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## THE ROLE OF RAILWAY INFRASTRUCTURE MANAGEMENT IN GLOBALIZATION OF TRANSPORTING MARKETS

### Abstract

*The nature of the international traffic demanded uniting of the rules by which it is being executed. This process is performed by unification aiming to create uniform rules and harmonization/adjustment of rules that were not identical but had a common goal - the opening of the European railway market. The international organizations of the railway infrastructure management play an important role in opening of the railway market and the globalization of the transport market in Europe. When defining the basic questions of the railway infrastructure distribution, European legislation established certain principles and procedures how to determine the cost of the railway infrastructure, by fully respecting the various national development and specific characteristics of national markets. National railway administration has been left in charge of determining individually for each state, the system of cost evaluation and distribution capacity, in compliance with the general principles of the legislation at the EU level.*

*Today the system of distribution of the railway infrastructure functions in a unique space of different railway networks, with increasing role of international organizations of associated management of the railway infrastructure. A special place in the distribution of railway infrastructure capacity belongs to the so-called "tools" of Internet software.*

**Keywords:** globalization, infrastructure managers, European railway market

**JEL Classification:** R40,R41

## УЛОГА УПРАВЉАЧА ЖЕЛЕЗНИЧКОМ ИНФРАСТРУКТУРОМ У ГЛОБАЛИЗАЦИЈИ ТРАНСПОРТНОГ ТРЖИШТА

### Резиме

*Природа међународног саобраћаја захтевала је уједначавање правила по којима се он обавља. Овај процес је извршен унификацијом чији је циљ стварање једнообразних правила и хармонизацијом или усклађивањем прописа која нису идентична али су имала заједнички циљ – отварање европског железничког тржишта. У отварању железничког тржишта и глобализацији транспортног тржишта у Европи значајну улогу имају међународне организације управљача железничком инфраструктуром.*

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*При дефинисању основних питања расподеле железничких инфраструктурних капацитета Европским законодавством одређени су принципи и поступци при утврђивању трошкова железничке инфраструктуре уз пуно уважавање различите националне развијености и посебних карактеристика националних тржишта. Националним железничким управама остављено је да систем утврђивања трошкова и расподеле капацитета државе појединачно одреде али у складу са општим принципима законске регулативе на нивоу ЕУ.*

*Данас систем расподеле железничке инфраструктуре функционише на јединственем простору различитих железничких мрежа, на коме све већу улогу имају међународне организације удружених управљача железничке инфраструктуре. Посебно место у расподели железничких инфраструктурних капацитета имају тзв. „алати“ интернет софтвера.*

**Кључне речи:** глобализација, управљачи инфраструктуре, европско железничко тржиште

## Introduction

Modern railway business is imbued with the integration of the European and global world economy, technical and technological changes and creation of a competitive environment in global terms. European transport market as a unique space of different railway networks must provide a successful response to the very clear demands of the modern business environment both to property and to the development, thus clearly defining its commitment towards improving the efficiency of operations, acceptance of the rules of behaving in the transport market and relationship with transportation services customers.

Rapid changes in the business environment, together with increasing competition in the market impose large business systems such as the railways, the need for a high degree of adaptability to the conditions imposed by the market. In this sense, the modern business system must be flexible and subject to adjustment. Recognizing the need to increase the competitiveness of railway on the market of transport services, fifteen to twenty years ago, all of the developed European railway management began restructuring with the aim to create the conditions for establishing a competitive and safe European railway system.

The process of restructuring of the railway sector in various degree and dynamics was carried out in the countries of the European Union and its individual regions. That was the only way to stop the decline of the of rail transport participation in the transport market.

Transport policy was marked by concrete measures by passing legislation, known in European legislation as a legislative package of measures on railways, where the directives provide a legal framework to each phase of the railway development, whereby the directives of each of the three packages will be transposed into the national legal framework for rail transport. This will contribute to the creation of the basic conditions for the restructuring and reorganization of the railway market in the European Union level.

In the field of harmonization of conditions, the application of modern concepts was prioritized which implies that every user should bear the costs of regular maintenance of the infrastructure, in proportion to the degree of its use.

## **Regulatory framework for access to railway infrastructure capacities**

There are political tendencies seeking to establish a policy of open access to the European railway system. Thanks to the efforts of the European Commission (EC) to create a legal and institutional framework for the opening of access to any authorized rail operator who intends to operate on the European railway, an increasing number of operators are requesting allocation of rail capacity.

In a situation where the railway infrastructure is available to many railway operators, railway infrastructure capacity can be regarded as an asset that can be bought in a single framework, which is analogous to the free market.

The European Commission expects that such a market will lead to more efficient use of railway capacity. Moreover, international traffic can be facilitated if the rail capacities would be authorized to foreign railway operators. Due to the strategic intents of the existing rail operators, which are formed from a single (national) rail operator, the legal framework for the allocation of the capacities is necessary to ensure equal and fair competition.

The first legal framework which provides free access to railway infrastructure capacities is defined in the EU Directive EU 91/440/EC (EC, 1991). This first railway directive was later updated and expanded in order to guarantee access to the national rail infrastructure for authorized railway operators. EU Directive 1995/18/EC aimed to standardize the definition of authorized railway operator and the conditions that needed to be fulfilled in order to be granted the access to rail capacities. There were a lot of unresolved issues preventing free access to the national rail infrastructure thus there was still a need to develop more directives published by the European Commission as a three so-called railway packages. Railway package of measures defines a significant number of changes to the legal framework of allocation of railway infrastructure capacity in the European Union.

Each package contains directives that had to be transposed into the national legal framework for rail transport. Framework for railway operations for a particular railway system is usually included in the Statement of network (NS/Network Statement) published by every railway society for infrastructure management.

The first railway package contains three European Directives: EU Directive 2001/12/EC, EU Directive 2001/13/EC and EU Directive 2001/14/EC (EC, 2001). Even after the entry into force of the first package of directives, there were still obstacles which hindered free access to the capacity of the railway infrastructure. EU Directive 2001/14/EC provides processed, standardized set of terms and conditions for the allocation of railway infrastructure capacity at the European level.

Second and third railway package came into force in order to address some of the deficiencies of the first railway package. They inherited some corrections of certain Directives of the first package. European Commission Directives, which came into force within the second railway package, are: EU Directive 2004/49/EC, EU Directive 2004/50/EC, EU Directive 2004/51/EC.

Directives of the third railway package include: EU Directive 2007/58/EC and EU Directive 2007/59/EC.

Since the focus of this paper is on the allocation of railway infrastructure capacity, we will consider only Directives relating to the EU Directive 2001/14/EC of particular importance.

EU Directive 2001/14/EC was amended and related to the following EC Directives:

- Commission Decision 2002/844/EC - Time plan of the process (dynamics) of infrastructure capacity allocation in Annex III of the EU Directive 2001/14/

EC has been changed. This refers to paragraph 2 of Annex III that defines the dates of the timetable.

- EU Directive 2004/49/EC (EC, 2004) - This Directive replaces the security requirements specified in the EU Directive 2001/14/EC. This even leads to a new name of EU Directive 2001/14/EC: “Directive 2001/14/EC of the European Parliament and of the Council from February 26, 2001 about the allocation of railway infrastructure capacity and the introduction of fees for using railway infrastructure”. The new name indicates that the security certificate is not any more prevalent in EU Directive 2001/14/EC, therefore the second paragraph of Article 34 of EU Directive 2001/14/EC is invalid. These sections relate to the safety certificate.
- EU Directive 2007/58/EC (EC, 2007) stipulates that transit train routes may be an exempt from the rules of EU Directive 2001/14/EC. After the assessment of the economic impact of international driving routes to the national railway system, under certain conditions, the requirements for the award of international driving routes may be rejected.

European legislation in the field of railway sector defines the basic questions related to allocation of railway infrastructure capacities and the specific principles and procedures in determining the costs of rail infrastructure.

The introduction of fees for the use of railway infrastructure is one of the preconditions for the introduction of the railway market and the emergence of several operators on it.

The fee is an obligation of payment for the railroad operators for the use of railway infrastructure and services provided within. It is introduced as an instrument for establishing a market on the railway. On the other hand, it is an important instrument that can achieve goals such as increasing efficiency, reducing subsidies and increasing the competitiveness of rail transport.

With appreciation of the diverse national development and specific characteristics of the national markets, states are left to individually determine costs and the distribution of capacities, but in accordance with the general principles of legislation at the EU level.

The system of determining costs and allocation of railway infrastructure capacity is left to the states to determine individually in the frameworks of national regulations that will be in accordance with the principles established by EU legislation. This is the reason why there is more than one way or methodology for determining the elements and the amount of fees and fee structures in the countries members of the EU. The implementation of several models of fees that range from marginal pricing to pricing with full cost recovery including return on capital is currently being applied. All models of fees have common characteristics that they all include elements of marginal costs associated with the physical use of the railway. There are differences in terms of charge units, definition of the cost bases and the definition by route.

It depends on the interest shown by stakeholders which model of the benefits cost for the use of railway infrastructure will be applied. Among those most interested we highlight the state, for which the fee is at the same time an instrument for the fulfillment of the strategic transport objectives which can be defined as: increasing participation and competitiveness of railways in the transport market, creation of rail market and its opening and reduction of subsidies ie. allocations from the state budget (Boskovic, 2011).

The amount of compensation for the use of railway infrastructure aims to make the use of available railway infrastructure network efficient and to achieve fair competition in the transport market. Interests of the infrastructure managers are based on a commercial approach to business and increasing efficiency of the railway system.

European legislation in the field of railway sector permits also certain variations of the institutional model of the regulatory bodies in the allocation of capacity, and therefore they differ from country to country. Regulatory body may be the Ministry responsible for transport matters or any other body that is independent in its organization, funding decisions, legal structure and decision-making by the infrastructure manager, the body that collects payments, the authority that granted the capacity or the operator as the applicant for the requirements.

## **Objectives and limitations in capacity allocation**

EU Directive 2001/14/EC determines the general objectives and constraints within which capacity allocation will be implemented (Article 14 of EU Directive 2001/14/EC) (EC, 2001):

- A righteous non-discriminatory awarding in accordance with EU legislation
- Allocation of capacity should be carried out by an independent body. This body is in most cases the infrastructure manager.
- Infrastructure manager and body for allocation of capacity should respect the confidentiality of commercial information provided.

These are key objectives and constraints that are developed in order to provide competitive allocation of railway infrastructure capacity, which in the long run, should provide an increase in competitiveness of the European railway system.

## **Allocation of railway infrastructure capacity**

EU Directive 2001/14/EC defines the available capacity of the railway infrastructure as an opportunity to honor requests for train routes in the railway system. This directive defines the routes as the use of railway infrastructure capacity for the train traffic.

## **Types of requirements for the award of the route**

The time period between the date of application for the award of the route and the date when the application for a route is irrevocably included in the schedule is called term planning of the requirements for the route. Depending on the planned time period and whether the request for the allocation of route refers to the capacity of the railway infrastructure for more than one national infrastructure management, four different types of requirements can be distinguished.

- The long-term requirements for the award of the route are agreed with the so-called framework agreements. The duration of planning long-term requirements for the award of the route is from five to fifteen years. It should provide a basis for future planning of infrastructure managers and rail operators.
- International requirements for the award of the route require the capacity of rail infrastructure for at least two national infrastructure managers. Article 15 of Directive 2001/14/EC notes the fact that requests for international routes require a certain level of harmonization between the relevant infrastructure managers. This implies that different national requirements for the award of

the route should be modified in order to permit assignment of international demands for the allocation of the route.

- Annual requirements for the award of the route are submitted on an annual basis in order to be included in the annual timetable. They can require up to 12 months in advance from the entry into force of the working version of the timetable until the date that will be determined by infrastructure manager. Most European infrastructure managers give a deadline of eight months prior to the effective working version of the timetable.
- Ad hoc requests for routes are required in the short time period. This applies, for example to the moving of freight trains, which are being planned in a much more flexible way than the passenger trains.

### **Information required for capacity allocation**

The process of liberalization within the European railway system has stringent implications for the allocation of railway infrastructure capacity, since it prevents a global optimization: the infrastructure manager and rail operator work separately, moreover, Infrastructure Manager collects confidential information not available to the public. This raises the need to clarify the objectives for the allocation of railway infrastructure capacity for the European railway system.

Information that should be available in the capacity allocation process can be classified into three groups:

- Information about the railway infrastructure and available rail capacities
- Information on the requirements for the award of the route and their takeover of railway infrastructure capacity
- Information about the objectives and action points for train path allocation.

Infrastructure manager has an obligation to publish information about the railway infrastructure based on which the rail operators submit their applications for allocation of the route. Train operators submit their requests for the allocation of routes that are at the same time the information about the need for the capacity of the railway infrastructure. This information may be considered publically available to all participants.

Some rail operators want to disclose as little as possible information related to their participation in the secondary rail market. Secondary railway market is a market for trading of railway infrastructure capacities. Infrastructure managers offer available capacities of railway infrastructure to the train operators interested in the traffic on the given infrastructure and aiming to be more competitive in relation to other modes of transport.

### **Documents required for the application for the assignment of routes**

For each rail operator that wishes to use other infrastructure other than their own, the requirements are: a license to access the network, safety certificate, and agreement on access to the network (which will be concluded with the infrastructure owner).

## **Documents required for application for the allocation of international train routes**

Organization in charge for operational issues in the field of international rail - RailNetEurope (RNE) has announced the following documents:

- Manual on the procedure of establishing an international timetable for users who are mostly rail operators. These manuals describe the procedures that exist in the harmonization of international timetables in all phases of its draft, from the planning of the annual timetable to ad hoc requests for allocation of routes in the current timetable. These methods are used by all members of RNE (Republic of Serbia is a member of RNE).
- Guideline procedures of Route coordination system (RCS), which clearly defines roles and responsibilities.
- Request form for a route for international train routes and studies that have been adopted by RNE.

All applications are compiled into a single timetable through the process of time planning. In order to accept the demands in the fullest extent infrastructure manager can accommodate minor changes in the originally filed claims if they are not disruptive for business (commercial) and logistical links between different carriers, whilst such changes must be made by the claim applicants.

Infrastructure manager subsequently identifies those requirements that cannot be accepted or realized (due to the so-called “Conflict” with the needs for infrastructure capacity) for routine maintenance or for work on or in a proximity to the tracks. In this case, the infrastructure manager has an obligation to initiate coordination in order to implement these requirements.

Infrastructure manager must endeavor to harmonize with other infrastructure managers in Europe during the procedure of time planning and coordination in order to achieve as much as possible high-quality cross-border route trains. These measures are explained in detail in RNE document “Process for international path requests” (RS-Belgrade, 2012).

RNE has harmonized the majority of deadlines within the international process of determining the time for the annual timetable among which the deadline for applying for the integration in the annual timetable, deadlines for drafting of international timetable and deadline for issuing a final response to customers.

## **International cooperation between railway infrastructure managers**

### **Organization in charge of operational issues in the field of international railways - RailNetEurope (RNE)**

A number of European infrastructure managers and bodies for capacity allocation in the year 2004 formed a joint international organization in charge of the operational issues related to international railways - RailNetEurope (RNE).

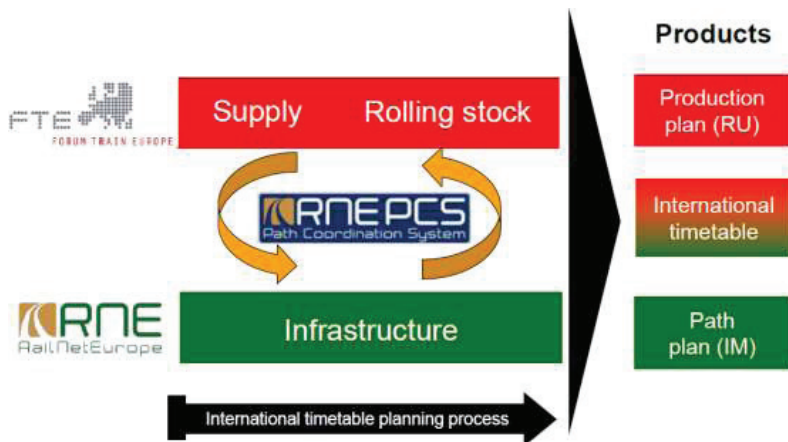
Under the coordination of common office based in Vienna, RNE represents its members as the Association for the facilitation of international traffic on the European rail infrastructure. Together, the members of RNE coordinate requirements and access to the infrastructure in order to enhance European railway operations from the standpoint of the railway infrastructure and for the benefit of the entire railway industry.



RNE has 38 members with 244 000 km of railway infrastructure. Infrastructure managers involved in RNE do business with about 140 railway operators engaged in international operations in Europe.

With the aim to develop and promote international railway transport, RNE focuses on the entire railway infrastructure and coordination process that involves the harmonization of medium-and long- term planning of the members, establishment of timetables , marketing and sales, performance of the transport process and post sales services, such as monitoring and reporting.

*Figure 1. FTE and RNE as leaders in the process of the allocation of railway infrastructure capacity. Taken from: "Technical Assistance to Serbian Railways in restructuring certain areas Europe »Aid/131196/C/SER/RS, Belgrade, 2012.*



European infrastructure managers and bodies for the allocation of capacities that have joined RNE founded One Stop Shop (OSS) which functions as the contact point for applicants under the RNE. When applying for the award of the international route, applicants should contact one of these OSSs, which start the whole process of coordinating international route allocation.

OSS is working closely with the managers of the railway infrastructure and is at all times able to:

- Provide to the customer support and information about the range of products and services of the infrastructure manager;
- Provide information needed for access to the infrastructure of any UI that is participating in RNE;
- harmonize the requirements for any international route within RNE, including requirements for the following timetable, in order to be properly taken into account in the process of annual timetable planning;
- Provide route offers for the entire international travel; coordination of the routes is mainly performed through RNE Path Coordination System - PCS.

Each OSS is part of an international network designed to make easier network access to the users. OSS also provides information about infrastructure fees and the train movement, including quality monitoring.

Functions are supported by the RNE with information tools: Information system of fees for the use of railway infrastructure (Charging Information System) and Information system for the monitoring of train movement (Train Information System).

### **RNE “Tools” - Route Coordination System (RNE RCS)**

RNE system for route coordination also known as RNE Internet software tools is available to all rail operators and infrastructure managers who agreed that the international routes (passenger and freight) will be defined using this tool.

RNE RCS facilitates communication in process of routes ordering and alignment within all phases of international timetable planning. RNE RCS fully reflect the international process of preparing the annual and the current timetable.

This also allows to “Serbian Railways” to submit a study on the routes in order to prepare for future demands for international routes. RCS Process Guidelines, which clearly explain the roles and responsibilities of the procedure, are published at the end of each calendar year (RS-Belgrade, 2012).

### **Information system for the charges of use of the infrastructure (charging information system - RNE CIS)**

RNE Information system for the charges of use of the infrastructure (Charging Information System - CIS RNE) is an international tool for the assessment of fees for access to the infrastructure built to provide users with information about the fees (Nash, 2005). The system is available on the Internet and is applicable to various international system of charges for the use of railway infrastructure, which calculates the charge of use of railway infrastructure within a few seconds for 24 hours a day - including fees for the routes, stations and marshalling stations (Remand, 2004; Crozet, 2004). Current goal for development of RNE CIS is to harmonize the information provided by RNE CIS with information in the network statement.

### **RNE information system for monitoring train traffic (Train Information System - RNE TIS)**

Information system for monitoring train traffic RNE TIS (Train Information System) is an Internet application simple to use which shows international trains from place of origin to destination. It supports international monitoring by providing data regarding passenger and goods transportation trains along the RNE corridor - RNE TIS does not deal with domestic services.

RNE TIS provides information on train traffic in real time, directly over the Internet, and collect reports from historical data. Two EUROPTIRAILS products are based on the same raw data:

Register of information about trains in real time collects, centralizes and publishes information on train traffic for most RNE corridors (in a growing number of countries including Austria, Belgium, France, Germany, Hungary, Italy, Luxembourg, the Netherlands, Slovenia and Switzerland) such as the current and previous train stops, agreed information about the daily schedule on delays and delay causes.

The reporting function allows tracking of trains and information about the delay in a certain period of time RNE TIS was selected as a tool to support European Performance Regime (EPR) - a joint project with RNE / UIC (Bozic, 2012).

## **European Forum for trains (Forum Train Europe - FTE)**

FTE is the European Association of Railroad and Utilities Company based in Bern, which promotes cross-border freight and passenger traffic in Europe. As a coordinating body for railway operators, FTE aims to harmonize international plans of making timetables and requirements for the routes in the European rail transport. FTE is working closely with following organizations:

CER - Community of European Railways and infrastructure companies

CIT – Committee for International Traffic

RNE – RailNet Europe

UIC – International Union of Railways.

European Forum for trains FTE includes the following alignment functions of harmonization in freight transport within the combined transport and transport of shuttle trains:

- Planning of transport stock
- Composition of trains
- Planning of shunting
- Shifting of vehicle personnel (train drivers)
- Shifting of locomotives
- Border Services
- Planning services in the end-stations
- Requirements for the award of the routes sent to infrastructure manager.

European Forum for trains FTE includes the following functions of harmonization in passenger transport within the transport services, passenger train companies and rented trains:

- Passenger services, travel companies trains, rented trains etc.
- Diagrams of available cars
- Dining cars, sleeping cars, etc.
- Service contracts
- Composition of trains
- Shifting of the vehicles and accompanying staff (train drivers, conductors)
- Shifting of locomotives
- Study of the routes and the requirements for assignment of the route sent to infrastructure managers FTE

## **Assessment of compliance of «SERBIAN RAILWAYS» with basic actions of EU assignment**

Assessment of the current situation of railway infrastructure capacity allocation in “Serbian Railways” (SR) leads to the following conclusions:

- Almost none of the procedures under Directive 2011/14 are applied in SR (except the existing criteria for the allocation of capacity and procedures in the planning of the timetable)

- In order to implement the provisions of Directive 2011/14 , it is necessary to develop new procedures and train staff on how to implement them .
- There is a need for the use of the appropriate software to create timetables in order to increase the efficiency of the relevant process. Existing software solutions allow to calculate the running time of the train for different compositions and developing and printing (plotting) of a timetable chart. Appropriate software will enable decisions and actions to be taken concerning the criteria and priorities for the allocation of capacity and roads and preparation of timetables. These should be undertaken in the following direction:
  1. Restructuring of the “ Planning and organization of the timetable “ (job positions , descriptions and competence ( level of education and work experience ) for vacancies
  2. Provision of appropriate software for more efficient elaboration of the timetable
  3. Training of staff in the implementation of new processes (and use of the software when it is available).
  4. Establishment of One Stop Shop (OSS).

## **Conclusion**

In Europe, there are political tendencies for the establishment of open access to the European railway system. Thanks to the efforts of the European Commission to grant open access to the railway network every authorized rail operator who intends to operate on the European railways, there is an increasing number of requests for the allocation of rail capacity.

Development and the creation of the European railway market took place in several stages, from the reaffirmation of rail transport which was a turning point in European transport policy to the achieved level of allocation of railway infrastructure capacity at the global level.

The basis for the creation of an adequate regulatory and institutional framework for infrastructure of railway transport is a new legal and economic solution rail for infrastructure through the concept of fees for access to and use of the railway infrastructure, which is one of the essential elements of establishing markets in the railway infrastructure of European countries. Obligation for the railway operators of fee payment for the use of railway infrastructure and services provided is introduced as an element of the establishment of the railway market.

For the state the fee is at the same time an instrument for the fulfillment of strategic transportation goals such as increasing the participation and competitiveness of railways in the transport market, opening of the railway market and the reduction of subsidies for rail infrastructure ie reduction of funds from the state budget.

For infrastructure managers the fees represent a change in the way of functioning of the railways that is now taking place on a commercial basis and efficient use of railway infrastructure. .

For rail operators fee is a way to achieve mutual fair competition in the transport market.

The level of fees for the use of railway infrastructure and the ratio of compensation between passenger and freight trains are clearly affected by the environment of the infrastructure manager, but also the factors that are inherently immeasurable nature, such as the impact of national policies, different interests and influences.

With the entrance of the operator in the European railway network, a continuous harmonization of technical requirements and regulations on the use of all components of rapid and conventional railway network is achieved and a gradual opening of the new international passenger capacity protects and enhances the quality of railway services.

One of the common characteristics of the fee is that their structure does not sufficiently take into account demand, which in most countries is not monitored.

In the presented way of work of the international organizations of associated infrastructure managers in most European countries, and by the use of the latest technology means of communication in the allocation of railway infrastructure capacity at the European level, we come to the very important results that are achieved in being able to assess the daily needs for the type and volume of transport as well as expected quality of services. Functioning of the capacity allocation through the associations of infrastructure managers will reduce the impact of national policies, different interests and other types of influences.

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