D.T2.3.7

Evaluation Report: **Version 1.0**

Wielkopolska **08.2020**

The pilot action of the SubNodes project partner The Marshal Office of the Wielkopolska Region (UMWW) is an online platform which enables the collection, storage, sharing and visualization of communication data related to public transport in the Wielkopolska Region as well as an application for handling and settling subsidies for the regional bus passenger transport.

1. Pilot Evaluation - Description

The pilot action was finally implemented in August 2020. Since this date the internet platform http:platformatransportowa.com and the application for handling and settling subsidies for the regional passenger bus transport are working.

The established online platform enables the collection, storage, sharing and visualization of communication data related to public transport in the Wągrowiec County so far as the city of Wągrowiec was during development of the project SUBNODES defined as a subnode.

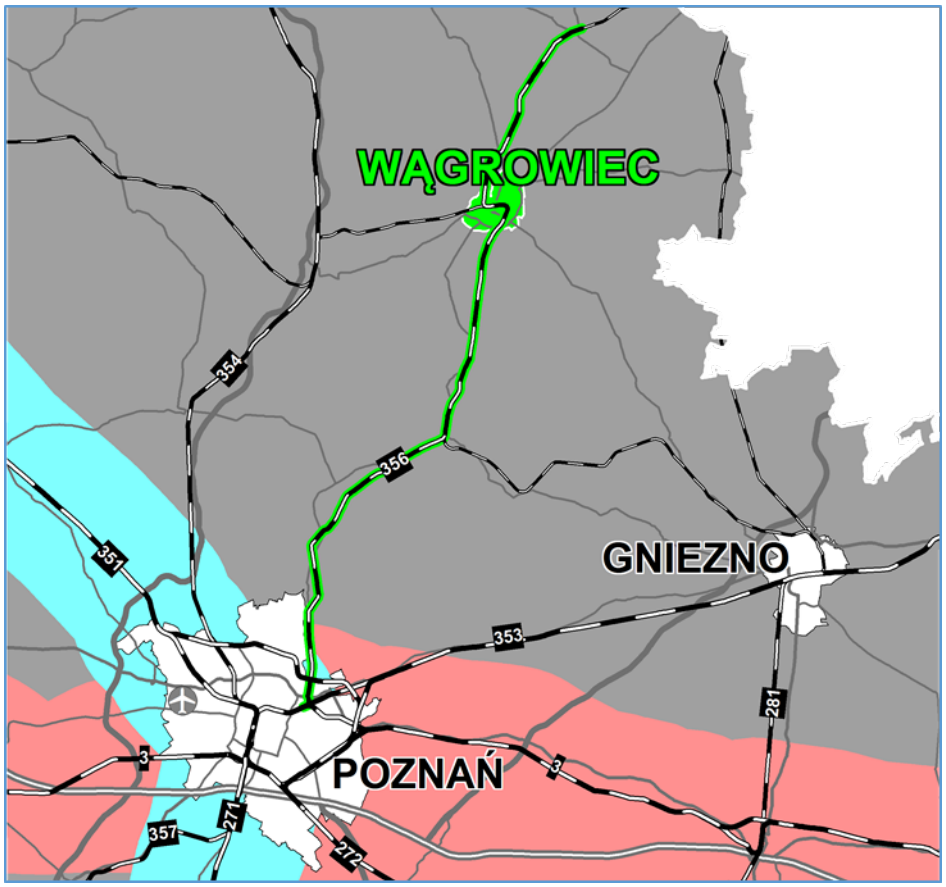

Figure 1. *Subnode Wągrowiec (blue: the Baltic-Adriatic TEN-T Corridor; red: North Sea – Baltic TEN-T Corridor; green: local railway line number 356)*

Local governments and entities involved in the planning and ongoing implementation of passenger transport in the region will benefit. Data that is unified, collected in one place and made available in a given standard will allow for more efficient coordination of actions and faster decision making. The issuance of an administrative decision by the organizer of public mass transport based on decentralized databases of timetables, stops, and carriers, each time requires to update information at the source of their origin. Obtaining the necessary data is time-consuming and unnecessarily extends the processing time of applications. The people who deal with the analysis, development of transport plans and planning of the connection network meet the same problem on a larger scale. A centralized database is the solution to these problems.

Passengers living in peripheral areas will benefit from providing current and standardized transport data. So far, data on transport connections from these areas has not been and is not yet included in the global communication network (planning a trip from a place of residence away from the main transfer points requires the use of many data sources about communication links). The obstacles are, among others, lack of specialist knowledge, high costs of creating and maintaining local IT systems or lack of uniform databases. Providing passenger information vehicle location monitoring in real time is technically difficult and costly. The possibility of using the IT infrastructure of the Marshal Office of the Wielkopolska Region free of charge by local self-governments facilitates the organization, eliminates the barrier of implementation resulting from the lack of specialized IT knowledge and high costs. At the same time, the data on timetables and the location of vehicles can be made available to existing solutions on the market.

In the case of equipping transport vehicles with GPS locators, information on the current location of vehicles would be directly sent to the IT platform. As a result, the information on the historical location of vehicles gathered in one place (e.g. a monthly history of temporary deviations from the timetable) allows for performing analysis of the implementation of timetables. Such a list can help to identify critical points on routes where deviations from timetables are most common. Ultimately, it allows to optimize the timetable and improve the quality of services. Carriers could use the internet platform on similar terms as local government units. It would not involve any costs and it only requires the use of solutions compliant with the data description standards defined for the platform.

The internet application for handling and settling subsidies for passenger bus transport" allows for comprehensive management of data (viewing, adding, deleting, editing) assigned to the carrier, i.e.

• carrier's details (address, billing, initial balance)

• list of Carrier's employees who have the right to have access to the system

• cash registers

• basic vehicle data

and enables the circulation of documents within the framework of submitted applications for transport refunds (application for a contract, application for a surcharge), including above all:

• the possibility of examining applications submitted by carriers

• the introduction of applications by the Office's staff

• editing of data in submitted applications

• approval/rejection of the application (change of application).

2. Evaluation of Results

The internet platform allows the collection, storage and provision of information on public transport. They consist of information about:

1. Timetables:

a. Routes - name, description, carrier performing the service, type of communication (railway, bus, metro, etc.).

b. Courses - name, description, direction, date of running

c. Times of departures and arrivals at stops.

d. Running calendar

2. Carriers:

a. Name.

b. Contact data.

3. Stops:

a. Name.

b. Description.

c. Longitude and latitude.

d. Type of stop.

4. Vehicle location:

a. Longitude and latitude.

b. Vehicle.

c. Direction.

d. Speed.

e. Service being provided.

The task of the IT platform will be to collect, store and share data. The recipients of the data will be:

1. the Marshal Office of the Wielkopolska Region,
2. offices of communes and counties,
3. carriers,
4. passengers,
5. other beneficiaries (e. g .travel planners).

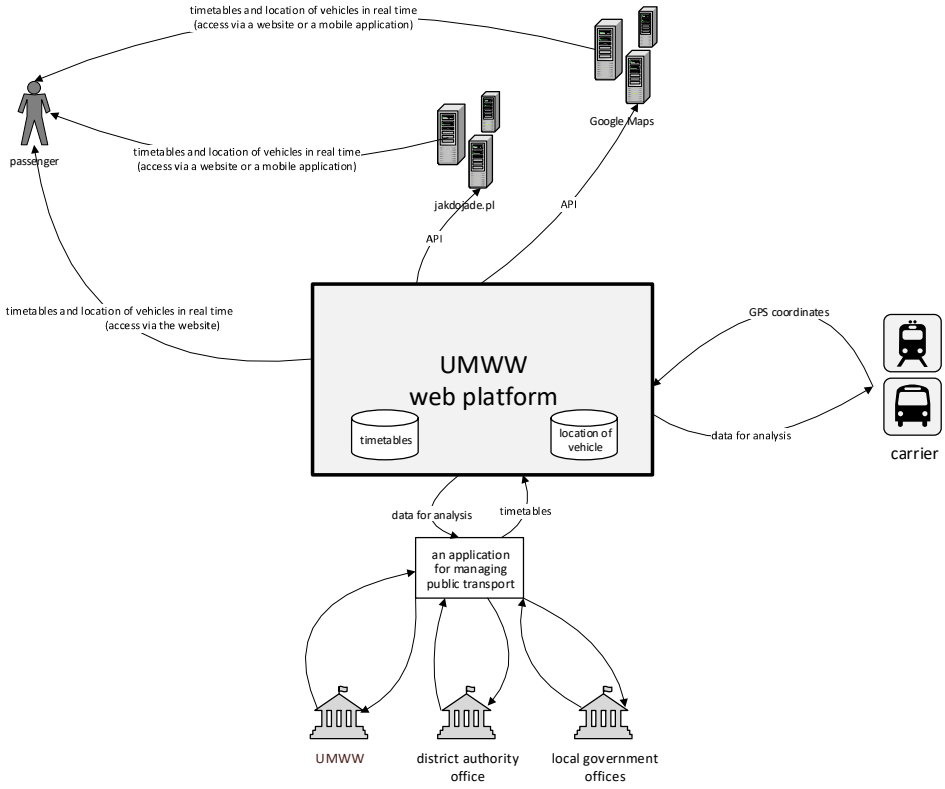

Figure 2. Internet platform – functionality and beneficiaries

The platform has been divided into three functional parts due to the tasks performed by them. The first layer is responsible for the distribution of static content (not requiring data
processing). Static content includes files included in the website (including HTML, CSS, JS, graphic files) and files saved in the GTFS and GTFS RT formats.

The second layer is responsible for the processing of incoming and outgoing data from the system. It makes use of web-based API (Application Programming Interface) services and is responsible for executing the application's business logic, i.e. data validation, information filtering, data aggregation, etc.

The third layer is responsible for storing data in the database. Each layer should operate in a dedicated virtual machine, container or dedicated cloud service.

The platform is providing two types of static files:
-Website files (including HTML, CSS, JS, graphics).
- Files containing information on public transport in GTFS and GTFS RT format.

For sharing files it is advisable to use the HTTP server, for web files and for SFTP server sharing files in GTFS and GTFS RT format. Communication between the client and the server is encrypted using TLS (Transport Layer Security). The SSL certificate issued by the so-called Certificate Authority (CA) is used to encrypt the connection.

The HTTP server acts as a proxy server. It is responsible for providing the API of the application server and possibly API documentation. The HTTP server is responsible for making all content available on the platform. It is serving web files, GTFS files and also acts as a proxy server (intermediary) in API sharing. File sharing in GTFS and GTFS RT format will also be supported using the SFTP server.

The most important functionality of the platform, apart from data storage, is their standardization. The system is to ensure that data from different sources indicate the same information, for example, stops. Each carrier will have the same data but described in various ways. Before the data is made available by the platform, it will be necessary to map them to existing data in the system. Unapproved data is not visible to all users of the system. Only platform administrators and data owners will have access to them.

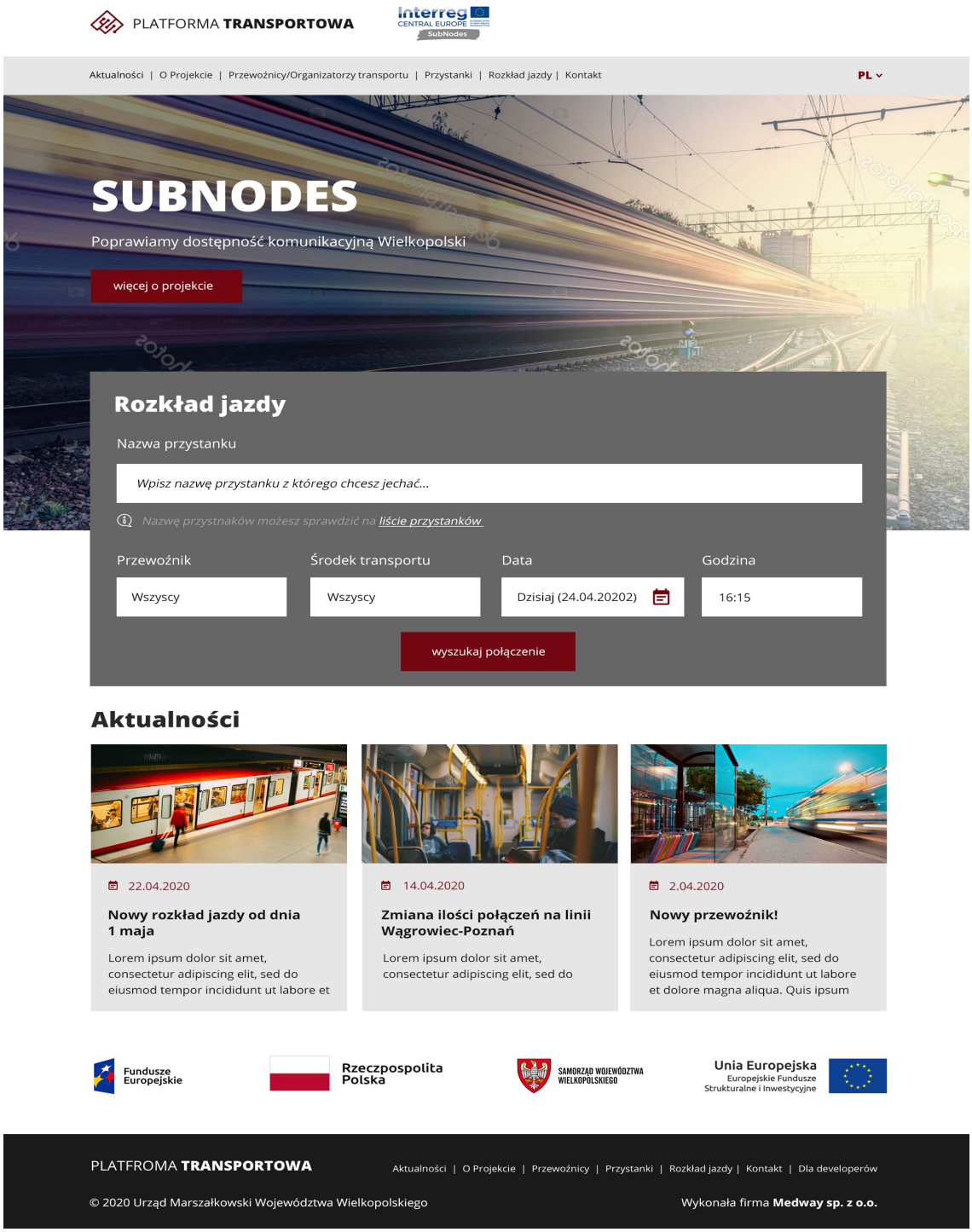

Figure 3. Screen of the transport internet platform first site.

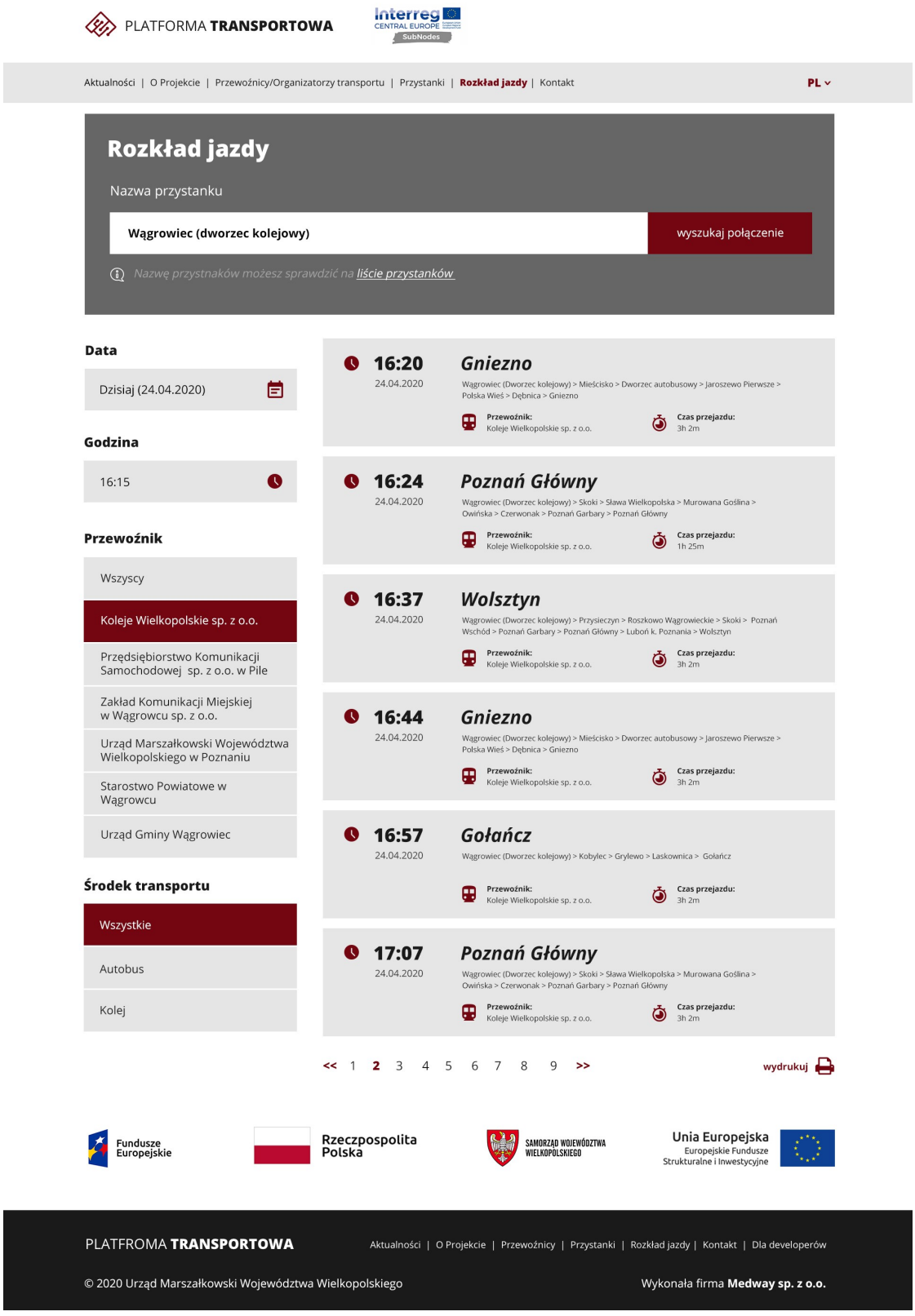

Figure 4. Screen of the transport internet platform time-table.

The Department of Transportation does not have a system to support employees in handling and settling surcharges for passenger transport. All data has so far been aggregated and stored in spreadsheets and in paper form. The application design does not assume the import of historical data held by the Department of Transportation into the system, thus it is not necessary to validate and verify them at the stage of this analysis. The forms currently submitted by the Carriers and the accounting reports prepared by the Department of Transportation employees have been verified as part of this analysis:

-List of vehicles and list of cash registers (spreadsheet)

-Application for a surcharge agreement (Microsoft Word document)

-Monthly application for a surcharge (spreadsheet)

-Transfer to DF (spreadsheet)

-Measuring instruments for the Marshal Office of the Wielkopolska Region (spreadsheet)

- Quarterly report to the the Marshal Office of the Wielkopolska Region (spreadsheet).

-Model agreement (Microsoft Word document).

These documents will form the basis for creating forms in the designed system. These forms were provided to the Contractor to verify and identify additional requirements. The system is in compliance with the adopted legislation, including above all:

a) The Act of 20 June 1992 on the entitlement to concessional journeys by means of public collective transport (Journal of Laws of 2012, item 1138, as amended)

b) Act of 6 September 2001 on road transport (Journal of Laws of 2013, item 1414, as amended)

c) the Civil Code Act of 23 April 1964 (Journal of Laws of 2016, item 380 as amended).

Each carrier have an account in the system, which they set up in person. The carrier will also have a default user. The account is requiring activation by verification of the correctness of the e-mail address. The administrator have a possibility to modify the data entered by the Carrier, while the Carrier have a limited possibility of this edition (change of e-mail address, access password).

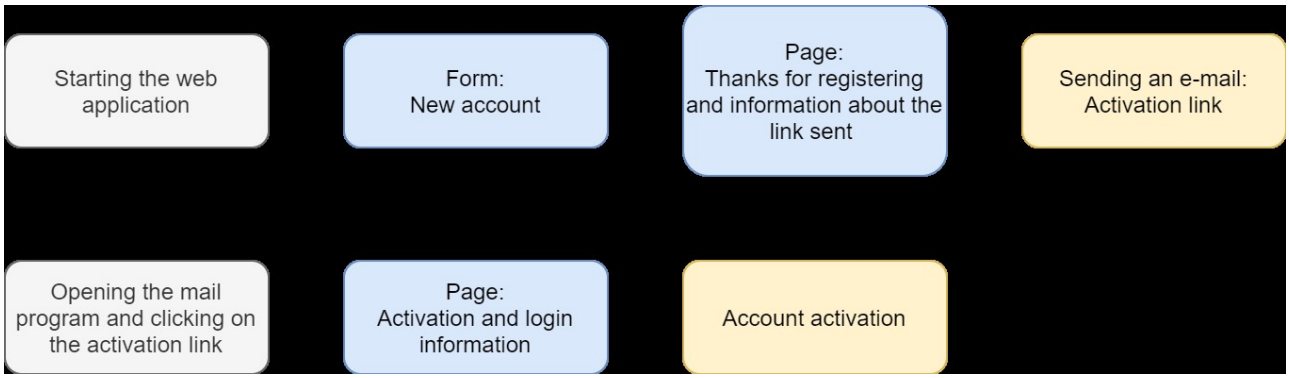

Figure 5. Registration of the Carrier.

The carrier will from now on be able to apply for a new contract, defining a list of its cash registers and vehicles. These data are linked to the contract concluded and not directly to the Carrier. The administrator have the possibility to delete the non-existent cash registers/vehicles, changing their status to "Deleted", but they will still be visible in the system. The administrator is also able to add new cash registers and vehicles to an existing contract. Upon acceptance of the submitted contract application, Carrier's data will be updated in the system.

There are two types of applications under the system:

• contract application - submitted for a given calendar year

• application for a monthly payment - submitted under the contract.

As part of the submitted applications, the Administrator is able to edit each field before the final acceptance of such an application. After its acceptance, it will not have the possibility of further editing.

Within the system, an employee of the Transport Department is able to settle the balance under the Agreement. There are three types of operations within the balance: incoming transfer, outgoing transfer and balance correction. In the case of a balance adjustment (+/-), it is obligatory to add a comment on why such an adjustment is made. New withdrawal orders are generated automatically after the application is accepted by an employee of the Department of Transportation.

The application allows for editing basic system settings, such as document numbering counter, session duration, information about sending documents by mail. Applications that are incorrect are stored in the system, so a user who wants to edit a rejected application can make a copy.

The application enables its launch and proper operation in all popular web browsers in their current versions, i.e. Microsoft Edge, Mozilla Firefox, Opera, Safari, Google Chrome. The application has an interface allowing to use it on mobile and stationary devices with a minimum screen width of 360px.

After completing the application for the contract, the Carrier is to have a PDF document generated, which will print, sign and send to the server its signed scan. The contract is generated by the system with empty fields for entering the date and contract number. Data about the contract (date from, date to) will be entered when activating the contract. Contracts are signed for a given calendar year.

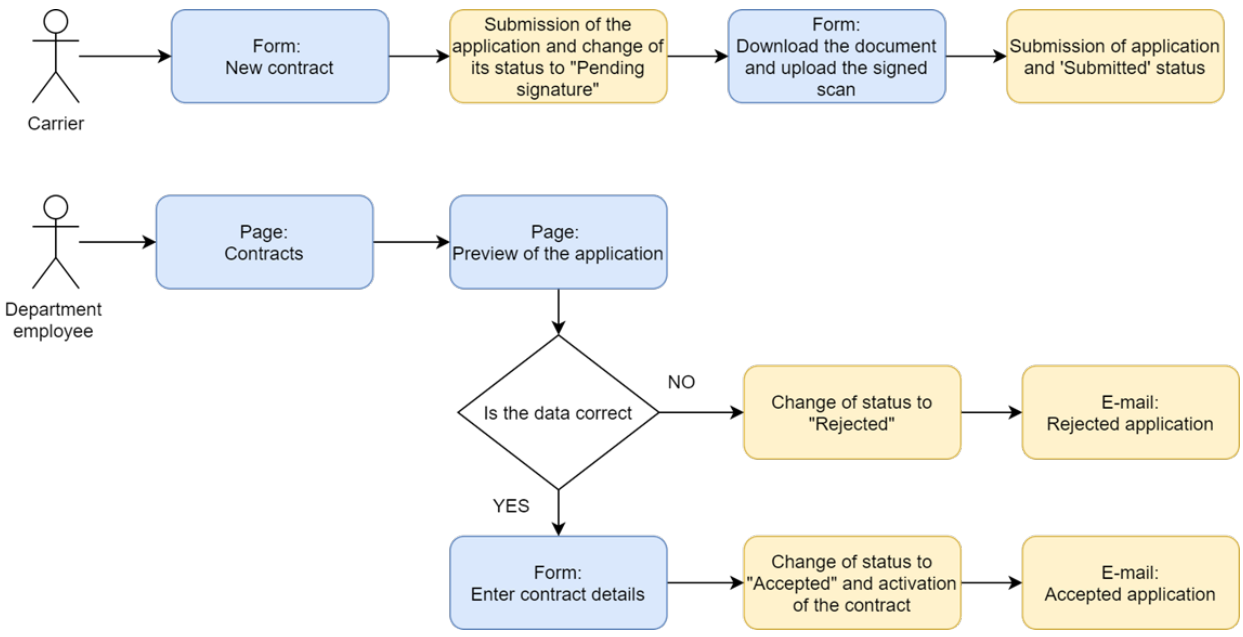

Figure 6. Application for a contract.

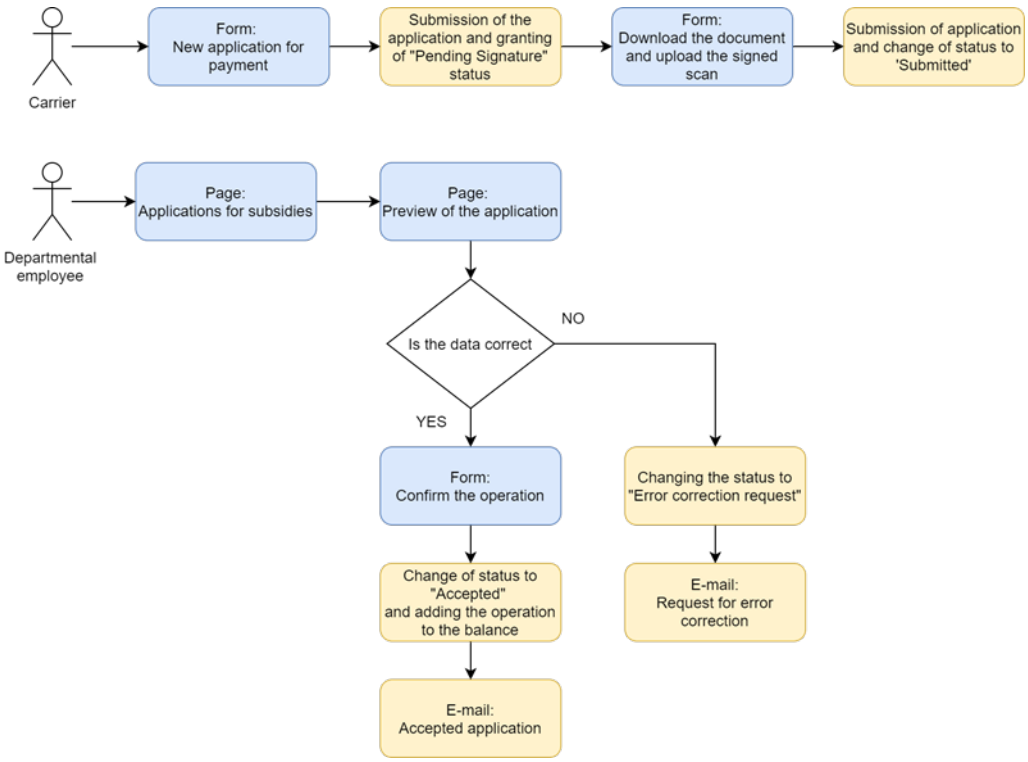

Figure 7. Application for a surcharge.

3. Conclusions

The pilot action of the UMWW is realized successfully. Two IT tools improving the conditions of the public transport in the rural areas are established and will be used and developed next years. For this reason the UMWW has jointed e.g. a consortium of partners from 6 countries and will realize a capitalization project within the range of the Interreg Central Europe called RegiaMobil.

The UMWW has also prepared an 3 minutes animated movie for promotion of the pilot action which is targeted mostly for young people for whom the public transport is atractiv if it is easy to get time table information on the internet.

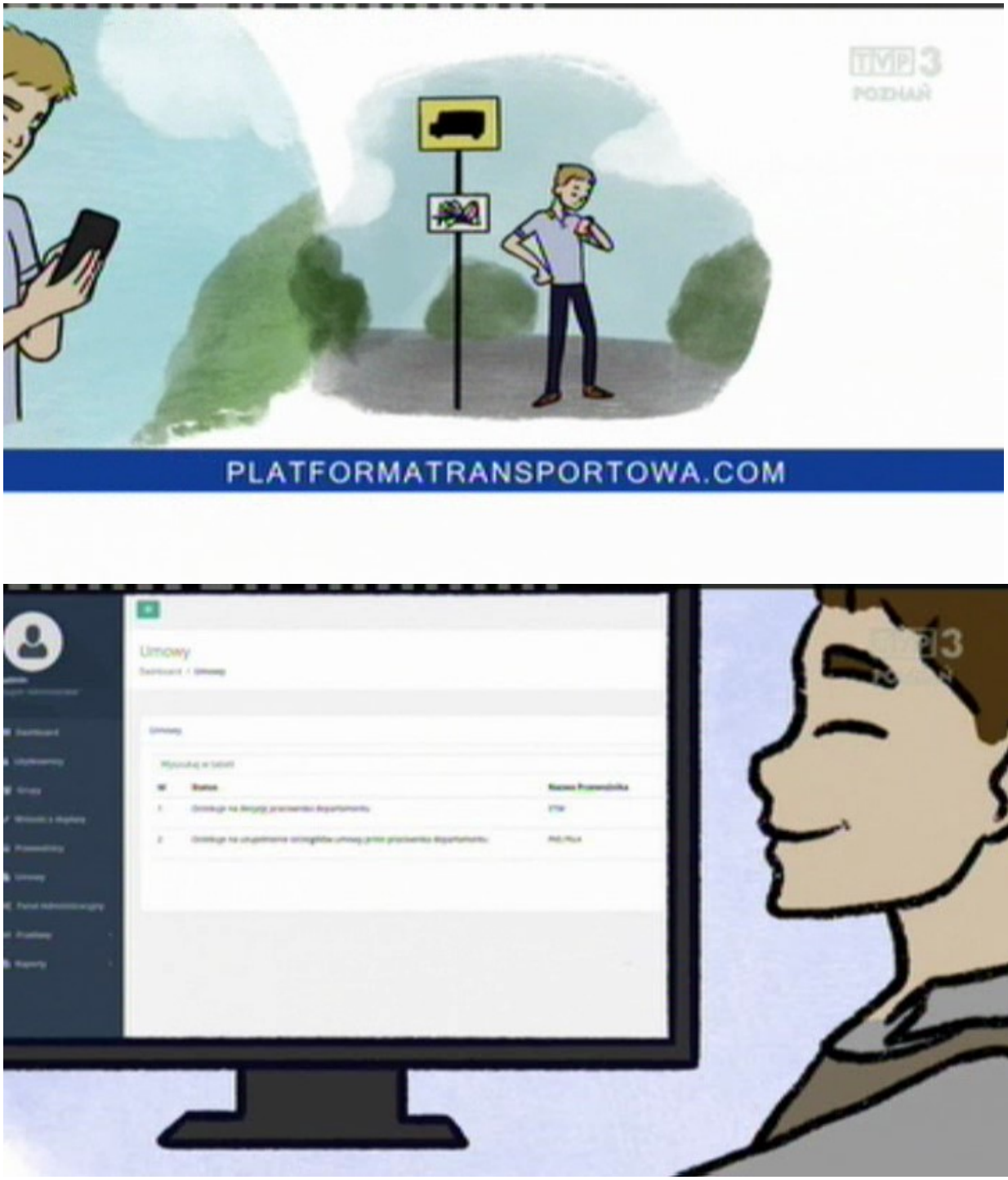

Figure 8 : Screens from the promotional movie