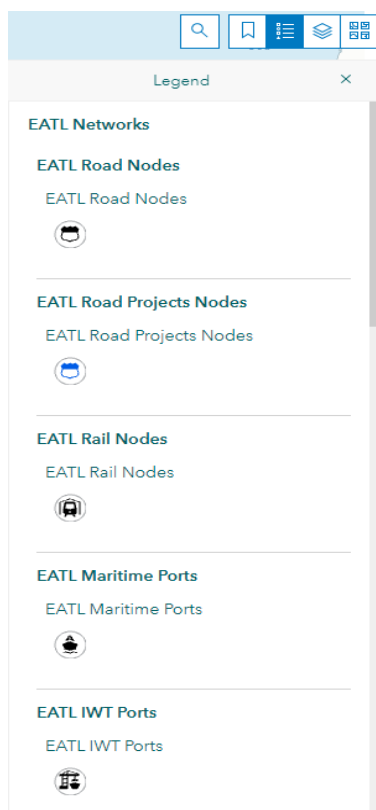
Figure 4
Visualization of the transport networks and nodes application via the Governments user interface

Source: ECE

- Step 3: In the right upper corner of your screen, select the legend to understand the different map symbols and signs.
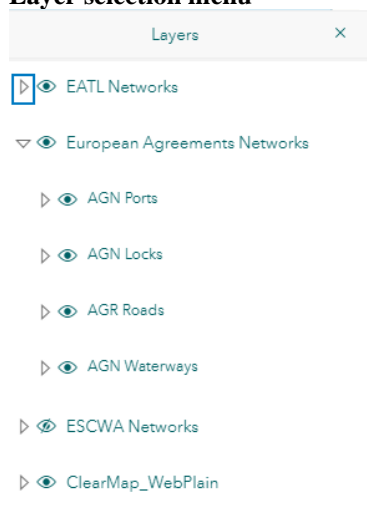
Figure 5
Legend menu

Source: ECE

- Step 4: Select the layers you wish to visualise on the maps (e.g. AGN networks, EATL data, ESCWA data on ports etc.).
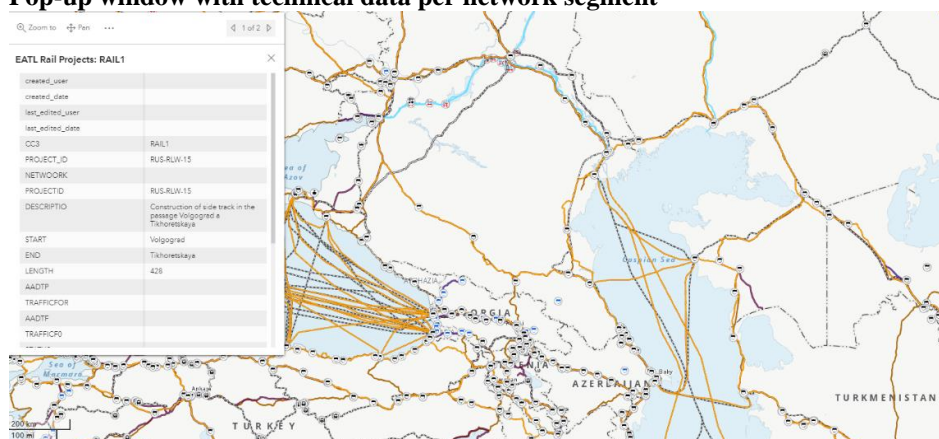
Figure 6
Layer selection menu

Source: ECE

- Step 5: When clicking on specific infrastructure segments, a pop-up window appears with technical data relating to the route.

Figure 7
Pop-up window with technical data per network segment

Source: ECE

2. **Visualize rail and road corridors**

- Steps to be followed include:

  - Step 1: sign in on the home page (as above);

  - Step 2: access to the Government user interface (as above);

  - Step 3: select the "transport corridors" button.

- At this stage ITIO hosts all data related to the nine rail and nine road corridors identified in the framework of the EATL project. It also hosts data on the main rail and road arteries in the ESCWA region as well as data on transport networks in the Western Mediterranean region provided by CETMO.

Figure 8
Transport corridors map
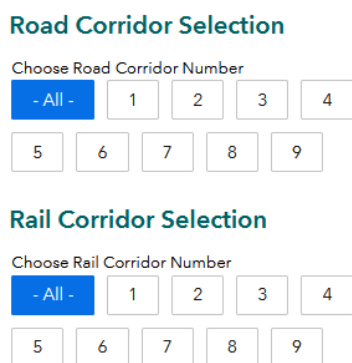

Source: ECE

Figure 9
Main rail and road arteries in the ESCWA region (Middle East, North Africa, Western Mediterranean region

Source: ECE

• Step 4: Road and rail corridor layers can be hidden or activated individually.
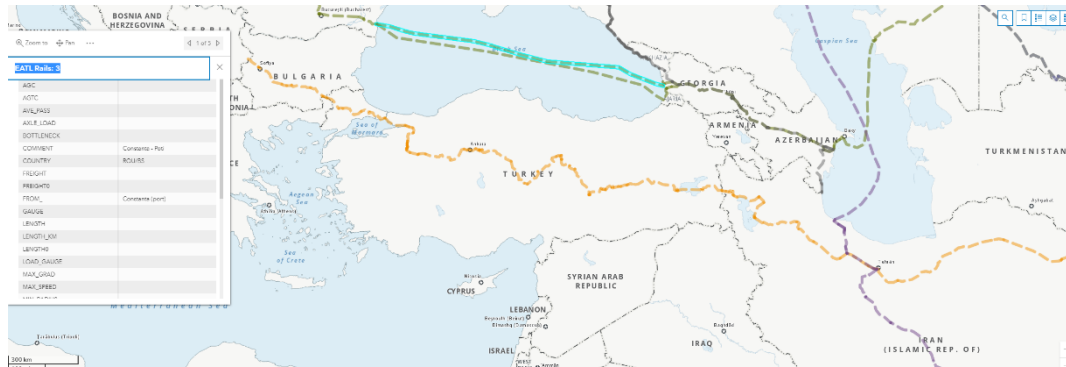
Figure 10
Transport corridors map

Source: UNECE

• Step 5: by clicking on any given (rail or road) corridor, a list of technical data appears.

Figure 11
Corridor specific technical data

Source: ECE

- Corridor specific technical data may include:

  - Whether or not the rail or road link is part of one of the ECE infrastructure agreements (AGC, AGR, AGTC or AGN) or any of the corridor initiatives.

  - Start and end point of the route (from/ to) as well as its total length, average daily passage, and the countries it transits through.

  - Maximum axle load, gauge width, number of tracks, maximum speed, maximum train length etc.

3.   Create new transport infrastructure projects to be uploaded for fundraising purposes

- Steps to be followed include:

  - Step 1: sign in on the home page (as above);

  - Step 2: access to the Government user interface (as above);

  - Step 3: select the "submit new transport infrastructure projects" button;
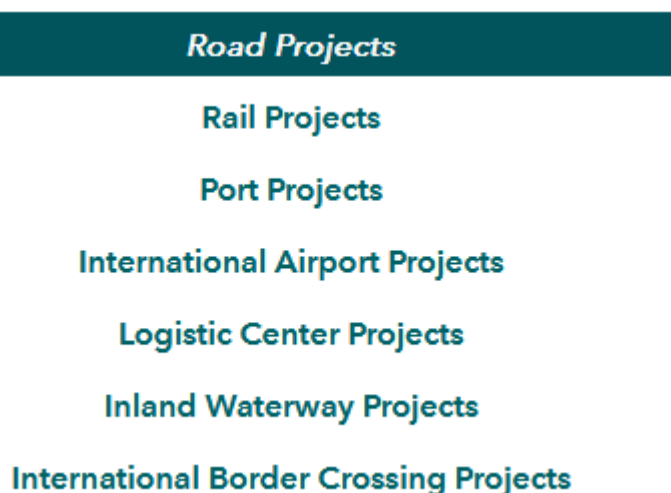

Add new Transport Infrastructure Projects.

  - Step 4: a dashboard application shows where the Government user can select in the left menu any of the following transport modes;

Figure 12
Selection of buttons on the dashboard function

Road Projects

Rail Projects

Port Projects

International Airport Projects

Logistic Center Projects

Inland Waterway Projects

International Border Crossing Projects

Source: ECE

- Step 5: Once a mode has been selected from the options above, a pop-up window appears requiring specific data fields to be filled;

Figure 13
Application to upload new transport projects, data fields to be filled pop-up

Source: ECE

- Step 5a - Data fields to be filled for road projects, includes Section 1 "Route technical characteristics" and Section 2 "Project information". While section 2 is identical for project proposals relating to all modes of transport, section 1 differs by mode.

Section 1. Route Technical Characteristics:

1. Location (latitude/longitude)

2. Start point/node/city

3. End point/node/city

4. Major intermediate (economic) centres

5. Road Classification

6.   Length (in km)

7.   Number of carriageways

8.   Number of lanes

9.   Design Speed/Average speed (km/h)

10.   Annual Average Daily Traffic

11.   Estimated percentage of freight vehicles

12.   Annual Average Daily Traffic (passengers)

13.   Annual Average Daily Traffic (tons)

14.   Minimum overbridge height clearance

15.   Maximum axle load

16.   Road toll implementation

Section 2. Project Information

17.   Project cost (USD)

18.   Expected Starting Date

19.   Expected Completion Date

20.   Internal Rate of Return (IRR)

21.   Project's stage: Construction Tendering Study/Design

Planning Identification

22.   Expected Funding Sources (and the percentage of funding for each one)

23.   Importance to regional connectivity, national economy, and social needs

    • Step 5b - Data fields to be filled for railway projects, include:

Section 1. Route Technical Characteristics:

1.   Location (latitude/longitude)

2.   Start point/node/city

3.   End point/node/city

4.   Length (in km)

5.   Track gauge (mm)

6.   Number of tracks

7.   Traction: Electrified Non-Electrified

8.   Signalling type: Automatic/Manual

9.   Maximum allowed speed - passenger trains

10.   Maximum allowed speed - freight trains

11.   Average Daily Train Traffic - Passenger trains

12.   Average Daily Train Traffic - Freight trains

13.   Volume of cargo moved (tons and TEUs)

14.   Number of passenger journeys

    • Step 5c - Data fields to be filled for inland waterway projects include:

Section 1. Route Technical Characteristics:

Route Name: Waterway name: Network e.g. (a) EATL Route: (b) other international route: (c) national importance: (d) combination of (a), (b), (c).

Route Description:

Section 1. Project Technical Characteristics:

1. Location (latitude/longitude or alternatively a map)

2. Start point/node/city

3. End point/node/city

4. Length (in km)

5. Maximum admissible at Low Navigable Water Level (LNWL)

6. Minimum bridge clearance at High Navigable Water Level (HNWL)

7. Lock dimensions

8. Permitted operational speed (km/h)

9. Annual vessel traffic

10. Annual freight tonnage

    Specific data fields also need to be filled for ports, airports, logistics centres and border crossings.

    • Step 6: Right after all data fields have been filled, a new project immediately becomes visible on the map, when clicking through on this new link a pop-up box appears with relevant technical data.

Figure 14
Application to upload new transport projects
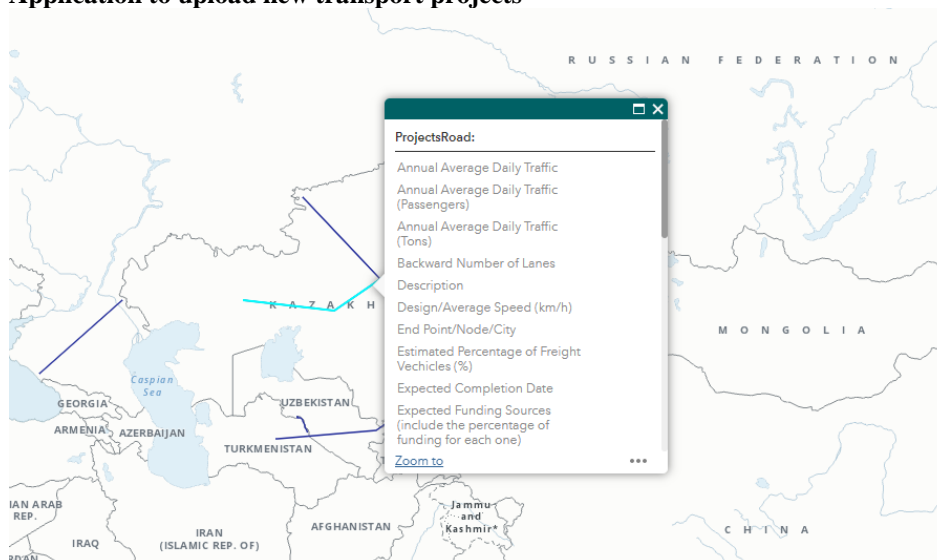


Source: ECE

4. **Update existing ITIO Networks**

12. This feature is limited to the users from the Governments group. The edited data (such as updating information of EATL corridors or projects) will be periodically submitted to the secretariat for review.

    • Step 1: sign in on the home page (as above);

    • Step 2: access to the Government user interface (as above);

- Step 3: select the "update or revise your Networks" link or the "Update Existing ITIO Networks" tab if you are already on the map application;

- Select the layer to edit then click on the "Smart Editor" icon;
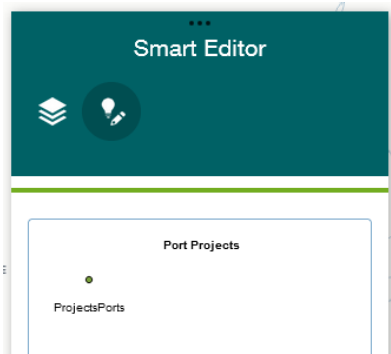
- Select the feature (point or line) on the map to edit, and change the relevant attributes values:
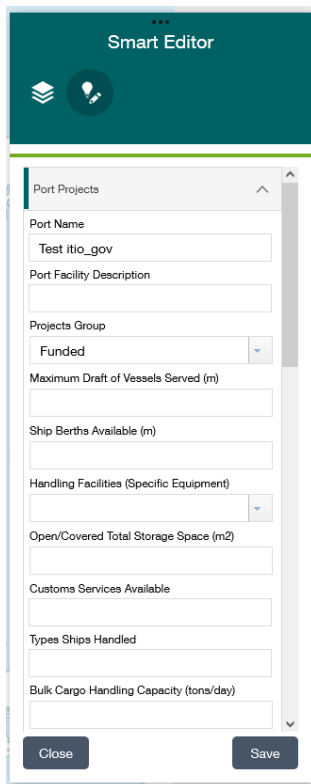
- If necessary, check the box "Edit Geometry" to move the feature on the map;

- Once you have finished, click the "Save" button.

5.   Visualise on a map the international legal instruments they are party to

- Step 1: sign in on the home page (as above);

- Step 2: access to the Government user interface (as above);

- Step 3: select the "International Conventions and Agreements button" button;

- Step 4: an interactive dashboard function appears with different functionalities;
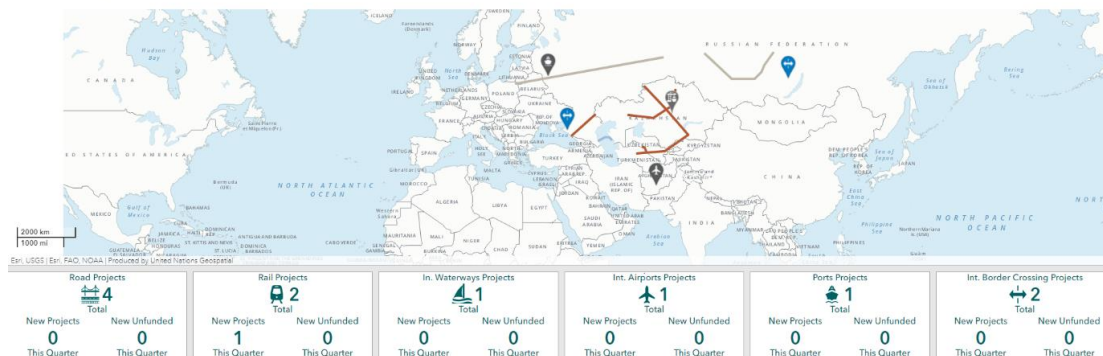
Figure 15
Interactive dashboard
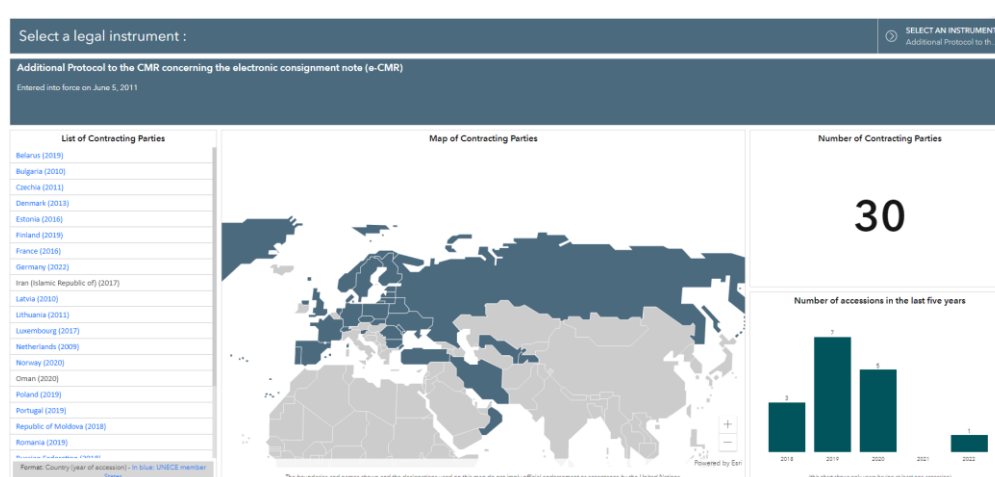
Source: ECE

- Step 5: in the right upper corner, select a legal instrument and the list of contracting parties appears both on the map and in a written, click-through list. A chart also shows indicating the number of accessions to that particular instrument over the last 5 years etc.

6. **Take stock of the funding status of project proposals**

- Step 1: sign in on the home page (as above);

- Step 2: access to the Government user interface (as above);

- Step 3: select the "submit new transport infrastructure projects" button;

- Step 4: as s sub-function click through and get access to an interactive dashboard function showing all information related to project proposals and their funding status. At this stage, for Government users it will also be possible to see which MDBs have accessed their proposals/ left comments, raised questions or left contact data for follow up.

Figure 16
Dashboard function with all information related to project proposals (at national and regional level) as well as their funding status

Road Projects	Rail Projects	In. Waterways Projects	Int. Airports Projects	Ports Projects	Int. Border Crossing Projects
4 Total	2 Total	1 Total	1 Total	1 Total	2 Total

New Projects	New Unfunded	New Projects	New Unfunded	New Projects	New Unfunded	New Projects	New Unfunded	New Projects	New Unfunded	New Projects	New Unfunded
0	0	1	0	0	0	0	0	0	0	0	0
This Quarter	This Quarter	This Quarter	This Quarter	This Quarter	This Quarter	This Quarter	This Quarter	This Quarter	This Quarter	This Quarter	This Quarter

Source: ECE

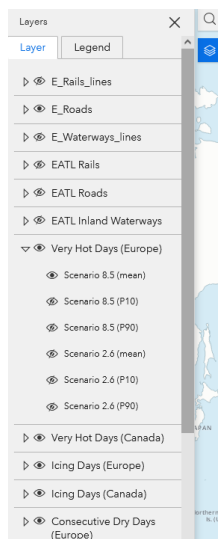## 7. Climate change impact

Step 1: sign in on the home page (as above);

Step 2: access to the Government user interface (as above);

Step 3: select the "adaptation for transport networks and nodes" button;

Step 4: select the different transport infrastructure and climate related layers you as a Government wishes to assess;

Figure 17
Drop down menu for Government users to select which transport infrastructure and climate related layers they wish to visualise

Source: ECE

Figure 18
Based on the selected layer a map with hot spots appears
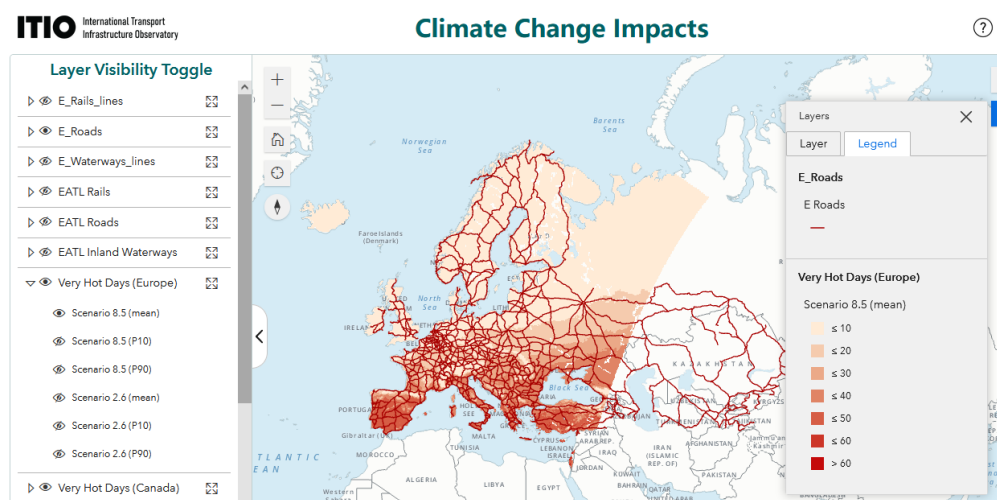
Source: ECE

- Step 5: In the Observatory, changes in indices as proxies for impacts of climate change are overlain with transport infrastructure data. In this way, areas in which infrastructure may be at risk due to climate change and extreme weather events can be visualized. Based on this risk assessment Governments and/ MDBs can then either suggest or introduce additional technical measures adapting their infrastructure projects to these climate change impacts or relocate their project(s).

8. Other initiatives and applications

- GIS data of national cycling networks is being collected in the framework of the ongoing efforts on the development of an infrastructure module of the Transport, Health and Environment Pan-European Programme (THE PEP) European Cycling Master Plan. All the gathered data so far has been made available.

- In the user dashboard function a cycling network tab is available (see below), when clicking through, data on national cycling networks from a number of countries in the region appears.
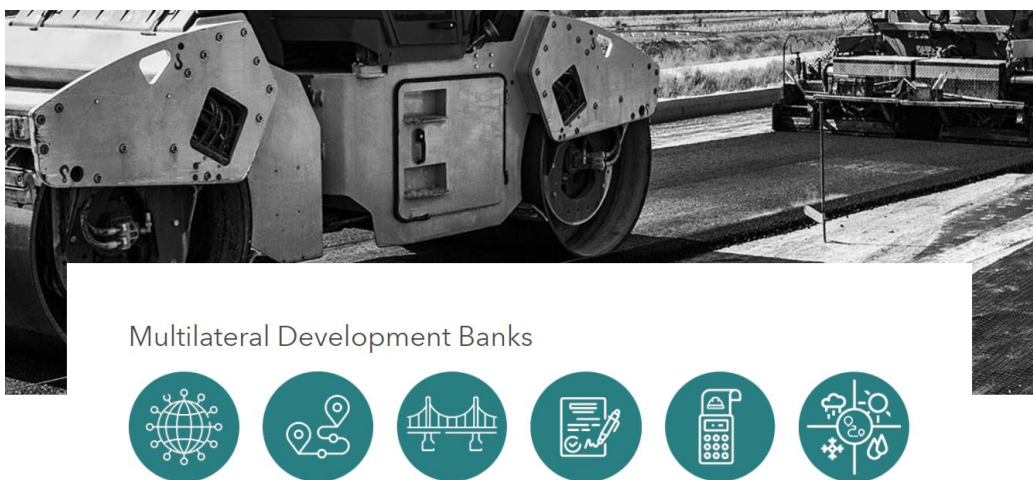
Figure 19
All GIS data of national cycling networks collected so far is visible in this map

Source: UNECE

D. Multilateral Development Banks

Figure 20
Multilateral Development Banks user interface

Source: ECE

13. Similar to Government users, also accredited users from MDBs and other interested donors will receive their own password / username in order to access and navigate the observatory and use its functions. This user category has access to all information made

available by Government users and Regional Cooperation Organizations but without being able to edit data.

14.	An interface exists for each MDB user tailored to their needs and specific funding criteria with an overview of all functionalities available to them, including:

- Access to country profiles, providing general statistical information for each country;

- Access to Governments / Regional Cooperation Organizations submitted information about new transport infrastructure projects;

- Access to fully developed infrastructure projects available for funding;

- Creation of an MDB funding portfolio (projects already funded by the bank);

- Access to other MDBs funding portfolios in a specific country or region;

- Communication channels with National Focal Points per country;

- Communication channels with counterparts in other MDBs.

Figure 21
MDBs can select from a drop-down menu the countries in which they have a funding interest, the national network of that specific country then visualises on the map
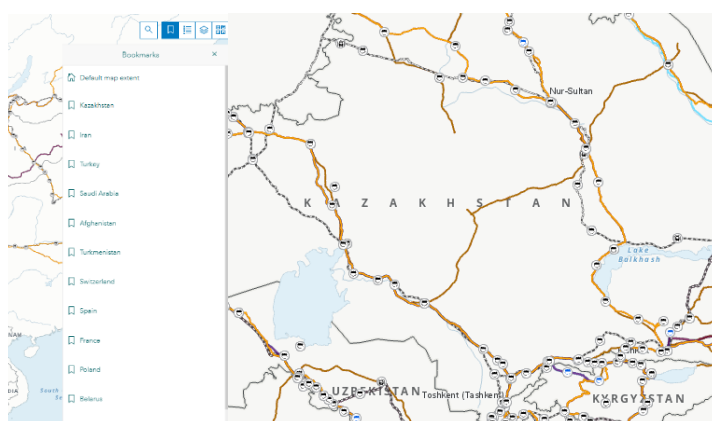
Source: ECE

15.	For MDBs a functionality is available enabling them to compare studies and project proposals of different countries in order to understand:

- Estimated cost/ price differences among projects of a similar nature;

- Economic viability of specific projects vis-à-vis other projects;

- Infrastructure standards used at national/regional level;

- International legal instruments in use at national/ regional level.

Figure 22
Multilateral Development Banks access to new projects available for funding, its existing portfolio as well as projects funded by other MDBs and designated contact forms to reach out to other users
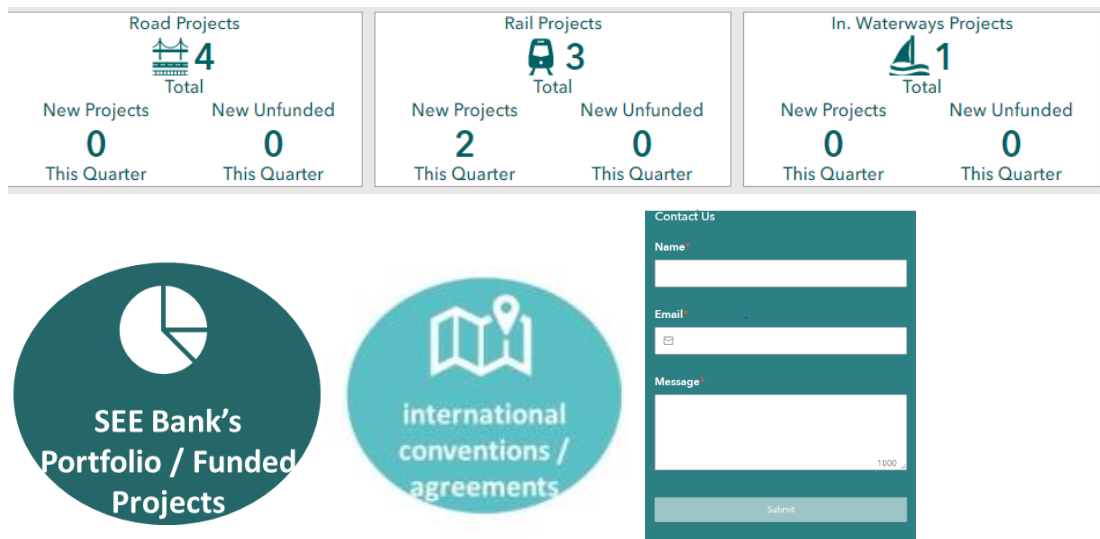
Source: ECE

E. Regional Cooperation Organizations

Figure 23
Regional Cooperation Organization interface

16.   Similar to Government and MDB users, also accredited users from RCOs will receive their own password / username and credentials for the Observatory.

17.   This user category has access to all information made available by Government users and Regional Cooperation Organizations but without being able to edit this data. They are however able to upload their own infrastructure initiatives.

18.   RCOs can:

• Upload geo-coded data (directly onto the corridor application);

• Access to country profiles in their region;

• Access to region specific profiles;

• Access to fully developed infrastructure projects available for funding (in their region);

• Projects being funded by MDBs in a specific country or region;

• Communication channels with National Focal Points per country;

• Communication channels with counterparts in other RCOs/ MDBs.

Figure 24
In addition to the currently available corridor initiatives, additional RCO networks could be uploaded as well

Source: ECE

F. General public

Figure 25
Public user interface

Source: ECE

19. General public: the observatory and the illustration of transport infrastructure data is available to all interested users, also including academia and the private sector.

- For the general public no security level/ permissions are required since they only have access to high-level data and maps vetted and approved by Governments. Depending on Government consent, an overview of already funded/ongoing infrastructure projects (including data on nature and technical parameters of the project, estimated timescales and associated budget as well as donors) could be made available publicly.

- General public users would not be able to edit the data or access technical data fields. To a limited extent they will be able to generate charts and tables comparing infrastructure investments by region or mode.

Figure 26
For public viewers only high-level network data is available

Source: ECE

III. Guidance by the Working Party

20.   Ahead of its thirty-fifth session, the Working Party is invited:

(a)   To contact (if not yet done so) at individual country-level the ECE secretariat to request an ITIO user account and password.

(b)   To share its preliminary ITIO user experience, identify areas for improvement and define additional features that could be developed, either through filling out the online survey or by providing oral feedback during the discussions under agenda item 4 (a).

Annex

ITIO user experience questionnaire

The International Transport Infrastructure Observatory (ITIO) is an online application which uses a Geographical Information System. It allows users to browse maps and access geographical data on a large variety of transport infrastructure networks and nodes across different modes including road, rail, inland waterways, ports, airports, intermodal terminals.

1.   Please enter your contact details (mandatory)

Name

Organization

Country

Email Address

Phone Number

2.   How likely is it that you would recommend the ITIO to an institutional or private partner involved in transport infrastructure?

Not at all likely   Extremely likely

0   1   2   3   4   5   6   7   8   9   10

3.   How satisfied are you with the information and usefulness of the ITIO homepage (ITIO-GIS.org)?

Extremely satisfied

Very satisfied

Somewhat satisfied

Not so satisfied

Not at all satisfied

Other (please specify)

4.   How satisfied are you with the information and usefulness of the map "ITIO Network and Nodes" (first tab on the left in the bottom menu)?

Extremely satisfied

Very satisfied

Somewhat satisfied

Not so satisfied

Not at all satisfied

Other (please specify)

Please share your comments on possible improvements for this map here

5.   How satisfied are you with the information and usefulness of the map "ITIO Network Corridors" (second tab on the left in the bottom menu)?

Extremely satisfied

Very satisfied

Somewhat satisfied

Not so satisfied

Not at all satisfied

Other (please specify)

Please share your comments on possible improvements for this map here

6.   How satisfied are you with the information and usefulness of the map "ITIO Projects" (third tab on the left in the bottom menu)?

Extremely satisfied

Very satisfied

Somewhat satisfied

Not so satisfied

Not at all satisfied

Other (please specify)

Please share your comments on possible improvements for this map here

7.   How satisfied are you with the information and usefulness of the map "ITIO Projects Creation" (fourth tab on the left in the bottom menu)?

Extremely satisfied

Very satisfied

Somewhat satisfied

Not so satisfied

Not at all satisfied

Other (please specify)

Please share your comments on possible improvements for this map here

8.   Which profile did you use to access the ITIO app?

Government

Multilateral Development Bank

Regional Organizations

9.   How satisfied are you with the information and usefulness of the map "Update Existing ITIO Networks" (fifth tab on the left in the bottom menu)?

Extremely satisfied

Very satisfied

Somewhat satisfied

Not so satisfied

Not at all satisfied

Other (please specify)

Please share your comments on possible improvements for this map here

10.   How satisfied are you with the information and usefulness of the map "Update ITIO Projects" (fifth tab on the left in the bottom menu)?

Extremely satisfied

Very satisfied

Somewhat satisfied

Not so satisfied

Not at all satisfied

Other (please specify)

Please share your comments on possible improvements for this map here

11.   Did you notice and understand the explanations given in the left panel "Editing Data Instructions"?

Yes

No

Please share your comments on the help displayed on the left panel

12.   Did you manage to edit data (by changing the value of a network section or node attribute) on this same map (fifth tab on the left in the bottom menu)?

Yes

No

Please share your comments on the editing feature

13.   How satisfied are you with the information and usefulness of the maps "Climate Change Impacts", "Conventions and Agreements", "Cycling Network" (sixth, seventh and eights tabs on the left in the bottom menu)?

Extremely satisfied

Very satisfied

Somewhat satisfied

Not so satisfied

Not at all satisfied

Other (please specify)

Please share your comments on possible improvements for this map here

14.   Do you have any thoughts on how to improve the ITIO app?

15.   Do you think you were the right person (in terms of skills and knowledge) to contact for testing and using the ITIO app?

Yes

No

Other (please specify)

16.   In your organization or company, if you know a person having the relevant professional background for using the ITIO app, would you mind sharing his contact details so that we can contact her/him on your behalf?

Name

Company

Email Address

Phone Number