

Feasibility Study for the Implementation of the eCMR in Road Transport in the Republic of Serbia and the Western Balkans



DIGITAL DOCUMENTS



SECURITY



INTEROPERABILITY



SMARTER TRANSPORT



Client:

bitsEverywhere DOO Petrovaradin



Prepared by:

CIS inženjering doo



Location:

Odžaci, Republic of Serbia



Date:

June 2026.

I. Document Information

Element	Content
Document Title	Feasibility Study for the Implementation of the eCMR System in Road Freight Transport in the Republic of Serbia and the Western Balkans
Status	This document is protected by copyright.
Version	Final Version (v1.1)
Distribution	Controlled Distribution
Language	English (translated from the original Serbian version) Note: Machine-translated text
Reference Analysis Period	2026 – 2035.
Client	bitsEverywhere doo Petrovaradin 
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Place of Preparation	Odžaci, Republic of Serbia
Date	June 2026.

II. STATEMENT OF AUTHORSHIP AND RESTRICTIONS ON USE

This study constitutes an original professional work prepared for the purpose of assessing the feasibility of implementing the Electronic Consignment Note (eCMR) in the Republic of Serbia and the Western Balkans.

The study has been prepared on the basis of available data, relevant national and international legislation, strategic documents, professional literature, the results of the conducted research, as well as the analyses and assessments carried out during the preparation of this document.

All conclusions, recommendations, projections and assessments contained in this study are based on the assumptions and information available at the time of its preparation. Any subsequent changes to the regulatory framework, market conditions, technological solutions, institutional environment or other relevant parameters may affect the results presented herein. Accordingly, the findings of this study should be interpreted within the context of the period and conditions under which the analysis was conducted.

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III. EXECUTIVE SUMMARY

Introduction

This Feasibility Study assesses the technical, legal, institutional, financial, economic and organisational feasibility of establishing a National eCMR Platform in the Republic of Serbia, while considering the potential for future regional interoperability across the Western Balkans. The financial and economic analyses presented in this study are primarily based on the national implementation scenario for the Republic of Serbia, whereas the indicators relating to the Western Balkans are presented as an indicative regional potential and are not incorporated into the core financial and economic model.

Background and Rationale

The road freight transport and logistics sector in the Republic of Serbia and the Western Balkans continues to rely heavily on paper-based transport documentation. This results in increased administrative costs, slower information exchange, a higher risk of errors and limited opportunities for the digitalisation of business processes. The existing model for managing CMR consignment notes represents one of the principal challenges to the modernisation of road freight transport and logistics.

The project aims to establish a National eCMR Platform that will enable the digitalisation of the entire lifecycle of transport documentation, improve the efficiency of transport processes, and facilitate the gradual integration of the Republic of Serbia and the Western Balkans into the European environment for the electronic exchange of freight transport information.

Project Objectives

The overall objective of the project is to modernise the transport documentation management system through the implementation of an eCMR solution in accordance with international and European standards.

The specific objectives are to:

- digitalise the creation, exchange and archiving of transport documentation;
- reduce administrative costs and document processing times;
- improve the transparency and traceability of transport processes;
- strengthen legal certainty and improve data quality;
- enhance the competitiveness of the road freight transport and logistics sector;
- support the digital transformation of the economy and public administration; and
- establish the prerequisites for future interoperability with the European Union eFTI environment.

Proposed Solution

The study recommends the establishment of a National eCMR Platform based on an eFTI-ready architecture, ensuring the legal validity of electronic documents electronic signing, lifecycle management of transport documentation, audit trail mechanisms, QR code verification and secure data archiving, in accordance with the conceptual framework developed in this study.

The proposed implementation model follows a phased approach comprising five interrelated phases:

- Project Preparation
- System Configuration and Customisation
- Pilot Implementation
- National Implementation
- Regional Interoperability

Key Project Indicators

Based on the assumptions and parameters adopted in this study, the key project indicators are as follows:

Indicator	Value
Number of CMR consignment notes in Serbia	≈ 1.5 million annually
Number of CMR consignment notes in the Western Balkans (WB6)	≈ 3.25 million annually
Initial investment (CAPEX)	≈ €3 million
Annual operating expenditure (OPEX)	≈ €400,000
Cost of a paper CMR consignment note	≈ €7.20
Cost of an eCMR	≈ €2.00
Average savings per document	≈ €5.20
Estimated annual direct benefits	≈ €7.8 million
Estimated total annual benefits	≈ €16.8 million
Reduction in document processing time	≈ 60%
Financial Net Present Value (FNPV)	≈ €41.07 million
Financial Internal Rate of Return (FIRR)	>100%
Payback Period	≈ 2 years
Economic Net Present Value (ENPV)	≈ €95.5 million
Economic Internal Rate of Return (ERR)	≈ 194%
Benefit–Cost Ratio (B/C)	≈ 16.68

Table ES-1. Key Financial and Economic Performance Indicators of the Project

Source: Author's calculations based on the results of the financial and economic analyses.

Implementation Plan

The implementation is planned through five interrelated phases. The core system functionality is expected to be established over a period of approximately four years, while full operational stabilisation and achievement of the planned system adoption rate are anticipated during the subsequent period, in accordance with the adoption scenario presented in this study.

The planned system adoption trajectory is as follows:

Year	Adoption Rate
1	25%
2	50%
3	75%
4	90%
5–10	95%

The key prerequisites for successful implementation are:

- strong institutional support;
- effective coordination between the public and private sectors;
- user training and continuous support;
- continuous monitoring of Key Performance Indicators (KPIs); and
- the gradual development of regional interoperability.

Conclusion

The results of the analyses conducted demonstrate that the establishment of a **National eCMR Platform** in the Republic of Serbia is technically feasible, institutionally implementable, financially sustainable, economically justified and strategically aligned with the ongoing digitalisation of the transport sector and the evolving European regulatory framework. The proposed solution has the potential to significantly reduce administrative costs, increase the productivity of the road freight transport and logistics sector, enhance the transparency and traceability of transport processes, and establish the foundations for the gradual integration of the Republic of Serbia into the European environment for the electronic exchange of freight transport information, while enabling future interoperability with the systems of the Western Balkan countries.

The results of the financial and economic analyses confirm the high viability of the project. A positive **Financial Net Present Value (FNPV)** of approximately **€41.07 million**, a **Financial Internal Rate of Return (FIRR)** exceeding **100%**, a **Payback Period** of approximately **two years**, a positive **Economic Net Present Value (ENPV)**, an **Economic Internal Rate of Return (ERR)** significantly higher than the reference discount rate, and a **Benefit–Cost Ratio (B/C)** substantially greater than one all confirm that the project is expected to generate benefits that significantly exceed the required investment costs.

The project is technically feasible, institutionally implementable, financially sustainable and economically justified. Accordingly, its implementation is recommended through a phased implementation model, accompanied by continuous performance monitoring, proactive risk management, and the gradual development of national and regional interoperability. Successful implementation will require the continuation of activities related to regulatory alignment, including consideration of the accession of the Republic of Serbia to the **Additional Protocol to the Convention on the Contract for the International Carriage of Goods by Road (CMR) concerning the Electronic Consignment Note (eCMR Protocol)**, the establishment of an appropriate system governance model, the provision of sustainable financing for the operation of the platform, and the execution of the phased implementation programme with continuous monitoring of project outcomes.

Based on the results of the analyses conducted, it is recommended that the implementation of the **National eCMR Platform** be initiated as one of the priority measures supporting the digital transformation and modernisation of the road freight transport and logistics sector in the Republic of Serbia. The project is expected to establish the conditions necessary for future interoperability with the systems of the Western Balkan countries and for the gradual alignment of the Republic of Serbia with the European digital freight transport environment.

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VI. Abbreviations and Definitions

Abbreviation Full Name / Meaning

API	Application Programming Interface
B/C	Benefit-Cost Ratio
CAPEX	Capital Expenditure (инвестициони трошкови)
CEFTA	Central European Free Trade Agreement
CMR	Конвенција о уговору за међународни превоз робе друмом и товарни лист у друмском превозу
CBA	Cost-Benefit Analysis (анализа трошкова и користи)
DRP	Disaster Recovery Plan
EBRD	European Bank for Reconstruction and Development
EIB	European Investment Bank
eCMR	Electronic Consignment Note (електронски товарни лист)
eFTI	Electronic Freight Transport Information
eIDAS	Electronic Identification, Authentication and Trust Services
ENPV	Economic Net Present Value
ERP	Enterprise Resource Planning
ERR	Economic Rate of Return
EU	Европска унија
FIRR	Financial Internal Rate of Return
FNPV	Financial Net Present Value
GDPR	General Data Protection Regulation
ICT	Information and Communication Technologies
IRR	Internal Rate of Return
IRU	International Road Transport Union
KPI	Key Performance Indicator
OPEX	Operational Expenditure (оперативни трошкови)

Abbreviation Full Name / Meaning

PMO	Project Management Office
QR	Quick Response Code
ROI	Return on Investment
SOC	Security Operations Center
TMS	Transport Management System
UNECE	United Nations Economic Commission for Europe
WB6	Western Balkans Six
WMS	Warehouse Management System

1. eCMR (Electronic Consignment Note)

The electronic consignment note that serves as the digital equivalent of the traditional paper-based CMR consignment note, enabling the electronic creation, exchange, signing, storage and verification of freight transport information.

2. eFTI (Electronic Freight Transport Information)

The European regulatory framework that enables the electronic exchange of freight transport information between economic operators and competent authorities.

3. eFTI-ready Architecture

An architectural approach whereby a national solution is designed to enable future interoperability with, and compliance with, the requirements of the European eFTI environment.

4. Interoperability

The ability of different information systems, digital platforms and organisations to exchange, process and use data in a standardised, secure and reliable manner.

5. Audit Trail

A mechanism for recording all activities performed on documents or data, enabling traceability of changes, verification of authenticity and accountability throughout the entire document lifecycle.

6. Data Governance

A framework of policies, procedures and responsibilities established to ensure the quality, integrity, availability and security of data throughout its lifecycle.

7. Digital Transformation

The process of integrating digital technologies into business and administrative processes to improve efficiency, transparency, service quality and organisational performance.

8. Key Performance Indicators (KPIs)

Measurable indicators used to monitor project implementation, evaluate performance and assess the achievement of planned objectives.

9. Pilot Project

A limited initial implementation of the system intended to validate functionality, operational processes and organisational arrangements prior to nationwide deployment.

10. National eCMR System

The central information system designed for the creation, exchange, signing, storage and verification of Electronic Consignment Notes within the territory of the Republic of Serbia.

11. Regional Interoperability

The capability to exchange eCMR data between the Republic of Serbia and other Western Balkan countries through interconnected digital platforms and interoperable information systems.

12. Document Lifecycle

The sequence of stages through which a document passes, from its creation, signing and exchange to its storage, archiving and eventual deletion, in accordance with applicable legislation and established business rules.

1. INTRODUCTION AND METHODOLOGY

1.1. Introduction

The subject of this study is an feasibility assessment of introducing of the electronic consignment note (eCMR) in the Republic of Serbia and the Western Balkans countries, together with an assessment of its impact on the efficiency of transport processes, administrative costs, cross-border data exchange, economic competitiveness, and the sustainability of the transport system. The financial and economic analyses presented in this study are based primarily on the national scenario of the Republic of Serbia, whilst the indicators for the Western Balkans are presented as indicative regional potential and are not incorporated into the baseline calculation model.

Digitalisation of transport and logistics processes represents one of the key directions in the development of modern transport systems. In international road freight transport, the CMR consignment note constitutes the fundamental document accompanying the transport process, serving as evidence of the concluded contract of carriage, the acceptance of goods, and their delivery.

The traditional paper-based CMR form has represented the standard in international road transport for decades. However, advances in information and communication technologies, together with the need to improve the efficiency of logistics chains, reduce administrative costs, and increase business transparency, have led to the development of the electronic CMR (eCMR).

eCMR is expected to enable the digital creation, exchange, signing, and archiving of transport documentation, thereby reducing paper consumption, accelerating business processes, and improving data exchange amongst all participants in the transport chain. The anticipated benefits of eCMR implementation include, in addition to those already noted, savings in documentation processing costs, environmental improvements, increased reliability and accuracy of transport documentation, enhanced information reliability, and more straightforward control and review of transport documentation.

In line with the global digital transformation of services, the Republic of Serbia and the Western Balkans countries are engaged in an intensive process of digital transformation of the transport sector and alignment with the European regulatory framework. In this context, the assessment of the effects of wider eCMR system application constitutes an important prerequisite for strategic decision-making and the planning of future activities in the digital transformation of the transport sector.

This study aims to analyse the potential effects of the transition from conventional paper-based to electronic CMR, and to assess the economic, operational, environmental, and institutional benefits that such a transition could bring to Serbia and the Western Balkans region.

The introduction of the eCMR system forms part of the broader process of digitalisation of the transport sector in Europe and alignment with European Union initiatives promoting the electronic exchange of data in transport and logistics. Of particular significance are the Additional Protocol to the CMR Convention governing the use of the electronic consignment note (eCMR), and the European Union Regulation on electronic freight transport information (eFTI), which aims to establish a unified digital environment for the exchange of transport data. The application of eCMR is also regarded as one of the significant prerequisites for the future integration of the Western Balkans transport sector into the single European digital transport market and the development of interoperable logistics information systems.

The study considers eCMR to be the first component of a broader process of digitalisation of transport information. For this reason, the solution analysed is based on an eFTI-ready architecture, which

enables the gradual development of the national platform towards future interoperability with the European electronic freight transport information environment.

1.2. Purpose and Objectives of the Study

The primary purpose of this study is to provide a professional, analytical, and documented basis for decision-making in relation to the introduction of the electronic consignment note (eCMR) in the Republic of Serbia and the Western Balkans countries. The study aims to examine the current state of affairs in road freight transport and transport documentation management, to identify the key challenges and limitations of the existing system, and to assess the possibilities and effects of the transition from paper-based to electronic CMR documentation.

The purpose of the study is further to provide a comprehensive assessment of the technical, organisational, legal, financial, and economic justification for eCMR system implementation, with due regard to national specificities and international standards. Particular attention is devoted to the analysis of potential benefits for carriers, freight forwarders, undertakings, public institutions, and other participants in the supply chain.

The general objective of the study is to establish the justification and feasibility of introducing the eCMR system as an instrument for the digitalisation of road freight transport and the improvement of logistics process efficiency in Serbia and the Western Balkans region.

The specific objectives of the study are:

analysis of the current state and degree of digitalisation of transport processes;

- analysis of the volume of transport activities involving the use of CMR documentation;
- examination of the legal and institutional framework for eCMR application;
- analysis of international experience and examples of good practice;
- assessment of the technical and organisational requirements for system implementation;
- analysis of the costs, benefits, and economic effects of the project;
- identification of potential risks and measures for their mitigation;
- definition of the implementation model and recommendations for project realisation.

The results of the study are intended to serve as a basis for policy formulation, strategic decision-making, and the planning of activities directed towards advancing the digital transformation of the road transport and logistics sector in line with European and international trends.

1.3. Scope of the Study

In accordance with the Terms of Reference of the study, which encompass the analysis of the justification for the introduction of the electronic consignment note (eCMR) in the Republic of Serbia and the Western Balkans countries, with the aim of examining the possibilities for digitalising the processes associated with road freight transport, the analyses necessary to assess the technical, organisational, legal, institutional, financial, economic, and social aspects of eCMR system application have been identified, together with its impact on the efficiency of transport and logistics processes.

On the basis of these specificities, the scope of the study has been defined and may be divided into:

- geographical scope,
- thematic scope,
- stakeholders.

The geographical scope of the study encompasses the Republic of Serbia and the Western Balkans countries and accordingly covers the following states:

- Serbia;
- Bosnia and Herzegovina;
- Montenegro;
- North Macedonia;
- Albania;
- Kosovo¹.

Particular attention has been devoted to the analysis of the interconnectedness of the Western Balkans states in the field of international road freight transport and their integration with European Union transport flows. Cross-border transport processes, administrative procedures, and possibilities for improving data exchange between competent institutions and economic operators have been analysed in particular detail.

For the purposes of the financial, economic, and project impact analysis, two reference scenarios have been considered. The first scenario covers the Republic of Serbia as the primary area of implementation of the national eCMR platform, whilst the second covers the Western Balkans region (WB6) and serves to examine the potential for future regional interoperability and cross-border exchange of eCMR data. Both scenarios provide the basis for estimating the volume of documentation, the rate of system adoption, and the expected financial, economic, and regional effects of the digitalisation of transport documentation.

The thematic scope of the study encompasses an analysis of the existing system of paper-based CMR document usage, the degree of digitalisation of the transport sector, the relevant legislative and institutional framework, available technological solutions, and international experience in eCMR application. In addition, the study examines various implementation models, assesses their costs and benefits, identifies potential risks, and proposes measures for their mitigation.

The study analyses the effects of eCMR introduction on the key participants in the transport chain, i.e. on the key stakeholders, which comprise:

- carriers,
- freight forwarders,
- consignors and consignees,
- logistics operators,
- customs and inspection services,
- ministries responsible for transport,
- chambers of commerce,
- information service providers, as well as other
- national, regional, and international organisations, institutions, and initiatives.

The overall success of eCMR system implementation depends on the cooperation and active participation of the aforementioned stakeholders in the transport and logistics chain.

The study does not include a detailed technical specification of the future information system, nor the preparation of project documentation for its implementation. Its primary objective is to provide an

¹ This designation is without prejudice to positions on status and is in line with United Nations Security Council Resolution 1244 (1999) and the Advisory Opinion of the International Court of Justice on the Kosovo Declaration of Independence.

analytical basis for the decision on the justification and modality of eCMR system introduction, and to propose recommendations for its successful realisation in accordance with national needs and international standards.

1.4. Methodological Approach

The methodological approach constitutes the foundation for the preparation of this Feasibility Study and defines the manner of collecting, processing, and analysing the data necessary for reaching objective and well-grounded conclusions regarding the possibilities and justification for the introduction of the electronic consignment note (eCMR) in the Republic of Serbia and the Western Balkans countries.

An integrated methodological approach was applied in preparing the study, encompassing the collection and analysis of the relevant legislative and institutional framework, an analysis of the current state of road freight transport and transport documentation management, and an examination of international experience and examples of good practice in eCMR system application. Particular attention was devoted to the analysis of the technical, organisational, financial, economic, and social aspects of electronic consignment note implementation.

The study is based on data collected from relevant national and international sources, including primary and secondary legislation, strategic documents, statistical publications, reports of competent institutions, scientific and professional literature, as well as available data from international organisations and associations active in the field of transport and logistics.

The methodological framework for the financial and economic analysis is based on the principles set out in the European Commission's Guide to Cost-Benefit Analysis of Investment Projects, whilst the relevant documents of UNECE, the European Commission, and other international organisations were used for the analysis of the legal, institutional, and technical framework.

The study employs methods of current-state analysis, comparative analysis, options analysis, financial and economic analysis, risk analysis, and Cost-Benefit Analysis. On the basis of the results of the analyses conducted, the justification of the project has been assessed and recommendations have been defined for the phased and sustainable implementation of the eCMR system in the region.

The methodological approach as defined enables a comprehensive assessment of the effects of transport documentation digitalisation, the identification of potential benefits and risks, and the formulation of recommendations grounded in relevant data and international best practice.

Within the methodological approach, key performance indicators (KPIs) have also been defined, which will be used to assess the effects of eCMR system introduction. These indicators enable the quantitative measurement of achieved benefits and the comparison of the baseline situation with the situation following the implementation of the electronic consignment note.

The key indicators to be analysed within the study include:

- number of eCMR documents processed;
- percentage of digitalised transport operations;
- average processing time per transport document;
- average cost per transport document;
- number of administrative errors;
- availability time of transport documentation;
- time detained in administrative procedures;

- rate of system adoption by year;
- level of interoperability with other information systems;
- FNPV, FIRR, ENPV, ERR, ROI, and B/C ratio indicators.

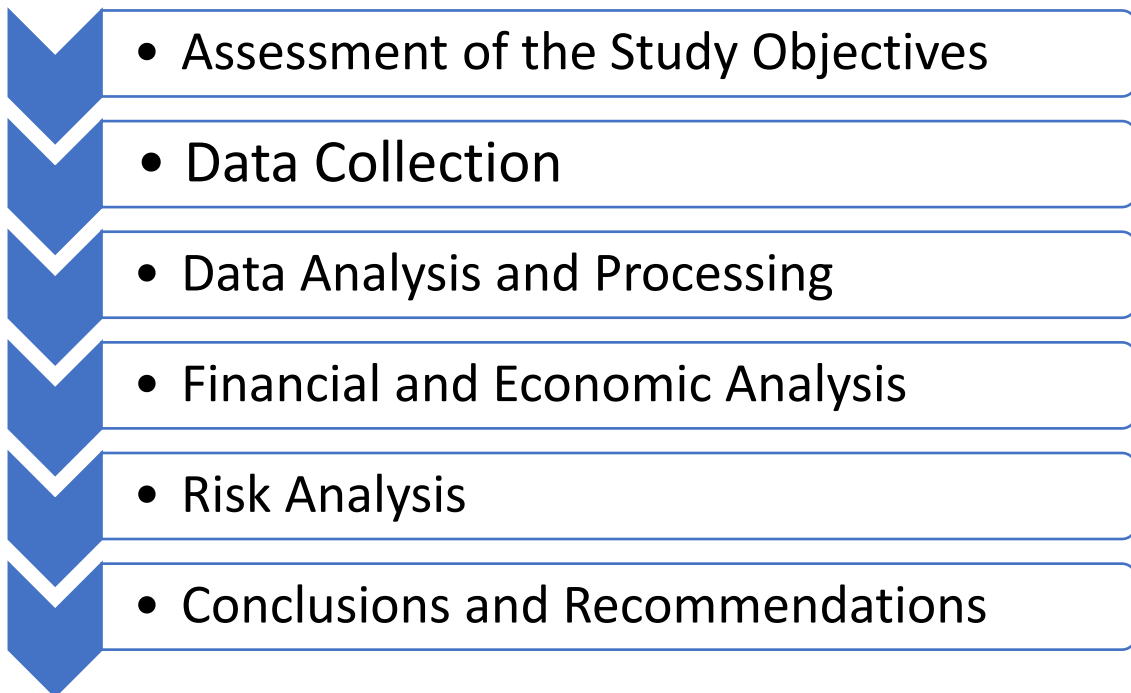


Figure 1.4-1: Overview of the adopted methodological approach

Source: Authors' analysis.

1.4.1. Data Sources

The preparation of the Feasibility Study on the Introduction of eCMR in the Republic of Serbia and the Western Balkans countries is based on the analysis of data collected from a number of relevant sources. The use of diverse sources enables a comprehensive examination of the current state of affairs, the identification of key challenges, and the assessment of the effects of potential eCMR system implementation.

Primary data sources comprise data collected during the preparation of the study through survey research, consultations, and communication with representatives of transport companies, logistics operators, freight forwarders, business associations, and other stakeholders involved in the road freight transport chain. Where possible, information obtained through expert interviews and consultations with relevant institutions and organisations was also used.

Secondary data sources encompass domestic and international legislation, strategic documents, scientific and professional publications, statistical databases, reports of competent institutions, and publications of international organisations relating to transport, logistics, the digitalisation of business processes, and eCMR application.

Of particular importance for the purposes of the analysis were publicly available data and publications of organisations such as UNECE, IRU, the European Commission, Eurostat, the World Bank, and the OECD, as well as data from national statistical institutions and other competent authorities monitoring the volume of road freight transport, foreign trade flows, and the degree of digitalisation of the transport sector.

All data used in the study have been analysed and processed in accordance with the principles of relevance, reliability, comparability, and currency, in order to ensure the greatest possible objectivity and accuracy of the study's results and conclusions.

In instances where complete data were unavailable, conservative estimates based on available statistical indicators and relevant international experience were employed.

1.4.2. Data Collection and Processing Methods

For the purposes of preparing this Feasibility Study, a combination of qualitative and quantitative research methods was applied in order to ensure a comprehensive analysis of the current state of affairs and an assessment of the effects of eCMR introduction in the Republic of Serbia and the Western Balkans countries.

Data collection was carried out through the analysis of relevant primary and secondary legislation, strategic documents, professional and scientific literature, statistical publications, reports of public institutions, international organisations, and professional associations active in the field of transport and logistics. In addition, available data on the volume of road freight transport, foreign trade flows, the degree of digitalisation of business processes, and the experience of countries that have already implemented the eCMR system were used.

The following methods were applied for the purposes of the analysis:

- Document analysis method, for the purpose of examining the legal, institutional, and technical framework for eCMR application;
- Statistical analysis, used for the processing of data on transport flows, transport volumes, and other relevant indicators;
- Comparative analysis, through comparison of the current situation with the practice and experience of states that have already introduced the electronic consignment note;
- Options analysis, through which various models of transport documentation digitalisation and possible approaches to eCMR system implementation were examined;
- Financial analysis, directed towards the assessment of investment and operational costs, as well as expected financial benefits;
- Economic analysis, encompassing the assessment of the broader social and economic effects of the project;
- Risk analysis, for the purpose of identifying potential obstacles and defining measures for their mitigation;
- SWOT analysis, used for the identification of strengths, weaknesses, opportunities, and threats associated with the introduction of the eCMR system;
- Stakeholder analysis, for the purpose of identifying key stakeholders, assessing their influence, interests, and role in eCMR system implementation.

The processing of collected data was carried out using analytical and descriptive methods, applying the principles of objectivity, relevance, and data comparability. The results of the individual analyses have been integrated into a unified analytical framework enabling the assessment of technical feasibility, economic justification, and institutional readiness for the introduction of the eCMR system.

The application of the aforementioned methods has provided a reliable basis for drawing conclusions and formulating recommendations that will contribute to the efficient and sustainable digital transformation of the transport sector in Serbia and the Western Balkans countries.

1.4.3. Analytical Assumptions

Given that certain data required for the analysis are not available to the same extent for all Western Balkans countries, the study employs a set of analytical assumptions based on available statistical data, international experience, and relevant professional literature.

The principal assumptions relate to:

- the growth trend in road freight transport volumes;
- the gradual increase in the degree of digitalisation of the transport sector;
- the continued alignment of national legislation with European Union regulations;
- the gradual increase in the number of eCMR system users;
- the availability of basic information and communication infrastructure;
- the acceptance of electronic documentation by competent institutions.

All assumptions used in the analyses are presented and explained in the relevant chapters of the study.

For the purposes of the financial and economic analysis, reference assumptions have also been adopted, including an estimated volume of approximately 1.5 million CMR documents per annum in the Republic of Serbia and approximately 3.25 million documents at the level of the WB6 region, an initial investment of approximately EUR 3 million, annual operational costs of approximately EUR 400,000, and a gradual system adoption rate of 25% in the first year to 95% in the fifth year of operation.

1.5. Limitations of the Study

In the course of preparing this study, certain limitations were taken into account that may affect the scope and precision of particular analyses and assessments. These limitations do not call into question the validity of the study's conclusions, but must be borne in mind when interpreting the results and planning further activities.

One of the principal limitations concerns the availability and comparability of statistical data from the various Western Balkans countries. The manner of data collection, processing, and publication may differ between individual states and institutions, which to a certain extent makes direct comparison of particular indicators more difficult.

A further limitation is the restricted availability of data on the use of transport documentation and the degree of digitalisation of business processes amongst certain economic operators. In such cases, estimates based on available data, international experience, and relevant professional literature were used.

The financial and economic analyses are based on currently available data and assumptions applicable at the time of the study's preparation. For this reason, the results of the financial and economic analysis should be viewed in the context of the adopted assumptions and analytical scenarios. Future changes in the regulatory framework, economic conditions, technological development, and market circumstances may affect the actual costs, benefits, and timeline of eCMR system implementation.

The study is directed towards the assessment of the justification and feasibility of eCMR introduction at the strategic level and does not encompass the detailed design of the information system, technical specifications of individual software solutions, or detailed operational implementation procedures.

Notwithstanding the limitations identified, the use of relevant data sources, recognised analytical methods, and international experience has provided a reliable basis for assessing the justification for

the introduction of the electronic consignment note and for formulating recommendations for its successful application in the Republic of Serbia and the Western Balkans countries.

1.6. Technology Maturity and Implementation Readiness

The results of the technical and technological analysis have confirmed that the proposed national eCMR system, based on an eFTI-ready architecture, relies on technological components already in use in the application of eCMR systems in certain European states. The technological foundation of eCMR is based on existing digital platforms, electronic signatures, data exchange systems, and electronic document archiving solutions.

Given that eCMR represents a mature and proven technology whose application has already been confirmed under real operational conditions, the subject of this study is not the demonstration of the technical feasibility of the solution, but rather the assessment of the justification for its wider application and the measurement of the expected effects of the transition from paper-based to electronic documentation.

The successful implementation of the electronic consignment note (eCMR) in Serbia and the Western Balkans region depends not only on the existence of an appropriate legal framework, but also on the degree of technological maturity and organisational readiness of all participants in the transport chain, institutional coordination, acceptance by the transport industry, and other factors. For this reason, one of the significant aspects of this study relates to the assessment of the existing technical, institutional, and human resource capacities required for the introduction and use of the eCMR system.

The assessment of technological maturity encompasses an analysis of the degree of digitalisation of business processes amongst carriers, freight forwarders, logistics operators, consignors, and consignees, as well as the level of development of information and communication infrastructure in the Republic of Serbia and the Western Balkans countries. Particular attention has been devoted to existing electronic services, the possibilities for data exchange between information systems, and the level of application of electronic documents and electronic signatures.

In addition to the technological aspects, the institutional readiness of competent authorities to accept and process electronic transport documentation is also analysed. This entails an assessment of existing procedures, organisational capacities, the regulatory framework, and the ability of institutions to support the digital transformation of the transport sector.

The level of digital competencies of system users is also examined, together with the need for additional training and capacity building amongst economic operators and public authorities. The degree of acceptance of digital solutions represents an important factor in the success of eCMR implementation and influences the pace and efficiency of the transition from paper-based to electronic business processes.

On the basis of the analysis of technological maturity and implementation readiness, it is possible to identify the key prerequisites, potential obstacles, and necessary support measures for the introduction of the eCMR system. The results of this analysis constitute a significant basis for defining the implementation model, the project timeline, and the assessment of risks associated with the digital transformation of the transport sector.

Table 1.6-1: Estimated level of technological and organisational readiness by user group

User Group	Estimated Level of Readiness
Large carriers	High
Medium-sized carriers	Medium
Small carriers	Medium to low
Freight forwarders	High
Logistics operators	High
Customs administrations	Medium to low
Inspection services	Medium

Source: Authors' analysis based on stakeholder analysis, survey research results, and technical and technological analysis. The assessment is of an indicative nature.

By examining the technological maturity and readiness of all relevant participants, a realistic assessment of the possibilities for the successful introduction of eCMR is ensured, together with the identification of the activities that need to be undertaken in order to secure the sustainable and efficient application of the system at the national and regional level.

1.7. Structure of the Document

In order to ensure clarity and a logical presentation of the analytical results, the study is structured into a number of interrelated chapters covering all relevant aspects of the justification for the introduction of the electronic consignment note (eCMR) in the Republic of Serbia and the Western Balkans countries.

Following the introductory section, in which the subject, scope, objectives, and methodological approach of the study are defined, an analysis of the current state of the road freight transport sector is presented, with particular reference to the use of CMR documentation, the degree of digitalisation of business processes, and the current challenges in transport documentation management.

The subsequent chapters examine the market, institutional, legal, and technological aspects of eCMR system application, as well as the experience of countries that have already implemented the digitalisation of transport documentation. Particular attention is devoted to the analysis of various development options and the selection of the optimal implementation model.

The study further encompasses a technical and technological analysis, a financial analysis, and an economic analysis, within which the required resources, costs, benefits, and expected effects of the project are assessed. In addition, a risk analysis has been conducted, together with an assessment of the project's impact on the economy, society, the environment, and the functioning of public institutions.

The concluding section of the study is devoted to the implementation plan, which includes a proposal for the phases of realisation, institutional responsibilities, the timeframe, and the mechanisms for monitoring project implementation. On the basis of all analyses conducted, conclusions and

recommendations have been formulated regarding the justification and modality of eCMR system introduction.

The document structure as conceived enables the systematic examination of all relevant aspects of the project and provides a clear basis for informed decision-making on the further development and implementation of the electronic consignment note in Serbia and the Western Balkans countries.

2. PROBLEM DEFINITION AND ANALYSIS OF THE EXISTING SITUATION

2.1. Introduction

Road transport is the dominant mode of freight carriage in the Republic of Serbia and the Western Balkans countries, and plays a key role in regional and international trade. Although significant progress has been made in recent years in the digitalisation of the public and private sectors, transport documentation in international road freight transport continues to rely predominantly on the paper-based CMR consignment note.

The use of paper documentation generates additional administrative costs, prolongs document processing times, increases the risk of errors, and hampers the timely exchange of information between participants in the transport chain. At the same time, the growth in trade volumes, the need for more efficient logistics processes, and alignment with European transport digitalisation initiatives create an imperative for the introduction of modern digital solutions.

The electronic consignment note (eCMR) represents one of the key instruments of the digital transformation of the transport sector, enabling faster data exchange, greater transparency, improved shipment traceability, and more efficient management of transport documentation.

The purpose of this chapter is to analyse the existing situation in the field of road freight transport and transport documentation management in the Republic of Serbia and the Western Balkans countries, to identify the key problems and limitations of the existing system, and to examine the regulatory, organisational, and technological preconditions for the successful implementation of an eCMR platform.

The results of this analysis provide the basis for defining the problem, formulating the project objectives, considering possible development options, and assessing the justification for introducing a national eCMR platform in the Republic of Serbia and the Western Balkans countries.

2.2. Analysis of the Existing Situation

The starting point for assessing the justification for introducing the electronic consignment note (eCMR) is a comprehensive analysis of the existing situation in the field of road freight transport and transport documentation management in the Republic of Serbia and the Western Balkans countries. Its primary objective is to provide a comprehensive overview of the existing business, technological, organisational, and regulatory frameworks that define the functioning of road freight transport and transport documentation management in the region.

Although significant progress in the digitalisation of logistics and transport processes has been observed in recent years, the majority of participants in the supply chain continue to rely on paper documentation as the primary means of recording and confirming transport operations. This practice necessitates a large number of manual procedures, increases administrative costs, and slows the exchange of information between carriers, consignors, consignees, freight forwarders, customs authorities, and other relevant institutions.

On the other hand, ongoing digital transformation processes in the transport sector — both at the level of the European Union and in the Western Balkans region — are creating the preconditions for the gradual introduction of electronic documents and fully digitalised transport procedures. Of particular significance is the Additional Protocol to the CMR Convention on the Electronic Consignment Note (eCMR Protocol), which enables the legally recognised use of electronic transport documentation in international road freight transport.

The analysis of the existing situation encompasses several interrelated aspects. Within the scope of this analysis, the existing situation has been examined and the key problems requiring resolution have been identified. The following sections analyse: the existing use of CMR documentation, the degree of digitalisation of the transport sector, the specificities of the transport and institutional environment of the Western Balkans, the regulatory and institutional framework relevant to the application of eCMR, and the most significant challenges and limitations of the existing system.

The results of this analysis will enable a clear definition of the baseline situation, identification of the key deficiencies of existing processes, and determination of the needs that the introduction of an eCMR platform should address. At the same time, they will serve as the basis for the subsequent analysis of the technical, economic, organisational, and social justification of the proposed solution.

2.2.1. Existing Use of CMR Documentation

The CMR consignment note is the primary document in international road freight transport. It serves as evidence of the contract of carriage, confirmation of the receipt and delivery of goods, and as a document accompanying the shipment throughout the entire transport process. Its application is based on the Convention on the Contract for the International Carriage of Goods by Road (CMR Convention), which is applied in the Republic of Serbia and the Western Balkans countries.

In the existing system, CMR documentation continues to be used predominantly in paper form. The document is prepared by the consignor, freight forwarder, or carrier, after which it is printed in multiple copies that are exchanged between the participants in the transport process. One copy is retained by the consignor, another accompanies the goods during transport, whilst the remaining copies are delivered to the consignee, carrier, freight forwarder, and competent institutions in accordance with the requirements of the specific transport operation.

The CMR documentation management process encompasses data preparation, completion and signing of the document, its physical accompaniment of the shipment, as well as subsequent delivery and archiving. In international transport, the documentation is additionally used in customs, inspection, and other administrative procedures.

Although information technology has significantly advanced transport and logistics processes, CMR documentation management continues to rely to a considerable extent on paper-based procedures. Data is frequently entered manually on multiple occasions into various documents and systems, which increases the risk of errors, prolongs processing times, and generates additional administrative costs.

The paper-based business model simultaneously limits the speed and availability of information. The physical exchange of documentation between participants requires additional time, whilst the loss, damage, or incompleteness of documents may lead to delays in the execution of transport operations and additional costs. A significant challenge is also presented by the archiving of large volumes of documents, which requires the provision of archive space, organised storage, and efficient retrieval of documentation.

In Serbia and the Western Balkans, Transport Management Systems (TMS), Electronic Data Interchange (EDI), and other digital tools are in use. However, their application is not sufficiently integrated to enable fully electronic CMR documentation management throughout the entire transport chain. As a consequence, the hybrid business model — in which digital data is combined with paper documentation — remains dominant in practice.

The analysis of the existing situation demonstrates that the current model, whilst functional and widely accepted, has significant limitations in terms of efficiency, speed of data exchange, transparency, and

business costs. These limitations represent one of the key reasons for considering the introduction of electronic CMR as a solution that enables the full digitalisation of transport documentation management processes.

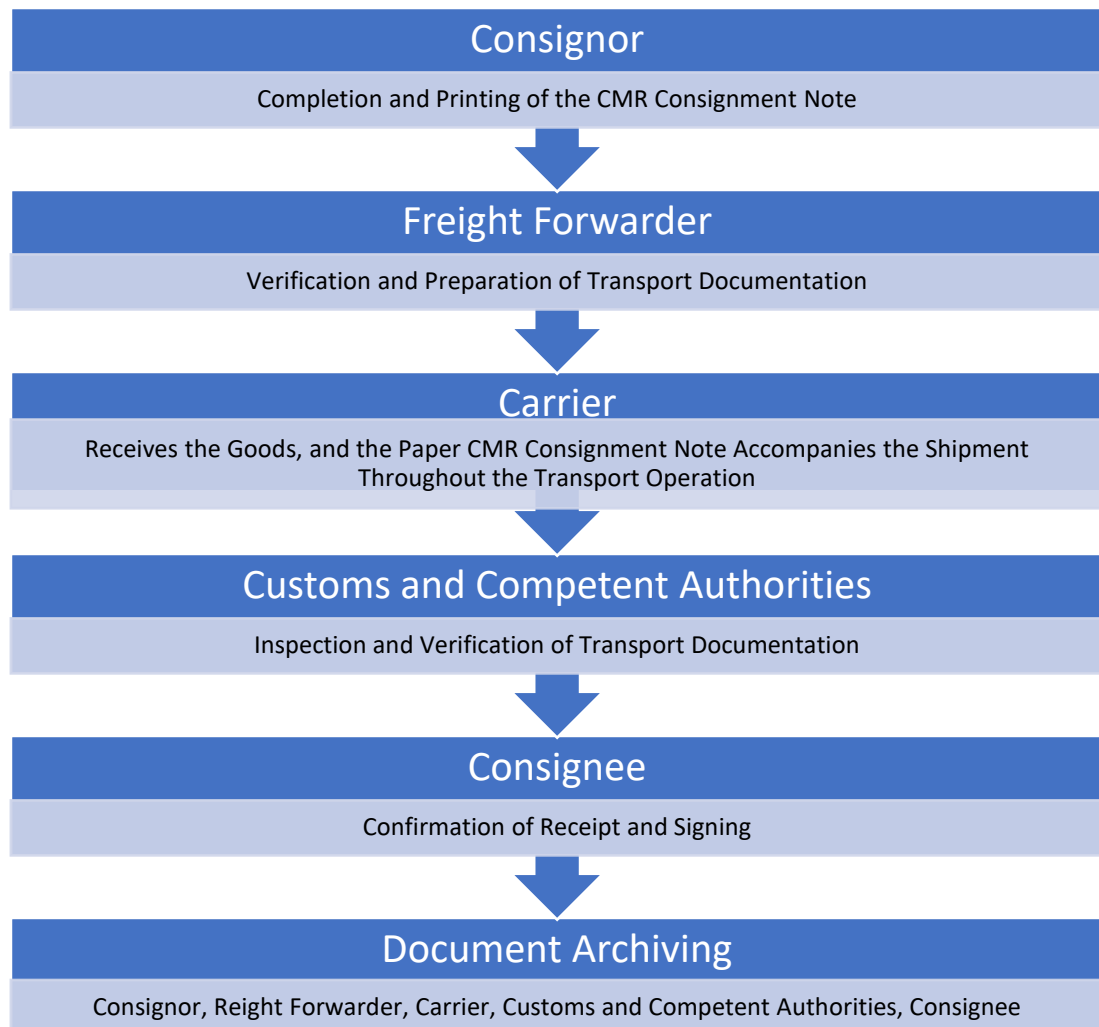


Figure 2.2-1: Existing CMR Documentation Management Process

Source: Authors' illustration based on analysis of existing transport procedures in international road freight transport.

The process illustrated depicts the traditional model of CMR documentation management, which encompasses the preparation, printing, signing, physical exchange, and archiving of documents. Manual processing and multiple exchanges of data between participants increase administrative costs, prolong processing times, and create the risk of errors. The identified critical points provide the basis for considering the introduction of an eCMR platform, the objective of which is the digitalisation of processes, reduction of administrative burden, and provision of real-time data exchange.

2.2.1.1 Quantification of the Existing CMR Process

Although no single official statistical source on the number of CMR documents issued exists, an estimate of the number of transport operations generating CMR documentation can be derived on the basis of transport performance, international road freight volumes, and average vehicle payload capacity. Based on estimates derived from UNECE data, national statistical institutions, and

international road transport volumes, approximately 1.5 million CMR documents are generated annually in the Republic of Serbia, whilst across the Western Balkans this figure is estimated at 3.0–3.4 million documents per year. These figures indicate the significant administrative scale of the process that is the subject of digitalisation².

Country	Estimated Annual CMR Volume
Serbia	Approximately 1.5 million
Bosnia and Herzegovina	0.6–0.8 million
Albania	Approximately 0.4 million
North Macedonia	Approximately 0.3 million
Montenegro	0.1–0.2 million
Kosovo *	Approximately 0.15 million

Table 2.2-1: Estimated Number of CMR Documents Issued in the Western Balkans

2.2.1.2. Critical Points of the Existing Process

The existing paper-based CMR documentation management model involves numerous manual activities that recur throughout the transport process. Although this model has for many years represented the standard in international road freight transport, the growing volume of transport operations, increasing demands for rapid information exchange, and the need for more efficient logistics management reveal its numerous limitations.

The critical points of the existing process most frequently arise during manual data entry, document printing, physical exchange of documents between participants in the transport chain, manual signing, and archiving of documentation. Each of these activities represents a potential source of delays, errors, and additional administrative costs.

A particular problem is the fact that the same data is frequently entered multiple times into different information systems and documents. This practice increases the likelihood of errors, prolongs processing times, and reduces the efficiency of the entire transport process. In addition, the physical exchange of documentation may lead to delays in the transfer of information, loss of documents, or the need for subsequent administrative corrections.

The results of international pilot projects and eCMR implementation analyses demonstrate that the paper-based transport documentation management model requires significantly more time and resources compared to the digital model. According to available analyses, the average processing time for a single paper CMR document is approximately 23 minutes, whilst processing an electronic CMR document requires approximately 9 minutes³. This represents a reduction in administrative processing time of approximately 60%.

In addition to time savings, significant financial differences between the paper-based and electronic processes have also been identified. The estimated cost of processing a single paper CMR document is

² **Source:** Author's estimate based on data from **UNECE**, the **World Bank**, and national statistical sources.

³ According to the findings of a study conducted for the Danish Ministry of Transport.

approximately €7.20, whilst the cost of processing an electronic document is approximately €2.00. This yields an average saving of approximately €5.20 per document, and in more complex logistics environments the savings may be considerably greater. The methodology for estimating these values is presented in detail in Section 9.4.1 of the Financial Analysis.

The foregoing indicators confirm that the existing system, whilst functional, generates significant administrative burdens and costs that increase further with growing transport volumes. For this reason, the critical points of the existing process represent one of the key arguments for considering the introduction of electronic CMR as a solution enabling more efficient transport documentation management.

Chart 2.2-2: Critical Points of the Existing CMR Process

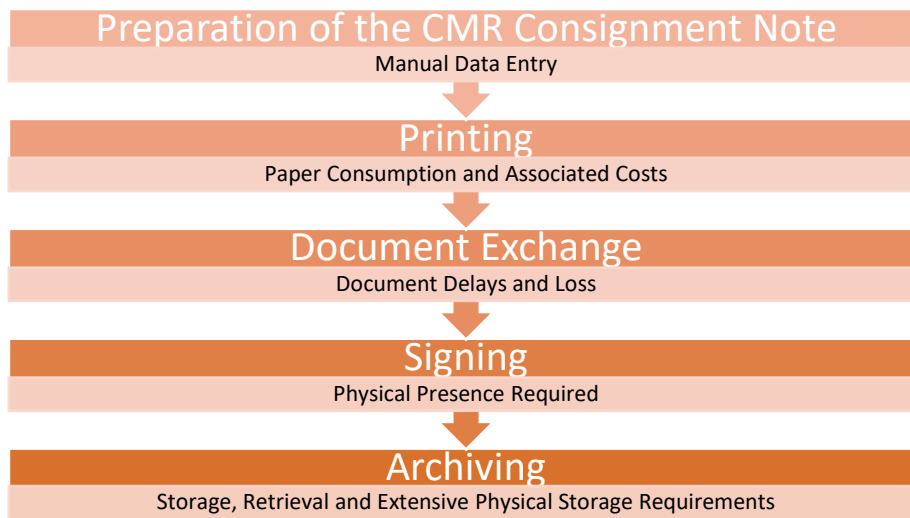


Table 2.2-1: Critical Points of the Existing Process

Indicator	Paper CMR	eCMR
Average processing time	23 minutes	9 minutes
Cost per document	€7,20	€2,00
Administrative burden	High	Low
Data exchange	Manual	Digital

The results of pilot projects and eCMR implementation studies demonstrate that the transition from paper to electronic consignment notes can reduce administrative processing time by approximately 60%, with a significant reduction in direct documentation management costs.

According to European Union estimates, the widespread adoption of electronic transport documentation could lead to the elimination of approximately 160 million sheets of paper annually.

2.2.2. Degree of Digitalisation of the Transport Sector

The past two decades have been characterised by intensive digitalisation of the transport and logistics sector. The development of information and communication technologies, growth in international trade, and the need for more efficient transport process management have led to the increasingly

widespread adoption of digital solutions in transport and logistics. Digitalisation is today regarded as one of the key preconditions for increasing competitiveness, reducing administrative costs, and improving service quality.

In the Republic of Serbia and the Western Balkans countries, the process of digital transformation is under way, but is not uniformly developed across all participants in the transport chain. Larger transport and logistics companies make significant use of modern information systems for the planning, organisation, and monitoring of transport operations, whilst smaller economic operators continue to employ traditional administrative procedures and manual data processing.

Transport Management Systems (TMS), Fleet Management Systems (FMS), GPS and telematics solutions, electronic tachographs, ERP systems, and Electronic Data Interchange (EDI) are widely used in practice. The application of these technologies has enabled better control of transport processes, real-time shipment tracking, and more efficient resource management.

In addition to the private sector, significant progress has also been achieved in the digitalisation of administrative and regulatory procedures. In the majority of countries in the region, electronic public administration services, electronic customs procedures, and systems for digital document submission have been introduced, which represents an important precondition for the application of electronic transport documentation.

Of particular significance is the degree of digitalisation of the customs system of the Republic of Serbia. According to data from the Customs Administration for the first quarter of 2026, more than 99% of customs declarations were submitted electronically, indicating the existence of a developed digital infrastructure and institutional readiness for the further digitalisation of transport processes.

Nevertheless, despite significant progress, digitalisation of the transport chain is not yet complete. In many cases, digital business processes continue to culminate in the printing of paper documentation that accompanies goods during transport. As a consequence, digital and paper information flows operate in parallel, which diminishes the effects of investments already made and limits the possibilities for full automation.

This is particularly pronounced in the case of the CMR consignment note, which continues to be used predominantly in paper form. Although the majority of data required for the preparation of a CMR document is already present in the information systems of transport chain participants, it is frequently re-entered, printed, and physically exchanged, leading to duplication of activities and increasing the risk of errors.

At the level of the European Union, there is a clear trend towards the digitalisation of transport documentation through initiatives such as eCMR, eFTI, and Intelligent Transport Systems (ITS). The objective of these initiatives is to establish a single digital transport area and fully digital data exchange between economic operators and competent authorities. Of particular significance is the eFTI Regulation, the full application of which is expected from 2027 and which provides for digital exchange of transport information at the level of the European Union.

The analysis demonstrates that in the Republic of Serbia and the majority of Western Balkans countries, significant elements of digital infrastructure have been established that provide a sound basis for the further digitalisation of the transport sector. The main limitations relate to the uneven level of digitalisation among transport chain participants, insufficient interoperability of certain information systems, and the continued reliance on paper documentation. Given the existing technological infrastructure and regulatory trends, the introduction of eCMR represents a logical continuation of the

digital transformation process in the transport sector. This assessment is based on an analysis of the degree of digitalisation of customs procedures, the application of electronic public administration services, the availability of national electronic identification and electronic signature systems, and the existing information and communication infrastructure.

Table 2.2-2: Degree of Digitalisation of Customs Procedures in the Republic of Serbia

Indicator	Value
Total Customs Declarations Submitted	895,832
Electronically Submitted Customs Declarations	893,334
Share of Electronic Customs Declarations	99.72%
Reference Period	Q1 2026

The full application of the eFTI Regulation in the European Union is planned from 2027, which further underscores the need for the timely introduction of an eCMR platform in Serbia and the Western Balkans countries.

2.2.3. Regional Specificities of the Western Balkans

The Western Balkans region occupies a significant geostrategic position at the crossroads of the main European transport corridors connecting central and western Europe with south-eastern Europe, the Middle East, and the eastern Mediterranean. By virtue of its location, the region represents an important transit zone for international road freight transport and an area of intensive economic cooperation between the countries of the region and their principal foreign trade partners.

For the purposes of this study, the term Western Balkans refers to the Republic of Serbia, Bosnia and Herzegovina, Montenegro, North Macedonia, Albania, and the Provisional Institutions of Self-Government in Pristina. These economies are characterised by strong trade linkages, a high degree of dependence on road transport, and a significant volume of cross-border freight traffic.

Regional digitalisation of transport processes is supported by initiatives such as CEFTA, the Common Regional Market (CRM), and the Transport Community, which recognise digital data exchange and improvement of cross-border procedures as one of the preconditions for increasing the competitiveness of the region. In this context, eCMR represents an important instrument for enhancing the interoperability and efficiency of transport flows.

Table 2.2-4 presents the key regional factors supporting the introduction of eCMR.

Table 2.2-3: Regional Factors Supporting the Introduction of eCMR

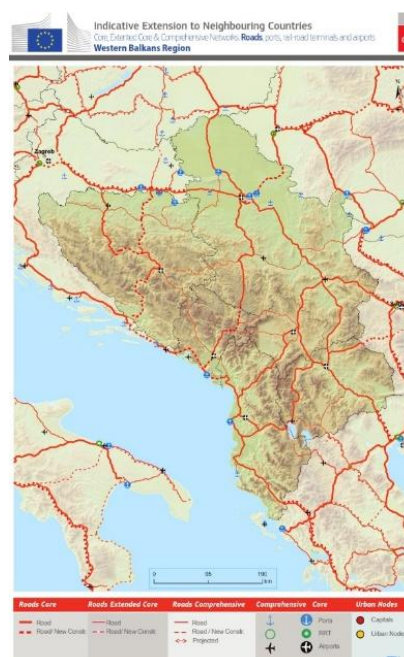
Indicator	Relevance to eCMR
High Share of Road Freight Transport	Large Volume of CMR Consignment Notes
Significant Volume of Cross-Border Trade	Frequent Exchange of Transport Documentation
Integration with the EU Market	Need for Alignment with eCMR and eFTI Standards
Large Number of Small and Medium-Sized Road Transport Operators	Need for User-Friendly Digital Solutions
Growth of Logistics and Transport Services	Increase in the Volume of Transport Documentation

Road transport is the dominant mode of freight carriage in the region, resulting in the daily exchange of large volumes of transport documents. At the same time, a significant number of cross-border transport operations involve various institutions and administrative procedures, which means that the efficiency of documentation management directly affects transport speed, business costs, and the competitiveness of economic operators.

One of the challenges for the wider application of electronic transport documentation is the varying degree of digital maturity among countries, institutions, and economic operators in the region. Whilst certain companies have already implemented modern information systems, a significant number of small and medium-sized enterprises continue to rely on traditional paper-based procedures.

Figure 2.2-2 illustrates the geographical position of the region and the main transport routes connecting the Western Balkans countries with the European Union market.

Figure 2.2-2: Map of the Western Balkans with Main Transport Routes



All countries in the region are undertaking activities aimed at advancing the digitalisation of public administration, electronic business, and transport procedures, with gradual alignment with the European regulatory framework. Table 2.2-4 presents selected digital readiness indicators relevant to the application of eCMR.

Table 2.2-4: Digital Readiness Indicators for eCMR in the Region

Indicator	Serbia	Western Balkans
Electronic Customs Declarations	99.72%	High Level in Most Economies
Law on Electronic Documents	Yes	Yes (in Most Economies)
Law on Electronic Signatures	Yes	Yes
National eGovernment Portal	Yes	Yes
eCMR Initiatives	Limited Initiatives	From Feasibility Assessment to Pilot Implementation
eFTI Preparatory Activities	Ongoing	Ongoing

The region's connectivity with the European Union market, the high share of road transport in freight flows, and the need for more efficient cross-border data exchange indicate the existence of genuine preconditions for the application of the electronic consignment note. Although challenges exist in relation to varying national procedures and uneven levels of digitalisation, these do not represent a fundamental obstacle to the gradual introduction of eCMR.

On the basis of the indicators analysed, it may be concluded that the Western Balkans is a region with significant potential for the application of eCMR and the development of interoperable digital transport solutions, which may contribute to the more efficient functioning of the transport sector and further convergence with European standards in the field of transport and logistics.

2.2.3.1 Border Crossing Delays

One of the significant factors affecting the efficiency of road freight transport in the Western Balkans is delays at border crossings. Given that a significant proportion of transport flows in the region are of an international character, transport operations frequently involve passage through one or more border crossings during the execution of a consignment.

Waiting times at borders depend on a number of factors, including traffic intensity, seasonal variations, the type of goods, customs and inspection procedures, and the volume of documentation accompanying the shipment. In certain cases, administrative procedures may account for a significant portion of the total transport time, particularly in the case of consignments involving multiple countries and multiple control points.

Although most countries in the region are undertaking activities aimed at modernising customs and inspection procedures, paper documentation continues to be one of the factors affecting the duration of administrative processes. Manual document verification, physical exchange of paper documentation, and the need for repeated inspection of the same data may contribute to extended waiting times for vehicles at border crossings.

The table below presents indicative values for the average waiting times at certain significant border crossings in the region.

Table 2.2-5: Indicative Waiting Times at Selected Border Crossings in the Region

Border Crossing	Average Waiting Time
Horgoš	30–90 min
Batrovci	20–60 min
Preševo	30–60 min
Karasovići	10 min – 3 h

The data presented indicate that administrative procedures continue to represent an important factor in the efficiency of cross-border transport. In this context, the digitalisation of transport documentation and the application of a national eCMR platform may contribute to faster data exchange, simplified document verification, and the gradual reduction of administrative delays in international road freight transport.

2.2.3.2. Example of Good Practice

The application of the electronic consignment note (eCMR) has already been established in several European countries that have ratified the Additional Protocol to the CMR Convention and have developed operational solutions for the electronic exchange of transport documentation. Spain, France, Denmark, and the Netherlands are particularly noteworthy, where eCMR has been applied in various segments of international road transport with the active participation of carriers, logistics companies, and competent institutions.

The experience of these countries demonstrates that the introduction of eCMR contributes to faster exchange of transport information, reduced administrative burden, greater data reliability, and more efficient transport process management. At the same time, phased implementation and pilot projects have demonstrated the importance of public-private sector coordination, as well as the need for standardised technical solutions that enable interoperability with other national and international information systems.

These experiences represent a useful example of good practice for the Republic of Serbia and the Western Balkans countries, confirming that eCMR can be successfully introduced in phases, with the gradual expansion of functionality and the number of users.

2.2.4. Regulatory and Institutional Framework

The successful application of the electronic consignment note (eCMR) depends on the existence of an appropriate regulatory and institutional framework that enables the legal recognition, exchange, and use of electronic transport documentation. It is therefore necessary to examine the international, European, and national regulations, as well as the institutional capacities relevant to the application of the eCMR platform.

The legal basis for the regulation of international road freight transport is the Convention on the Contract for the International Carriage of Goods by Road (CMR Convention). With the aim of digitalising transport documentation, the Additional Protocol to the CMR Convention (eCMR Protocol) was adopted, enabling the electronic consignment note to have the same legal force as the paper

document, subject to the fulfilment of requirements regarding the authenticity, integrity, and availability of data.

In the Western Balkans, there are varying degrees of normative and institutional readiness for the application of the eCMR system. Certain countries have ratified the eCMR Protocol, whilst others are still in the process of preparing the normative framework or are considering accession to the Protocol. Irrespective of ratification status, the majority of countries in the region are undertaking activities aimed at digitalising transport documentation.

Table 2.2-6: Status of eCMR Protocol Ratification in the Region

Country / Economy	eCMR Protocol Status
Serbia ⁴	Not Ratified
Montenegro	Not Ratified
North Macedonia	Ratified
Bosnia and Herzegovina	Not Ratified
Albania	Ratified
Kosovo*	Limited Implementation

This table reflects the ratification status of the eCMR Protocol at the time of preparation of the Study and does not constitute an assessment of the level of digitalisation of the transport sector of individual countries at the time of preparation of this study.

At the level of the European Union, particular significance attaches to the Regulation on electronic freight transport information (eFTI), which provides the basis for establishing a single digital transport area. The full application of the eFTI framework is expected from 2027, which further incentivises the digitalisation of transport documentation and data exchange between economic operators and competent authorities.

The Republic of Serbia and the Western Balkans countries are progressively aligning their transport and digital legislation with European regulations through the process of accession to the European Union, the implementation of national digitalisation strategies, and the adoption of regulations governing electronic business. At the same time, a significant body of legislation has been adopted that provides an important basis for the future application of the eCMR system, although its full operational application will require further normative and institutional alignment.

In addition to the regulatory framework, the institutions responsible for transport, trade, digitalisation, and customs procedures, as well as the economic operators participating in the transport chain, play a significant role. Their mutual cooperation and coordination represent one of the key preconditions for the successful implementation of electronic transport documentation

⁴ Note: At the time of finalisation of this Study, the Draft Law on the Ratification of the Additional Protocol to the Convention on the Contract for the International Carriage of Goods by Road (CMR) concerning the Electronic Consignment Note (eCMR Protocol) was undergoing the legislative procedure before the National Assembly of the Republic of Serbia.

Table 2.2-7: Key Regulations and Institutions Relevant to the Application of eCMR

Area	Key Legal Instrument / Institution	Relevance to eCMR
International Road Freight Transport	CMR Convention	Legal Framework for International Carriage of Goods
Electronic Consignment Note	eCMR Protocol	Legal Framework for the Electronic Consignment Note
Digital Freight Transport	EU eFTI Regulation	Digital Exchange of Freight Transport Information
Electronic Business	Law on Electronic Documents, Electronic Identification and Trust Services	Legal Validity of Electronic Documents
Customs Procedures	Customs Administrations	Exchange and Verification of Customs Data
Transport Policy	Ministries Responsible for Transport	Implementation Coordination
Business Sector	Road Transport Operators, Freight Forwarders and the Chamber of Commerce and Industry of Serbia	Practical Implementation of the System

The analysis demonstrates that in the Republic of Serbia and the Western Balkans countries, the basic legal and institutional preconditions for the introduction of an eCMR platform have been largely established. Nevertheless, for its wider application it is necessary to further align legislation, improve the interoperability of information systems, and strengthen cooperation between the public and private sectors.

2.2.5. Quantification of the Consequences of the Existing System

The analysis of the existing CMR documentation management system demonstrates that the negative effects of the paper-based system are not limited to organisational and administrative challenges, but also manifest in measurable temporal, financial, and environmental consequences. The quantification of these consequences enables a more objective assessment of the scale of the problem and provides the basis for the subsequent analysis of the benefits of introducing an eCMR platform.

According to the results of international studies and pilot projects, the average time required to process a single paper CMR document is approximately 23 minutes, whilst electronic CMR requires approximately 9 minutes. This means that the transition to an electronic system can achieve a reduction in administrative processing time of approximately 60%, which is of particular significance in conditions of high transport operation volumes.

In addition to time-related effects, significant differences also exist with regard to costs. The estimated cost of managing a single paper CMR document is approximately €7.20, whilst the cost of an electronic document is estimated at approximately €2.00. At the level of an individual transport operation, the average saving amounts to approximately €5.20 per document, whilst in more complex logistics chains the benefits may reach up to €13 per transport operation.

When these indicators are considered in the context of the estimated 1.5 million CMR documents generated annually in the Republic of Serbia, and 3.0–3.4 million documents at the level of the Western Balkans, it becomes clear that the existing system generates a significant administrative burden and costs across the entire transport sector. The cumulative effects of these activities directly affect the efficiency of transport operations, the competitiveness of the economy, and the quality of logistics services.

At the level of the European Union, it is estimated that the widespread adoption of electronic transport documentation could result in savings exceeding one billion euros annually, with a reduction in administrative burden of more than 102 million working hours. At the same time, a significant reduction in paper consumption and other material resources is anticipated, contributing to the achievement of sustainable development objectives and the green transition of the transport sector.

The indicators presented confirm that the consequences of retaining the existing system are not merely administrative in nature, but carry significant economic, organisational, and environmental implications. For this reason, they may be regarded as one of the key arguments in favour of considering and introducing an electronic CMR system in the Republic of Serbia and the Western Balkans countries.

Table 2.2-8: Key Performance Indicators — Paper CMR and eCMR

Indicator	Paper-Based CMR	eCMR	Impact
Average Processing Time	23 minutes	9 minutes	Approximately 60% Reduction
Cost per Document	€7.20	€2.00	Savings of €5.20 per Document
Potential Benefits in Complex Logistics Environments	–	High	Up to €13 per Document
Administrative Burden	High	Low	Reduced Administrative Workload
Data Exchange	Manual	Digital	Faster and More Secure Exchange

According to European Commission estimates, the full digitalisation of transport documentation at the level of the European Union may result in savings exceeding one billion euros annually and a reduction in administrative burden of more than 102 million working hours. At the same time, the transition to electronic documentation contributes to a significant reduction in paper consumption and improvement of the sustainability of the transport sector.

2.2.6. Key Indicators of the Existing Situation

The analysis of the existing situation has demonstrated that the transport sector of Serbia and the Western Balkans possesses significant potential for the digitalisation of transport documentation. At the same time, the large number of CMR documents processed annually, the prevalence of paper-based procedures, and the existing administrative costs indicate considerable scope for improving business efficiency.

The summarised indicators presented below constitute the baseline for further analyses within this study. These values will be used as reference parameters in assessing the effects of introducing the eCMR system, preparing the financial analysis, the economic analysis, and the cost-benefit analysis.

The indicators presented constitute the baseline for further analysis of the problem, assessment of needs, and determination of the potential effects of introducing the eCMR system. At the same time, they confirm the existence of significant scope for improving the efficiency of transport documentation management in the Republic of Serbia and the Western Balkans countries.

2.2.7. Conclusion of the Analysis of the Existing Situation

The analysis of the existing situation has demonstrated that the CMR documentation management system in the Republic of Serbia and the Western Balkans countries continues to rely to a considerable extent on paper-based procedures that generate administrative burdens, increase business costs, and slow the exchange of information between participants in the transport chain.

At the same time, the analysis has confirmed that significant progress in the digitalisation of the transport and logistics sector has been achieved in the preceding period. The high degree of digitalisation of customs procedures, the increasingly widespread application of information systems in transport, and the development of the regulatory framework for the use of electronic documents indicate the existence of favourable preconditions for the introduction of the eCMR system.

Of particular significance is the fact that concrete temporal and financial benefits that can be achieved through the transition from paper to electronic consignment notes have been identified. At the same time, the regional specificities of the Western Balkans, the large volume of cross-border transport, and the increasingly intensive alignment with European digital initiatives further underscore the need for the modernisation of transport documentation.

On the basis of the results of the analysis, it may be concluded that there is a clear gap between the existing situation and the possibilities offered by modern digital solutions. The identified deficiencies and limitations represent precisely the basis for formulating the key problems requiring resolution, which is the subject of the following chapter.

2.3. Problem Identification

The analysis of the existing situation has demonstrated that in the Republic of Serbia and the Western Balkans countries, significant preconditions for the digitalisation of the transport sector have been established, including the development of information systems, electronic services, and the progressive alignment of the regulatory framework with European standards. Nevertheless, the paper-based CMR consignment note continues to represent the dominant form of documentation for international road freight transport.

The results of the analysis indicate that the existing transport documentation management model generates administrative burdens, increases business costs, and slows the exchange of information between participants in the transport chain. Additional challenges relate to the risk of errors in manual document processing, limited data availability, and the uneven degree of digitalisation among individual process participants.

On the basis of the analysis conducted, five key groups of problems have been identified: administrative inefficiency, risk of errors in document processing, limited availability of information, high costs of paper documentation, and negative environmental impact. These problems constitute the basis for considering the introduction of the electronic consignment note (eCMR) and assessing the potential benefits that its application may yield.

The following sections provide a more detailed analysis of the causes, consequences, and significance of the identified problems, with the aim of establishing the need for the introduction of the eCMR system and defining possible directions for improving the existing situation.

2.3.1. Administrative Inefficiency

One of the most significant problems of the existing transport documentation management system is the high level of administrative burden arising from the dominant use of paper CMR documents. The existing working model involves a large number of manual activities encompassing the preparation, completion, printing, signing, exchange, verification, and archiving of documentation. These activities recur during every transport operation and involve multiple participants in the transport chain, including consignors, carriers, freight forwarders, consignees, and competent institutions.

The problem of administrative inefficiency is further pronounced in international road transport, where a single transport operation frequently involves the exchange of documentation between multiple organisations and institutions. In such conditions, the same data is often manually entered on multiple occasions into different documents and information systems, which increases processing times and burdens employees with administrative tasks that do not create additional value in the transport process.

According to available analyses and pilot project results, the average time required to process a single paper CMR document is approximately 23 minutes, whilst processing an electronic CMR document requires approximately 9 minutes. This indicates that the paper-based model generates significantly greater administrative burden and that there is scope to reduce processing times by approximately 60% through the application of electronic documentation.

Considered at the level of the Republic of Serbia, where approximately 1.5 million CMR documents are generated annually, the administrative activities associated with paper documentation represent a significant burden for the transport sector. A similar situation exists at the level of the Western Balkans, where it is estimated that between 3.0 and 3.4 million CMR documents are processed annually. The cumulative effect of the large number of documents and manual procedures results in significant time expenditure, increased operational costs, and reduced business efficiency.

Administrative inefficiency is particularly evident in situations where rapid information exchange between transport process participants is required, or where corrections and additions to data are necessary. In the paper-based working model, any amendment involves additional administrative activities, which may lead to delays in transport execution and an increase in overall business costs.

In addition to the direct effects on costs and productivity, administrative inefficiency also negatively affects the competitiveness of transport companies. In conditions of increasingly intensive digitalisation of logistics processes and growing demands for rapid data exchange, reliance on paper documentation represents a factor that impedes business modernisation and hampers integration with modern digital transport systems.

In view of the foregoing, it may be concluded that administrative inefficiency represents one of the key problems of the existing transport documentation management system. This problem represents one of the most important drivers of initiatives for the introduction of electronic CMR, the primary purpose of which is to simplify administrative procedures, reduce the need for manual document processing, and increase the efficiency of transport processes.

Table 2.3-1: Comparison of Administrative Burden — Paper CMR and eCMR

Indicator	Paper-Based CMR	eCMR
Document Processing Time	23 minutes	9 minutes
Method of Exchange	Physical	Digital
Data Entry	Multiple Manual Entries	Single Data Entry
Archiving	Physical	Electronic
Administrative Burden	High	Significantly Lower

The indicators presented confirm that a significant portion of the administrative burden in the transport sector can be reduced through the application of electronic transport documentation.

2.3.2. Risk of Errors

One of the significant shortcomings of the existing CMR documentation management system is the increased risk of errors arising during the preparation, processing, and exchange of documents. Since the process relies to a considerable extent on manual data entry and paper documentation, the possibility of inaccuracies is present at all stages of the transport process.

Manual completion and repeated transcription of the same data into different documents and information systems increases the likelihood of typographical, numerical, and logical errors. Inaccurate data relating to the consignor, consignee, type of goods, quantity, or place of delivery may lead to additional administrative procedures, transport delays, and the need for subsequent document corrections.

The risk of errors is further pronounced in situations where amendments or additions to already prepared documentation are required. In the paper-based system, such amendments necessitate manual intervention and additional coordination between transport chain participants, which increases the likelihood of data inconsistencies and the creation of multiple versions of the same document.

The consequences of errors may manifest in delivery delays, extended customs procedures, increased business costs, and the emergence of disputes between transport process participants. At the same time, inaccurate or incomplete data adversely affects transport planning, shipment tracking, and business decision-making, rendering the risk of error not merely an administrative but also a managerial problem.

On the basis of the indicators presented, it may be concluded that the risk of errors represents one of the key problems of the existing CMR documentation management system. The application of electronic CMR and automated data exchange enables single entry and multiple use of information, thereby significantly reducing the likelihood of errors and increasing the reliability of transport documentation.

Table 2.3-2: Most Common Errors in Paper Transport Documentation

Type of Error	Potential Consequences
Incorrect Consignor or Consignee Information	Delivery Delays
Incorrect Quantity or Weight of Goods	Administrative Corrections and Additional Inspections
Inconsistencies Between Documents	Customs and Regulatory Inspection Issues
Missing Signatures or Stamps	Incomplete Documentation
Incorrect Delivery Date or Place of Delivery	Disputes Between the Parties
Loss or Damage to the Document	Additional Costs and Delivery Delays

2.3.3. Limited Availability of Information

The existing CMR documentation management system is characterised by limited availability of information during the execution of the transport process. Since data exchange relies to a considerable extent on paper documents, access to relevant information is frequently limited to those participants who physically possess the documentation at a given moment.

In such an environment, information regarding the status of a shipment, changes to transport arrangements, confirmation of goods collection, or delivery is not always available to all transport chain participants in real time. As a consequence, operational decision-making may be slowed, and coordination between consignors, carriers, freight forwarders, consignees, and competent institutions may be hampered.

The limited availability of information is particularly pronounced in international road transport, where a greater number of organisations and institutions are involved in the process. The lack of timely access to documentation may lead to additional verifications, delays in administrative procedures, and an increased need for communication between transport process participants.

In addition to operational consequences, limited data availability also affects the transparency and traceability of transport operations. Insufficient information visibility hampers the monitoring of documentation flows, verification of shipment status, and rapid response in the event of unforeseen circumstances or the need for data amendments.

In view of the foregoing, it may be concluded that limited availability of information represents one of the significant limitations of the existing system. The application of electronic CMR enables faster and simpler data exchange, access to relevant information in real time, and a greater degree of transparency in the transport process, thereby increasing the efficiency of logistics flow management.

Table 2.3-3: Comparison of Information Availability — Paper CMR and eCMR

Indicator	Paper-Based CMR	eCMR
Access to Documentation	Limited	Available to Authorised Users
Data Availability	After Physical Exchange	Real-Time
Shipment Status Tracking	Limited	Continuous
Information Exchange	Manual	Digital
Process Transparency	Limited	High

The differences presented indicate that limited availability of information represents one of the factors affecting the efficiency of the transport process.

2.3.4. Costs of Paper Documentation

The existing paper-based CMR documentation management system generates significant direct and indirect costs for all participants in the transport chain. In addition to the costs of printing and procuring forms, paper documentation requires physical distribution, manual processing, archiving, and retention of documentation for the prescribed period, which further increases overall business costs.

The financial burden is not limited to material costs. A significant portion of costs arises from the time employees spend on the preparation, verification, exchange, and archiving of documentation. With a large number of transport operations, even relatively small costs per individual document may result in significant annual expenditure at the level of a company or the entire sector.

According to available analyses, the average cost of processing a single paper CMR document is approximately €7.20, whilst the cost of processing an electronic CMR document is estimated at approximately €2.00. This indicates a potential saving of approximately €5.20 per document, and in more complex logistics environments the benefits achieved may be considerably greater. The detailed methodology for estimating unit costs and financial benefits is presented in Section 9.4.1.

Considered at the level of the Republic of Serbia, where approximately 1.5 million CMR documents are estimated to be processed annually, and at the level of the Western Balkans with more than 3 million documents per year, the costs associated with paper documentation represent a significant burden for the transport sector. For this reason, the costs of paper documentation represent one of the important problems of the existing system and one of the key arguments for the introduction of electronic CMR.

It follows from the foregoing that paper documentation generates costs that can be significantly reduced through the application of digital solutions. The transition to eCMR enables the rationalisation of administrative processes, reduction of operational costs, and more efficient use of resources in the transport sector.

Table 2.3-4: Comparison of Costs — Paper CMR and eCMR

Indicator	Paper-Based CMR	eCMR
Average Cost per Document	€7.20	€2.00
Cost Difference / Savings	–	€5.20 per Document
Archiving Method	Physical	Electronic
Document Exchange	Manual	Digital

The indicators presented indicate that the costs of paper documentation represent a significant financial burden for the transport sector.

2.3.5. Environmental Impact

The existing paper-based CMR documentation management system also has certain negative environmental impacts. Although an individual document represents a relatively small resource requirement, the large number of transport operations executed daily leads to significant paper consumption and consumption of other materials required for the preparation, printing, distribution, and archiving of documentation.

In addition to direct paper consumption, the paper-based system also involves additional resources associated with printing, copying, transport, and storage of documentation. In conditions of high transport operation volumes, these processes generate additional energy and material consumption, increasing the overall environmental footprint of the transport sector.

A particular challenge is presented by the long-term archiving of documentation, which requires physical space and continuous management of archival materials. As the number of documents grows, so do the requirements for storage and maintenance of archives, placing additional burdens on organisational and material resources.

In the context of European sustainable development and green transition policies, measures aimed at reducing paper consumption and transitioning to digital business processes are gaining increasing importance. The digitalisation of transport documentation has been recognised as one of the mechanisms for reducing the use of paper documents, more rational use of resources, and improvement of the sustainability of the transport sector.

In view of the foregoing, it may be concluded that the paper-based CMR documentation management system has adverse environmental effects that increase further with growing transport volumes. For this reason, environmental impact represents one of the relevant problems of the existing situation and an additional argument for considering the introduction of electronic CMR.

Table 2.3-5: Environmental Aspects of Paper and Electronic CMR

Indicator	Paper-Based CMR	eCMR
Average Cost per Document	€7.20	€2.00
Savings per Document	–	€5.20
Archiving Method	Physical	Electronic
Document Exchange	Manual	Digital

Although environmental effects are not the primary driver of transport documentation digitalisation, they represent a significant additional benefit. The reduction of paper use and physical archiving contributes to more efficient use of resources and the alignment of the transport sector with the principles of sustainable development and the green transition.

2.4. Analysis of the Root Causes of the Problems

The identified problems in the existing CMR documentation management system are not the result of a single factor, but the outcome of several interrelated circumstances that have developed over an extended period of time. The analysis of the existing situation has demonstrated that administrative inefficiency, risk of errors, limited availability of information, high costs of paper documentation, and negative environmental effects arise from a combination of regulatory, technological, organisational, and economic factors.

Regulatory factors relate primarily to the varying pace of adoption and application of the eCMR Protocol, inconsistent legislative solutions, and varying degrees of institutional readiness among the countries of the region. Although significant progress in the digitalisation of the transport sector has been achieved in the preceding period, differences in the normative and institutional framework continue to exist that affect the pace and scope of application of electronic transport documentation.

Technological factors are reflected in the lack of integrated digital platforms, varying levels of digitalisation among economic operators, and limited interoperability — that is, limited mutual connectivity and data exchange between existing information systems. This situation hampers efficient data exchange and slows the digital transformation of transport processes. The lack of common standards for cross-border exchange of transport data and limited regional interoperability represent additional factors impeding the digitalisation of transport documentation.

Organisational factors are associated with existing working methods and business process management. Resistance to change, insufficient training of employees for working in a digital environment, and long-standing reliance on paper-based procedures represent significant challenges in the process of modernising transport documentation.

Economic factors relate to the need for initial investments in digitalisation, the costs of information system integration, and the varying financial capabilities of companies operating in the transport market. Although significant long-term savings and benefits are anticipated, the initial costs of introducing new solutions may represent a constraint for some economic operators, particularly small and medium-sized enterprises.

In view of the foregoing, it may be concluded that the identified problems are the result of the interaction of several interrelated causes. For this reason, the successful introduction of an eCMR

platform requires the simultaneous addressing of the regulatory, technological, organisational, and economic factors affecting the functioning of the existing system.

Table 2.4-1: Overview of Key Root Causes of the Identified Problems

Category of Causes	Key Factors
Regulatory	Different Rates of eCMR Protocol Adoption; Non-Harmonised Legislative Frameworks; Varying Levels of Institutional Readiness
Technological	Lack of Integrated Platforms; Varying Levels of Digitalisation; Limited System Interoperability
Organisational	Resistance to Change; Insufficiently Trained Personnel; Reliance on Paper-Based Procedures
Economic	Initial Investment Requirements; System Integration Costs; Varying Financial Capacity of Companies

The root causes presented indicate that the problems of the existing system are not exclusively technical in nature, but are the result of the simultaneous interaction of regulatory, organisational, technological, and economic factors. A comprehensive approach is therefore necessary when planning and implementing the eCMR system.

2.5. Consequences of Retaining the Existing Situation

Should the predominantly paper-based CMR documentation management system continue to be applied, the negative effects on the efficiency of the transport and logistics sector, as well as on the environment, may be expected to persist. The identified problems — including administrative inefficiency, risk of errors, limited availability of information, and high costs of transport documentation processing — will continue to burden transport processes and adversely affect the competitiveness of economic operators.

Retaining the existing situation would lead to a further increase in administrative costs and the need for manual processing of large volumes of documents. At the same time, transport processes would remain slower and less efficient compared to systems utilising digital data exchange and electronic documentation.

In addition to operational and financial consequences, the continued reliance on paper documentation may adversely affect the competitiveness of transport companies, particularly in conditions of increasingly intensive digitalisation of the European transport market. Limited integration with European digital transport platforms and initiatives — including the development of the eFTI framework and the expanding application of eCMR — could further impede the modernisation of the sector.

Retaining the existing system also hampers the monitoring of transport flows, access to relevant information, and efficient logistics process management. At the same time, the potential benefits of digital transformation are foregone, including faster data exchange, reduced administrative burden, greater transparency, and more efficient use of resources.

In the longer term, this situation may adversely affect the development and competitiveness of the transport and logistics sector of the Republic of Serbia and the Western Balkans countries relative to

European Union member states that are intensively implementing the digitalisation of transport documentation and logistics processes. For this reason, retaining the existing situation does not represent a sustainable long-term option, but rather indicates the need for further modernisation and digital transformation of the sector.

Table 2.5-1: Consequences of Retaining the Existing Situation

Area	Consequences
Public Administration	Increased Administrative Costs and Burden
Operational Processes	Slower Processing of Transport Operations
Competitiveness	Reduced Competitiveness of Companies
Digital Integration	Limited Integration with European Digital Platforms
Transport Monitoring	Reduced Visibility and Control of Transport Flows
Sector Development	Missed Opportunities Arising from Digital Transformation

The consequences presented indicate that retaining the existing system would have a negative impact on the efficiency, competitiveness, and further development of the transport sector. For this reason, it is necessary to consider the possibilities of modernisation and the introduction of electronic solutions, which is the subject of the following chapter.

Retaining the existing situation also implies an increasing risk of gradual technological lagging behind European transport systems that are intensively transitioning to digital exchange of transport information.

2.6. The Need for the Introduction of an eCMR Platform

The results of the analysis of the existing situation indicate that the transport documentation management system in the Republic of Serbia and the Western Balkans countries continues to rely to a considerable extent on paper-based procedures that generate administrative burdens, increase business costs, and slow the exchange of information. At the same time, the growth in international road transport volumes and the increasingly intensive digital transformation of the transport sector indicate the need for the modernisation of the existing system.

Electronic CMR (eCMR) represents a digital version of the traditional CMR consignment note that enables the electronic creation and signing of documentation, real-time data exchange, integration with other information systems, and secure electronic archiving. In this way, the preconditions are created for more efficient transport documentation management throughout the entire lifecycle of a transport operation.

The need for the introduction of an eCMR platform arises from the need to reduce administrative burden, improve the efficiency of transport processes, and ensure better data availability for all participants in the transport chain. At the same time, the application of electronic documentation represents an important step in the process of digital transformation of the transport sector and creates the preconditions for integration with national and international digital platforms.

The particular significance of introducing an eCMR platform is reflected in the process of alignment with European digital initiatives and the regulatory framework. The development of the eFTI framework and the increasingly widespread application of electronic transport documentation in the European Union indicate that digital data exchange will in the coming period become the standard in international transport. The timely introduction of eCMR would enable Serbia and the Western Balkans countries to more easily integrate into the European digital transport area and be better prepared for future regulatory requirements.

Table 2.6-1: Expected Effects of Introducing the eCMR Platform

Area	Expected Effects
Public Administration	Reduced Administrative Burden and Costs
Transport Processes	Faster Processing and Exchange of Transport Documentation
Data Quality	Reduction in Data Entry Errors
Information Availability	Real-Time Access to Information
Cross-Border Cooperation	Simplified Cross-Border Data Exchange
Digital Integration	Integration with National and European Digital Platforms
Sustainability	Reduced Paper Consumption and Physical Archiving Requirements

The effects presented demonstrate that eCMR does not merely represent the replacement of a paper document with its electronic equivalent, but rather the foundation for the modernisation and further digitalisation of transport processes, with improvements to the efficiency, interoperability, and competitiveness of the transport sector.

2.7. Formulation of the Central Problem

The analysis of the existing situation, the identified problems, their causes and consequences, has demonstrated that the existing transport documentation management system in the Republic of Serbia and the Western Balkans countries no longer fully meets the requirements of the modern transport and logistics environment. Although significant progress in the digitalisation of the transport sector has been achieved in the preceding period, CMR documentation management continues to rely to a considerable extent on paper-based procedures that limit efficiency and the possibilities for further development.

On the basis of the analysis conducted, the central problem of this study may be defined as follows:

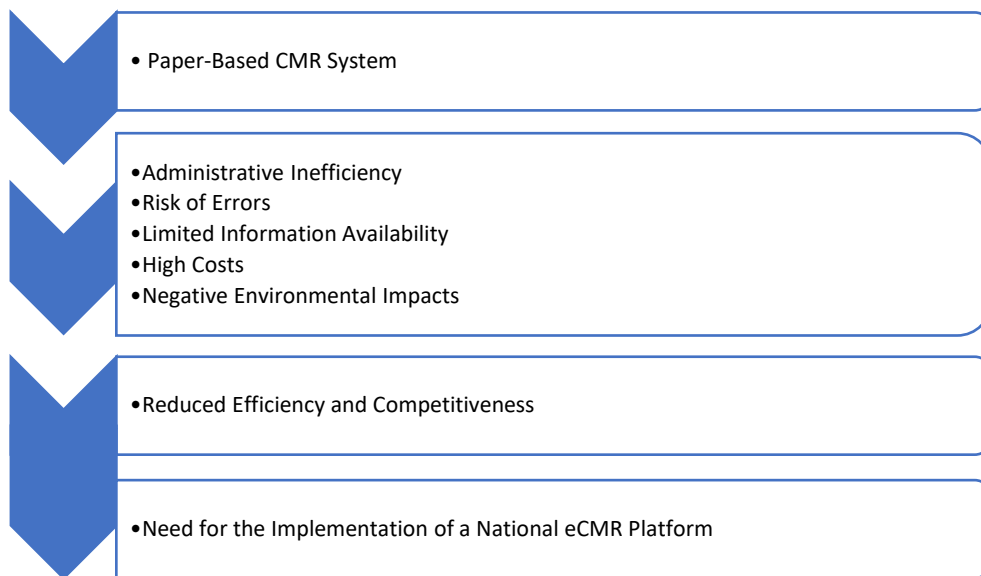
The existing CMR documentation management system in the Republic of Serbia and the Western Balkans countries relies to a considerable extent on paper-based processes that generate administrative costs, slow transport operations, increase the risk of errors, limit the availability of information, and hamper the integration of the transport sector with modern European digital logistics and transport systems.

The problem thus defined has a direct impact on the efficiency of transport processes, the competitiveness of economic operators, the quality of transport flow management, and the capacity of the transport sector to respond to the demands of digital transformation and increasingly intensive

international integration. At the same time, retaining the existing situation leads to the foregone potential benefits of modern digital solutions, including faster data exchange, greater transparency, reduced administrative burden, and more efficient use of resources.

Proceeding from the problem as defined, a need arises to consider the possibilities of introducing an electronic CMR system as one of the instruments for the modernisation of transport documentation and the improvement of transport sector efficiency. In this context, the subsequent chapters of the study will analyse the technical, institutional, economic, financial, social, and environmental justification for introducing an eCMR platform in the Republic of Serbia and the Western Balkans countries, as well as the potential effects of its application on all relevant participants in the transport process.

Figure 2.7-1: Logical Framework of the Central Problem — Problem Tree



3. LEGAL AND INSTITUTIONAL FRAMEWORK

3.1. Legal Framework of the Analysis

The legal and institutional analysis represents one of the fundamental elements of the Feasibility Study for the introduction of the electronic consignment note (eCMR) system, as it enables an assessment of the existing normative and institutional preconditions for the establishment and functioning of a national eCMR platform in the Republic of Serbia. The objective of the analysis is to determine the extent to which the applicable legal framework enables the use of electronic transport documents, electronic identification, trust services, and digital data exchange, and to identify areas in which additional normative, institutional, or organisational improvements may be required.

The subject of this analysis is the legal and institutional framework of the Republic of Serbia, which has been examined as the basis for assessing the justification for establishing a national eCMR platform. At the same time, in accordance with the subject matter and methodology of this study, regional aspects of relevance to the Western Balkans have also been considered, primarily with regard to potential cross-border interoperability, alignment with European transport policies, and the possibilities for future exchange of electronic transport data.

The legal and institutional frameworks of the individual Western Balkans economies were not the subject of a separate normative analysis; rather, regional aspects were considered at the level of common initiatives, international and European regulatory frameworks, and the potential for future regional cooperation. Accordingly, a detailed analysis of national legislation was conducted for the Republic of Serbia, whilst the regional level was analysed to the extent necessary for examining the possibilities of future interoperability and the development of the eCMR system across the Western Balkans.

The legal analysis is based on a review of the applicable regulations of the Republic of Serbia governing the fields of electronic documents, electronic identification, trust services, electronic governance, personal data protection, and information security, as well as on an analysis of the relevant international and European legal frameworks that serve as the reference basis for the development of electronic transport systems. Particular attention has been paid to assessing their applicability to the proposed solution and identifying any normative limitations that could affect its implementation.

The starting point for the analysis is provided by the results of the preceding chapters of this study, in particular the analysis of the existing situation, the market and needs analysis, the stakeholder analysis, and the options analysis, as well as the adopted technical solution presented in Chapter 5, which provides for the establishment of a national eCMR platform designed in accordance with the principles of interoperability and future alignment with the European framework for electronic freight transport information (eFTI-ready architecture).

The analysis is not directed at interpreting or assessing the status of accession to individual international treaties, but rather at evaluating the existing legal and institutional preconditions for the establishment of a national system. Accordingly, international and European legal instruments are considered as a reference normative framework for the development of the system and its future interoperability, whilst the assessment of the readiness of the Republic of Serbia is based primarily on the applicable national legislation and institutional capacities.

The results of this analysis provide the basis for examining the legal and institutional feasibility of the project and are directly linked to the technical and technological analysis (Chapter 8), the financial analysis (Chapter 9), the economic analysis (Chapter 10), the risk analysis (Chapter 11), and the implementation plan (Chapter 13), in which the functional, organisational, and economic aspects of establishing the national eCMR platform are examined.

3.2. International Legal Framework

The international legal framework provides the basis for the legal regulation of international road freight transport and the development of electronic transport documentation. In the context of this study, its significance lies in establishing the international legal standards that enable the application of the electronic consignment note (eCMR) and serve as the starting point for the development of a national system in the Republic of Serbia, whilst ensuring future interoperability with international transport flows.

The primary international legal instrument in the field of road freight transport is the Convention on the Contract for the International Carriage of Goods by Road (CMR Convention), adopted in 1956 under the auspices of the United Nations Economic Commission for Europe (UNECE). The Convention establishes uniform rules governing the rights, obligations, and liabilities of the contracting parties in international road freight transport, as well as the legal significance of the consignment note as the primary document evidencing the conclusion and execution of the contract of carriage. By virtue of its widespread international application, the CMR Convention constitutes the foundation of legal certainty in international road transport.

The development of digital documentation was made possible by the adoption of the Additional Protocol to the CMR Convention on the Electronic Consignment Note (eCMR Protocol) of 2008. The Protocol establishes the legal basis for the issuance, exchange, signing, and storage of the consignment note in electronic form, based on the principle of legal equivalence between the electronic and paper document. At the same time, it prescribes the fundamental requirements relating to ensuring the authenticity, integrity, and availability of electronic data, as well as the application of reliable electronic identification and electronic signing mechanisms. The application of eCMR in a specific international transport operation is conditional upon the fulfilment of the relevant requirements under international law, primarily with regard to the applicability of the eCMR Protocol to the states participating in the carriage, or the existence of another legal basis for the recognition of electronic transport documentation.

In addition to the CMR Convention and the eCMR Protocol, the development of electronic business in international transport is also supported by other international instruments which, although they do not directly regulate the application of eCMR, constitute an important reference framework for the digitalisation of transport processes. These include the United Nations Convention on the Use of Electronic Communications in International Contracts, the recommendations and standards of UNECE in the field of digitalisation of transport and trade documentation, the UNCITRAL Model Law on Electronic Transferable Records (MLETR), and the digital initiatives developed within the TIR system. These instruments contribute to the development of internationally accepted principles of electronic data exchange, interoperability, and legal recognition of electronic documents, but do not in themselves constitute a direct legal basis for the application of the eCMR system.

From the perspective of the subject matter of this study, the international legal framework serves as the reference basis for assessing the alignment of the national legislation of the Republic of Serbia with internationally accepted legal standards in the field of electronic transport documentation, as well as for examining the potential for future interoperability and regional cooperation across the Western Balkans. In accordance with the methodological approach defined in Section 3.1, this analysis is not directed at individually assessing the application of each international instrument, but rather at examining their significance for the establishment of the national eCMR platform, its future interoperability, and its alignment with contemporary international and European transport digitalisation frameworks. Proceeding from these principles, the following section examines the

European legal framework, which is of particular significance for the future development of the eCMR system and its connectivity with European Union digitalisation initiatives in the field of transport.

3.3. European Legal and Regulatory Framework

The European Union has in recent years been implementing an intensive digital transformation of the transport sector with the aim of establishing a single European area for the electronic exchange of transport information. In this context, a comprehensive regulatory framework has been developed encompassing electronic transport documentation, electronic identification, trust services, personal data protection, and cybersecurity. Although the Republic of Serbia is not subject to the direct application of these regulations, they constitute the reference normative framework for the design of a national eCMR system and its future interoperability with the European transport environment.

The most significant European regulation in the field of transport digitalisation is Regulation (EU) 2020/1056 on electronic freight transport information (eFTI). It establishes a single legal framework for the electronic exchange of information that economic operators provide to competent authorities during the carriage of goods. The Regulation provides that the competent authorities of Member States shall accept the prescribed transport information in electronic form when submitted via certified eFTI platforms, whilst the technical and organisational conditions for its application are elaborated through delegated and implementing acts of the European Commission. The eFTI concept is based on the exchange of standardised datasets rather than individual documents, thereby enabling a higher degree of interoperability, security, and efficiency in cross-border information exchange. For this reason, within the framework of this study, the national eCMR platform has been designed in accordance with the principles of eFTI-ready architecture.

The legal reliability of electronic transactions is ensured by Regulation (EU) No 910/2014 on electronic identification and trust services for electronic transactions in the internal market (eIDAS), as amended by Regulation (EU) 2024/1183, which established the European Digital Identity Framework. This regulatory framework governs electronic identification, qualified electronic signatures, electronic seals, time stamps, electronic registered delivery services, and other trust services that ensure the authenticity, integrity, and legal validity of electronic documents. These principles constitute an important basis for the establishment of a reliable and legally acceptable national eCMR system.

Since the electronic consignment note may contain data relating to natural persons, an important component of the European regulatory framework is also the General Data Protection Regulation (GDPR — Regulation (EU) 2016/679). Its principles of lawfulness, data minimisation, purpose limitation, integrity, confidentiality, and accountability constitute reference guidelines for designing the processing and protection of data within the national eCMR platform. In the Republic of Serbia, these principles have been largely incorporated into the national legislation governing personal data protection.

Given that the national eCMR platform constitutes an information system of significance for the functioning of the transport sector, the European cybersecurity framework is also relevant, in particular Directive (EU) 2022/2555 (NIS2). Although its provisions are not directly applicable in the Republic of Serbia, the principles of risk management, protection of information systems, resilience of digital infrastructure, and management of security incidents constitute important guidelines for the design of a secure and reliable national eCMR platform. These requirements are further examined in Chapter 8 (Technical and Technological Analysis) and Chapter 11 (Risk Analysis).

In addition to the foregoing regulations, the European regulatory framework is complemented by strategic documents of the European Union, primarily the Strategy for Smart and Sustainable Mobility and the Trans-European Transport Network (TEN-T) development policy, which recognise the digitalisation of transport processes, interoperability of information systems, and electronic data exchange as key preconditions for the more efficient functioning of the European transport system.

For ease of reference, Table 3.3-1 below provides a concise overview of the most significant European regulations relevant to the establishment of a national eCMR system.

Table 3.3-1: Most Significant European Regulations and Strategic Documents Relevant to the Establishment of a National eCMR System

European Legislation / Policy Document	Primary Area	Relevance to the National eCMR Platform
Regulation (EU) 2020/1056 (eFTI)	Electronic Freight Transport Information	Reference Framework for an eFTI-Ready Architecture and Future Interoperability
Regulation (EU) No 910/2014, as amended by Regulation (EU) 2024/1183 (eIDAS)	Electronic Identification and Trust Services	Legal Validity of Electronic Documents and Electronic Signatures
Regulation (EU) 2016/679 (GDPR)	Personal Data Protection	Lawful and Secure Processing of Personal Data
Directive (EU) 2022/2555 (NIS2)	Cybersecurity	Resilience, Security and Risk Management of the Information System
Sustainable and Smart Mobility Strategy and TEN-T Policy	Development of the European Transport System	Strategic Framework for Transport Digitalisation and Interoperability

Proceeding from the European regulatory frameworks analysed, and in particular from the principles established by the eFTI Regulation, this study considers the establishment of a national eCMR platform designed in accordance with the principles of eFTI-ready architecture as the preferred solution. Such an approach enables the development of a system in accordance with the applicable national legislation of the Republic of Serbia, whilst simultaneously ensuring future interoperability with the European transport environment and supporting regional cooperation across the Western Balkans. These principles constitute the basis for the technical solution presented in Chapter 8, the financial and economic analyses in Chapters 9 and 10, the risk analysis in Chapter 11, and the implementation plan in Chapter 13.

3.4. National Legal Framework of the Republic of Serbia

The national legal framework of the Republic of Serbia constitutes the basis for assessing the legal feasibility of establishing a national eCMR platform. Unlike the international and European regulatory frameworks, which serve as reference standards for system development, national legislation directly governs the conditions under which electronic documents may be issued, exchanged, signed, stored, and used in legal transactions and in communication with public authorities. The analysis was

conducted with the aim of determining whether the existing normative framework enables the establishment of a national eCMR system without the need for substantive amendments to primary legislation.

The most significant regulation in this regard is the Law on Electronic Documents, Electronic Identification and Trust Services in Electronic Business, which governs the legal status of electronic documents, electronic identification, and trust services, including qualified electronic signatures, electronic seals, time stamps, electronic delivery, and long-term preservation of electronic documents. This Law ensures that an electronic document cannot be denied legal validity solely on account of its electronic form, thereby establishing the fundamental normative precondition for the application of the electronic consignment note within the national legal system. The Law is largely aligned with the principles of the European eIDAS framework and constitutes the key legal pillar for the functioning of the national eCMR platform.

The Law on Electronic Administration also plays a significant role, governing electronic communication between public authorities, economic operators, and citizens. The principles of electronic data exchange, interoperability, data reuse, and the development of electronic services established by this Law are directly applicable to the concept of the national eCMR platform, particularly with regard to cooperation with competent authorities during inspection, customs, and other administrative procedures.

Given that the electronic consignment note may contain data relating to natural persons, the Law on Personal Data Protection constitutes an important element of the national legal framework. It incorporates into the domestic legal system the fundamental principles of lawful, transparent, and secure processing of personal data, which are aligned with the principles of the General Data Protection Regulation (GDPR) of the European Union. In designing the national eCMR platform, it is necessary to ensure the application of the principles of data minimisation, purpose limitation, integrity, confidentiality, and accountability throughout the entire lifecycle of the electronic document.

In addition to data protection, the security of the information system represents one of the fundamental preconditions for the functioning of the national platform. In this context, the Law on Information Security is relevant, governing measures for the protection of information and communication systems, risk management, response to security incidents, and the development of the institutional framework for information security. The principles of this Law are aligned with the contemporary European approach to cybersecurity risk management and constitute the normative basis for the design of a secure, reliable, and available eCMR platform.

From the perspective of transport legislation, the Law on Transport in Road Traffic is relevant, governing the conditions for the performance of road transport, the rights and obligations of transport process participants, and the maintenance of prescribed documentation. Although this Law does not directly regulate the application of the electronic consignment note, its provisions constitute the normative framework within which the national eCMR system will be applied, and it is therefore necessary to ensure their mutual alignment during implementation.

The Law on Inspection Supervision is also relevant, as it promotes electronic communication, data exchange, and the digitalisation of inspection procedures. The development of the national eCMR platform can significantly contribute to the more efficient conduct of inspection supervision by enabling authorised authorities faster and more reliable access to relevant transport data, in accordance with the law and prescribed powers.

For ease of reference, Table 3.4-1 below presents the most significant regulations relevant to the establishment of the national eCMR platform.

Table 3.4-1: Most Significant National Regulations Relevant to the Establishment of the National eCMR Platform

National Legislation	Primary Area	Relevance to the National eCMR Platform
Law on Electronic Documents, Electronic Identification and Trust Services for Electronic Transactions	Electronic Documents and Trust Services	Legal Validity of the Electronic Consignment Note
Law on eGovernment	Electronic Communication with Public Authorities	Interoperability and Electronic Data Exchange
Law on Personal Data Protection	Personal Data Protection	Lawful and Secure Data Processing
Law on Information Security	Cybersecurity	Protection and Resilience of the National eCMR Platform
Law on Road Transport	Road Transport Operations	Regulatory Framework for the Implementation of the National eCMR System
Law on Inspection Oversight	Inspection Procedures	Digitalisation of Inspection Activities and Access to Transport Information

The analysis of national legislation demonstrates that the Republic of Serbia already possesses a developed normative framework that enables the legal recognition of electronic documents, the application of trust services, electronic data exchange, personal data protection, and the provision of information security. On this basis, it may be concluded that the existing legal framework constitutes a sound foundation for the establishment of the national eCMR platform, whilst any further normative improvements will be directed primarily at more precisely regulating specific aspects of its application and ensuring full interoperability with the European digital transport environment.

3.5. Institutional Framework

The establishment of a national eCMR platform does not depend solely on the existence of an appropriate legal framework, but also on the availability of institutional capacities for its development, establishment, implementation, and long-term functioning. Given that eCMR entails electronic data exchange between the public and private sectors, its successful application requires the coordination of a number of institutions and organisations which, in accordance with their statutory powers, may participate in individual phases of project implementation.

In the context of the subject matter of this study, the Ministry of Construction, Transport and Infrastructure may play a significant role in coordinating activities relating to the development of road transport policies, the modernisation of the transport sector, and the coordination of activities in the

process of establishing the national eCMR system. Such a role derives from its remit in the field of transport policy and transport system development, without prejudging individual statutory competences within the future system governance model.

In the field of cross-border goods traffic, the Ministry of Finance, specifically the Customs Administration, may represent one of the key institutional partners in the development of interoperable solutions for the electronic exchange of transport data. Given the significance of customs procedures in international road transport, their involvement may contribute to more efficient data exchange, reduction of administrative burdens, and the gradual digitalisation of cross-border procedures, in accordance with applicable national regulations and future European frameworks.

The Office for Information Technology and Electronic Administration, which develops and maintains significant components of the national digital infrastructure, may be of particular importance for the technical realisation of the system. Depending on the selected implementation model, existing platforms, interoperability mechanisms, and electronic administration services may provide the basis for integrating the national eCMR platform with other public administration information systems.

In addition to the aforementioned institutions, other competent bodies may participate in certain segments of implementation, in accordance with their statutory powers and the functional requirements of the system. This applies in particular to bodies conducting inspection supervision, bodies responsible for information security, bodies responsible for personal data protection, as well as other institutions whose involvement would be conditional upon the organisation of the future system and the specific data exchange model.

The private sector constitutes an important part of the institutional framework. Carriers, freight forwarders, logistics operators, consignors, and consignees represent the primary users of the eCMR system, and their technical and organisational readiness therefore directly affects the success of implementation. The integration of the national eCMR platform with existing business information systems, including ERP, TMS, WMS, and other specialised logistics platforms, represents one of the key preconditions for the efficient application of electronic transport documentation.

Support for the digital transformation process may also be provided by the Chamber of Commerce and Industry of Serbia, professional associations of carriers, logistics companies and freight forwarders, as well as trust service providers, who supply qualified electronic signatures, electronic seals, time stamps, and other services necessary for the legally valid functioning of electronic documents. Their participation may be significant for user education, support for the digitalisation process, and ensuring the reliability of electronic business.

Given that the subject of this study is a national eCMR platform with a regional perspective, regional initiatives and international organisations that promote transport digitalisation and cross-border cooperation may also make a significant contribution, such as the Transport Community, CEFTA, and other regional initiatives. Their role is reflected primarily in the sharing of experience, the development of common standards, the strengthening of interoperability, and support for the gradual interconnection of national systems across the Western Balkans.

For ease of reference, Table 3.5-1 below presents the potential institutional participants and their possible contribution to the establishment of the national eCMR platform.

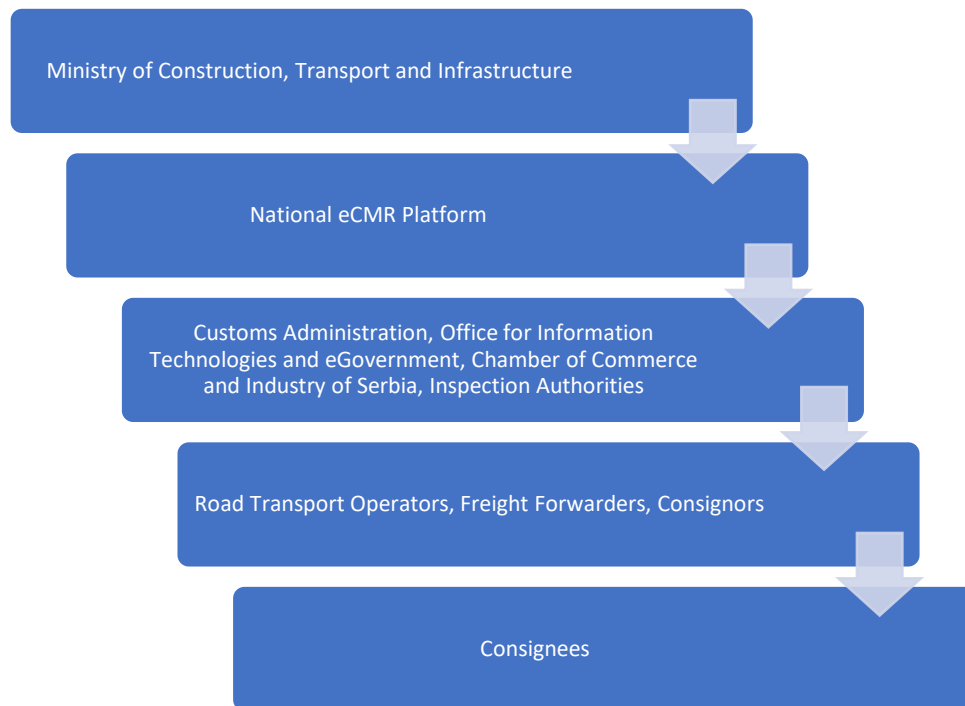
Table 3.5-1: Potential Institutional Participants in the Establishment of the National eCMR Platform

Institution / Organisation	Potential Role in the Establishment of the National eCMR Platform
Ministry of Construction, Transport and Infrastructure	Coordination of road transport policies and support for the development of the National eCMR Platform
Ministry of Finance / Customs Administration	Support for the electronic exchange of freight transport information in cross-border transport operations
Office for Information Technologies and eGovernment	Support for interoperability, system integration and the use of the national digital infrastructure
Authorities Responsible for Inspection Oversight	Potential use of electronic freight transport information within legally prescribed inspection procedures
Authorities Responsible for Information Security and Personal Data Protection	Support for the implementation of information security and data protection requirements
Road Transport Operators, Freight Forwarders, Logistics Operators, Consignors and Consignees	Primary users and key stakeholders responsible for the implementation of the National eCMR System
Chamber of Commerce and Industry of Serbia and Professional Associations	Awareness-raising, training and support for business entities
Trust Service Providers	Provision of Qualified Trust Services for Electronic Transactions
Regional Initiatives (Transport Community, CEFTA, etc.)	Support for regional cooperation and the development of interoperability

Proceeding from the legal and institutional analysis conducted, it may be concluded that the Republic of Serbia possesses institutional capacities that may serve as the basis for establishing the national eCMR platform. At the same time, the analysis indicates that the success of its implementation will depend primarily on the establishment of an efficient inter-institutional cooperation model, clearly defined roles for all participants, interoperability of information systems, and the active involvement of the business sector. The institutional model described constitutes the starting point for the technical solution examined in Chapter 8, the risk analysis in Chapter 11, and the Implementation Plan presented in Chapter 13, in which the organisational, technical, and operational aspects of establishing the national eCMR platform are elaborated in greater detail.

Figure 3.5-1 provides a simplified illustration of the potential institutional relationships relevant to the establishment and functioning of the national eCMR platform.

Figure 3.5-1: Simplified Illustration of Potential Institutional Relationships Relevant to the Establishment of the National eCMR Platform



3.6. Strategic Framework of the Republic of Serbia

In addition to alignment with the relevant international, European, and national legal framework, the justification for establishing the national eCMR platform has also been considered in relation to the applicable strategic documents of the Republic of Serbia. The objective of this analysis is not to interpret individual strategic documents, but to determine whether the objectives of the proposed project are aligned with the strategic commitments of the Republic of Serbia in the fields of digitalisation, modernisation of public administration, economic development, and technological innovation.

Among the most significant documents relevant to the subject matter of this study is the Programme for the Development of Electronic Administration in the Republic of Serbia, which defines the objectives for the development of electronic services, interoperability of information systems, digitalisation of public administration, and improvement of electronic data exchange. These objectives are directly relevant to the establishment of the national eCMR platform, which is based on electronic business and integration with public sector information systems.

Also relevant is the Smart Specialisation Strategy of the Republic of Serbia for the period 2020–2027, which promotes the development of digital technologies, innovation, and the application of modern information and communication solutions in the economy. Although this strategy does not directly relate to transport, its objectives in the field of digital transformation and innovation constitute an important strategic framework for the development of national digital platforms, including the eCMR system.

In the context of public sector modernisation, the Public Administration Reform Strategy of the Republic of Serbia is also relevant, defining the directions for the development of a more efficient, transparent, and digitally oriented public administration. The principles of developing electronic services, improving administrative procedures, and wider application of digital solutions constitute the

strategic basis for the development of electronic transport documentation and the improvement of public-private sector cooperation.

As one of the documents guiding the economic policy of the Republic of Serbia, the Economic Reform Programme recognises the importance of digitalisation, increasing the competitiveness of the economy, improving the business environment, and developing digital public services. These commitments provide additional strategic support for initiatives that contribute to reducing administrative burdens and modernising transport and logistics processes.

For ease of reference, Table 3.6-1 below provides a concise overview of the relevant strategic documents of the Republic of Serbia.

Table 3.6-1: Relevant Strategic Documents of the Republic of Serbia

Strategic Document of the Republic of Serbia	Relevant Strategic Objective	Relevance to the National eCMR System
eGovernment Development Programme	Development of Electronic Services, Interoperability and Digitalisation of Public Administration	Support for the Development of the Electronic Exchange of Freight Transport Information
Smart Specialisation Strategy of the Republic of Serbia (2020–2027)	Development of Digital Technologies, Innovation and Competitiveness	Support for the Development of National Digital Platforms
Public Administration Reform Strategy	Modernisation of Public Administration and Development of Digital Services	Support for Electronic Business and Administrative Simplification
Economic Reform Programme	Improvement of the Business Environment and Digital Transformation	Support for the Digitalisation of Transport and Logistics Processes

Proceeding from the strategic documents analysed, it may be concluded that the objectives of the proposed project are aligned with the strategic commitments of the Republic of Serbia in the fields of digital transformation, modernisation of public administration, development of electronic services, and strengthening the competitiveness of the economy. At the same time, at the time of finalisation of this study, the Republic of Serbia had not yet completed the process of accession to the Additional Protocol to the Convention on the Contract for the International Carriage of Goods by Road (CMR Convention) on the Electronic Consignment Note (eCMR Protocol). However, during the preparation of the study, the legislative procedure for the adoption of the Law on the Ratification of the said Protocol was initiated and referred to the procedure of the National Assembly of the Republic of Serbia. Accordingly, this study proceeds on the basis of the applicable legal framework, whilst acknowledging the fact that the process of accession to the eCMR Protocol is under way, which represents a positive institutional step towards the full application of the electronic consignment note in international road transport.

3.7. Chapter Conclusions

The legal and institutional analysis conducted demonstrates that the Republic of Serbia possesses a developed normative and institutional framework that provides a sound basis for the establishment of the national eCMR platform. The applicable national legislation in the fields of electronic documents,

electronic identification, electronic administration, personal data protection, and information security provides the fundamental preconditions for the legally valid application of electronic transport documentation, whilst the international and European legal frameworks constitute the reference basis for ensuring future interoperability and alignment with contemporary transport digitalisation developments.

The analysis of the institutional framework indicates that in the Republic of Serbia there exist institutions and organisations which, in accordance with their statutory powers, may play a significant role in the development, establishment, and functioning of the national eCMR platform. At the same time, the success of its implementation will depend primarily on efficient inter-institutional cooperation, clearly defined roles for all participants, interoperability of information systems, and the active involvement of the business sector.

The analysis of the strategic framework demonstrates that the proposed project is aligned with the strategic commitments of the Republic of Serbia in the fields of digital transformation, modernisation of public administration, development of electronic services, and strengthening the competitiveness of the economy. The proposed concept of the national eCMR platform has simultaneously been designed in accordance with the principles of future interoperability with the European digital transport environment, without prejudging obligations arising from European Union regulations.

At the same time, the analysis has demonstrated that the process of accession of the Republic of Serbia to the Additional Protocol to the CMR Convention on the Electronic Consignment Note has not yet been completed. During the finalisation of the study, the legislative procedure for the adoption of the Law on the Ratification of the eCMR Protocol was initiated, which represents a significant institutional step towards the full application of the electronic consignment note in international road transport. This circumstance further confirms the timeliness and strategic justification of the proposed project, but does not affect the methodology, assumptions, and results of the analyses conducted.

The existing legal and institutional capacities provide a sound basis for the development of the national eCMR platform, whilst any further normative and organisational improvements will depend on the final implementation model, the project implementation timeline, and future alignment with the international and European legal framework. In this context, the full application of the electronic consignment note in international road transport under international law presupposes the existence of an appropriate legal basis in accordance with the Additional Protocol to the CMR Convention on the Electronic Consignment Note (eCMR Protocol). The possible accession of the Republic of Serbia to the said Protocol is a matter within the competence of the state authorities and does not fall within the scope of decision-making in this study, but is recognised as one of the possible preconditions for the full application of eCMR under international law.

The foregoing conclusions constitute the starting point for the technical and technological, financial, and economic analyses, as well as for defining the implementation model of the national eCMR platform, which are examined in the subsequent chapters of this study.

4. ANALYSIS OF THE TRANSPORT SECTOR AND MARKET ENVIRONMENT

4.1. Introduction

The analysis of the existing state of the sector provides the basis for examining the market, technological, and institutional environment in which the introduction of the electronic consignment note (eCMR) in the Republic of Serbia and the Western Balkans countries would be realised. The objective of this analysis is not to revisit the identified shortcomings of the existing system, but to assess the capacity of the transport sector, the degree of its digital maturity, and its readiness for the application of modern solutions for the electronic exchange of transport documentation.

Road transport represents the dominant mode of freight carriage in the Republic of Serbia and the Western Balkans region, playing a significant role in national economies, foreign trade, and regional connectivity. The favourable geographical position of the region at the crossroads of important European transport corridors further underscores the importance of efficient management of transport and logistics processes. According to available data, more than three million CMR documents are generated annually across the Western Balkans, whilst in the Republic of Serbia alone the annual volume is estimated at approximately 1.5 million CMR consignments, indicating significant potential for the digitalisation of transport documentation and the improvement of logistics flows.

At the same time, the transport sector is undergoing a process of intensive digital transformation driven by European policies and regulatory initiatives aimed at establishing a single digital transport area. Of particular significance are the Protocol on the Electronic Consignment Note (eCMR) and the European Union Regulation on electronic freight transport information (eFTI), which lay the foundations for the gradual transition from paper-based to electronic documentation in international road transport.

The Western Balkans countries are at different stages of digital maturity and readiness for the application of the eCMR system. The Republic of Serbia possesses significant institutional, technical, and normative preconditions for the development of a national eCMR platform, whilst the countries of the region are at varying stages of normative, institutional, and technological development. It is therefore necessary to consider not only the national context, but also the regional aspects of interoperability and cross-border data exchange.

In this context, this chapter covers the analysis of the transport sector of Serbia and the Western Balkans, the significance of international road freight transport and CMR documentation, the degree of digitalisation of transport processes, the status of eCMR application in the region, a comparative analysis of the experiences of European Union Member States, and a SWOT analysis of the factors that may affect the successful implementation of the electronic consignment note. The results of this analysis provide the basis for the further assessment of technical feasibility, economic justification, and the expected effects of introducing the eCMR system in the Republic of Serbia and the Western Balkans region.

4.2. Transport Sector of the Republic of Serbia and the Western Balkans

The transport sector represents one of the key drivers of economic development in the Republic of Serbia and the Western Balkans countries, playing a significant role in the functioning of the economy, foreign trade, and regional integration. By virtue of its geostrategic position at the crossroads of pan-European transport corridors, the Western Balkans region constitutes an important transit and logistics area connecting the markets of the European Union, South-Eastern Europe, and the Middle East.

In the structure of freight carriage, road transport occupies the dominant position, representing the primary mode of transport in both national and international transport flows. Its flexibility, the ability to provide door-to-door delivery, a well-developed road network, and a high degree of accessibility

make it the most prevalent mode of transport in the region. At the same time, the growth of foreign trade, the development of logistics chains, and the intensification of regional cooperation further increase the importance of road transport as a driver of economic activity.

The Republic of Serbia plays a particularly significant role in regional transport flows by virtue of its geographical position, developed transport infrastructure, and connectivity with the main European transport corridors. According to available data from competent institutions and professional associations, several thousand licensed carriers operate in Serbia with a significant fleet dedicated to international road freight transport. At the same time, the volume of international transport operations indicates a high level of use of the CMR consignment note as the primary document in international road transport.

Since there is no single official statistical record of the number of CMR documents issued, the estimation of their annual volume was carried out using an indirect analytical methodology based on multiple independent data sources. The estimation methodology and the justification for the adopted values are presented in Section 4.3.1 — Methodology for Estimating the Number of CMR Documents.

According to the results of the said analysis, it is estimated that approximately 1.5 million international CMR documents are generated annually in the Republic of Serbia, whilst the total annual volume for the Western Balkans countries is estimated at approximately 3.25 million CMR documents. These values represent analytical estimates used as the starting point for the financial and economic analysis of the national scenario, whilst the regional figure is presented exclusively as an indicative indicator of the potential for the development of regional interoperability.

At the same time, the transport sector of the region faces the need for further improvements in efficiency, digitalisation, and interoperability of transport systems. The growth of international trade, demands for faster data exchange, alignment with the European regulatory framework, and the need to reduce administrative burdens all necessitate the modernisation of existing procedures and transport documentation. In this context, the introduction of the electronic consignment note (eCMR) represents one of the key steps towards the digital transformation of the transport sector and its gradual alignment with the European digital transport environment.

The analysis of the structure and characteristics of the transport sector demonstrates that the Republic of Serbia and the Western Balkans countries possess significant institutional, market, and technical potential for the application of eCMR solutions. The large volume of international transport operations, the well-developed transport network, the gradual digitalisation of logistics processes, and the strategic commitment to alignment with the European regulatory framework provide a sound basis for the gradual transition from a paper-based to an electronic model of transport documentation management.

4.3. International Road Freight Transport and the Significance of CMR Documentation

International road freight transport represents one of the most significant segments of the transport sector of the Republic of Serbia and the Western Balkans countries. By virtue of the geographical position of the region and its connectivity with the European Union market, a significant proportion of foreign trade is conducted by road. In addition to national transport flows, the region plays an important transit role in the movement of goods between Central Europe, South-Eastern Europe, Turkey, and the Middle East.

In such an environment, transport efficiency does not depend solely on the quality of infrastructure and transport capacities, but also on the speed and reliability of the exchange of accompanying documentation. The primary transport document accompanying international road freight transport is the CMR consignment note, used in accordance with the Convention on the Contract for the International Carriage of Goods by Road (CMR Convention). This document constitutes evidence of the concluded contract of carriage and contains key data on the consignor, carrier, consignee, place of dispatch and destination, the type and quantity of goods, and other information necessary for the execution of the transport process.

The significance of CMR documentation derives from the fact that it represents the central document used by all participants in the transport chain — consignors, carriers, freight forwarders, consignees, customs authorities, inspection services, and insurance companies. During a single transport operation, the data contained in the CMR document is frequently transcribed or entered manually into various information systems on multiple occasions, thereby increasing the administrative burden and the risk of errors.

Since there is no single official statistical record of the number of CMR documents issued, the estimation of their annual volume was carried out using an analytical methodology based on multiple independent sources, including statistical data on international road transport, customs procedures, transport flows, and relevant institutional and market indicators. The estimation methodology is presented in detail in Section 4.3.1. On the basis of the analysis thus conducted, it is estimated that approximately 1.5 million international CMR documents are generated annually in the Republic of Serbia, whilst the total annual volume for the Western Balkans countries is estimated at approximately 3.25 million CMR documents.

In addition to their operational significance, CMR documents also play an important role in customs procedures, the control of goods flows, invoicing, and the resolution of any disputes between transport participants. The quality, availability, and accuracy of the data contained in the CMR document therefore directly affect the efficiency of the entire logistics chain.

In the context of the increasingly intensive digitalisation of transport and logistics, the traditional paper-based model of CMR documentation management is gradually giving way to electronic solutions. The European Union and international organisations have in recent years been actively promoting the application of the electronic consignment note (eCMR) as a means of accelerating administrative procedures, increasing transparency, and improving cross-border data exchange. Precisely because of the large volume of international road transport and the significant number of CMR documents exchanged daily, the digitalisation of this documentation represents one of the most significant steps towards the modernisation of the transport sector in the Republic of Serbia and the Western Balkans countries.

The analysis of the significance of international road freight transport and the role of CMR documentation demonstrates that there is a clear operational and economic potential for the application of the eCMR system. The large number of transport operations, the high degree of involvement of different participants in the transport chain, and the need for faster and more reliable data exchange constitute a strong argument in favour of continuing the process of digitalisation of transport documentation in the region.

4.3.1. Methodology for Estimating the Number of CMR Documents

For the purposes of the financial and economic analysis, it was necessary to estimate the annual number of international CMR documents generated in the Republic of Serbia and the Western Balkans

countries. This indicator represents one of the key input parameters for assessing the potential benefits of digitalising transport documentation, but is not recorded as a separate statistical indicator in the official statistical systems of the Republic of Serbia or in most European countries.

For this reason, it was not possible to directly obtain an official figure for the number of CMR documents issued; instead, an indirect analytical methodology was applied, based on the synthesis of multiple independent data sources and indicators describing the volume and structure of international road freight transport.

The starting point for the analysis comprised the available statistical data of the Statistical Office of the Republic of Serbia, statistical data and annual reports of the Customs Administration of the Republic of Serbia, data on the structure of international road transport, the number of licensed carriers and transport capacities, as well as transport market analyses and other relevant sources used in the preparation of this study.

In conducting the estimation, individual indicators were not used as a direct basis for calculating the number of CMR documents, as there is no straightforward mathematical relationship between the volume of goods transported, transport performance, the number of carriers, the number of vehicles, and the number of CMR documents. A single CMR document may cover varying quantities of goods, one or more customs declarations, different types of transport operations, and different logistics models; consequently, the application of a simple formula would yield methodologically unreliable results.

For this reason, a multi-criteria analytical estimation approach was applied, within which independent indicators characterising the volume of international road transport and the logistics market were mutually analysed and compared.

Table 4.3-1: Starting Indicators Used for Estimating the Number of International CMR Documents

Baseline Indicator	Role in the Analysis
Volume of International Road Transport	Estimation of the Total Number of Transport Operations
Customs Procedure Statistics (Imports, Exports and Transit)	Verification of the Intensity of Cross-Border Road Transport
Number of Licensed Road Carriers	Estimation of the Capacity of the Road Transport Market
Available Road Transport Capacity (Freight Vehicles)	Verification of the Realism of the Estimated Transport Volume
Structure of Foreign Trade and Transport Flows	Estimation of the Share of Road Transport in International Transport
Transport Market Analysis and Expert Assessments	Validation of the Results Obtained from the Analysis of Available Indicators

Following the analysis of the foregoing indicators, the results obtained were cross-checked against the realities of the transport market and available transport capacities. The analysis established that an estimate significantly below approximately one million CMR documents per year would be

disproportionate to the volume of international road transport and the number of customs procedures, whilst values exceeding approximately two million documents would imply an intensity of transport operations not confirmed by the available indicators.

Proceeding from the results of the multi-criteria analysis, an estimate of approximately 1.5 million CMR documents generated annually in the Republic of Serbia was adopted as the baseline and conservative scenario. This value represents an analytical estimate which is used throughout the remainder of the study as the primary parameter for the financial and economic model.

For the Western Balkans countries, an analogous methodological approach was applied, taking into account the size of the transport market, the volume of international trade, and the level of development of the road transport sector in each individual country. On this basis, it was estimated that approximately 3.25 million international CMR documents are generated annually in the region. This value was used exclusively as an indicative indicator of regional potential and is not included in the primary financial and economic model of the study, which is based entirely on the national scenario of the Republic of Serbia.

The methodology applied enabled the estimation of the number of CMR documents to be based on multiple independent and mutually verified indicators, thereby providing a conservative and methodologically sound baseline parameter for the further financial, economic, and scenario analyses presented in the remainder of this study.

4.4. Degree of Digitalisation of Transport Processes

In recent years, the transport and logistics sector has been undergoing an intensive process of digital transformation, driven by the development of information and communication technologies, growing demands for more efficient management of transport chains, and the need to align with the European regulatory framework. Modern transport processes are increasingly reliant on digital tools that enable business automation, real-time data exchange, and better integration of logistics chain participants.

In the Republic of Serbia and the Western Balkans countries, the degree of digitalisation of the transport sector is continuously increasing, but remains uneven among different categories of market participants. Larger transport and logistics companies make significant use of transport management systems (TMS), GPS-based vehicle tracking systems, electronic invoicing, and various forms of electronic data interchange. Smaller carriers, on the other hand, continue to base a large proportion of their administrative processes on paper documentation and manual data processing.

Although numerous operational processes have already been digitalised, transport documentation in a large number of cases continues to be processed in paper form. This applies in particular to the CMR consignment note, which remains one of the last key documents in international road transport that has not yet been fully digitalised at the regional level. It is precisely for this reason that the electronic consignment note (eCMR) represents the logical continuation of the transport sector digitalisation process.

Table 4.4-1: Degree of Digitalisation of Key Transport Processes

Process	Level of Digitalisation	Current State in Practice
GPS Vehicle Tracking	High	Widely Implemented
Fleet Management	High	Widely Implemented
Transport Management Systems (TMS)	Medium to High	Most Commonly Used by Medium-Sized and Large Companies
Electronic Invoicing	Medium to High	Continuously Increasing
Electronic Data Interchange (EDI)	Medium	Limited Implementation
Customs Information Systems	High	Well-Developed National Systems
CMR Documentation	Low	Predominantly Paper-Based
eCMR Documentation	Low to Medium	Initial Stage of Implementation

In addition to the technological benefits, the digitalisation of transport processes enables faster information exchange, reduction of administrative costs, greater data accuracy, easier monitoring of transport operations, and better interoperability between different information systems. These advantages are of particular significance in international road transport, where a single transport process involves multiple economic operators and institutions from different countries.

The analysis of the existing situation demonstrates that the basic technical preconditions for the application of eCMR solutions are already present among a significant proportion of the transport sector in Serbia and the region. Further progress will depend primarily on normative alignment, system interoperability, user adoption, and the development of common digital standards that will enable seamless cross-border exchange of transport documentation.

The results of the survey research conducted for the purposes of this study, on a sample of 12 representatives of carriers, freight forwarders, logistics companies, and other relevant economic operators, provide additional insights consistent with the findings presented above. The survey research was primarily indicative in character and was used as a supplementary source of information, rather than as a statistically representative survey of the transport sector. The research demonstrated that 58.3% of respondents currently do not use digital systems for transport documentation management, whilst only 16.7% of respondents indicated that they were well acquainted with the concept of eCMR. At the same time, 83.3% of respondents expressed interest in receiving additional information or potentially participating in a pilot implementation project. These results indicate that the transport sector possesses significant potential for digital transformation, but simultaneously highlight the need for systematic user education, stakeholder information, and the implementation of change management activities during the rollout of the national eCMR platform.

4.5. Status of eCMR and Digital Readiness in the Western Balkans Countries

The degree of readiness for the application of the electronic consignment note (eCMR) in the Western Balkans countries depends on several interrelated factors, among which the normative framework, the degree of digitalisation of the transport sector, the level of development of information and communication infrastructure, and the degree of interoperability between institutions and economic operators are particularly prominent. As presented in the preceding sections, the transport sector of the region already employs numerous digital solutions in the fields of vehicle tracking, transport management, and electronic data exchange, which provides an important foundation for the further digitalisation of transport documentation.

Of particular significance for the application of eCMR is the ratification of the Additional Protocol to the CMR Convention enabling the use of the electronic consignment note in international road transport. According to available data at the time of preparation of the study, Albania and North Macedonia have ratified the eCMR Protocol, whilst Serbia, Bosnia and Herzegovina, and Montenegro have not yet ratified the Protocol. Kosovo* has limited possibilities of acceding to the eCMR Protocol through United Nations mechanisms, which represents a specific feature of the regional legal framework.

Table 4.5-1: Status of Ratification of the eCMR Protocol in the Western Balkans Countries

Country	Status of the eCMR Protocol
Serbia	Not Ratified
Albania	Ratified
North Macedonia	Ratified
Bosnia and Herzegovina	Not Ratified
Montenegro	Not Ratified
Kosovo*	Accession through the UN mechanism is not possible

In addition to normative readiness, the degree of digital maturity of the transport sector also represents a significant factor. The countries of the region have in recent years been implementing numerous activities directed at the development of electronic administration, the digitalisation of public services, and the modernisation of logistics processes. Although differences exist in the level of development of individual systems, it may be concluded that across the entire region there is a clear trend of digital transformation that creates favourable preconditions for the introduction of eCMR solutions.

The Republic of Serbia possesses a developed transport market, significant institutional capacities, and a relatively high degree of digital maturity, which provides a favourable basis for the future application of the eCMR system. However, full international application also requires the resolution of the question of accession to the eCMR Protocol, should such a policy be adopted.

Given the high degree of interconnection of transport flows in the region, the full effects of eCMR application can only be achieved through the gradual establishment of a regionally interoperable

system that enables seamless electronic exchange of transport documentation between all participants in international road transport. It is precisely for this reason that cooperation among the Western Balkans countries and their alignment with European initiatives, in particular with the requirements of the eFTI Regulation, represents one of the key preconditions for the successful digitalisation of transport documentation in the region.

4.6. Benchmarking Analysis of European Union Member States

The experiences of European Union Member States represent a relevant reference framework for assessing the potential effects of implementing the eCMR system in the Republic of Serbia and the Western Balkans countries. As presented in the preceding sections, the region is in a phase of gradual digitalisation of the transport sector, whilst certain European Union Member States have already implemented pilot projects or established operational systems for the application of eCMR in international road transport.

The European Union has in recent years been intensively supporting transport digitalisation through the development of a single digital transport area and the application of the Regulation on electronic freight transport information (eFTI). The objective of these initiatives is to reduce administrative burdens, increase the efficiency of logistics processes, and enable secure cross-border data exchange between all participants in the transport chain.

Among European Union Member States, France, Belgium, the Netherlands, Denmark, and Spain are particularly notable, having been among the first to commence the practical application of eCMR solutions or to implement significant pilot projects in the field of transport documentation digitalisation. Their experiences demonstrate that the introduction of electronic transport documentation leads to a reduction in administrative costs, faster document processing, more efficient data exchange, and better traceability of transport processes. These countries have therefore been included in the benchmarking analysis as a relevant reference framework for assessing the potential effects of establishing a national eCMR platform in the Republic of Serbia.

Table 4.6-1: Benchmarking Analysis of Selected EU Member States

Country	Status of eCMR Implementation	Key Effects
France	Advanced Implementation	Reduced Administrative Costs and Faster Document Processing
Belgium	Advanced Implementation	Developed Interoperability and Integration of Logistics Systems
The Netherlands	Advanced Implementation	High Level of Digitalisation of the Transport Sector
Denmark	Wide-Scale Implementation	Efficient Electronic Exchange of Transport Data
Spain	Operational Implementation	Improved Cross-Border Transport Processes

In addition to direct operational benefits, countries that have implemented eCMR also record positive effects in the areas of sustainability and environmental protection through the reduction of paper consumption and the need for physical document archiving. Furthermore, electronic documentation

enables greater transparency of transport processes and a better foundation for the development of advanced digital services in the logistics sector.

For the Western Balkans countries, it is particularly significant that the key preconditions for the application of eCMR in the European Union are very similar to the conditions already existing in the region: a developed road transport sector, growing use of digital tools, and the need for alignment with the European regulatory framework. The experiences of EU Member States therefore constitute a relevant reference framework for assessing the technical feasibility, organisational sustainability, and potential effects of establishing a national eCMR platform in the Republic of Serbia. The examples presented do not represent directly comparable projects, but rather examples of eCMR and related solution implementations used for the purpose of identifying good practices.

4.7. SWOT Analysis of eCMR Introduction

The SWOT analysis of the introduction of the electronic consignment note (eCMR) was conducted on the basis of the results of the analysis of the existing situation presented in the preceding sections, the applicable legal and institutional framework, relevant international documents, and the results of the survey research conducted among representatives of transport, freight forwarding, and logistics companies in the Republic of Serbia. In preparing the analysis, account was taken of the requirements of the Protocol to the Convention on the Contract for the International Carriage of Goods by Road (eCMR Protocol), Regulation (EU) 2020/1056 on electronic freight transport information (eFTI), as well as the findings from studies and reports of the European Commission, IRU, and UNECE relating to the digitalisation of transport documentation.

The results of the analysis of the existing situation demonstrate that in the Republic of Serbia and the Western Balkans countries, paper-based transport documents continue to predominate, with a limited degree of digitalisation and varying levels of technological readiness among transport chain participants. At the same time, significant potential has been identified for improving business efficiency, reducing administrative burdens, and aligning with European transport digitalisation processes.

Table 4.7-1 presents the key internal and external factors that may affect the process of introducing eCMR.

Table 4.7-1: SWOT Analysis of eCMR Introduction⁵

Strengths	Weaknesses
Clearly Recognised Benefits of the Digitalisation of Transport Documentation	Low Level of Digitalisation of Transport Documentation among a Significant Number of Business Entities
High Level of Participation of Business Entities in International Transport Flows	Limited Awareness of the eCMR Concept and the eFTI Regulation
Existence of a Regulatory and Technological Framework at the European Level	Dependence on Paper-Based Documents and Manual Procedures
Readiness of Part of the Sector to Participate in Pilot Projects and Further Digitalisation	Uneven Level of Digital Maturity among Different Categories of Users
Possibility of Integration with Existing TMS, ERP and Logistics Systems	Limited Capacity for Change Management in Certain Organisations
Opportunities	Threats
Alignment with the eFTI Regulation and European Digital Transport Corridors	Insufficient Implementation of eCMR by All Participants in the Transport Chain
Reduction of Administrative Costs and Document Processing Time	Insufficiently Developed or Non-Harmonised Legal Framework
Faster Invoicing and Shorter Cash-to-Cash Cycle	Lack of User Knowledge and Awareness
Reduction in the Number of Errors, Disputes and Lost Documentation	Resistance to Organisational and Business Changes
Development of Regional Interoperability and Cross-Border Data Exchange	Different Pace of Digitalisation across the Countries of the Region

The SWOT analysis demonstrates that the most significant strengths of the project derive from the possibilities of improving the efficiency of transport documentation management and aligning with European transport digitalisation processes. The results of the survey research indicated that economic operators recognise faster payment, time savings in document processing, and reduction of errors in transport documents as the most significant potential benefits. At the same time, a significant number of respondents expressed interest in participating in pilot projects and receiving further information on the application of eCMR.

On the other hand, the analysis confirmed that the main obstacles to the introduction of eCMR are not of a technological nature, but relate primarily to limited user awareness, insufficient digitalisation among certain transport chain participants, and the need for further development of the institutional

⁵ **Source:** Author's analysis based on collected data, UNECE, IRU, eFTI documentation, and the findings of the preceding chapters of the study.

and legal framework. Of particular significance is the risk arising from the fact that the effects of eCMR depend on the readiness of all relevant actors — carriers, freight forwarders, consignors, consignees, and competent authorities — to adopt and use electronic documentation.

Considered overall, the results of the SWOT analysis indicate that favourable preconditions exist for the gradual introduction of eCMR in the Republic of Serbia and the Western Balkans countries. The identified weaknesses and threats can be substantially mitigated through phased implementation, pilot projects, user information and training activities, and further alignment of national legislation with the European regulatory framework. On the basis of the analysis conducted, it may be concluded that the expected benefits of introducing eCMR outweigh the identified risks and limitations, which constitutes one of the arguments in favour of the further development and implementation of this system. The findings of the SWOT analysis have been used as one of the input elements for the Stakeholder Analysis, Risk Analysis, Change Management Plan, and scenario analysis presented in the subsequent chapters and annexes of the study.

5. DESCRIPTION OF THE PROPOSED SOLUTION

5.1. Introduction

The preceding chapters examined the existing state of transport documentation management in the Republic of Serbia and the Western Balkans countries, with particular reference to the use of the paper-based CMR consignment note, the legal and institutional framework, and the challenges arising from the traditional approach to document processing and exchange. The analysis demonstrated that the existing model is characterised by a significant administrative burden, manual data processing, limited visibility of transport processes, an increased risk of errors, and additional costs incurred through the printing, delivery, and archiving of documentation.

With a view to overcoming the identified limitations, and in order to align with modern European and international trends in the digitalisation of transport and logistics, the introduction of an electronic CMR system (eCMR) is proposed as a digital replacement for the traditional paper-based consignment note. The proposed solution is based on the application of the eFTI Connect platform, which enables the electronic creation, exchange, signing, tracking, and archiving of transport documentation within a single digital environment.

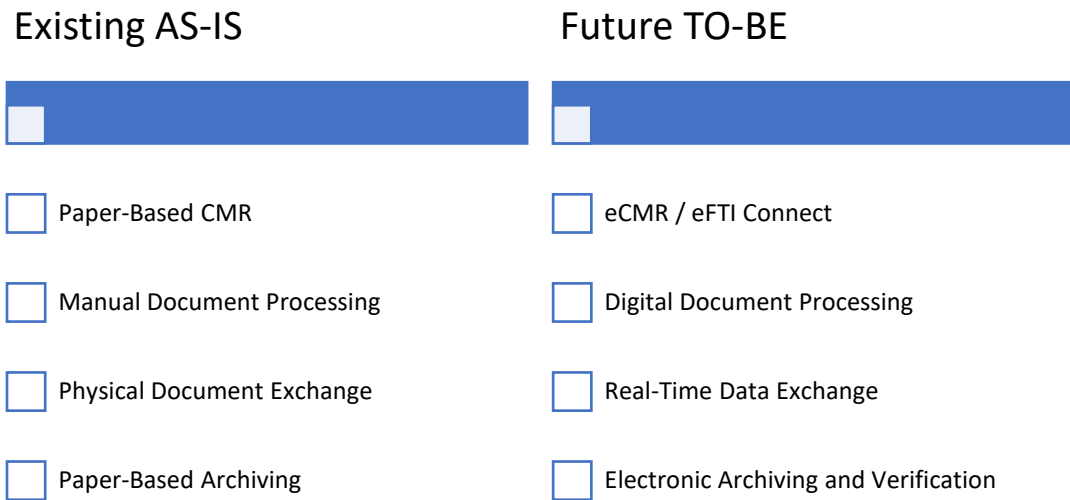
For the purposes of this study, the proposed solution is based on the eFTI Connect platform, which constitutes the subject of the technical analysis and the reference technical solution underpinning all further technical, financial, and economic analyses. The final solution and technological platform will be defined in subsequent project phases and procurement procedures.

The concept of the proposed solution is based on the complete digitalisation of the transport document lifecycle, from creation and issuance, through transport and consignment tracking, to delivery confirmation and long-term archiving. The solution encompasses a web application for business users, a mobile application for drivers, mechanisms for the electronic signing and verification of documents, and the possibility of future integration with the information systems of economic operators and competent institutions.

The particular significance of the proposed solution lies in its potential to improve the efficiency of transport processes, reduce administrative costs, increase the transparency and traceability of consignments, and create the preconditions for the further digital transformation of the transport sector. At the same time, the proposed concept is aligned with the principles of the eCMR Protocol and provides the basis for future development towards a broader application of electronic transport information in accordance with the eFTI initiatives of the European Union.

The remainder of this chapter provides a detailed description of the concept of the proposed solution, its functionalities, users, technical architecture, integration capabilities, and the expected benefits for all participants in the transport chain in the Republic of Serbia and the Western Balkans countries.

Figure 5.1-1: Comparative overview of the existing process and the future process



5.2. Concept of the Electronic CMR System

The proposed solution entails the introduction of the electronic consignment note (eCMR) as a digital replacement for the traditional paper-based CMR document used in domestic and international road freight transport. The concept of the solution is based on the complete digitalisation of the processes of creating, exchanging, signing, tracking, and archiving transport documentation, whilst preserving the legal validity and business functionality afforded by the conventional CMR document.

The proposed system is implemented through the eFTI Connect platform, which constitutes the central digital environment for all participants in the transport process. The platform encompasses a web application for business users, a mobile application for drivers, and mechanisms for the secure exchange and verification of documents. This ensures that all relevant data are available to authorised participants throughout the entire lifecycle of the transport document.

The fundamental operating principle of the system is that transport data are entered only once, after which they are exchanged electronically between the consignor, carrier, consignee, and other authorised participants. The document passes through defined statuses, from creation and issuance, through the execution of transport, to delivery confirmation and archiving. All changes and activities performed on the document are recorded in the system, thereby ensuring the traceability, transparency, and reliability of data.

The practical application of the eCMR system is based on a clearly defined lifecycle of the electronic document. Throughout its creation, processing, and archiving, the eCMR document passes through several status phases that enable the tracking of the consignment status and the activities of all participants in the transport process.

In the initial phase, the document has the status of ****Draft****, during which data are entered and prepared for issuance. Upon completion of data entry and the formal creation of the document, the status changes to ****Issued****, at which point the document becomes available to the other participants in the process. The carrier then confirms acceptance of the document, whereupon the document receives the status ****Accepted****.

Upon commencement of transport, the document transitions to the status ****In Transit****, during which relevant events and changes in consignment status may be recorded. Should it be necessary to amend the document prior to acceptance or the commencement of transport, the system allows for the correction of data with all amendments recorded in an audit trail. In the event that one of the participants rejects the document, it receives the status ****Rejected****, after which the necessary corrections may be made and the document reissued.

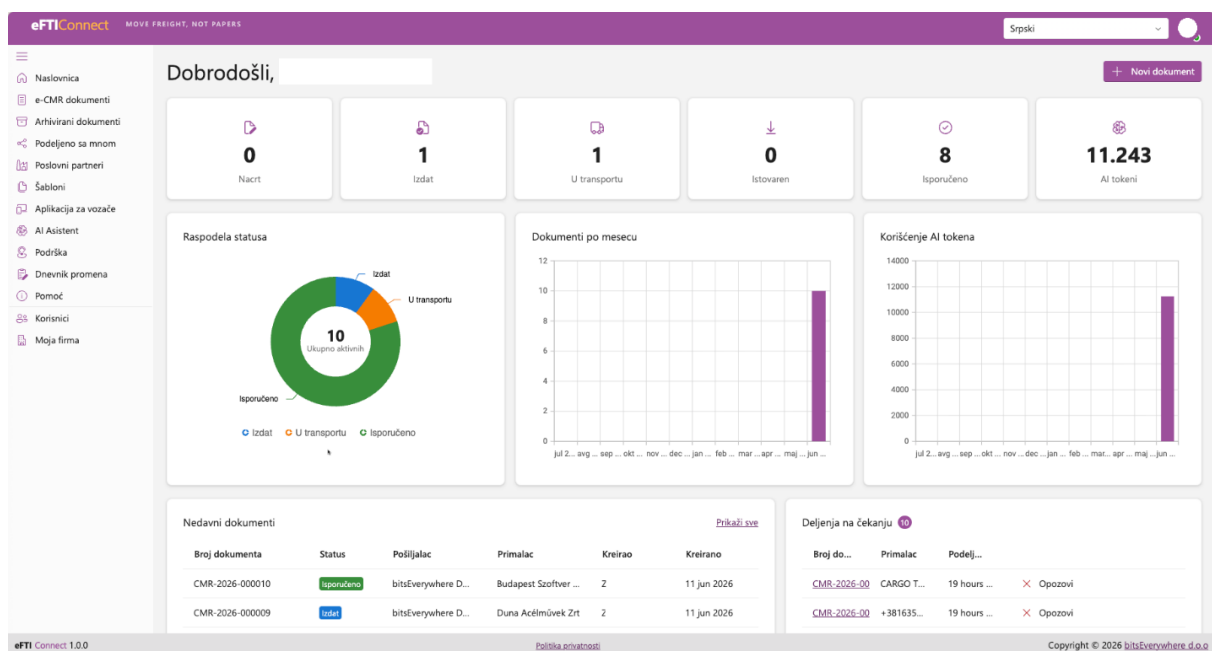
Following successful delivery of the goods and confirmation of receipt by the consignee, the document receives the status ****Delivered****. The final phase of the lifecycle is ****Archived****, at which point the document is permanently stored in the electronic archive for the purposes of subsequent access, control, audit, or proof of completed transport

Table 5.2-1 presents the typical lifecycle of an eCMR document within the proposed solution.

Table 5.2-1: Lifecycle of the eCMR Document within the Proposed Solution

Status	Description
Draft	Document Creation and Preparation
Issued	The Document Has Been Issued and Is Available to the Participants
Accepted	The Carrier Has Accepted the Document
In Transit	The Transport Operation Is in Progress
Delivered	The Goods Have Been Delivered and Receipt Has Been Confirmed
Archived	The Document Has Been Archived

Figure 5.2-1: Overview of the eFTI Connect platform user interface



The concept of the solution is based on a hybrid model that enables centralised management of documents and users, whilst simultaneously supporting future interoperability with other platforms and information systems. The platform architecture provides for the possibility of integration with other systems through standardised interfaces, thereby creating the basis for the gradual digitalisation of the entire transport and logistics chain.

In addition to supporting the electronic CMR document, the proposed solution is designed so that in subsequent development phases it may serve as the basis for a broader application of electronic transport information in accordance with the eFTI initiatives of the European Union.⁶ This ensures the long-term sustainability of the solution and its alignment with the direction of development of the European digital transport area.

The proposed concept does not represent merely the replacement of a paper document with an electronic equivalent, but rather a platform for the digital transformation of transport processes, with the objective of increasing efficiency, reducing administrative costs, improving data quality, and strengthening cross-border cooperation between the Republic of Serbia and the Western Balkans countries.

5.3. Key System Functionalities

The proposed solution is based on the eFTI Connect platform and encompasses a set of functionalities that enable the complete digitalisation of transport documentation management processes. The functionalities are designed in accordance with the requirements of the eCMR Protocol, the needs of transport chain participants, and the principles of digital transformation of logistics processes.

The primary functionality of the system relates to the electronic creation, issuance, and management of eCMR documents. Users may create new documents, utilise pre-defined templates, review and amend data, and monitor the status of documents throughout the entire transport process. In this way, the need for printing and manual processing of paper documentation is eliminated.

The platform supports the electronic signing and electronic sealing of documents, with the possibility of verifying the authenticity and integrity of electronic documents throughout their lifecycle. The specific model of electronic identification, electronic signing, and trust services must be defined and aligned with the applicable regulatory framework during the detailed design and system implementation phase. Independently of this, the platform also enables QR verification of documents, thereby providing authorised persons with a rapid means of checking their validity and current status.

A significant functionality of the system relates to document lifecycle management. Each eCMR document passes through clearly defined statuses, from creation and issuance, through transport and delivery, to archiving. All activities performed on the document are recorded in the system, thereby ensuring complete traceability and an audit trail.

The platform encompasses a web application designed for business users and a mobile application for drivers. The web application enables the management of documents, business partners, users, and reports, whilst the mobile application enables drivers to access documents and consignment statuses during transport. Support for mobile device access ensures greater operational efficiency and faster information exchange in the field.

⁶ Regulation (EU) 2020/1056 on electronic freight transport information (eFTI).

The system provides centralised document archiving and archive search functionality, thereby significantly simplifying the storage and subsequent retrieval of documents. In comparison with the traditional paper-based model, this reduces archiving costs and the risk of document loss.

In addition to operational functionalities, the platform enables the monitoring of key performance indicators, the generation of reports, and analytical overviews. These capabilities provide users with better insight into documentation flows and transport processes, which constitutes the basis for business improvement and more informed management decisions.

The platform enables the display of the number of documents, their status, and other operational indicators accessible through the dashboard and reports. These indicators provide operational insight into the state of documentation and user activity.

Table 5.3-1: Key Functionalities of the Proposed eCMR System

Functional Group	Description
eCMR Management	Creation, Modification and Archiving
User Management	Roles and Permissions
Verification	QR Code and Electronic Signature
Reporting	Reports and Operational Indicators
Mobile Access	Drivers and Field Operations
Integrations	Future API Interfaces

The system architecture provides for the possibility of future integrations with other information systems through standardised API interfaces.

The foregoing functionalities provide the foundation for the establishment of a modern digital environment for transport documentation management and create the preconditions for the further development of electronic transport information in accordance with European eCMR and eFTI initiatives.

Figure 5.3-1: Overview of the key functionalities of the proposed system

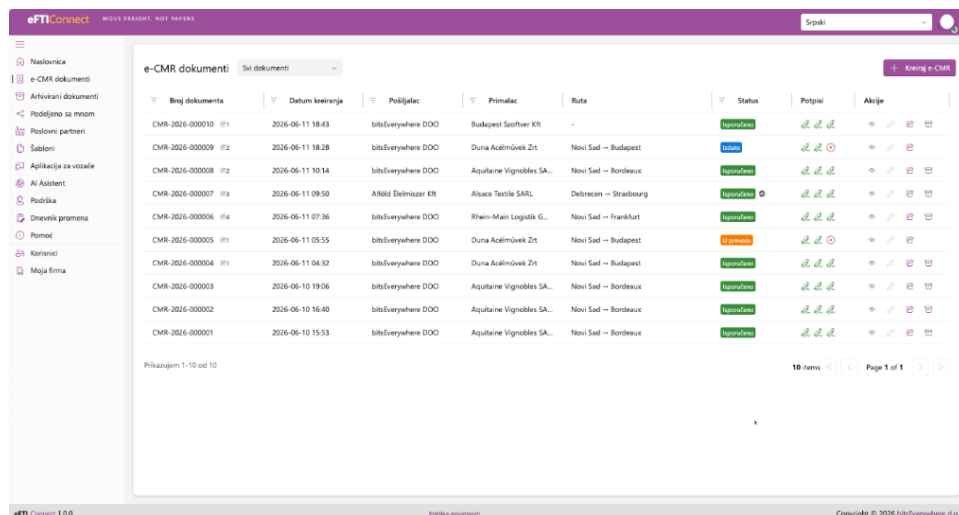


Figure 5.3-2: Creation and processing of eCMR documentation

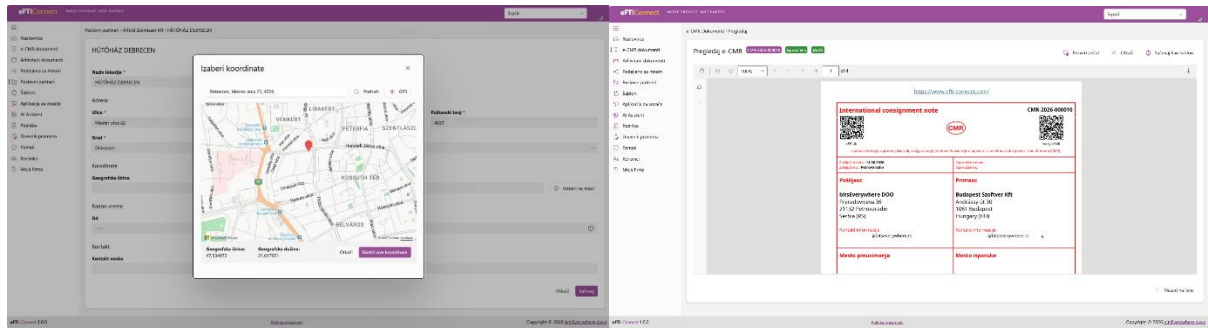
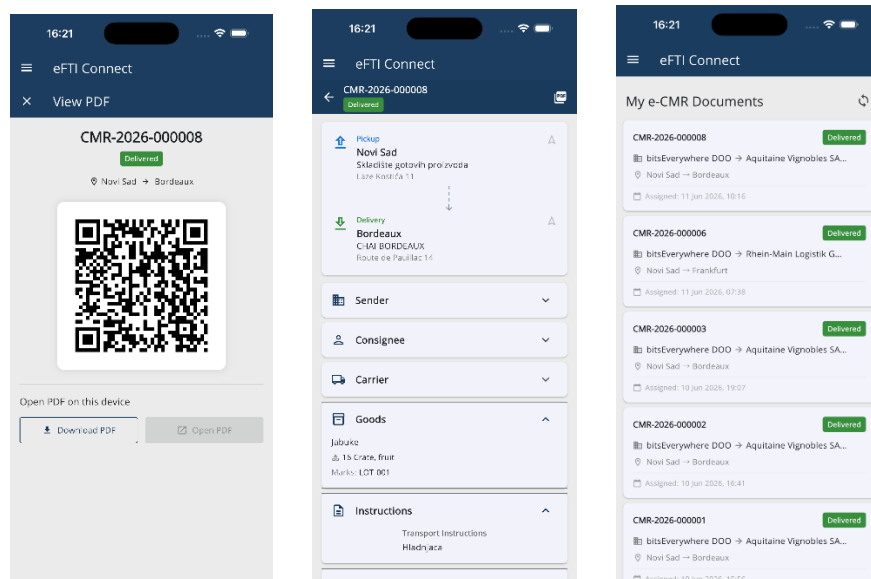


Figure 5.3-3: Display of the eFTI Connect mobile application for accessing eCMR documents during transport



5.4. Users of the eCMR System

The proposed eCMR solution is intended for a wide range of participants involved in the processes of transport, logistics, trade, and the control of goods movements. In accordance with the concept described in the preceding sections, the system provides access to data and functionalities in accordance with the roles and access levels of individual users.

The primary group of users comprises carriers, who use the system for the creation, management, and tracking of eCMR documents during the execution of transport services. For this category of users, the system serves as the central point for transport documentation management, communication with business partners, and monitoring of consignment statuses.

A significant group of users comprises consignors and consignees, who through the platform have access to relevant consignment data, document status, and the progress of transport execution. This ensures greater transparency and reliability in the exchange of information between all participants in the supply chain.

Freight forwarders and logistics operators constitute a specific category of users for whom the system enables the coordination of transport activities, the management of a larger number of consignments, and more efficient documentation exchange with carriers and clients. Given their role in the

organisation of international transport, the digitalisation of documentation contributes to a reduction in administrative burden and an acceleration of business processes.

Drivers, as direct participants in the execution of transport, also play an important role in the system. Through the mobile application, they are provided with access to assigned eCMR documents, consignment data, loading and unloading locations, and transport statuses. This ensures the availability of relevant information throughout the entire transport process.

In addition to economic operators, the system may also be used by competent state authorities, primarily those responsible for transport, customs procedures, inspection supervision, and statistical reporting, in accordance with the law and their assigned powers.

In a broader sense, users of the system may also include insurance companies, financial institutions, and other entities involved in the processes of financing, insuring, and managing transport risks. For these users, the possibility of rapid access to reliable and verified data on transport operations is of particular significance.

The concept of user management is based on the assignment of roles and access rights, thereby ensuring that each participant has access exclusively to the data and functionalities necessary for the performance of their business activities. This simultaneously ensures operational efficiency, data protection, and a high level of information security.

The introduction of the eCMR system establishes a single digital environment connecting all relevant transport chain participants and enabling more efficient cooperation at the national and regional level, which represents one of the key preconditions for the successful digital transformation of the transport sector in the Republic of Serbia and the Western Balkans countries.

Table 5.4-1: Categories of Users and Their Roles in the eCMR System

User Category	Primary Role
Consignor	Creation and Initiation of the eCMR Document
Carrier	Management of the Transport Process
Driver	Execution of Transport and Access to Documents
Consignee	Confirmation of Receipt of Goods
Customs Authorities	Control and Access to Documentation
Inspection Authorities	Supervision and Data Verification
Public Authorities	Monitoring and Analysis of Transport Flows

5.5. Future Working Process Following Digitalisation

In accordance with the concept of the proposed solution and the functionalities described in the preceding sections, the future working process is based on fully digital management of transport documentation throughout the entire lifecycle of the consignment. In contrast to the existing situation, in which data are entered manually on multiple occasions, exchanged, and archived in paper form, the

proposed model enables single electronic processing and exchange of data between all participants in the transport process.

The process commences with the creation of the eCMR document by the consignor or an authorised logistics operator through the web platform. Following the entry of the required data concerning the consignor, consignee, goods, loading location, unloading location, and transport conditions, the document becomes available to the carrier and other authorised participants in the system.

The carrier receives the document electronically and confirms acceptance of the transport order. The driver is provided with access to the assigned eCMR document through the mobile application, along with all relevant information required for the execution of the transport. During transport, the document status is updated in real time, enabling continuous monitoring of the progress of the consignment.

Upon arrival at the delivery location, the consignee confirms receipt electronically, whereupon the transport operation is considered complete. The document receives its final status and is automatically archived in the system. All activities performed on the document remain recorded in the audit trail, ensuring complete traceability and the possibility of subsequent verification.

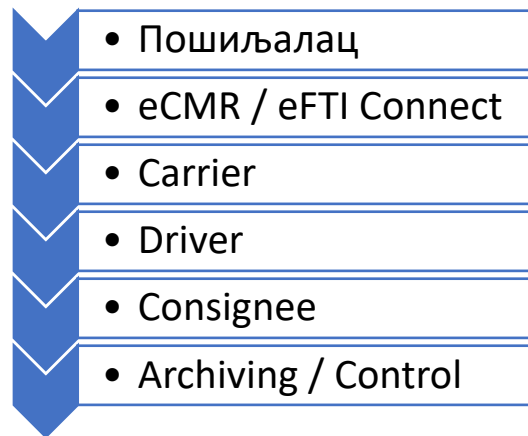
In the future implementation, it will be possible to grant competent authorities access to certain data in accordance with their statutory powers. This will reduce the time required for administrative procedures and increase the operational efficiency of institutions.

The proposed working process ensures that data are entered only once and used throughout the entire transport cycle, thereby reducing the possibility of errors, increasing data quality, and improving cooperation between all participants in the supply chain. At the same time, it creates the technical foundation for future integration with other logistics, customs, and business information systems, as well as for the gradual transition towards a broader application of electronic transport information in accordance with the eFTI concept.

Table 5.5-1: Basic Process Flow in the eCMR System

Step	Participant	Activity
1	Consignor	Creates the eCMR Document
2	Carrier	Accepts the Document
3	Driver	Retrieves the Document via the Mobile Application
4	Transport	Monitors the Status and Performs the Transport Operation
5	Consignee	Confirms Receipt of the Goods
6	System	Archives the Document and Maintains the Audit Trail

Figure 5.5-1: Simplified overview of the future working process following digitalisation



During the execution of transport, the driver accesses assigned eCMR documents through the mobile application, enabling real-time access to consignment data and transport status.

5.6. Technical Architecture of the System

The proposed solution is based on a modern multi-tier architecture that ensures reliable, secure, and scalable management of electronic transport documentation. The architecture is designed to support the current requirements of electronic CMR application, whilst providing for the gradual expansion of functionalities and alignment with the future requirements of the European Union's eFTI ecosystem.

The central element of the architecture is the eFTI Connect platform, which enables the creation, exchange, electronic signing, verification, tracking, and archiving of eCMR documents throughout their entire lifecycle. The platform consolidates all relevant data and provides a single collaborative environment for transport chain participants.

Users access the system through a web application and a mobile application. The web application is intended for carriers, freight forwarders, consignors, consignees, and other business users, whilst the mobile application enables drivers to access documents and consignment statuses during transport execution. This ensures the real-time availability of information, irrespective of the user's location.

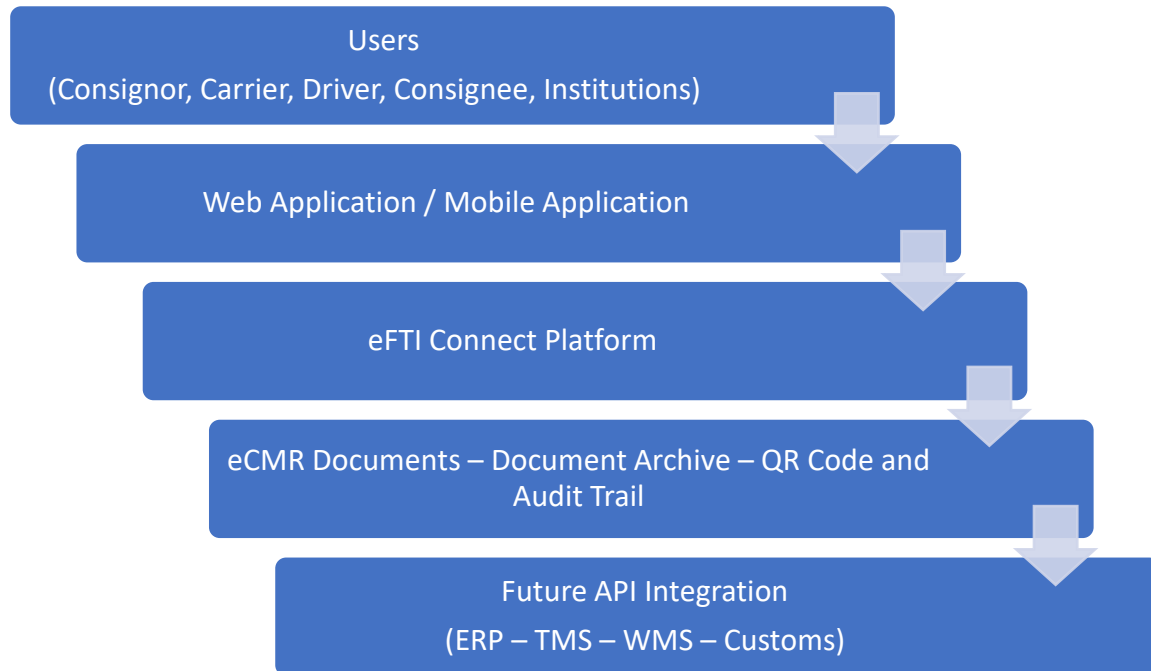
Within the platform, modules have been implemented for document management, user and role management, electronic signing, QR verification, document archiving, audit trail, reporting, and analytical overviews. Particular attention has been paid to data protection, access control, and ensuring the integrity of documents during their processing and exchange.

The architecture is implemented in a cloud environment, ensuring high system availability, centralised maintenance, and straightforward capacity expansion in line with the growth in the number of users and documents. This approach simultaneously reduces the need for local infrastructure on the part of users and facilitates the introduction of new functionalities.

In addition to existing capabilities, the platform architecture also provides for integrations with other information systems through standardised API interfaces. Although these integrations are not yet implemented in the production environment at the time of preparation of this study, their realisation is planned for subsequent development phases, thereby providing the foundation for the complete digitalisation of logistics and transport processes.

The architecture as defined provides the technical basis for the application of electronic CMR in the Republic of Serbia and the Western Balkans countries, with the possibility of future development towards the broader concept of electronic transport information and regional system interoperability.

Figure 5.6-1: Architecture of the proposed eCMR solution



5.7. Integrations and Interoperability

One of the key preconditions for the successful digitalisation of transport documentation is the ability to exchange data between different information systems and organisations. The proposed solution has therefore been designed with particular emphasis on interoperability and the possibility of future integrations with national, regional, and international platforms participating in transport and logistics processes.

The eFTI Connect platform architecture provides for the use of standardised data exchange interfaces (APIs), enabling connectivity with existing business and logistics information systems. In this way, the multiple entry of the same data is avoided, the possibility of errors is reduced, and the efficiency of business processes is increased.

Of particular significance is the possibility of integration with ERP (Enterprise Resource Planning), TMS (Transportation Management System), and WMS (Warehouse Management System) systems through standardised interfaces. Such integration may contribute to more efficient data exchange between transport documentation and the business processes of users, and provides the basis for a higher degree of business automation.

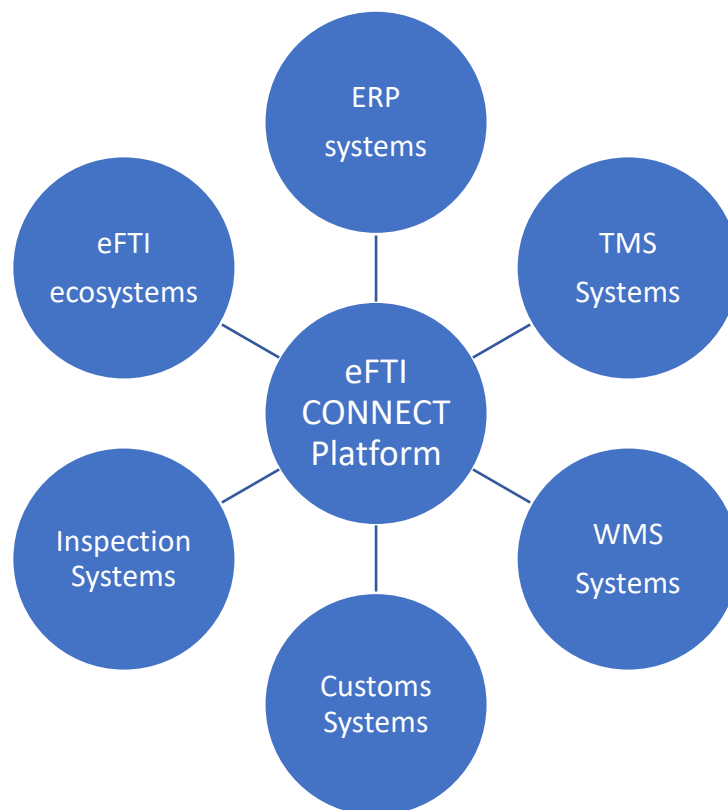
The solution architecture provides for the possibility of future connectivity with other information systems through standardised interfaces and data exchange mechanisms. This approach creates the preconditions for expanding system functionalities and developing additional integrations in accordance with future business, technical, and regulatory requirements.

In alignment with the strategic direction of transport digitalisation in the European Union, the proposed solution is designed so that it may in future become part of the broader eFTI ecosystem⁷. This orientation enables the gradual expansion of functionalities from the electronic CMR document to other types of electronic transport information and documents, without the need for fundamental changes to the core system architecture.

The particular significance of interoperability is evident in the regional context of the Western Balkans, where a significant proportion of transport flows cross state borders. The introduction of compatible digital solutions creates the preconditions for more efficient cross-border data exchange, the reduction of administrative barriers, and alignment with European practices in the field of digital transport and logistics.

The technical architecture of the proposed solution is based on the principles of interoperability and standardised data exchange, with provision for future connectivity with other information systems through appropriate interfaces. This approach ensures flexibility in the further development of the solution and creates the preconditions for the gradual expansion of system functionalities in accordance with user needs and the development of the digital environment.

Figure 5.7-1: Conceptual overview of the potential integrations and interoperability of the proposed solution



5.8. Regional Connectivity and Application in the Western Balkans

The successful application of electronic CMR does not depend exclusively on the digitalisation of national transport processes, but also on the existence of conditions for efficient cross-border data exchange and cooperation between countries. Given that a significant proportion of the Republic of Serbia's freight transport is conducted with Western Balkans and European Union countries, regional

⁷ European Commission, Digital Transport and Logistics Forum (DTLF), Final Report and Recommendations.

connectivity represents an important precondition for realising the full effects of transport documentation digitalisation.

The proposed solution is based on the principles of interoperability and standardised data exchange. Such an architecture creates the preconditions for its application in the national environment, as well as for potential future connectivity with other digital platforms and systems used in the region and the European Union.

Of particular significance is the fact that all economies of the region are engaged in processes of alignment with European transport and digital policies. In this context, the application of eCMR represents a practical step towards the modernisation of the transport sector and gradual alignment with European initiatives in the field of digital transport and logistics. At the same time, such solutions may support the objectives of regional cooperation, including the improvement of transport connectivity and the development of a common regional market.

The significance of digitalising transport documentation has also been recognised through the activities of the CEFTA initiative, the Transport Community, and the Common Regional Market (CRM) concept. These initiatives are directed at reducing administrative barriers, improving cross-border transport, and supporting digital data exchange in the region. In this context, the application of eCMR may represent one of the steps towards the further digitalisation of transport corridors and the strengthening of regional economic integration.

The broader application of electronic transport documentation may contribute to faster information exchange, more efficient implementation of administrative procedures, and greater transparency of transport flows. In addition to the potential benefits for economic operators, the digitalisation of documentation may create conditions for improved statistical data collection, better transport infrastructure planning, and more effective monitoring of transport flows at the regional level.

The proposed eFTI Connect platform is designed to provide for the possibility of future connectivity with other information systems and platforms through standardised interfaces. This approach provides the basis for future interoperability development and reduces the risk of technical limitations in the event of a potential expansion of the system to the regional level.

From the perspective of the Republic of Serbia, the introduction of eCMR represents an opportunity for active participation in the processes of digital transformation of the Western Balkans transport sector. The timely establishment of a functional solution may contribute to strengthening the competitiveness of the economy, improving regional cooperation, and better preparedness for future European digital initiatives in the field of transport.

Given the significance of road transport in regional trade, as well as the strategic commitment of the Western Balkans countries to digitalisation and European integration, the application of eCMR represents a logical step towards the modernisation of transport documentation management and the creation of preconditions for more efficient and transparent transport processes.

The proposed solution represents the reference option (Option 2), which has been selected as the preferred solution within the options analysis and which is the subject of further technical, financial, and economic analyses in the remainder of the study. Given the varying degrees of digital maturity among participants and countries of the region, the implementation of the solution is envisaged through a phased implementation model encompassing a pilot phase, national rollout, and gradual expansion of the system's scope in accordance with user needs and the development of the regulatory and technological environment.

5.9. Advantages of the Proposed Solution

The proposed solution represents a technical and business model that may contribute to the digital transformation of the transport and logistics sector in the Republic of Serbia and the Western Balkans countries. In comparison with the existing model based on paper documentation, the proposed system delivers numerous operational, economic, organisational, and institutional benefits for all participants in the transport chain.

One of the most significant advantages lies in the reduction of administrative burden and the elimination of a large number of manual activities associated with the creation, processing, distribution, and archiving of transport documentation. The transition to an electronic mode of working enables faster document processing, simpler data exchange, and a reduced need for physical document handling.

The application of the eCMR system is expected to result in a significant reduction of operational costs arising from the printing, delivery, storage, and archiving of paper documents. At the same time, the risk of loss, damage, or unauthorised alteration of documentation is reduced, thereby increasing the reliability of business processes.

The digitalisation of transport documentation enables greater transparency and traceability of transport flows. All activities performed on documents are recorded in the system through an audit trail, ensuring better process control, simpler data verification, and greater legal certainty for all transport participants.

A significant advantage of the system also lies in the improvement of data quality. Since data are entered only once and subsequently exchanged electronically between users and systems, the possibility of errors arising from manual transcription and the repeated entry of the same information is reduced. This contributes to greater accuracy, consistency, and reliability of transport documentation.

The proposed solution enables better cooperation between carriers, freight forwarders, consignors, consignees, and competent institutions. Faster access to data and the electronic availability of documentation contribute to the more efficient conduct of transport, customs, and inspection procedures, particularly in cross-border transport.

Of particular significance is the possibility of future integrations with various platforms, as well as with other logistics and institutional systems. This creates the basis for the gradual automation of business processes and the establishment of a single digital environment for transport information management.

The proposed system also contributes to the achievement of sustainable development objectives through the reduction of paper use and associated administrative resources. Although environmental effects are not the primary objective of the project, their significance is becoming increasingly pronounced in the context of European digitalisation and green transition policies.

Finally, the proposed solution provides the basis for the further development of electronic transport information in accordance with the eFTI initiatives of the European Union. This ensures the long-term sustainability of the investment, alignment with future regulatory requirements, and the creation of preconditions for the full integration of the Republic of Serbia and the Western Balkans region into modern European digital transport flows.

Considered as a whole, the proposed solution does not represent merely the replacement of a paper document with an electronic equivalent, but rather a platform for the modernisation and improvement of the entire process of transport documentation management, with positive effects for the economy, public administration, and end users of transport services.

Table 5.9-1: Overview of Key Benefits of the Proposed eCMR Solution

Category	Effect
Operational	Faster Processing
Financial	Lower Costs
Organisational	Better Control
Regulatory	Support for Alignment with the European Regulatory Framework
Environmental	Reduced Paper Consumption
Technological	Foundation for Further Digitalisation
Regional	Improved Cross-Border Cooperation

5.10. Key Differences in Relation to the Existing Situation (AS-IS and TO-BE)

The preceding chapters examined the existing state of transport documentation management, whilst this chapter has presented the target state model achieved through the introduction of the electronic CMR system. The primary purpose of the proposed solution is not merely the replacement of a paper document with an electronic equivalent, but the improvement of the entire process of transport information management, the increase of operational efficiency, and the creation of preconditions for the further digital transformation of the transport sector.

In the existing working model, transport documentation is largely created, exchanged, and archived in paper form. Such an approach entails a significant administrative burden, the repeated entry of the same data, an increased risk of errors, and limited availability of information during the execution of transport processes. In contrast, the proposed solution enables centralised management of electronic documentation, faster data exchange, and greater transparency of the entire transport chain.

The digitalisation of processes ensures better document traceability, a higher degree of automation, and the possibility of integration with other business and logistics systems. At the same time, it creates the technical foundation for the future application of the eFTI concept and regional interoperability with the systems of other Western Balkans and European Union countries.

The key differences between the existing and target states are presented in Table 5.10-1.

The comparison demonstrates that the proposed solution brings about a fundamental change in the manner of transport documentation management. In addition to the direct benefits of faster document processing, lower administrative costs, and improved data quality, the system provides the foundation for the future development of digital transport services and integration with European initiatives in the field of electronic transport information.

Table 5.10-1: Comparison of the Existing State (AS-IS) and the Target State (TO-BE)

Area	Current State (AS-IS)	Target State (TO-BE)
Transport Documentation	Predominantly Paper-Based CMR Documents	Electronic CMR (eCMR) Documents
Document Creation	Manual Completion of Forms	Digital Creation within the System
Data Entry	Multiple Manual Entry of the Same Data	Single Data Entry and Data Reuse
Document Exchange	Paper Documentation, E-mail and Manual Delivery	Centralised Electronic Exchange via the Platform
Signing	Manual Signature on a Paper Document	Electronic Signing
Information Availability	Limited and Often Delayed	Real-Time Data Availability
Shipment Tracking	Communication by Telephone and E-mail	Digital Transport Status Tracking
Documentation Control	Physical Access to Documentation	Digital Verification and Access to Documents
Archiving	Paper Archives and Local Storage	Centralised Electronic Archive
Activity Traceability	Limited Ability to Track Changes	Complete Audit Trail
Risk of Errors	High Due to Manual Work and Data Transcription	Significantly Reduced Through Automation
Risk of Document Loss	High	Minimal
Document Processing Time	Extended Due to Manual Procedures	Significantly Shorter
Administrative Costs	High Printing, Delivery and Archiving Costs	Significantly Lower Operating Costs
Integration with Other Systems	Limited or Non-Existent	Planned API Integrations with ERP, TMS and WMS Systems
Interoperability	Limited Data Exchange	Standardised Data Exchange and Future eFTI Compatibility
Cross-Border Transport	High Administrative Burden	Simplified Procedures and Faster Data Exchange
Regional Connectivity	Limited Digital Cooperation	Support for Cooperation Between Serbia and the Western Balkan Countries
Reporting and Analytics	Limited Statistical Data	Automated Reports and Analytical Overviews
Future Development	Limited by Paper-Based Processes	Foundation for eFTI and Further Transport Digitalisation
Document Verification	Manual Verification	QR Code Verification and Electronic Verification

On the basis of the analysis of the existing situation, the identified problems, and the characteristics of the proposed solution, it may be concluded that the transition from the AS-IS to the TO-BE model represents a necessary step towards the modernisation of the transport sector, the enhancement of economic competitiveness, and the improvement of regional and international connectivity of the Republic of Serbia and the Western Balkans countries.

The proposed solution represents the technical and business model used as the basis for the cost analysis, benefits assessment, financial analysis, economic analysis, and implementation plan presented in the subsequent chapters of the study.

6. PROJECT OBJECTIVES

6.1. General Objective

Drawing on the analysis of the existing situation presented in Chapters 2 and 4 of this study, it may be concluded that a significant proportion of administrative processes in international road freight transport in the Republic of Serbia and the Western Balkans region continues to be based on paper documentation, manual data processing, and limited electronic information exchange. This mode of operation gives rise to increased administrative costs, longer document processing times, a greater risk of errors, limited transparency of transport processes, and insufficient interoperability between supply chain participants. At the same time, the processes of digital transformation of the transport sector and the development of the European framework for the electronic exchange of transport information indicate the need for the gradual modernisation of existing business processes and their alignment with contemporary international and European standards.

In accordance with the results of the market and needs analysis (Chapter 4), the proposed technical solution (Chapter 5), and the preferred option that is the subject of analysis within Chapter 7, the general objective of the project is the establishment of a sustainable, secure, and interoperable national eCMR platform that will enable the gradual digitalisation of transport documentation management, the improvement of road freight transport efficiency, and the creation of preconditions for future interoperability with the European environment for the electronic exchange of transport data. The proposed solution is based on a national eCMR platform designed in accordance with the principles of eFTI-ready architecture, which within this study has been considered as the preferred option and constitutes the basis for the further technical, technological, financial, and economic analysis presented in the remainder of the study.

The realisation of the project is expected to bring about a gradual transition from a paper-based to an electronic model of transport documentation management, whilst creating conditions for faster, more reliable, and more secure data exchange between carriers, freight forwarders, consignors, consignees, competent authorities, and other participants in the transport process. In accordance with the assumptions adopted within this study, a reduction in the time and costs of transport documentation processing is expected, along with an improvement in data quality and availability, a reduction in the administrative burden on the economy, and an improvement in the efficiency of transport and logistics processes. The quantitative assessment of these effects constitutes the basis of the financial and economic analysis presented in Chapters 9 and 10.

The general objective of the project has been defined in accordance with the legal, institutional, and strategic framework analysed in Chapter 3 of this study. The proposed solution is based on the principles established by the CMR Convention, with due regard to the provisions of the Additional Protocol on the Electronic Consignment Note (eCMR Protocol) as the relevant international framework for the application of the electronic consignment note, the European framework for electronic freight transport information (Regulation (EU) 2020/1056 – eFTI), and the relevant national legislation and strategic documents of the Republic of Serbia. The realisation of the project also entails the continuation of activities on regulatory alignment, including consideration of the accession of the Republic of Serbia to the Additional Protocol on the Electronic Consignment Note (eCMR Protocol), in accordance with future decisions of the competent authorities and any amendments to the relevant legal framework. At the same time, the project is conceptually aligned with regional initiatives directed at the digitalisation of transport and the facilitation of trade, including the activities of the Transport Community, CEFTA, and the Common Regional Market initiative.

From a development perspective, the proposed project provides the foundation for the further digitalisation of transport and logistics processes, the development of electronic services, and the

gradual strengthening of institutional and technical capacities for the electronic exchange of transport data. In this way, it may contribute to increasing the efficiency of the transport sector, improving regional connectivity, and strengthening the competitiveness of the economy of the Republic of Serbia and the Western Balkans region.

According to the analytical estimates adopted within this study, as elaborated in Chapter 4, approximately 1.5 million international CMR documents are generated annually in the Republic of Serbia, whilst the figure for the Western Balkans as a whole is estimated at more than 3 million documents per year. On the basis of these assumptions, even a moderate improvement in the efficiency of transport documentation management may produce significant economic, organisational, and operational effects, as analysed in greater detail in the financial and economic model of the study.

6.2. Specific Objectives

Drawing on the general objective of the project, the results of the analysis of the existing situation (Chapters 2 and 4), the proposed technical solution (Chapter 5), and the preferred option analysed in Chapter 7, the specific objectives of the project have been defined. These represent the operationalisation of the general objective and the basis for monitoring the success of the implementation of the national eCMR platform through the expected results and performance indicators presented in the remainder of this chapter.

1. Digitalisation of Transport Documentation and Business Processes

The specific objective is to establish the conditions for a gradual transition from a paper-based to an electronic model of transport documentation management, thereby creating the preconditions for more efficient data exchange, a reduction in administrative activities, and the improvement of business processes in road transport.

2. Improvement of the Efficiency of Transport and Logistics Processes

The objective is to improve the operational efficiency of all transport chain participants through a reduction in the time required for transport documentation processing and the rationalisation of administrative procedures. In accordance with the parameters adopted in the financial and economic model, the processing time for a paper-based CMR document is estimated at approximately 20–23 minutes, whilst a figure of 5–9 minutes has been projected for eCMR. These values represent the adopted input parameters for the analyses presented in Chapters 9 and 10.

3. Reduction of Administrative and Operational Costs

The specific objective is to reduce the costs associated with the preparation, exchange, archiving, and processing of transport documentation. According to the parameters adopted in the study, the average cost of processing a paper-based CMR document is approximately €7.20, whilst a value of €2.00 has been adopted for eCMR. These values constitute the baseline assumptions of the financial and economic analysis.

4. Improvement of Data Quality, Reliability, and Availability

The objective is to ensure a single and reliable electronic source of transport data, to reduce the possibility of errors arising from manual data entry, to increase the availability of information, and to improve the quality of data exchanged between participants in the transport process.

5. Enhancement of Transparency and Traceability of Transport Processes

The objective is to establish an electronic environment that enables the tracking of the lifecycle of transport documentation, the recording of activities performed on documents, and greater procedural transparency, which may contribute to more efficient process management and a reduction in the risk of errors and disputes.

6. Strengthening of Interoperability and Cross-Border Data Exchange

The objective is to establish a national eCMR platform designed in accordance with the principles of eFTI-ready architecture, so as to create the preconditions for future interoperability with other national systems and the European environment for the electronic exchange of transport data. This objective is based on the legal and institutional framework analysed in Chapter 3 and the technical concept presented in Chapter 5.

7. Support for the Digital Transformation of the Transport Sector

The specific objective is to encourage the broader application of electronic business, integration with existing information systems, and the gradual modernisation of transport and logistics processes, thereby creating the preconditions for increasing the competitiveness of economic operators.

8. Contribution to More Sustainable Resource Management

By reducing the use of paper documentation, physical archiving, and administrative activities associated with their processing, the project may contribute to more rational resource utilisation and support for sustainable development objectives. A more detailed analysis of environmental and social impacts is provided in Chapter 12.

Considered as a whole, the foregoing specific objectives represent the operationalisation of the general objective of the project and are directly linked to the expected results (Section 6.3), performance indicators (Section 6.4), the technical and technological analysis (Chapter 8), the financial and economic analysis (Chapters 9 and 10), the risk analysis (Chapter 11), and the Implementation Plan (Chapter 13).

6.3. Expected Results

Drawing on the defined general and specific objectives of the project, the results of the analysis of the existing situation (Chapters 2 and 4), the proposed technical solution (Chapter 5), and the preferred option that is the subject of further analysis within this study, the expected results of the project have been identified. These results represent the direct effects anticipated in the event of the realisation of the national eCMR platform and constitute the basis for monitoring project success through the performance indicators presented in Section 6.4.

Established National eCMR Platform

One of the key results of the project is the establishment of a functional national eCMR platform enabling the electronic creation, exchange, signing, storage, and management of electronic transport documentation. The proposed technical solution, described in Chapter 5, provides the basis for the gradual transition from a paper-based to an electronic business model and creates the preconditions for future integration with other information systems in transport, logistics, and public administration.

Improved Efficiency of Transport and Logistics Processes

A reduction is expected in the time required for the preparation, processing, and exchange of transport documentation, as well as an acceleration of related processes, including delivery confirmation,

invoicing, archiving, and data exchange between transport chain participants. The quantitative analysis of these effects is presented in Chapters 9 and 10.

Reduced Administrative and Operational Costs

A reduction is expected in the costs associated with the printing, exchange, archiving, and manual processing of transport documentation. According to the parameters adopted in the study, the average cost of processing a paper-based CMR document is €7.20, whilst a value of €2.00 per document has been adopted for eCMR. These values constitute the input parameters of the financial and economic analysis, on the basis of which the financial and economic effects of the project have been assessed.

Improved Quality and Availability of Transport Data

The establishment of a more reliable transport data management system is expected, accompanied by a reduction in the possibility of errors arising from manual data entry and an improvement in the availability of information to authorised users. Improved data quality provides the basis for more efficient operational management, reporting, and the making of business and institutional decisions.

Enhanced Transparency and Traceability of Transport Processes

The proposed solution is expected to enable the recording of activities performed on electronic documents throughout their lifecycle, the monitoring of transport operation statuses, and greater procedural transparency. Such an approach may contribute to the more efficient conduct of control procedures, a reduction in the risk of errors, and the easier resolution of potential disputes.

Preconditions Established for Interoperability and Cross-Border Data Exchange

One of the expected results is the establishment of the technical and organisational preconditions for the future interoperability of the national eCMR platform with other information systems and the European environment for the electronic exchange of transport data. The proposed solution is based on the principles of eFTI-ready architecture and is aligned with the legal and institutional framework analysed in Chapter 3, thereby creating the preconditions for gradual connectivity with regional and European initiatives in the field of transport digitalisation.

Contribution to Digital Transformation and Sustainable Development

The project is expected to contribute to the further digitalisation of the transport and logistics sector, the broader application of electronic business, and more efficient utilisation of available resources. The reduction in the use of paper documentation and the rationalisation of administrative procedures may also produce positive environmental effects, which are considered in greater detail in Chapter 12.

Considered as a whole, the expected results represent the direct effects of project realisation and the logical link between the defined objectives, the technical solution, and the project performance indicators. They constitute the basis for the definition of performance indicators (Section 6.4), whilst their technical feasibility, financial and economic justification, risk analysis, and implementation timeline are elaborated in detail in the subsequent chapters of the study.

The achievement of the foregoing results will be monitored through a system of key performance indicators (KPIs), defined in Section 6.4, which constitute the basis for monitoring the effects of project realisation during implementation and the operational functioning of the system.

6.4. Key Performance Indicators (KPIs)

The success of project realisation will be monitored through the application of a system of Key Performance Indicators (KPIs), which enable the measurement of the degree to which the general and specific project objectives have been achieved, as well as the assessment of the effects of establishing the national eCMR platform throughout its lifecycle. The defined indicators are based on the results of the analysis of the existing situation (Chapters 2 and 4), the proposed technical and business model (Chapter 5), the assumptions adopted in the financial and economic analysis (Chapters 9 and 10), and the planned implementation timeline presented in Chapter 13.

For the purposes of a clearer overview of the monitoring system, the key project performance indicators are presented in Table 6.4-1.

Table 6.4-1: Key Project Performance Indicators

Indicator	Baseline	Target*
Share of eCMR Documents in the Total Number of CMR Documents	0%	>80%
Average Transport Document Processing Time	20–23 minutes	5–9 minutes
Average Document Processing Cost	€7.20	approximately €2.00
Average Direct Savings per Document	EUR 0	approximately EUR 5.20
Number of Administrative Errors	Baseline State	Reduction >50%
Delivery Confirmation Time	Baseline State	Reduction >30%
Invoicing Time	Baseline State	Reduction >30%
Number of Integrated Information Systems	0	Initial Integration with Priority Systems **
User Satisfaction Level	Not Measured	>80%
Share of Electronically Exchanged Transport Documentation	0%	>90%

* Target values represent projected values based on the adopted implementation timeline, the parameters of the financial and economic model, and the assessment of the achievable degree of system adoption within this study.

** Integrated information systems refer to priority systems of state authorities, business information systems of users, and other platforms relevant to the electronic exchange of transport documentation.

The final number and scope of integrations will be defined during the detailed design and implementation of the system.

The defined KPI indicators enable the monitoring not only of the degree of adoption of the national eCMR platform, but also of its actual impact on the efficiency of transport processes, administrative burden, data quality, and the digitalisation of transport documentation. Of particular significance are the indicators measuring document processing time, business costs, and the degree of digitalisation, as these are directly linked to the assumptions used in the financial and economic analysis.

The monitoring of KPI indicators is planned throughout the implementation and operation of the system, on the basis of data generated within the national eCMR platform, user reports, available statistical data, and periodic analyses of project effects. The detailed monitoring model, reporting frequency, participant responsibilities, and evaluation mechanisms are elaborated in Chapter 13 – Implementation Plan.

Considered as a whole, the KPI indicators represent the link between the project objectives (Sections 6.1 and 6.2), the expected results (Section 6.3), the financial and economic analysis (Chapters 9 and 10), and the implementation monitoring system (Chapter 13), providing an objective basis for monitoring project success and evaluating the effects achieved.

6.5. Alignment with Strategic Documents

The general and specific project objectives, expected results, and performance indicators defined in this chapter are based on the legal, institutional, and strategic framework analysed in Chapter 3 of this study. Accordingly, this section does not constitute a renewed analysis of individual strategic documents, but rather presents their connection with the objectives of the proposed project.

For the purposes of a clearer overview, Table 6.5-1 presents the alignment of the project objectives with the most significant strategic documents and initiatives relevant to its realisation.

Table 6.5-1: Alignment of Project Objectives with Strategic Documents and Initiatives

Strategic Document / Initiative	Relevance to the Project	Relationship to the Project Objectives
Strategic Documents of the Republic of Serbia Analysed in Chapter 3	Development of Digital Government, Electronic Business and the Transport System	Support for the Digitalisation of Transport Documentation, Modernisation of Business Processes and Strengthening of Institutional Capacities
Regulation (EU) 2020/1056 (eFTI)	European Regulatory Framework for Electronic Freight Transport Information	Development of the National eCMR Platform Designed in Accordance with the Principles of an eFTI-Ready Architecture
eIDAS and the European Trust Services Framework	Legal Certainty of Electronic Business	Support for Electronic Identification, Electronic Signing and the Integrity of Electronic Documents
Transport Community	Transport Digitalisation and Regional Connectivity	Support for Interoperability and the Development of Cross-Border Cooperation
CEFTA and the Common Regional Market	Trade Facilitation and the Digitalisation of Procedures	Support for More Efficient Exchange of Transport Data and the Gradual Integration of the Region
European Transport Digitalisation Policies	Modernisation of the Transport Sector	Support for the Long-Term Digitalisation of Transport and Logistics Processes

The alignment presented above demonstrates that the project objectives are fully consistent with the relevant legal, institutional, and strategic framework analysed in Chapter 3. The proposed National eCMR Platform (Chapter 5), together with the expected results and key performance indicators (Sections 6.3 and 6.4), directly supports the digitalisation of the transport sector, the advancement of electronic business, enhanced interoperability, and a more efficient exchange of transport data.

Furthermore, the proposed solution is based on principles that allow its gradual adaptation to future developments in both the national and European regulatory frameworks, without prejudging the implementation approach or future legislative amendments. This provides a sustainable foundation for the long-term development of the platform while ensuring its continued alignment with the evolving needs of the transport sector and the broader digital transformation process.

Taken as a whole, the project objectives constitute a logical continuation of the problem analysis (Chapters 2 and 4), the proposed technical solution (Chapter 5), and the selection of the preferred option (Chapter 7). They also provide the basis for the financial analysis (Chapter 9), the economic analysis (Chapter 10), the risk analysis (Chapter 11), and the Implementation Plan (Chapter 13).

7. OPTIONS ANALYSIS

7.1. Options Analysis Methodology

The options analysis constitutes one of the key steps in the feasibility study preparation process, as it enables the identification and selection of the optimal model for the introduction of the electronic consignment note (eCMR) in the Republic of Serbia and the Western Balkans countries. The primary objective of the analysis is to determine the option that provides the most favourable balance between costs, benefits, technical feasibility, institutional readiness, and long-term sustainability.

The analytical methodology is based on the principles set out in the European Commission's *Guide to Cost-Benefit Analysis of Investment Projects*, the UNECE guidelines for the implementation of eCMR systems, and the provisions of the eCMR Protocol. In the course of evaluating the options, relevant European directions of development in digital transport were also taken into account, including Regulation (EU) 2020/1056 on electronic freight transport information (eFTI). The analysis is further grounded in the results of the preceding chapters of the study, in particular the analysis of the existing situation, the identified problems, user needs, and the defined project objectives.

The starting point of the analysis is the existing situation in which paper-based CMR documentation continues to predominate in international road transport in the Republic of Serbia and the majority of countries in the region. The analysis of the existing situation has demonstrated that this model generates significant administrative costs, duplicate data entry, an increased risk of errors, limited information exchange, and insufficient connectivity with modern digital logistics and customs systems.

In accordance with the recommended European Commission methodology, three development options were considered:

- Option 0 – Do Nothing, which entails retaining the existing mode of operation and continuing the use of paper-based CMR documentation;
- Option 1 – Do Minimum, which entails the limited digitalisation of certain processes without the full implementation of an eCMR system;
- Option 2 – Full Implementation of an eCMR Platform, which entails the establishment of a national eCMR system with the capacity for regional interoperability and future connectivity with the eFTI system.

Each option was analysed from the perspective of legal compliance, institutional feasibility, technical and technological readiness, financial effects, economic benefits, impact on the economy and transport service users, as well as from the perspective of risks and sustainability.

Particular attention was devoted to the assessment of effects on key stakeholders, including carriers, freight forwarders, consignors, consignees, customs authorities, inspection services, and other institutions involved in the transport chain. The analysis also encompassed the regional dimension of the project, given that one of the strategic objectives is to enable the cross-border exchange of electronic transport documents within the Western Balkans and future connectivity with European digital transport corridors.

The following principal criteria were applied in the evaluation of the options:

- compliance with the international and national regulatory framework;
- contribution to the achievement of project objectives;
- level of process digitalisation and automation;
- financial acceptability and cost-effectiveness;
- economic and social benefits;
- technical and organisational feasibility;

- degree of interoperability;
- impact on users and institutions;
- implementation risks;
- long-term sustainability of the solution.

The results of the analysis are presented through a qualitative and quantitative comparison of all options considered, following which the optimal option was selected — namely the one that provides the greatest degree of fulfilment of the established objectives at an acceptable level of costs and risks. The selected option constitutes the basis for the further technical, technological, financial, and economic analyses presented in the subsequent chapters of the study.

7.2. Option 0 – Do Nothing

7.2.1. Description of the Option

Option 0 represents the reference scenario ("Do Nothing") and entails retaining the existing mode of operation without introducing the electronic consignment note (eCMR) and without undertaking any significant activities towards the digitalisation of transport documentation. Under this option, the paper-based CMR document continues to be used as the primary document in international road freight transport, together with the existing administrative procedures, manual data processing, and limited electronic exchange of documents between transport chain participants.

This option serves as the baseline for the comparison of all other options and as the reference scenario for the subsequent financial, economic, and cost-benefit analysis.

7.2.2. Expected Situation in the Absence of Intervention

In the event that the eCMR system is not introduced, the existing practices in the field of road freight transport in the Republic of Serbia and the majority of Western Balkans countries are expected to continue. The transport sector would remain based on paper documentation, entailing the manual completion, signing, delivery, and archiving of CMR documents.

According to the results of the analysis of the existing situation presented in the preceding chapters, this approach involves relatively high administrative costs, longer document processing times, limited real-time data availability, and an increased risk of errors arising from manual operations. At the same time, the trend of uneven degrees of digitalisation among carriers, freight forwarders, and other transport chain participants would persist.

7.2.3. Impact on Key Stakeholders

Retaining the existing situation requires no additional investment expenditure or organisational changes on the part of economic operators and institutions. However, the absence of digitalisation also means that the existing limitations affecting business efficiency are maintained.

For carriers and logistics companies, this entails the continuation of costs associated with paper documentation, physical archiving, and manual data processing. For customs and inspection authorities, the existing document verification and exchange procedures remain in place, whilst consignors and consignees do not gain the ability to fully monitor transport processes in real time.

At the regional level, the absence of eCMR implementation may limit the possibilities for integration with future European and regional initiatives in the field of transport digitalisation, including the application of Regulation (EU) 2020/1056 on electronic freight transport information (eFTI), the activities of the Transport Community, and the Common Regional Market (CRM) initiatives.

7.2.4. Advantages of the Option

The principal advantage of this option is the absence of initial investment costs. No new information systems need to be established, no additional user training is required, and no modifications to existing business procedures are necessary.

Furthermore, this option does not entail the technical and organisational risks that are typical in the early stages of digital transformation, such as the need for system integration, change management, or the alignment of different process participants.

7.2.5. Disadvantages and Limitations

Despite the absence of investment costs, this option does not enable the realisation of the benefits arising from the digitalisation of transport documentation. The existing administrative costs, prolonged document processing times, increased risk of errors, and limited interoperability between transport chain participants are all retained.

According to the input parameters adopted in the study, the processing time for a paper-based CMR document is approximately 20–23 minutes, whilst the processing cost reaches approximately €7.20 per document. At the same time, the potential savings that could be achieved through the application of the eCMR system are not realised, including the reduction of administrative costs, the shortening of document processing times, and more efficient cross-border procedures.

Viewed from a long-term perspective, this option does not contribute to the achievement of the objectives defined in Chapter 6, in particular those relating to the digitalisation of the transport sector, the improvement of logistics process efficiency, the strengthening of regional interoperability, and alignment with European digital transport policies.

7.2.6. Assessment of the Option

The "Do Nothing" option constitutes a necessary reference scenario for the purposes of the analysis, but does not represent a sustainable solution for the long-term development of the transport sector. Although it requires no additional financial investment in the short term, it does not enable the realisation of the identified benefits, does not address the existing problems, and does not contribute to the achievement of the strategic objectives of the digital transformation of transport in the Republic of Serbia and the Western Balkans countries. For this reason, the following sections analyse alternative options that enable different levels of transport documentation digitalisation and modernisation.

7.3. Option 1 – Do Minimum

7.3.1. Description of the Option

Option 1 ("Do Minimum") entails the limited digitalisation of existing transport processes without the full implementation of an eCMR system. This option represents a transitional model between the existing situation and the full digitalisation of transport documentation, whereby the paper-based CMR document remains the primary legally valid document, whilst certain administrative activities are partially digitalised.

Within this option, it is possible to introduce electronic document archiving, the exchange of scanned documents via electronic mail or web portals, the limited use of electronic signatures, and the integration of certain transport and business information systems. However, no unified national eCMR system is established, nor is full interoperability between all transport chain participants ensured.

7.3.2. Expected Effects of Application

In comparison with Option 0, this option brings certain improvements in the organisation and management of documentation. Partial digitalisation enables faster access to documents, simpler archiving, and more efficient data exchange between economic operators that already possess the appropriate information infrastructure.

At the same time, the retention of the paper-based CMR document as the primary document means that the majority of administrative procedures continue to be conducted through a combination of paper-based and electronic processes. As a result, a significant proportion of the identified problems from the analysis of the existing situation persist, including the need for manual data entry, the parallel maintenance of multiple records, and limited real-time structured data exchange.

7.3.3. Impact on Stakeholders

For carriers, freight forwarders, and logistics companies, this option entails moderate organisational and financial changes. Certain investment in document digitalisation, the adaptation of business processes, and user training is required, but this is significantly less than the investment necessary for the full implementation of an eCMR system.

From the perspective of public administration and supervisory authorities, the effects of this option remain limited, as no unified system for the exchange of transport data is established. Customs and inspection procedures continue to rely to a large extent on paper documentation and manual verification procedures.

At the regional level, this option provides a certain degree of preparation for future digitalisation, but does not enable the full exploitation of the potential for cross-border exchange of electronic transport documents in accordance with the eCMR Protocol and the requirements of the eFTI Regulation.

7.3.4. Advantages of the Option

The principal advantage of this option lies in its gradual approach to digital transformation. In comparison with the full implementation of eCMR, smaller initial investment and less organisational effort are required, which reduces the risk of user resistance and enables gradual adaptation to new working methods.

Additionally, this option may serve as a preparatory phase for the subsequent implementation of more advanced digital solutions, as it enables the development of basic digital capacities among economic operators and institutions.

7.3.5. Disadvantages and Limitations

Although it brings certain improvements, this option does not eliminate the fundamental shortcomings of the existing system. The parallel existence of paper-based and electronic documentation leads to process duplication, increases administrative complexity, and reduces the potential benefits of digitalisation.

The retention of the paper document as the primary source of data limits the possibility of full process automation, integration with other information systems, and real-time structured data exchange. Consequently, a significant proportion of the potential time and cost savings remains unrealised.

Furthermore, this option does not enable full alignment with the long-term direction of development of the European transport sector, which is based on the application of eCMR, the eFTI framework, and the broader digitalisation of transport documentation.

7.3.6. Assessment of the Option

The "Do Minimum" option represents an acceptable transitional scenario that enables the gradual introduction of digital tools and a partial reduction in administrative burden. However, due to the limited scope of changes and the retention of the key characteristics of the existing system, this option does not ensure the full achievement of the project objectives defined in Chapter 6.

Viewed from a long-term perspective, this option may contribute to the gradual modernisation of the sector, but does not provide the level of efficiency, interoperability, and economic benefits that may be expected from the full implementation of an eCMR system. For this reason, it is regarded as an intermediate step towards the more advanced digitalisation model that is the subject of analysis under Option 2.

7.4. Option 2 – Introduction of an eCMR Platform

7.4.1. Description of the Option

Option 2 entails the establishment of a national eCMR platform with regional and European interoperability in the Republic of Serbia, with the capacity for interoperability with the Western Balkans countries and future connectivity with the European digital transport ecosystem. This option represents the target ("TO-BE") state described in Chapter 5 and is directly oriented towards the achievement of the project objectives defined in Chapter 6.

The fundamental characteristic of this option is the replacement of the paper-based CMR document with the electronic consignment note (eCMR), in accordance with the provisions of the eCMR Protocol, whilst ensuring the legal validity of electronic documents, electronic signing, electronic data exchange, and centralised management of transport documentation.

The proposed solution does not merely entail the replacement of the paper document with an electronic equivalent, but the digitalisation of the entire lifecycle of transport documentation. The TO-BE model encompasses the creation and updating of eCMR documents, the electronic signing of process participants, the use of a mobile application for drivers, the maintenance of an Audit Trail record of all activities, QR mechanisms for document verification, and the technical basis for future integrations with other information systems via API interfaces.

7.4.2. Concept of the Proposed Solution

The proposed model is based on the establishment of a national platform enabling the creation, signing, exchange, archiving, and verification of eCMR documents throughout the entire transport process. The platform would be accessible to all relevant transport chain participants, including carriers, freight forwarders, consignors, consignees, customs authorities, inspection services, and other competent institutions.

In accordance with the concept presented in Chapter 5, the solution entails web and mobile access to the system, the use of electronic identification and electronic signatures, and the possibility of integration with other logistics information systems.

The platform incorporates a REST API as an integral component of the system architecture, thereby providing the technical basis for future integrations. This study does not proceed from the assumption that such integrations have already been realised; rather, they are treated as a potential direction of future development and an additional source of benefits.

Of particular significance is the provision of interoperability with regional and European platforms, which enables data exchange in cross-border transport and creates the preconditions for the future application of the concept of electronic transport information in accordance with the eFTI Regulation.

The proposed solution has been designed in accordance with the objectives of the key international and European initiatives in the field of transport and trade digitalisation. The implementation of the eCMR platform supports the application of the UNECE eCMR Protocol, contributes to future alignment with the requirements of Regulation (EU) 2020/1056 on electronic freight transport information (eFTI), and advances the objectives of regional cooperation promoted by the Transport Community, CEFTA, and the Common Regional Market initiatives. In this way, the solution follows the direction of development of the European digital transport environment and creates the preconditions for the future cross-border exchange of transport data in electronic form.

7.4.3. Expected Effects of Implementation

The full application of the eCMR system enables the digitalisation of the entire lifecycle of the eCMR document, from document creation, signing, and data exchange, through to archiving and verification.

According to the parameters adopted in the study, the processing time for a single transport document may be reduced from approximately 20–23 minutes to 5–9 minutes, whilst the direct document processing cost is reduced from approximately €7.20 to approximately €2.00 per document. In addition to direct financial effects, significant benefits are expected through the acceleration of administrative procedures, a reduction in the number of errors, improved data availability, and enhanced cross-border cooperation.

On the basis of the input parameters adopted in the study, which project approximately 1.5 million CMR documents per year in the Republic of Serbia, the financial effects of implementation have been assessed within the financial model presented in Chapter 9, proceeding from an average direct saving of approximately €5.20 per document. In addition to direct financial effects, significant indirect benefits are also expected through a reduction in document processing times, a decrease in errors, faster cross-border procedures, and improved logistics process efficiency. The potential for accumulated benefits over the project lifecycle constitutes one of the key arguments in favour of this option.

7.4.4. Impact on Stakeholders

The implementation of the eCMR platform brings benefits to all transport chain participants.

For carriers and logistics companies, it enables a reduction in administrative burden, faster document processing, and improved control of business processes. Consignors and consignees gain greater transparency and the ability to monitor shipment status in real time. State authorities gain more reliable access to data, faster document verification, and a better basis for the digitalisation of public services in the field of transport and logistics.

At the regional level, this option supports the development of a common digital transport space in the Western Balkans and contributes to the realisation of initiatives implemented by CEFTA, the Transport Community, and other regional organisations.

7.4.5. Advantages of the Option

In comparison with the previously analysed options, this option provides the greatest degree of fulfilment of the defined project objectives.

The key advantages include:

- full digitalisation of transport documentation;
- significant reduction in administrative costs;
- reduction in document processing times;
- reduction in errors arising from manual data entry;
- greater transparency and availability of information;
- improved cross-border data exchange;
- compliance with the international and European regulatory framework;
- the possibility of future connectivity with the eFTI environment;
- long-term sustainability and scalability of the solution.

7.4.6. Limitations and Risks

Unlike Options 0 and 1, this option requires initial investment in platform development, infrastructure establishment, system integration, and user training. In addition to the technical aspects, it is necessary to ensure appropriate institutional coordination, change management, and continuous user support during the transition period.

Attention must also be paid to matters of information security, personal data protection, interoperability, and long-term system maintenance. These risks will be analysed in greater detail in Chapter 11 – Risk Analysis.

7.4.7. Assessment of the Option

On the basis of the results of the analysis, Option 2 represents the option that contributes most substantially to addressing the identified problems, achieving the project objectives, and aligning with the strategic directions of transport digitalisation in the Republic of Serbia, the Western Balkans region, and the European Union.

Although it requires greater initial investment compared to the other options considered, the expected operational, economic, institutional, and social benefits significantly exceed the implementation costs. For this reason, this option constitutes the basis for further comparison with the other options considered and is the subject of selection within Section 7.6.

7.5. Comparison of Options

7.5.1. Approach to Comparison

Following the analysis of the options considered, a mutual comparison was conducted with the aim of identifying the solution that contributes most substantially to the achievement of the project objectives, at an acceptable level of costs, risks, and organisational complexity. The comparison was conducted in accordance with the methodology described in Section 7.1 and is based on the results of the analyses presented in the preceding chapters of the study.

In the evaluation of the options, the key criteria taken into account encompassed compliance with the regulatory framework, the degree of contribution to the digitalisation of the transport sector, effects on users, the possibility of interoperability, expected economic benefits, and the long-term sustainability of the proposed solutions.

7.5.2. Qualitative Comparison of Options

Viewed from the perspective of the fulfilment of project objectives, Option 0 provides the lowest level of benefits, as it retains the existing situation and does not address the identified problems in the field of transport documentation. Although it requires no additional investment, this option does not contribute to the digitalisation of the sector, does not reduce administrative costs, and does not ensure alignment with current European trends.

Option 1 brings certain improvements through the partial digitalisation of certain processes and the gradual introduction of digital tools. However, due to the retention of the paper-based CMR document as the primary information carrier, the majority of potential benefits remain unrealised. This option may serve as a transitional solution, but does not provide a complete transformation of transport processes.

Option 2 enables the full digitalisation of transport documentation, the improvement of cross-border data exchange, a reduction in administrative burden, and the creation of preconditions for integration with the future European digital transport environment. Although it requires greater initial investment, it provides the greatest scope of long-term benefits and the highest degree of fulfilment of the strategic project objectives.

7.5.3. Multi-Criteria Analysis

For the purposes of selecting the most favourable option, a comparison of the options was conducted against the key criteria defined within the analysis.

Table 7.5-1: Comparative Overview of the Options

Criterion	Option 0 – Do Nothing	Option 1 – Minimal Changes	Option 2 – eCMR System
Contribution to the Achievement of Project Objectives	Low	Medium	High
Process Digitalisation	Low	Medium	High
Reduction of Administrative Burden	Low	Medium	High
Interoperability	Low	Limited	High
Compliance with the eCMR and eFTI Framework	Low	Partial	High
Readiness for Future Alignment with the eFTI Environment	Low	Limited	High
Economic Benefits	Low	Medium	High
Organisational Complexity	Low	Medium	High
Initial Investment	Low	Medium	High
Long-Term Sustainability	Low	Medium	High
Contribution to KPI Targets	Low	Medium	High

All criteria were weighted equally, as the objective of the analysis was the qualitative comparison of options rather than the formal scoring of investment alternatives.

The results of the comparison indicate that Option 0 has an advantage solely in terms of the absence of investment costs, whilst simultaneously achieving the weakest results across all strategically significant criteria. Option 1 provides moderate improvements and represents an acceptable transitional model, but does not enable the full potential of digitalisation to be realised.

Option 2, on the other hand, achieves the highest ratings across all criteria that are directly linked to the project objectives and the long-term development of the transport sector, including process efficiency, interoperability, economic benefits, and regulatory compliance.

7.5.4. Results of the Comparison

On the basis of the analysis conducted, it may be concluded that there is a clear distinction between the short-term costs and the long-term benefits of the options considered. Options 0 and 1 are characterised by lower initial costs, but simultaneously by limited potential for the improvement of transport processes and the achievement of strategic objectives.

Option 2 requires greater initial investment, but simultaneously provides the greatest operational, economic, and institutional benefits throughout the project lifecycle. The results of the comparison

indicate that this option represents the most favourable balance between implementation costs and expected long-term effects, making it the most promising option for further elaboration within the feasibility study.

7.6. Selection of the Optimal Option

7.6.1. Results of the Analysis

On the basis of the analysis of the options considered, it may be concluded that there are significant differences in terms of the possibilities for achieving project objectives, the level of digitalisation, the expected benefits, and the long-term sustainability of the proposed solutions.

Option 0 ("Do Nothing") represents the reference scenario that requires no additional investment, but simultaneously does not address the identified problems in the field of transport documentation management. Retaining the existing situation entails the continued use of paper documents, the persistence of existing administrative costs, and limited possibilities for the further improvement of transport processes.

Option 1 ("Do Minimum") enables a certain degree of modernisation through the partial digitalisation of certain activities, but does not provide a complete transformation of the transport sector. Due to the retention of the paper-based CMR document as the primary information carrier, the majority of the potential benefits of digitalisation remain unrealised.

Option 2 ("Introduction of an eCMR Platform") provides the greatest degree of fulfilment of the defined project objectives and enables the full digitalisation of transport documentation, the improvement of interoperability, a reduction in administrative burden, and the establishment of a basis for the further digital transformation of the transport sector.

The results of the multi-criteria analysis indicate that Option 2 achieves the most favourable results across the majority of criteria that are of significance for project realisation. Of particular note are the effects in terms of business process efficiency, the reduction of documentation processing costs, increased transparency, improved cross-border data exchange, and compliance with the international and European regulatory framework.

In relation to the baseline scenario, the implementation of the eCMR platform enables a significant reduction in transport documentation processing times, a decrease in administrative costs, and an improvement in data quality. At the same time, the solution is fully aligned with the strategic direction of development of digital transport in the European Union, including the application of the eCMR Protocol and the concept of electronic transport information defined through the eFTI Regulation.

Although this option entails greater initial investment compared to the other options analysed, the expected benefits over the project lifecycle significantly exceed the initial implementation costs. For the purposes of the subsequent financial and economic analyses, the effects of the selected option will be assessed over an analytical period of ten years, in accordance with the methodology adopted in the study.

The selection of the preferred option is further confirmed by the results of the financial and economic analysis presented in Chapters 9 and 10. The results of the analysis have demonstrated positive effects in terms of operational savings, economic benefits, improvements in transport process efficiency, and the long-term sustainability of the proposed solution.

7.6.2. Selected Option

On the basis of the results of the analysis conducted, the following has been selected as the optimal option for the Republic of Serbia and the Western Balkans countries:

Option 2 – Introduction of a national eCMR platform based on eFTI-ready architecture, with the capacity for regional and European interoperability.

The selection of this option is based on its ability to:

- contribute most substantially to the achievement of the project objectives;
- provide the greatest economic and operational benefits;
- enable the full digitalisation of transport documentation;
- support the development of cross-border data exchange;
- contribute to the modernisation of the transport and logistics sector;
- ensure compliance with the relevant international and European regulations;
- create the basis for future integration with digital transport corridors and the eFTI environment.

7.6.3. Conclusion

The analysis conducted demonstrates that the introduction of an eCMR platform is the most rational and sustainable solution for the modernisation of transport documentation management in the Republic of Serbia and the Western Balkans region. The selected option provides the best balance between investment expenditure and expected benefits, with the greatest potential for the realisation of long-term economic, institutional, and social effects.

Accordingly, Option 2 is adopted as the reference option for further elaboration within the technical and technological analysis, financial analysis, economic analysis, and risk analysis that are the subject of the subsequent chapters of this feasibility study.

The selected option will be subject to detailed technical, technological, financial, and economic evaluation in the subsequent chapters, with a view to confirming the financial and economic justification of the project.

8. TECHNICAL AND TECHNOLOGICAL ANALYSIS

8.1. Technical Feasibility

The technical feasibility of the proposed project entails an assessment of whether the necessary technical preconditions exist for the establishment and use of the electronic consignment note (eCMR) system in the Republic of Serbia and the Western Balkans countries. The analysis is based on the results of the preceding chapters of the study, in particular the analysis of the existing situation, the digital maturity of the transport sector, the legal framework, and the adopted TO-BE model of electronic business operations.

Existing Infrastructure Base

The Republic of Serbia and the majority of Western Balkans countries possess a well-developed telecommunications infrastructure that enables the reliable application of digital services in the road transport sector. The wide availability of broadband internet, mobile 4G and 5G networks, and the high prevalence of smart mobile devices among transport operators and drivers constitute a necessary precondition for the real-time use of the eCMR system.

At the same time, the results of the analysis of the existing situation indicate that a significant number of carriers already use various digital tools for the management of transport processes, vehicle tracking, client communication, and the exchange of business documentation, which points to the existence of a solid technical foundation for the further digitalisation of transport documentation.

Technical Feasibility of the Proposed Solution

The selected project option (Option 2 – national eCMR system with regional and European interoperability) is based on technological components that are already widely applied and proven in practice. The proposed system encompasses a web application, a mobile application, electronic document signing, centralised data storage, QR verification, and mechanisms for tracking all activities performed on a document (Audit Trail).

The technical concept of the system supports the complete lifecycle of the eCMR document, which encompasses the stages of creation (Draft), issuance (Issued), transport (In Transit), updating during transport (Updated), delivery confirmation (Delivered), and document archiving (Archived). This defined lifecycle ensures full document traceability and constitutes the basis for status management and data exchange between all transport process participants.

A particular advantage of the proposed concept is the fact that users are not required to invest in complex local infrastructure. Access to the system is provided via standard web browsers and mobile devices, which significantly reduces implementation costs and enables the gradual inclusion of a large number of users of varying sizes and levels of digital maturity.

Compliance with the International Framework

The technical feasibility of the solution is further confirmed by the fact that it is based on internationally recognised standards and regulatory frameworks that already support the electronic exchange of transport documentation. Of particular significance are the eCMR Protocol to the CMR Convention, Regulation (EU) 2020/1056 on electronic freight transport information (eFTI), the eIDAS Regulation, and the UNCITRAL Model Law on Electronic Transferable Records (MLETR), which provide the legal and technical basis for the use of electronic transport documents.

In accordance with the adopted TO-BE model, the platform incorporates a REST API as an integral component of the system, thereby providing the technical basis for future integrations with other information systems. These integrations are not a precondition for the commencement of system

operations, but represent an important mechanism for the future expansion of functionality and the realisation of additional benefits.

Assessment of Technical Feasibility

On the basis of the analysis of infrastructure preconditions, the availability of the required technologies, the existing level of transport sector digitalisation, and compliance with international standards, it may be concluded that the technical preconditions exist to enable the implementation, establishment, and use of the eCMR system in the Republic of Serbia. The proposed solution is accordingly assessed as technically feasible and ready for phased implementation at the national and regional level⁸.

8.2. Technological Feasibility

The technological feasibility of the project constitutes an assessment of the maturity, availability, and sustainability of the technologies necessary for the establishment and long-term operation of the electronic consignment note (eCMR) system. Unlike technical feasibility, which assesses the existence of infrastructure preconditions, technological feasibility analyses whether the proposed technologies are sufficiently developed, standardised, and proven in practice to support the realisation of the project.

Maturity of the Proposed Technologies

The proposed eCMR system is based on technologies that are already widely applied in the field of digital business, logistics, and transport. The key system components — such as cloud infrastructure, web applications, mobile applications, electronic document signing, electronic archives, QR verification, and digital identity management systems — represent mature and proven solutions that are already in use in numerous public and private information systems.

Furthermore, numerous European countries already use eCMR or similar digital transport platforms, which further confirms the technological maturity of the proposed concept and reduces the risk of applying insufficiently tested technologies.

Compliance with European Digital Initiatives

The technological justification of the proposed solution further derives from its alignment with the current European directions of transport and logistics digitalisation. Of particular significance is the alignment with Regulation (EU) 2020/1056 on electronic freight transport information (eFTI), which provides for the gradual transition from paper-based to electronic exchange of transport documentation.

The adopted TO-BE model is based on the concept of eFTI-ready architecture, whereby eFTI Connect is used as a reference example of a platform designed in accordance with European requirements for interoperability and digital data exchange. This ensures that the proposed system is compatible with the future development of the European digital transport space.

Capacity for Further Development and Expansion

One of the key characteristics of the proposed solution is its modularity and capacity for gradual development. Core functionalities — such as the creation, signing, exchange, and archiving of eCMR documents — may be established in the initial phase of implementation, whilst additional

⁸ UNECE – CMR Convention and eCMR Protocol, Regulation (EU) 2020/1056., eIDAS Regulation, UNCITRAL – MLETR.

functionalities may be introduced in accordance with user needs and the development of the regulatory framework.

The platform incorporates a REST API as an integral component of the system, thereby providing the technical basis for future integrations with ERP, TMS, WMS, customs, and other information systems. In accordance with the methodological approach adopted in the study, these integrations are not considered as already-realised solutions, but as a potential direction of future development that may further increase the benefits derived from the system.

Furthermore, the architecture of the solution enables the future application of advanced technologies such as automated data exchange, analytical tools, reporting systems, Internet of Things (IoT) devices in transport, and artificial intelligence-based solutions.

The platform architecture enables the establishment of mechanisms for monitoring key performance indicators (KPIs), including the number of eCMR documents processed, document processing times, the degree of digitalisation of transport processes, the number of integrated users, and other indicators necessary for the management and continuous improvement of the system.

Long-Term Sustainability of the Technology

Viewed from the perspective of the project lifecycle, the proposed technologies exhibit a high degree of long-term sustainability. They are based on open standards, widely accepted protocols, and solutions that enjoy strong support from the international ICT industry. This significantly reduces the risk of technological obsolescence and ensures the possibility of future upgrades without the need for radical system changes.

Assessment of Technological Feasibility

On the basis of the analysis of technology maturity, market availability, compliance with the European regulatory and technological framework, and the capacity for further development and upgrading, it may be concluded that the proposed eCMR system possesses a high degree of technological feasibility. The proposed solution is based on stable and proven technologies that have already been successfully applied in practice and that are capable of ensuring the long-term sustainability of transport documentation digitalisation in the Republic of Serbia and the Western Balkans countries⁹.

8.3. Interoperability and Standards

Interoperability represents the ability of different information systems, organisations, and institutions to exchange data and utilise the exchanged information in a reliable, secure, and standardised manner. In the context of the electronic consignment note (eCMR), interoperability constitutes one of the key preconditions for the successful digitalisation of international road freight transport, given that the transport process involves a large number of participants from different countries, sectors, and information environments.

As presented in the preceding chapters, in particular the analysis of the existing situation (AS-IS), the description of the proposed solution (TO-BE), and the analysis of the selected project option, the objective is not merely the replacement of the paper document with an electronic form, but the

⁹ UNECE – *Additional Protocol to the Convention on the Contract for the International Carriage of Goods by Road concerning the Electronic Consignment Note (eCMR)*, Regulation (EU) 2020/1056 on Electronic Freight Transport Information (eFTI), Regulation (EU) No 910/2014 (eIDAS), UNCITRAL Model Law on Electronic Transferable Records (MLETR)

establishment of a digital ecosystem that enables the efficient exchange of data throughout the entire lifecycle of the eCMR document.

Compliance with International Standards and the Regulatory Framework

The proposed system is based on internationally recognised standards and regulatory frameworks that constitute the foundation for the electronic exchange of transport documentation. Of particular significance are:

- the CMR Convention and the Additional Protocol on the Electronic Consignment Note (eCMR Protocol);
- Regulation (EU) 2020/1056 on electronic freight transport information (eFTI);
- the eIDAS Regulation governing electronic identification and trust services;
- the UNCITRAL Model Law on Electronic Transferable Records (MLETR);
- national regulations governing the electronic document, electronic signature, data protection, and information security.

Compliance with the aforementioned instruments ensures that the electronic consignment note possesses legal validity, technical reliability, and the capacity for cross-border application in international road transport.

Of particular significance is the fact that the eCMR represents one of the key types of electronic transport information envisaged by the eFTI regulatory framework. The introduction of the eCMR system creates the technical and organisational basis for subsequent inclusion in the broader eFTI ecosystem and the exchange of transport information with other digital platforms in the European Union.

Interoperability with Existing Information Systems

Modern transport chains involve the use of various information systems for the management of logistics and business processes. It is therefore important that the eCMR system enables data exchange with the existing systems used by carriers, freight forwarders, logistics operators, economic operators, and competent institutions.

In accordance with the adopted TO-BE model, the platform incorporates a REST API as an integral component of the system, thereby providing the technical basis for future integrations with:

- ERP systems;
- TMS (Transport Management System) solutions;
- WMS (Warehouse Management System) platforms;
- customs information systems;
- public administration and electronic identification systems.

This study does not proceed from the assumption that such integrations have already been realised in a production environment. They are regarded as planned system development possibilities that may be realised in later phases of implementation and may represent an additional source of operational and economic benefits.

Regional and Cross-Border Interoperability

Given that the subject of the study encompasses the Republic of Serbia and the Western Balkans region, interoperability is of particular significance from the perspective of cross-border freight transport. The successful application of eCMR requires that the document can be created, exchanged,

signed, verified, and accepted by all relevant participants regardless of the country in which they are located.

The proposed concept is aligned with the objectives of regional cooperation within the framework of CEFTA, the Transport Community, and the Common Regional Market (CRM) initiatives, which recognise the digitalisation of transport and trade procedures as one of the regional development priorities. This approach enables the gradual connectivity of the national eCMR system with future regional and European platforms for the exchange of transport data.

Of particular significance is the fact that the transport corridors connecting the Western Balkans and the European Union involve frequent cross-border document exchange, which makes interoperability one of the key factors for the successful application of the eCMR system.

Assessment of Interoperability

On the basis of the analysis of the adopted standards, the regulatory framework, and the planned data exchange concept, it may be concluded that the proposed eCMR system provides a high degree of interoperability at the national, regional, and European level. Compliance with the eCMR, eFTI, and eIDAS frameworks, together with the possibility of future integrations via standardised API mechanisms, ensures that the proposed solution is compatible with the development of the European digital transport space and the long-term needs of the transport sector in Serbia and the Western Balkans¹⁰.

8.4. Security and Data Protection

Information security and data protection constitute one of the key preconditions for the successful introduction and acceptance of the electronic consignment note (eCMR) system. Unlike paper documentation, which is exposed to the risks of loss, damage, unauthorised access, and forgery, digital systems enable the application of advanced mechanisms for access control, activity monitoring, and data integrity protection.

As presented in the preceding sections of the technical and technological analysis, the proposed eCMR system is based on a digital document lifecycle encompassing the creation, electronic signing, exchange, archiving, and verification of the document. Security must therefore be ensured throughout all phases of data processing and exchange.

Protection of Document Integrity and Authenticity

One of the fundamental requirements of the eCMR system is the assurance of the integrity and authenticity of electronic documents. Every modification to a document must be recorded, whilst the identity of participants performing the creation, modification, or signing of the document must be reliably established.

To this end, the system uses electronic identification and electronic signature mechanisms that ensure:

- the authenticity of participants;
- the integrity of the document content;
- the non-repudiation of actions performed;
- the legal validity of electronic documentation.

¹⁰ UNECE – *Convention on the Contract for the International Carriage of Goods by Road (CMR)* and *Additional Protocol concerning the Electronic Consignment Note (eCMR)*, Regulation (EU) 2020/1056, Regulation (EU) No 910/2014, UNCITRAL – *Model Law on Electronic Transferable Records (MLETR)*, Transport Community, CEFTA

In this way, it is ensured that the electronic consignment note possesses the same or higher level of reliability compared to the traditional paper document.

Access Control and Activity Traceability

Given that the eCMR document contains commercially sensitive information concerning the consignor, carrier, consignee, type of goods, and transport operations, access to data must be restricted exclusively to authorised users.

The proposed system enables the application of access control based on user roles and authorisations, thereby ensuring that each participant has access only to the data necessary for the performance of their business obligations.

An additional level of security is provided by the Audit Trail mechanism, which enables the recording of all activities performed on the document, including creation, modifications, signing, access, and verification. This mechanism ensures full traceability throughout the entire lifecycle of the eCMR document and significantly reduces the risk of misuse and disputes.

An additional document authenticity verification mechanism is provided by QR verification, which enables rapid validation of document authenticity and access to relevant information by authorised users and supervisory authorities.

Compliance with Data Protection Regulations

In addition to security and data protection, the long-term sustainability of the system requires the establishment of an appropriate data governance model. This model should define data ownership, access rules, responsibilities for data quality, archiving and information exchange procedures, and mechanisms for the supervision of data use within the eCMR ecosystem.

The implementation of the eCMR system must be aligned with the relevant national and international regulations governing data protection, electronic identification, trust services, and information security.

The key regulatory framework encompasses:

- the Law on Electronic Document, Electronic Identification and Trust Services in Electronic Business;
- the Law on Electronic Administration;
- the Law on Personal Data Protection;
- the Law on Information Security;
- Regulation (EU) No 910/2014 (eIDAS);
- Regulation (EU) 2020/1056 on electronic freight transport information (eFTI);
- the data protection principles established by the General Data Protection Regulation (GDPR).

The application of the aforementioned regulations and principles constitutes the basis for the lawful processing of data, the protection of user rights, and the building of trust in the system. At the same time, it creates the preconditions for the long-term development and acceptability of the solution in both the national and international environment.

Cybersecurity and System Resilience

In addition to the protection of the documents themselves, it is necessary to ensure the resilience of the information system against modern cybersecurity threats. This entails the application of appropriate organisational and technical measures, such as the protection of communication channels,

access rights management, regular data backups, continuous system monitoring, and incident recovery plans.

The use of modern cloud infrastructure enables a high level of system availability, faster recovery from potential failures, and greater resilience to security risks compared to traditional on-premises systems.

The application of the principles of "security by design" and "privacy by design" during the design and development of the system further contributes to compliance with modern information security and data protection standards.

Assessment of Security and Data Protection

On the basis of the analysis of the proposed concept, the regulatory framework, and the available technological solutions, it may be concluded that all necessary preconditions exist for establishing a high level of security and data protection within the eCMR system. The application of electronic identification, electronic signatures, access control, Audit Trail mechanisms, and modern cybersecurity measures enables reliable, secure, and legally compliant exchange of transport documentation at the national, regional, and European level.

8.5. Organisational Feasibility

Organisational feasibility represents an assessment of the capacity of institutions, economic operators, and other transport process participants to accept, implement, and sustainably use the electronic consignment note (eCMR) system. In addition to the technical and technological preconditions analysed in the preceding sections, the successful implementation of eCMR also depends on the organisational readiness of all stakeholders to adapt existing business processes and establish new models of cooperation and data exchange.

Institutional Capacities

The analysis of the legal and institutional framework has demonstrated that institutions and mechanisms already exist in the Republic of Serbia that are capable of supporting the implementation of the eCMR system. The competent ministries, customs administration, inspection services, chambers of commerce, and other relevant bodies are already participating in the processes of public administration and transport sector digitalisation, which constitutes a significant foundation for the realisation of the project.

At the same time, the national regulations governing the electronic document, electronic identification, and electronic trust services provide the institutional preconditions for the acceptance of electronic transport documents and their use in business and administrative procedures.

The Chamber of Commerce and Industry of Serbia, sectoral carrier associations, and logistics associations may play a significant role in the implementation process through information, education, and support activities for economic operators during the transition period.

A detailed model of the institutional governance of the platform, including the distribution of responsibilities, the model for financing operational costs, and the responsibilities for system management, is presented in Chapter 13 – Implementation Plan.

Readiness of the Business Sector

The results of the analysis of the existing situation and market needs indicate that a significant number of transport, logistics, and freight forwarding companies already use various forms of digital solutions for business management, client communication, and the monitoring of transport processes. This

points to the existence of a basic level of digital maturity that enables the relatively rapid adoption of the eCMR system.

A particular advantage is the fact that the proposed solution does not require significant organisational changes to the core transport processes. Users continue to perform the same business activities as with the paper-based CMR, but with the application of a digital document and electronic data exchange. In this way, resistance to change is reduced and the process of accepting the new system is facilitated.

Change Management and Competence Development

Although the technical and institutional preconditions are largely fulfilled, the successful implementation of eCMR requires systematic organisational change management. Of particular significance are activities directed at user information, employee training, the development of operational procedures, and the provision of technical support during the transition period.

The most significant organisational challenges relate to:

- the adaptation of users' internal procedures;
- the training of drivers and operational staff;
- the alignment of working methods across different institutions;
- the establishment of coordination mechanisms between the public and private sectors;
- the gradual transition from paper-based to electronic documentation.

The experience of countries that have already introduced eCMR demonstrates that these challenges can be successfully overcome through phased implementation, pilot projects, and continuous user support during the adaptation period.

Regional Cooperation and Coordination

Given that the subject of the study relates to the Republic of Serbia and the Western Balkans countries, organisational feasibility must also be considered through the prism of regional cooperation. The effective application of eCMR requires coordination between national institutions, transport operators, and other participants in cross-border transport.

The existing regional cooperation initiatives, including activities within the framework of CEFTA, the Transport Community, and the Common Regional Market (CRM), represent a favourable institutional framework for the gradual alignment of procedures and the development of common approaches to the digitalisation of transport documentation. These initiatives significantly reduce organisational risk and increase the likelihood of the successful regional implementation of the eCMR system.

Assessment of Organisational Feasibility

On the basis of the analysis of institutional capacities, the degree of digital maturity of the business sector, the existing legal framework, and the mechanisms of regional cooperation, it may be concluded that realistic organisational preconditions exist for the establishment and use of the eCMR system in the Republic of Serbia and the Western Balkans countries. Although the implementation process will require certain organisational changes, training activities, and change management efforts, these challenges are typical of digital transformation projects and do not constitute a significant obstacle to

project realisation. The proposed solution is accordingly assessed as organisationally feasible and ready for phased implementation at the national and regional level¹¹.

8.6. Dynamics of eCMR System Implementation and Adoption

The successful implementation of the eCMR system does not depend exclusively on the technical functionality of the platform, but also on the degree of system adoption by all relevant participants in the transport chain. In addition to carriers, system users include freight forwarders, consignors, consignees, and the competent institutions participating in the processing, exchange, and verification of transport documentation.

The baseline assumption regarding the dynamics of eCMR system adoption is based on the gradual transition from the paper-based to the digital exchange of consignment notes, whereby no new business process is introduced but rather the existing and widely established CMR process is digitalised. For this reason, a faster rate of adoption is expected compared to entirely new digital services that require a change in existing business models.

System implementation is envisaged through a phased approach encompassing the preparation of the normative and institutional framework, the establishment of the technical platform, integration with existing information systems, a pilot project, and the gradual inclusion of users in regular operational use of the system. This approach enables the gradual building of user confidence, the elimination of initial organisational and technical obstacles, and the continuous growth in the volume of system use.

For the purposes of the financial and economic analysis, a conservative assumption of gradual system adoption during the initial years of operation has been applied. The model provides for an initial adoption rate of 25% in the first year of operation, followed by gradual growth to 50%, 75%, 90%, and 95% in subsequent years. This dynamic reflects the expected process of digital solution acceptance in the transport sector, including the user adaptation period, the completion of integrations, the effects of training, and the gradual expansion of the active user base.

The selected adoption dynamic represents a balanced scenario between the conservative and optimistic approaches. On the one hand, the model does not assume full system utilisation from the commencement of operations, whilst on the other hand it takes into account that eCMR is based on an internationally recognised legal and technical framework and represents the digital transformation of an already existing document rather than the introduction of a new business process.

The adopted adoption dynamic constitutes the basis for the projection of financial benefits and cash flows presented in Sections 9.4 and 9.5, as well as the economic effects presented in Chapter 10. This dynamic represents a scenario adopted exclusively for the purposes of financial and economic modelling and does not constitute a forecast of the actual system adoption rate, which will depend on the regulatory framework, institutional support, and market acceptance.

8.7. Concluding Assessment of the Technical and Technological Analysis

The technical and technological analysis conducted has demonstrated that all key preconditions exist for the successful introduction of the electronic consignment note (eCMR) system in the Republic of Serbia and the Western Balkans countries. The analysis encompassed technical and technological feasibility, interoperability and standards, security and data protection, and the organisational capacities necessary for the realisation of the project.

¹¹ UNECE – *Executive Guide on eCMR Implementation*, Transport Community, CEFTA, Common Regional Market

Results of the Technical and Technological Analysis

Within Section 8.1, it was established that adequate telecommunications and information and communication infrastructure exists to enable the application of the eCMR system under real business conditions. The wide availability of internet connections, mobile networks, and digital devices provides the necessary foundation for the electronic exchange of transport documentation.

The analysis of technological feasibility confirmed that the proposed solution is based on mature and widely accepted technologies that have already demonstrated their applicability in the fields of logistics, transport, and digital business. The proposed concept does not require the application of experimental or insufficiently tested technologies, which significantly reduces the technological risk of the project.

In the field of interoperability, it was established that the proposed system is compliant with the relevant international standards and regulatory frameworks, including the eCMR Protocol, the eFTI Regulation, the eIDAS framework, and other standards enabling cross-border data exchange and future integration with the European digital transport ecosystem.

The analysis of security and data protection demonstrated that the application of electronic identification, electronic signatures, access control, Audit Trail mechanisms, and modern cybersecurity measures can ensure a high level of reliability, integrity, and confidentiality of data throughout the entire lifecycle of the eCMR document.

The organisational analysis indicated that institutional and human resource capacities exist for the realisation of the project, as well as a sufficient degree of digital maturity in the business sector to enable the gradual acceptance and application of the new business model.

Risk and Limitation Assessment

Although the project entails certain challenges relating to change management, user training, institutional coordination, and the gradual alignment of business procedures, the identified risks do not constitute a critical obstacle to project realisation. On the contrary, these are typical challenges accompanying digital transformation processes that can be successfully managed through phased implementation, pilot projects, and appropriate user support programmes.

It is particularly important to emphasise that the proposed concept does not require radical changes to the core transport processes, but primarily the digitalisation of existing procedures and the gradual transition from paper-based to electronic documentation. This fact significantly increases the likelihood of successful system implementation and acceptance by users.

Concluding Assessment

On the basis of the results of the analysis conducted, it may be concluded that the proposed project option — the establishment of a national eCMR system based on eFTI-ready architecture, with regional and European interoperability — is technically, technologically, and organisationally justified.

The proposed solution is based on proven technologies, is compliant with the relevant international standards and regulations, ensures a high level of security and data protection, and possesses the necessary preconditions for integration into the future European digital transport space. At the same time, the existing infrastructure, institutional capacities, and the degree of digital maturity of the transport sector enable its realisation without significant technical constraints.

Accordingly, it may be assessed that the introduction of the eCMR system in the Republic of Serbia and the Western Balkans countries is technically justified and constitutes a realistic basis for the realisation of the economic, operational, and social benefits that will be the subject of analysis in the subsequent chapters of the study.

In addition to the direct benefits for the transport sector, the establishment of the eCMR system represents an important step towards the further digitalisation of logistics, the development of the eFTI ecosystem, and the strengthening of the integration of the Republic of Serbia and the Western Balkans countries into the unified European digital transport market.

The technical and technological analysis constitutes the basis for the assessment of capital expenditure (CAPEX), operational expenditure (OPEX), financial effects, and economic benefits analysed in the subsequent chapters of the study, whereby the adopted technical assumptions are directly incorporated into the financial and economic model of the project.

9. FINANCIAL ANALYSIS

9.1. Methodological Approach to the Financial Analysis

The financial analysis of the project for the introduction of the electronic consignment note (eCMR) has been conducted with the aim of assessing the financial justification of the investment, the sustainability of the project, and the expected financial effects over the observed period. The analysis encompasses the assessment of investment and operational costs, the projection of financial benefits, cash flow analysis, and the calculation of financial justification indicators for the project.

The methodological approach is based on the principles of cost-benefit analysis applied to digital transformation projects in the public and transport sectors, whilst taking into account the recommendations of the European Commission set out in the **Guide to Cost-Benefit Analysis of Investment Projects** and the relevant international documents relating to the application of eCMR and the digitalisation of transport documentation.

The baseline assumptions of the analysis have been defined on the basis of the results of the preceding chapters of the study, including the analysis of the existing situation, the market and needs analysis, the options analysis, and the technical and technological analysis. Particular attention has been paid to the assessment of the scope of eCMR application, the dynamics of system adoption, and the financial effects arising from the replacement of paper transport documentation with electronic documents.

The baseline scenario of the analysis relates to the Republic of Serbia and constitutes the basis for the assessment of the financial justification of the project. As a supplementary scenario, the regional potential of the Western Balkans (WB6) has also been considered, with the aim of examining the possible additional effects of future regional interoperability and the broader application of electronic transport documentation.

For the purposes of the analysis, an analytical period of ten years and a discount rate of 5% have been adopted, which is consistent with the methodological recommendations for the evaluation of public investment projects and the assumptions adopted for the purposes of this study.

The financial model is based on the dynamics of eCMR system implementation and adoption presented in Section 8.6, whereby the project benefits have been modelled in accordance with the gradual increase in the volume of system use during the analysis period. The model is based on the scenario and assumptions adopted exclusively for the purposes of this study, whilst the results presented constitute an analytical projection of financial effects and not a forecast of future trends.

The basic parameters used in the financial analysis are presented in Table 9.1-1.

Table 9.1-1: Basic Parameters of the Financial Analysis

Parameter	Adopted Value
Analysis Period	10 years
Discount Rate	5%
Selected Project Option	Option 2 – National eCMR System
Reference Number of Documents (Serbia)	1,500,000 per year
Reference Number of Documents (WB6)	3,250,000 per year
Capital Expenditure (CAPEX)	€3,000,000
Operating Expenditure (OPEX)	€400,000 per year
Cost of a Paper-Based CMR Document	€7.20
Cost of an eCMR Document	€2.00
Net Benefit per Document	€5.20
System Adoption Model	25% → 50% → 75% → 90% → 95%

The parameters presented constitute the basis for the assessment of project costs, benefits, and cash flows, and are used in the subsequent financial analysis for the calculation of financial justification indicators and the sensitivity analysis. All financial calculations within this chapter relate to the scenario of establishing a national eCMR platform in the Republic of Serbia. The regional potential of the Western Balkans is considered exclusively as a possibility for the future expansion of system application and is not included in the baseline financial model.

9.2. Investment Costs of the Project (CAPEX)

9.2.1. Methodology of Assessment

The investment costs of the project (CAPEX) encompass the one-off expenditures necessary for the establishment and initial commissioning of the national electronic consignment note (eCMR) system in the Republic of Serbia. The assessment of investment costs is based on the results of the options analysis, the technical and technological analysis, and the defined TO-BE model of system operation presented in the preceding chapters of the study.

The assessment proceeds from the assumption that the project is realised through the implementation of an existing and proven technological solution, with its adaptation to the national regulatory, institutional, and business environment. In this regard, the investment does not entail the development of an entirely new system from the outset, but rather the localisation, configuration, integration, testing, and preparation of users for operation in the new digital environment.

The assessment of investment costs has been carried out on the basis of the functional scope of the system, the expected number of users, the required level of security and interoperability, and the available information on similar transport documentation digitalisation projects in Europe. The analysis includes all costs necessary for the establishment of an operational and sustainable system that enables

the application of the electronic consignment note in accordance with the relevant international and European framework.

9.2.2. Structure of Investment Costs

The investment costs encompass the activities and resources necessary for the establishment of the system, including technical implementation, organisational preparation, and initial user support. The basic structure of investment costs is presented in Table 9.2-1.

Table 9.2-1: Structure of Investment Costs (CAPEX)

Cost Category	Description
Platform Adaptation	Localisation, Configuration and Adaptation to the National Environment
System Implementation	Installation, Integration and Initial Deployment
Testing and Verification	Functional, Integration and User Acceptance Testing
User Training	Training of Administrators, Carriers and Other Participants
Project Management	Project Coordination and Implementation Support
Initial Infrastructure	Provision of Initial Technical and Cloud Resources
Promotional Activities	User Awareness Activities and Change Management
Contingency Reserve	Risk Management During the Implementation Phase

The structure presented represents the typical categories of investment expenditure arising in projects for the establishment of national digital platforms and provides a comprehensive overview of the scope of the investment considered within this study.

9.2.3. Adopted CAPEX Scenario

On the basis of the results of the options analysis, the defined functional scope of the system, the proposed technical architecture, and the estimated activities necessary for project implementation, a value of investment costs of ****€3,000,000**** has been adopted as the reference scenario for the purposes of the financial analysis.

The adopted value is based on the assessment of the key investment components necessary for the establishment of the national eCMR platform, including platform adaptation, regulatory alignment, the development and configuration of integrations, pilot implementation, user training, change management activities, promotional activities, project management, and the contingency reserve.

The structure of investment costs is presented in Table 9.2-2.

Table 9.2-2: Adopted CAPEX Scenario

Cost Category	Amount (€)
Platform Adaptation	650,000
Regulatory Alignment	150,000
System Integrations	700,000
Pilot Implementation	300,000
Training	250,000
Change Management	200,000
Promotional Activities	150,000
Project Management	350,000
Contingency Reserve	250,000
Total	3,000,000

The adopted CAPEX represents a planned value used for the purposes of the financial and economic analysis and does not constitute an offer from a specific supplier or the final contractual price of the future implementation. The value has been defined as a medium reference scenario that enables a realistic assessment of the costs of establishing a national eCMR system and the conduct of further project justification analyses.

The adopted investment costs constitute the basis for the projection of cash flows, the calculation of financial justification indicators, and the sensitivity analysis presented in the subsequent sections of this chapter.

9.3. Operational Costs of the Project (OPEX)

9.3.1. Methodology of Assessment

The operational costs of the project (OPEX) encompass the costs arising during the regular operation, maintenance, and management of the national electronic consignment note (eCMR) system following its commissioning. Unlike investment costs, which represent one-off expenditures for the establishment of the system, operational costs arise continuously throughout the entire period of operation and are necessary to ensure the reliable, secure, and uninterrupted functioning of the platform.

The assessment of operational costs is based on the defined TO-BE model of the system, the functional scope of the platform, the expected number of users, the volume of transactions, and the required level of technical and user support. The analysis proceeds from the assumption that the system is fully operational and available to all relevant participants in the transport chain, including carriers, consignors, consignees, and the competent institutions.

In the assessment of operational costs, future functional upgrades of significant scope, the development of new modules, or the implementation of additional integrations with other information

systems have not been considered. Such activities would constitute separate investment projects and are not encompassed by the baseline scenario of the analysis.

9.3.2. Structure of Operational Costs

The operational costs encompass all expenditures necessary for the stable and continuous operation of the national eCMR platform during the period of operation. The basic structure of operational costs is presented in Table 9.3-1.

Table 9.3-1: Structure of Operational Costs (OPEX)

Cost Category	Description
Cloud Infrastructure	Hosting, Data Storage, Network Resources and Backup Services
Technical Maintenance	Maintenance of the Platform, Mobile Applications and Databases
System Security	Certificate Management, System Monitoring and Security Controls
User Support	Help Desk, Technical Assistance and User Support
Software Licences and Support Services	Software Licences and Related Support Services
System Administration	System Administration, Monitoring and Operational Management
Continuous Improvement	Minor System Upgrades and Functional Enhancements

The structure presented encompasses the key expenditure categories that are typical of national digital platforms and constitutes the basis for the assessment of annual operational expenditure within the financial analysis.

9.3.3. Adopted OPEX Scenario

On the basis of the functional scope of the system, the estimated number of users, the expected volume of platform use, and the characteristics of the proposed technical architecture, annual operational costs of ****€400,000**** have been adopted as the reference scenario for the purposes of the financial analysis.

The adopted value represents a medium reference scenario and encompasses all regular costs necessary to ensure the stable operation of the platform throughout the entire analysis period. The value has been defined as a planning assumption for the purposes of assessing the financial justification of the project and does not constitute a binding value for future maintenance, hosting, or support contracts.

For the purposes of this study, the assumption has been adopted that the operational costs following the establishment of the national eCMR platform will be financed through the regular financing mechanisms of the future system operator. The final model for financing, management, and the distribution of operational costs will be defined upon the establishment of the platform governance

model, which is discussed in greater detail in Chapter 13 – Implementation Plan. Given that eCMR represents national digital infrastructure of public interest, the baseline scenario does not envisage the mandatory introduction of user charges for access to the core system functionalities. At the same time, future financing models may include additional sources of revenue, such as advanced services, integrations, or specialised services for economic operators; however, such mechanisms are not encompassed by the baseline financial analysis and are not necessary for the sustainability of the reference scenario.

Table 9.3-2: Adopted OPEX Scenario

Indicator	Value
Adopted Annual Operating Expenditure (OPEX)	€400,000

The adopted operational costs are used in the subsequent analysis for the projection of cash flows, the calculation of financial justification indicators, and the sensitivity analysis of the project.

9.4. Financial Benefits

The financial benefits of the project arise from the reduction in the costs of processing transport documentation through the application of the electronic consignment note (eCMR) in place of the traditional paper-based CMR document. The basis of the analysis is a comparison of the average cost of processing a paper document and the average cost of processing an electronic document, whereby the difference between these two amounts represents the net financial benefit per document.

The assessment of benefits is based on the adopted analysis parameters presented in Table 9.1-1 and constitutes the basis for the projection of cash flows and the calculation of financial justification indicators in the subsequent sections of this chapter.

9.4.1. Methodology for the Assessment of Benefits per Document

The assessment of financial benefits from the introduction of the eCMR ¹² system is based on a comparative analysis of the costs of processing a paper CMR document and the costs of processing an electronic CMR document. The starting point is the results of the analysis of the existing state of transport processes presented in Chapter 2, the assessment of the volume of CMR documentation presented in Section 4.3.1, and the assumptions adopted in the financial model developed for the purposes of this Study.

The methodological approach is based on the identification of all relevant administrative activities arising during the lifecycle of the document, including data preparation and entry, printing and reproduction of documentation, exchange of documents between transport chain participants, data verification and correction, and archiving and storage of documentation. Particular attention has been paid to the time spent by staff on these activities, as administrative work constitutes the most significant component of the total cost of the paper-based process.

For the purposes of the financial analysis, an average cost of processing a paper CMR document of ****€7.20 per document**** has been adopted. This value represents a realistic and conservative estimate based on the analysis of the typical administrative activities arising in international road freight transport. The value has been adopted as an input assumption of the financial model on the basis of

¹² The estimated values presented are analytical estimates prepared for the purposes of this Feasibility Study and do not represent binding market prices for individual commercial solutions.

the analysis of administrative activities, available market information, and the professional assessment of the authors, and does not represent a normatively prescribed or uniform market cost.

Table 9.4-1 presents the structure of the estimated costs of the paper CMR document.

Table 9.4-1: Estimated Cost Structure of the Paper CMR Document

Cost Component	Estimated Cost (EUR/Document)
Data Preparation and Entry	2.20
Printing and Reproduction of Documentation	0.30
Document Exchange	1.00
Verification and Corrections	0.80
Document Archiving and Storage	0.60
Administrative Processing and Document Handling	2.30
Total	7.20

Source: Authors' analysis based on the process analysis presented in Chapter 2 and available international experience in the field of transport documentation digitalisation.

The cost of processing an electronic CMR document has been estimated at ****€2.00 per document****. The estimate is based on the analysis of the costs of using the eCMR platform, digital data exchange, electronic archiving, infrastructure support, and operational system maintenance. The adopted value represents a reference scenario that is aligned with available market solutions and the assumptions used in the financial model. The value constitutes a planning estimate of the average cost under the reference scenario and may vary depending on the implementation model, the number of users, and the system financing approach.

Table 9.4-2 presents the structure of the estimated costs of the eCMR document.

Table 9.4-2: Estimated Cost Structure of the eCMR Document

Cost Component	Estimated Cost (EUR/Document)
Platform Usage	0.80
Digital Data Exchange	0.20
Electronic Archiving	0.10
Infrastructure and Hosting	0.50
User Support and Maintenance	0.30
Other Operating Costs	0.10
Total	2.00

Source: Authors' analysis based on available market solutions and the assumptions used in the financial model.

On the basis of the comparative analysis, it has been established that the transition from the paper-based to the electronic consignment note enables an average direct financial saving of ****€5.20 per document****. This value represents the basic unit benefit used in the calculation of project financial benefits, the projection of cash flows, and the calculation of financial justification indicators presented in the subsequent sections of this chapter.

The adopted unit benefit is of a conservative character and does not encompass broader indirect effects such as the acceleration of transport processes, the reduction of delays, the reduction of the risk of document loss, the reduction of the number of disputes, or the positive effects on interoperability and cross-border data exchange. These effects are considered within the economic analysis presented in Chapter 10.

9.4.2. Structure of Benefits per Document

On the basis of the analysis of transport documentation processing costs, the average cost of the paper CMR document and the average cost of the electronic eCMR document have been estimated. The difference between these two amounts represents the net financial benefit realised per each processed document.

Table 9.4-3: Structure of Financial Benefits per Document

Indicator	Value (€)
Cost of a Paper-Based CMR Document	7.20
Cost of an eCMR Document	2.00
Net Financial Benefit per Document	5.20

The amounts presented represent the reference values used in the financial model and relate exclusively to the direct financial effects of transport documentation digitalisation.

9.4.3. Assessment of Benefits for the Republic of Serbia

For the purposes of the financial analysis, a reference scenario has been adopted that provides for approximately 1.5 million transport documents per annum on the territory of the Republic of Serbia. On the basis of the net financial benefit of €5.20 per document, the potential annual effect of the full application of the eCMR system has been estimated.

The calculation of financial benefits is based on the estimated number of CMR documents presented in Section 4.3.1 and the dynamics of eCMR system adoption presented in Section 8.6

Table 9.4-4: Assessment of Financial Benefits for the Republic of Serbia.

Indicator	Value
Annual Number of Documents	1,500,000
Net Financial Benefit per Document	€5.20
Potential Annual Financial Benefit	€7,800,000

The estimated value represents the maximum annual potential of direct financial benefits under conditions of full application of the eCMR system and serves as the basis for the cash flow projection presented in Section 9.5.

9.4.4. Regional WB6 Potential

In addition to the national scenario, the regional potential encompassing the Western Balkans countries (WB6) has also been considered. This scenario does not constitute the basis of the project financial analysis, but serves to examine the potential scope of benefits in the event of broader regional application of electronic transport documentation.

Table 9.4-5: Regional Potential of Financial Benefits (WB6)

Indicator	Value
Annual Number of Documents	3,250,000
Net Financial Benefit per Document	€5.20
Potential Annual Financial Benefit	€16,900,000

The results of the regional scenario indicate a significant potential for the realisation of additional financial effects in the event of broader application of the eCMR solution at the level of the Western Balkans. However, for the purposes of the financial analysis in the subsequent sections of the study, exclusively the Republic of Serbia scenario is used as the baseline scenario.

Sources:

- Analysis of the existing state of the sector (Chapter 3);
- Options analysis (Chapter 7);
- UNECE eCMR Protocol;
- UNECE Executive Guide on eCMR;
- Regulation (EU) 2020/1056 on electronic freight transport information (eFTI);
- Adopted analysis parameters presented in Table 9.1-1.

9.5. Cash Flow Projection

The cash flow projection constitutes the basis for the assessment of the financial justification of the project for the introduction of the electronic consignment note (eCMR). On the basis of the investment costs presented in Section 9.2, the operational costs presented in Section 9.3, and the financial benefits presented in Section 9.4, a cash flow projection for a period of ten years has been prepared.

The calculation is based on the reference scenario for the Republic of Serbia and provides for the gradual adoption of the eCMR system by transport chain participants. In this way, a realistic assessment

of the dynamics of benefit generation during the implementation and full operation period of the system has been enabled.

9.5.1. Adoption Model

On the basis of the experience of transport documentation digitalisation in European countries and the expected dynamics of new system acceptance by users, a gradual growth model for the volume of eCMR use has been adopted. The model provides for a gradual increase in the adoption rate during the initial years of system operation and stabilisation following the attainment of a high level of use.

Table 9.5-1: Adopted eCMR System Adoption Model

Year	Adoption Rate
1	25%
2	50%
3	75%
4	90%
5 onwards	95%

The adoption model presented has been applied in the projection of financial benefits and cash flows in the subsequent analysis. The adopted adoption model is identical to the system implementation and adoption scenario presented in Section 8.6.

9.5.2. Cash Flow Projection

On the basis of the adopted analysis parameters, projected costs, and expected financial benefits, a cash flow projection for the analytical period of ten years has been prepared. The calculation encompasses the initial investment in the year of project realisation, annual operational costs, and the financial benefits generated through the application of the eCMR system.

Table 9.5-2: Project Cash Flow Projection

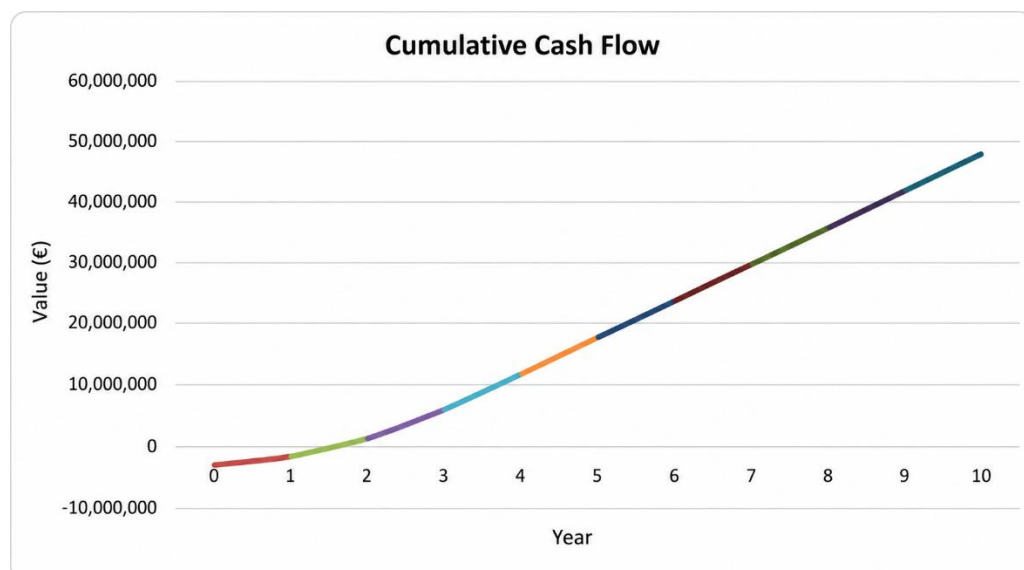
Year	Adoption Rate	Financial Benefits (€)	OPEX (€)	Net Cash Flow (€)
0	0%	0.00	0.00	-3,000,000.00
1	25%	1,950,000.00	400,000.00	1,550,000.00
2	50%	3,900,000.00	400,000.00	3,500,000.00
3	75%	5,850,000.00	400,000.00	5,450,000.00
4	90%	7,020,000.00	400,000.00	6,620,000.00
5	95%	7,410,000.00	400,000.00	7,010,000.00
6	95%	7,410,000.00	400,000.00	7,010,000.00
7	95%	7,410,000.00	400,000.00	7,010,000.00
8	95%	7,410,000.00	400,000.00	7,010,000.00
9	95%	7,410,000.00	400,000.00	7,010,000.00
10	95%	7,410,000.00	400,000.00	7,010,000.00

The projection demonstrates the gradual growth in annual net cash flows as a consequence of the increasing rate of system adoption and the growing volume of electronically processed transport documentation. Following the initial implementation phase, the financial benefits exceed the operational costs, resulting in the continuous growth of net financial effects during the analysis period.

9.5.3. Cumulative Cash Flow

In order to facilitate a clearer understanding of the dynamics of investment recovery, the movement of the cumulative cash flow during the observed period is presented in the chart below.

Figure 9.5-1: Cumulative Cash Flow of the Project



The graphical presentation enables a visual assessment of the relationship between the initial investment costs and the accumulated financial benefits during the period of operation. The growth of the cumulative cash flow indicates the capacity of the project to gradually recover the initial investment through the realised financial effects and to generate positive net benefits.

The cash flow projection constitutes the basis for the calculation of financial justification indicators presented in the subsequent section of this chapter.

Sources:

- Adopted analysis parameters presented in Table 9.1-1;
- Investment costs presented in Section 9.2;
- Operational costs presented in Section 9.3;
- Financial benefits presented in Section 9.4;
- Cash flow projection and calculations conducted during the preparation of the study.

9.6. Financial Justification Indicators

On the basis of the projected cash flows presented in Section 9.5 and the adopted analysis parameters, the basic financial justification indicators of the project have been calculated.

Table 9.6-1: Financial Justification Indicators of the Project

Indicator	Value
Financial Net Present Value (FNPV)	€41,077,248
Financial Internal Rate of Return (FIRR)	104.22%
Return on Investment (ROI)	802.57%
Payback Period	Approximately 1.5 years

The results obtained indicate that the project achieves a positive financial net present value, an internal rate of return significantly higher than the adopted discount rate, and a short investment payback period, which points to the financial justification of the proposed solution. The indicators presented constitute the basis for the sensitivity analysis presented in the subsequent section of this chapter.

The relatively high FIRR results primarily from the combination of a moderate initial investment (€3 million), comparatively low annual operating costs, and the rapid accumulation of direct financial benefits resulting from the large annual volume of transport documents processed. The indicator should therefore be interpreted in the context of the adopted analytical assumptions rather than as a general benchmark for comparable public investment projects.

Source: Adopted baseline analysis assumptions and the cash flow projection presented in Section 9.5.

9.7. Sensitivity Analysis

The sensitivity analysis has been conducted with the aim of assessing the impact of changes in key parameters on the financial justification of the project for the introduction of the national eCMR platform. The analysis enables an assessment of the resilience of the model to possible deviations from the baseline assumptions used in the financial analysis.

In accordance with the recommendations of the European Commission for conducting cost-benefit analysis, a single-factor approach has been applied, whereby only one parameter is varied in each scenario whilst all other assumptions are maintained at the level of the baseline scenario. In this way, an assessment of the relative impact of individual factors on the results of the analysis has been enabled.

9.7.1. Tested Scenarios

Table 9.7-1: Tested Sensitivity Analysis Scenarios

Scenario	Parameter Change
Base Scenario	Reference Case
CAPEX +20%	Increase in Capital Expenditure from €3,000,000 to €3,600,000
OPEX +20%	Increase in Annual Operating Expenditure from €400,000 to €480,000
Benefits -20%	20% Reduction in Estimated Financial Benefits
Slower Adoption	System Adoption Trajectory Lower than the Reference Scenario Presented in Section 8.6

The tested scenarios encompass the factors most commonly arising as sources of uncertainty in digital transformation projects: increased implementation costs, increased operational expenditure, reduced expected benefits, and slower system acceptance by users.

9.7.2. Results of the Sensitivity Analysis

The results of the sensitivity analysis are presented in Table 9.7-2.

Table 9.7-2: Results of the Sensitivity Analysis

Scenario	Expected Impact on Financial Viability	Risk Level
CAPEX +20%	Reduction in Financial Performance Indicators During the Initial Project Implementation Period	Low
OPEX +20%	Reduction in Net Cash Flows Throughout the Operational Period	Low
Benefits -20%	More Significant Reduction in the Overall Financial Benefits of the Project	Medium
Slower Adoption	Delayed Realisation of Benefits and Slower Investment Payback	Medium

The results demonstrate that the financial justification of the project is most sensitive to changes affecting the volume of realised benefits and the dynamics of system adoption by users. In contrast, a moderate increase in investment and operational costs has a more limited impact on the overall justification of the project.

These results are to be expected given that the largest part of the projected benefits is realised through the gradual increase in the number of users and the volume of electronically processed transport documentation. For this reason, the training, change management, user communication, and pilot

implementation activities described in Sections 8.6 and 13 represent important preconditions for the successful realisation of the planned financial effects.

9.7.3. Assessment of Model Robustness

On the basis of the analysis conducted, it may be concluded that the model demonstrates a satisfactory degree of resilience to moderate changes in key input parameters. Although increased costs or slower adoption dynamics may affect the financial indicators of the project, none of the analysed scenarios calls into question the fundamental logic of the project and the identified potential for the digitalisation of transport documentation.

The results of the sensitivity analysis confirm that the key success factors of the project are the degree of user acceptance of the eCMR system and the realisation of the planned benefits from the digitalisation of transport processes. For this reason, the activities of phased implementation, user support, and change management provided for in the Implementation Plan are of particular significance.

On the basis of the analysis conducted, it may be concluded that the adopted financial model demonstrates a satisfactory degree of robustness and that the results of the financial analysis are not based exclusively on a single optimistic assumption, but remain stable even under the tested deviations of key parameters.

9.8. Conclusion of the Financial Analysis

The financial analysis conducted demonstrates that the project for the introduction of the electronic consignment note (eCMR) in the Republic of Serbia achieves positive financial effects throughout the entire observed analysis period. The projected cash flows demonstrate that the benefits realised through the digitalisation of transport documentation exceed the investment and operational expenditures during the analysed period.

The results of the analysis indicate a positive Financial Net Present Value (FNPV) of ****€41,077,248****, which demonstrates that the project generates net financial benefits during the analysed period. At the same time, the achieved Financial Internal Rate of Return (FIRR) of ****104.22%**** is significantly higher than the adopted discount rate of 5%, which confirms the financial justification of the proposed solution. Additionally, the project demonstrates a high level of return on investment and a relatively short investment payback period of approximately ****1.5 years****.

The results of the sensitivity analysis indicate that the project is most sensitive to changes affecting the volume of realised benefits and the dynamics of system adoption by users. Nevertheless, the results of the sensitivity analysis indicate that the identified risks are manageable within the adopted analysis assumptions. The analysis conducted confirms a satisfactory degree of stability and resilience of the model to reasonable deviations of key parameters.

On the basis of the analyses conducted, it may be concluded that the proposed project possesses adequate financial preconditions for realisation and represents an economically rational approach to the digitalisation of transport documentation. The results of the financial analysis constitute the basis for the conduct of the economic analysis presented in the subsequent chapter, within which, in addition to the direct financial effects, the broader economic and social effects of the application of the eCMR system in the Republic of Serbia and the Western Balkans are also examined.

Source: Adopted baseline analysis assumptions, the cash flow projection presented in Section 9.5, and the calculations conducted during the preparation of the study.

10. ECONOMIC ANALYSIS

10.1. Introduction to the Economic Analysis

The economic analysis aims to assess the overall effects of the introduction of the electronic consignment note (eCMR) from the perspective of society and the economy as a whole. Unlike the financial analysis presented in Chapter 9, which focuses on cash flows, investment costs, and the direct financial benefits of the project, the economic analysis also encompasses the broader effects of transport documentation digitalisation realised at the level of the transport sector, the economy, and public administration.

The starting point of the economic analysis is constituted by the results of the previously conducted financial analysis, as well as the adopted baseline assumptions regarding the volume of transport flows, the number of CMR documents, the dynamics of eCMR system adoption presented in Section 8.6, and the estimated benefits from the digitalisation of transport processes. The economic indicators presented in this chapter have been calculated on the basis of the projected application of the eCMR system in the Republic of Serbia. The potential effects of broader regional application across the Western Balkans are not included in the baseline calculation scenario and are considered as an additional development potential of the project.

Within the economic analysis, effects are examined that go beyond the direct financial savings of system users, including time savings, the reduction of administrative burden, the reduction of errors and disputes in transport processes, the increase in business efficiency, and the positive effects on the competitiveness of the economy. On the basis of the identified benefits and costs, a cost-benefit analysis has been conducted and the key economic justification indicators of the project have been calculated.

The economic analysis is based on the adopted economic model developed during the preparation of the study, whereby the economic net present value (ENPV), the economic rate of return (ERR), and the benefit-cost ratio (B/C) have been used as the primary criteria for the assessment of justification. These indicators constitute the basis for the assessment of the economic justification of the proposed project and its contribution to the modernisation of the transport sector and the digital transformation of business processes.

The economic flows and benefits of the project are based on the dynamics of eCMR system adoption presented in Section 8.6, whereby the economic effects have been modelled in accordance with the gradual increase in the volume of system use during the analysis period. The baseline financial benefits per document have been taken from the financial analysis presented in Section 9.4, whilst the broader economic effects are analysed in the subsequent sections of this chapter.

10.2. Social Costs and Benefits

The economic analysis of the project is based on a comparison of the social costs and benefits arising from the introduction of the electronic consignment note (eCMR) in the transport sector of the Republic of Serbia. Unlike the financial analysis, which examines the direct monetary effects of the project, the economic analysis also encompasses the broader benefits realised by economic operators, carriers, public authorities, and other participants in the transport chain.

The starting point of the economic analysis is constituted by the investment and operational costs necessary for the establishment and operation of the eCMR system, as well as the direct and indirect benefits arising from the digitalisation of transport documentation. In this regard, the effects contributing to increased business efficiency, reduced administrative burden, accelerated transport

processes, and increased economic productivity have been identified as the relevant economic benefits.

Table 10.2-1 presents the basic categories of social costs and benefits encompassed by the economic analysis.

Table 10.2-1: Basic Categories of Social Costs and Benefits

Category	Description
Capital Expenditure	Investment in the Establishment and Implementation of the eCMR System
Operating Expenditure	Costs of System Operation, Maintenance and User Support
Time Savings	Reduction in the Time Required for Document Processing and Transport Procedures
Reduction in Administrative Costs	Reduced Need for Manual Processing and Archiving of Documentation
Reduction in Errors and Disputes	Reduction in the Costs of Corrections, Claims and Disputed Cases
Improved Operational Efficiency	Faster Data Exchange and Improved Business Processes
Wider Economic Benefits	Enhanced Productivity and Competitiveness of the Transport Sector

The adopted economic model proceeds from the assumption that the most significant economic effects are realised through the reduction of administrative activities, the increase in process efficiency, and the faster flow of information between transport chain participants. On the basis of the identified costs and benefits, economic cash flows have been formed which constitute the basis for the cost-benefit analysis and the calculation of the economic justification indicators of the project presented in the subsequent sections of this chapter.

10.2.1. Methodology for the Assessment of Broader Economic Benefits

In addition to the direct financial benefits arising from the reduction in transport documentation processing costs, the application of the electronic consignment note (eCMR) also generates broader economic benefits that are reflected in business efficiency, the productivity of transport chain participants, and the quality of transport process management. For the purposes of the economic analysis, these benefits have been considered separately from the direct financial effects in order to encompass the positive effects that are not fully visible through the project's cash flows.

The methodology for the assessment of broader economic benefits is based on the results of the analysis of the existing situation (Chapter 4), the identified problems in transport documentation management (Chapter 3), the technical and technological analysis of the proposed solution (Chapter 8), as well as the estimates of benefits arising from the reduction of administrative burden, faster data exchange, the reduction of errors, and the increase in operational efficiency. A conservative approach has been applied in the assessment in order to avoid overstating the economic effects of the project.

For the purposes of the economic model, an average broader economic benefit of **€6.00 per processed eCMR document** has been adopted, representing the sum of the estimated effects presented in Table 10.2-2.

Table 10.2-2: Structure of Estimated Broader Economic Benefits per eCMR Document

Economic Benefit Category	Estimated Economic Benefit per Document
Time Savings and Faster Document Processing	€2.00
Reduction in Administrative Burden	€1.50
Reduction in Errors, Corrections and Disputes	€1.00
Improved Productivity and Operational Efficiency	€1.50
Total	€6.00

The values presented do not represent directly measured costs or charges, but rather an analytical estimate of the economic effects realised as a result of the digitalisation of transport documentation. The adopted values have been used exclusively for the purposes of the economic analysis and represent analytical parameters of the economic model used exclusively for the calculation of the economic justification indicators of the project (ENPV, ERR, and B/C).

The individual categories of benefits are analysed in greater detail in the subsequent sections of this chapter, through the effects of time savings, the reduction of administrative burden, the reduction of errors and disputes, and the broader effects on the efficiency of the transport and logistics sector. The volume of realised economic benefits has been projected by applying the adopted dynamics of eCMR system implementation and adoption presented in Section 8.6, whereby the economic effects increase gradually in proportion to the degree of system application during the observed analysis period.

10.3. Time Savings

Time savings represent one of the most significant economic benefits of the introduction of the electronic consignment note (eCMR). The replacement of paper documentation with a digital document enables faster exchange of information between carriers, consignors, consignees, and the competent institutions, thereby reducing the time required for the preparation, processing, verification, and archiving of transport documentation.

In the traditional system based on the paper CMR document, a significant portion of time is spent on the manual completion of forms, the exchange of documentation between transport chain participants, data corrections, and subsequent administrative processing. The introduction of the eCMR system largely automates these activities, enabling faster information flow and the reduction of administrative delays.

Table 10.3-1: Overview of Time Savings

Indicator	Paper-Based CMR	eCMR
Average Processing Time	23 min	9 min
Time Savings	14 min	≈60%

In addition to the direct time savings in the documentation processing procedure, the application of eCMR also contributes to the acceleration of business processes through better data availability, simpler information exchange, and more efficient management of transport operations. Of particular significance is the possibility of immediate access to documentation and faster data verification by all authorised participants.

Table 10.3-2: Key Effects of Time Savings through eCMR Application

Area of Application	Effect
Document Preparation	Reduced Time Required for the Preparation and Exchange of Documents
Transport Order Processing	Faster Processing and Verification of Data
Administrative Procedures	Reduced Time Required for Manual Document Processing
Access to Information	Immediate Availability of Relevant Information
Stakeholder Coordination	Faster Communication and Information Exchange
Control Procedures	Simplified Verification and Monitoring of Document Status

The effects of time savings have been included in the economic model as one of the components of the broader economic benefits of the project. Their significance is reflected not only in the direct reduction of the time required for administrative activities, but also in the increase in the overall efficiency of the transport system and the productivity of logistics chain participants.

10.4. Reduction of Administrative Costs

One of the most significant economic benefits of the application of the electronic consignment note (eCMR) relates to the reduction of administrative costs associated with the preparation, processing, exchange, and archiving of transport documentation. In the traditional system based on paper documents, a significant portion of resources is engaged in the manual entry of data, document control, physical exchange of documents, and archiving.

Through the application of the eCMR system, these activities are largely digitalised and automated, thereby reducing the need for manual administrative procedures and enabling more efficient use of available human and organisational resources. At the same time, the costs of printing, physical distribution, and storage of documentation are reduced. The starting point for the assessment of these effects is the benefits per document presented in Section 9.4.1 and the methodology for the assessment of broader economic benefits presented in Section 10.2.1.

Table 10.4-1 presents the key effects of eCMR application on administrative processes.

On the basis of the assumption that the average administrative processing time for a single paper CMR document amounts to approximately 23 minutes, whilst the application of eCMR reduces this to approximately 9 minutes, the estimated saving amounts to approximately 14 minutes per document. At the estimated volume of approximately 1.5 million CMR documents per annum in the Republic of Serbia, this represents approximately 21 million minutes, or approximately 350,000 working hours of administrative work per annum. In the regional Western Balkans scenario (WB6), the estimated saving amounts to approximately 758,000 working hours per annum. These calculations constitute one of the

analytical bases for the assessment of the broader economic benefits of transport documentation digitalisation and are not used as a standalone basis for their monetary valuation.

Table 10.4-1: Key Effects of the Reduction of Administrative Costs

Area	Impact of eCMR Implementation
Data Entry	Reduced Manual Data Entry and Elimination of Duplicate Processing
Document Processing	Faster Processing and Verification of Data
Archiving	Reduced Need for Physical Archives
Document Exchange	Electronic Exchange Replacing Paper-Based Documentation
Document Control	Simplified Monitoring of Document Status and Availability
Administrative Resources	More Efficient Utilisation of Human Resources

The reduction of administrative burden contributes to greater productivity of transport and logistics chain participants and represents one of the key components of the broader economic benefits encompassed by the economic model of the analysis.

10.5. Reduction of Errors and Disputes

In addition to the reduction of administrative costs, the application of the electronic consignment note (eCMR) contributes to the increase in the accuracy, reliability, and consistency of data throughout the entire lifecycle of transport documentation. In the traditional system, errors most commonly arise during manual data entry, the transcription of information, the exchange of documentation between multiple participants, and subsequent administrative corrections.

Through the introduction of the eCMR system, data is created, exchanged, and stored in digital form, which reduces the risk of administrative errors, loss of documentation, and data inconsistencies between different participants in the transport process. The increased availability and traceability of information contributes to the faster resolution of complaints and the simpler establishment of facts in the event of disputed situations.

Table 10.5-1 presents the key effects of eCMR application in the area of reducing errors and disputes.

Table 10.5-1: Key Effects of the Reduction of Errors and Disputes

Area	Impact of eCMR Implementation
Data Entry	Reduction in Errors Resulting from Manual Data Entry
Document Exchange	Reduced Risk of Data Loss and Data Inconsistencies
Verification of Document Accuracy	Simplified Verification and Validation of Information
Claims Management	Reduced Number of Corrections and Subsequent Claims
Dispute Resolution	Faster Establishment of the Factual Situation Based on Available Data
Process Transparency	Improved Traceability and Availability of Relevant Information

The reduction of errors and disputes represents one of the components of the broader economic benefits encompassed by the economic model of the analysis. The positive effects are reflected in the increased reliability of transport processes, more efficient cooperation between supply chain participants, and more rational use of organisational resources.

10.6. Effects on the Economy

The introduction of the electronic consignment note (eCMR) has positive effects that go beyond the immediate benefits for individual system users and contribute to the improvement of the efficiency of the economy as a whole. The digitalisation of transport documentation enables faster information flow, more efficient organisation of transport processes, and better connectivity of supply chain participants.

The reduction in the time required for documentation processing, reduced administrative burden, and a lower number of errors and disputes have a positive impact on the productivity of economic operators. In this way, enterprises can make more rational use of available resources, accelerate business processes, and direct capacities towards activities that create greater added value.

The particular significance of the eCMR system is reflected in the increase in the transparency and reliability of transport flows. Faster data availability and the possibility of tracking the status of documentation in real time contribute to more efficient management of logistics processes and the reduction of operational risks. At the same time, the preconditions are created for better interoperability of information systems and easier integration with other digital platforms used in the field of transport and logistics.

The application of eCMR is aligned with the broader processes of economic digital transformation and modernisation of the transport sector. The improvement of transport operational efficiency may have a positive impact on the competitiveness of domestic economic operators, the reduction of administrative barriers, and the strengthening of the attractiveness of the business environment for new investment and the development of logistics services.

Table 10.6-1: Key Economic Effects of eCMR Application

Area	Expected Impact
Transport Sector	Improved Operational Efficiency and Process Reliability
Logistics Chains	Faster Data Exchange and Enhanced Stakeholder Coordination
Business Entities	More Efficient Resource Utilisation and Increased Productivity
Business Digitalisation	Promotion of Digital Solutions and System Integration
Competitiveness	Improved Business Environment and Market Development
Regional Cooperation	Strengthened Preconditions for Interoperability and Cross-Border Data Exchange

Although the economic analysis has been conducted for the Republic of Serbia as the reference area of analysis, the realised effects indicate that the broader application of the eCMR concept could contribute to additional improvements in the efficiency of transport and logistics flows across the Western Balkans, particularly in the area of cross-border transport and the exchange of electronic documentation.

An indicative analysis based on the estimated volume of CMR documentation in the Western Balkans countries indicates that the potential total economic benefit of the broader application of the eCMR concept could reach approximately €36.4 million per annum.

10.7. Cost-Benefit Analysis

The cost-benefit analysis represents the central part of the economic analysis of the project and serves to establish the relationship between the total economic benefits and the costs arising during the analysis period. The analysis has been conducted for the Republic of Serbia as the reference area, on the basis of the adopted baseline assumptions, the projected volume of eCMR system application, and the economic effects identified in the preceding sections of this chapter.

In accordance with the adopted economic model, the investment and operational costs of the project have been included in the analysis, as well as the direct and broader economic benefits arising from the digitalisation of transport documentation. The economic benefits encompass effects associated with time savings, the reduction of administrative burden, the reduction of errors and disputes, increased productivity, and the improvement of transport process efficiency.

The broader economic benefit per document represents the estimated aggregate of economic effects not directly encompassed by the financial flows of the project, including time savings, the reduction of administrative burden, the reduction of errors and disputes, and the increase in business process efficiency.

Table 10.7-1: Basic Parameters of the Cost-Benefit Analysis

Indicator	Value
Analysis Period	10 years
Discount Rate	5%
Capital Expenditure (CAPEX)	€3,000,000
Annual Operating Expenditure (OPEX)	€400,000
Annual Number of CMR Documents	1,500,000
Direct Financial Benefit per Document	€5.20
Wider Economic Benefit per Document	€6.00
Total Economic Benefit per Document	€11.20
Total Annual Economic Benefit	€16,800,000

On the basis of the parameters set out above, economic cash flows have been formed and the benefits and costs discounted throughout the entire analysis period. The adopted model enables an assessment of the economic effects throughout the entire project lifecycle and constitutes the basis for the calculation of the key economic justification indicators.

In addition to the analysis conducted for the Republic of Serbia, an indicative regional potential for the application of the eCMR system across the Western Balkans has also been considered during the preparation of the study. This analysis does not have the character of a separate regional economic analysis, but serves to examine the possible scope of benefits that could be realised in the event of broader regional application of the electronic consignment note concept.

Table 10.7-2: Indicative Regional Potential of eCMR Application

Indicator	Republic of Serbia	Western Balkans (WB6)
Estimated Annual Number of CMR Documents	1,500,000	3,250,000
Cost of a Paper-Based CMR Document	€7.20	€7.20
Cost of an eCMR Document	€2.00	€2.00
Net Direct Financial Benefit per Document	€5.20	€5.20
Potential Annual Direct Financial Benefit	€7,800,000	€16,900,000
Potential Total Annual Economic Benefit	€16,800,000	€36,400,000

The data presented indicate that the benefits of transport documentation digitalisation are not limited to the national level alone. The estimated volume of transport flows across the Western Balkans indicates a significant potential for the realisation of additional economic effects through regional

interoperability, the improvement of cross-border transport, and the broader application of digital transport documents.

The results of the cost-benefit analysis demonstrate that the economic benefits significantly exceed the total economic costs of the project, which constitutes the basis for the calculation of the key economic justification indicators presented in the subsequent section of this chapter.

10.8. Economic Indicators (ENPV, ERR, and B/C)

On the basis of the conducted cost-benefit analysis and the projected economic cash flows, the key economic justification indicators of the project have been calculated. These indicators enable the assessment of the economic viability of the investment from the perspective of society as a whole and represent the primary criterion for the evaluation of transport sector digitalisation projects.

Table 10.8-1: Key Economic Indicators of the Project

Indicator	Value
Economic Net Present Value (ENPV)	€95,499,488
Economic Rate of Return (ERR)	194.12%
Benefit–Cost Ratio (B/C)	16.68

The ENPV, ERR, and B/C values have been calculated on the basis of the economic cash flows presented in Section 10.7 and relate exclusively to the Republic of Serbia as the reference area of analysis.

The indicators presented have been calculated on the basis of the economic cash flows formed from the adopted CAPEX and OPEX parameters, the estimated economic benefits, and the system adoption dynamics presented in Section 8.6.

The positive Economic Net Present Value (ENPV) demonstrates that the discounted economic benefits significantly exceed the total economic costs of the project during the observed analysis period. At the same time, the Economic Rate of Return (ERR) is several times greater than the adopted discount rate, which indicates a high level of economic justification for the proposed solution.

The Benefit–Cost Ratio (B/C) is significantly greater than one, which confirms that the project generates economic benefits that substantially exceed the required investment. The results obtained indicate that the introduction of the eCMR system represents an economically justified investment that contributes to the increase in the efficiency of transport and logistics processes, the reduction of administrative burden, and the improvement of economic competitiveness.

The indicators presented relate to the Republic of Serbia as the reference area of analysis. At the same time, the indicative indicators presented in the preceding section suggest that the broader application of the eCMR concept across the Western Balkans could generate significant additional economic effects, given the greater volume of transport flows and the estimated number of approximately 3.25 million CMR documents per annum at the regional level. This confirms that the significance of the project extends beyond the national framework and constitutes the basis for future regional interoperability and digital integration of the transport sector.

Source: Calculations conducted during the preparation of the study on the basis of the adopted baseline assumptions, analysed data, and the economic analysis of the project.

10.9. Conclusion of the Economic Analysis

The economic analysis conducted demonstrates that the introduction of the electronic consignment note (eCMR) represents an economically justified investment with significant positive effects for the transport sector, the economy, and public administration. The analysis has demonstrated that the economic benefits arising from the digitalisation of transport documentation significantly exceed the costs of establishing and operating the system during the observed period.

The positive effects of the project are reflected in time savings, the reduction of administrative burden, the reduction of errors and disputes, increased productivity, and more efficient management of transport processes. The results obtained confirm that the application of the eCMR system contributes to the modernisation of the transport sector and the advancement of the digital transformation of business processes.

Table 10.9-1: Key Results of the Economic Analysis and Regional Potential

Indicator	Republic of Serbia	Western Balkans (WB6)
Annual Number of CMR Documents	1,500,000	3,250,000
Potential Annual Direct Financial Benefit	€7,800,000	€16,900,000
Potential Total Annual Economic Benefit	€16,800,000	€36,400,000
Economic Net Present Value (ENPV)	€95,499,488	—
Economic Rate of Return (ERR)	194.12%	—
Benefit–Cost Ratio (B/C)	16.68	—

The key economic indicators confirm the high degree of economic justification of the project. The positive Economic Net Present Value (ENPV), the Economic Rate of Return (ERR) that significantly exceeds the adopted discount rate, and the markedly favourable Benefit–Cost Ratio (B/C) indicate that the project generates a significant net benefit for society as a whole.

Although the economic analysis has been conducted for the Republic of Serbia as the reference area, the indicative indicators presented suggest that the broader application of the eCMR concept across the Western Balkans could realise significant additional benefits as a result of the greater volume of transport flows, the development of regional interoperability, and the improvement of cross-border electronic documentation exchange.

On the basis of the results of the analysis conducted, it may be concluded that the project for the introduction of the eCMR system represents an economically justified solution that contributes to the increase in the efficiency of the transport sector, the strengthening of economic competitiveness, and the creation of preconditions for further digital integration of transport processes in the Republic of Serbia and the Western Balkans region. The results of the economic analysis provide additional confirmation of the justification for the implementation of the eCMR system and constitute the basis for the formulation of the recommendations and implementation models presented in the subsequent chapters of the study.

11. RISK ANALYSIS

11.1. Methodological Approach to Risk Analysis

The risk analysis constitutes an integral part of the Feasibility Study for the Introduction of the Electronic Consignment Note (eCMR) System in the Republic of Serbia and the Western Balkans Countries. Its objective is to identify potential events and circumstances that may affect the successful realisation of the project, the dynamics of implementation, the achievement of planned benefits, and the long-term sustainability of the system.

The methodological approach is based on the principles of risk management applied in analyses of investment and digitalisation projects, as well as on the recommendations of the European Commission for the preparation of investment projects and the conduct of cost-benefit analyses. The analysis has been adapted to the specific characteristics of the eCMR introduction project, which encompasses the legal, institutional, organisational, technical and technological, and cross-border aspects of the digitalisation of transport documentation.

The starting point for the risk analysis is constituted by the results of the analyses previously conducted within this study, in particular the analysis of the existing situation, the market and needs analysis, the options analysis, the technical and technological analysis, the financial analysis, and the economic analysis. Particular account has been taken of the adopted parameters of the national scenario for the Republic of Serbia, which entail approximately 6,500 active carriers, approximately 24,000 freight vehicles, and approximately 1.5 million CMR documents per annum, as well as the regional scenario encompassing the Western Balkans countries and approximately 3.25 million CMR documents per annum.

In addition to the aforementioned analyses, the results of a survey conducted among representatives of transport, freight forwarding, and logistics companies were also used in the identification and assessment of risks. The survey enabled certain risks to be quantified on the basis of the views and experiences of potential eCMR system users, thereby grounding the risk analysis in empirical evidence rather than exclusively in expert assessments.

The risk analysis was conducted through the following steps:

- identification of risks that may affect the implementation and use of the eCMR system;
- classification of risks according to their nature and source;
- assessment of the probability of risk occurrence and possible consequences;
- prioritisation of risks on the basis of their significance;
- definition of measures for the prevention, mitigation, or elimination of negative effects;
- sensitivity analysis of the key project parameters;
- consideration of different development and system implementation scenarios.

The identified risks have been grouped into several categories according to their nature and source, as presented in the subsequent section.

Particular attention has been devoted to risks arising from the process of digital transformation of the transport sector, regional interoperability, and the gradual alignment with the European framework for electronic freight transport information (eFTI). Risks associated with system acceptance by economic operators, the level of digital maturity of users, data protection, and future integrations with other information systems have also been analysed.

A qualitative approach has been applied in the risk assessment, based on the assessment of the probability of occurrence and the magnitude of potential consequences. On the basis of the combination of these two parameters, risks have been classified as low, medium, or high, enabling their ranking and the establishment of management priorities during project implementation.

In addition to the analysis of individual risks, a sensitivity analysis of the key parameters of the financial and economic model has also been conducted. Scenarios have been analysed encompassing the reduction of expected benefits, the increase in investment and operational costs, the slower adoption of the system by users, as well as the scenario of broader regional interoperability within the Western Balkans. This has enabled an assessment of the project's resilience to changes in key assumptions and the identification of the factors that most significantly affect its success.

The results of the risk analysis constitute the basis for the definition of risk mitigation measures, the planning of activities during implementation, and the establishment of monitoring mechanisms that will contribute to the successful realisation of the project and the achievement of the expected financial, economic, and social benefits.

11.2. Risk Identification

The successful implementation of the electronic consignment note (eCMR) system depends on a range of regulatory, institutional, technical and technological, organisational, and market factors. Given that the project encompasses the digitalisation of transport documentation, the introduction of new business processes, and the gradual establishment of interoperability with the European and regional digital transport environment, it is necessary to identify in a timely manner the risks that may affect the realisation of the project and the achievement of the planned benefits.

For the purposes of this study, the identified risks have been grouped into seven basic categories encompassing the key success factors of the project. The identified risks encompass both the risks of implementing the eCMR introduction project and the risks relating to the long-term operation of the eCMR system and its future interoperability with the eFTI environment.

Table 11.2-1 presents the identified risk categories and their potential impact on the project.

Table 11.2-1: Overview of Risk Categories and Their Potential Impact on the eCMR System

Risk Category	Risk Description
Regulatory Risks	Delays in the Alignment of National Legislation, Incomplete Regulatory Support for Electronic Documents, and Divergent Interpretations of the Legal Framework.
Institutional Risks	Insufficient Coordination Among Competent Authorities, Limited Administrative Capacity, and Slow Decision-Making Processes.
Technical Risks	Platform Performance Issues, Limited System Scalability, Technical Failures, and Challenges Related to Future Interoperability.
Information Security Risks	Unauthorised Access to Data, Cyberattacks, Data Loss, and Compromise of the Integrity of Electronic Documents.
Organisational Risks	Insufficient User Preparedness, Resistance to Change, Inadequate Training, and Misalignment of Business Processes.
Financial Risks	Increases in Capital and Operating Expenditure, Implementation Delays, and Slower Realisation of Expected Benefits.
Regional and Cross-Border Risks	Uneven Adoption of eCMR Across the Region, Limited Interoperability, and Varying Levels of Digital Maturity Among the Western Balkan Countries.

Table 11.2-2: Risks Confirmed by the Survey

Risk	Survey Findings
Low Level of eCMR Awareness	Only 16.7% of respondents have a good understanding of eCMR.
Low Level of eFTI Awareness	None of the respondents are well acquainted with eFTI.
Insufficient Digital Maturity	58.3% of respondents do not use digital systems.
Limited Partner Participation	58.3% of respondents indicated that their business partners do not use eCMR.
Legal Uncertainty	Identified as a risk by 41.7% of respondents.
Lack of Knowledge and Information	Identified by 41.7% of respondents.
Resistance to Organisational Change	Identified by 25.0% of respondents.
Slower System Adoption	33.3% of respondents are not prepared to transition within the next 12 months.

Source: Survey conducted for the purposes of the Feasibility Study for the Introduction of eCMR in the Republic of Serbia and the Western Balkans Countries, N=12.

The identified risks are directly linked to the findings of the SWOT analysis presented in Section 5.7, in particular in the part relating to the weaknesses and threats concerning the limited digital maturity of the sector, insufficient awareness of the eCMR and eFTI concepts, and the need for additional regulatory and institutional activities. In addition to the SWOT analysis, the risk identification is also based on the results of the survey presented in Annex B and the synthetic survey summary, which enabled the empirical verification of the key organisational, regulatory, and market risks.

From the classification presented, it may be observed that risks are present throughout the entire project lifecycle — from regulatory preparation and eCMR system development, through the implementation phase, to full operational application and regional data exchange. Of particular significance are the risks that may affect the degree of system acceptance by carriers, logistics companies, and other transport chain participants, given that the financial and economic benefits of the project are directly linked to the volume of eCMR use.

Furthermore, it should be emphasised that future integrations with ERP, TMS, WMS, customs, and other information systems are, at this stage, considered as a development possibility rather than a realised functionality. For this reason, the risks of interoperability and integration have been identified as particularly significant in the medium- and long-term development period of the system.

The identified risks constitute the basis for the further analysis of their probability of occurrence and potential consequences, which is presented in the subsequent section of the study.

11.3. Assessment of Probability and Consequences

Following the identification of risks, an assessment of their probability of occurrence and possible consequences for the eCMR introduction project was conducted. The objective of this analysis is to determine the risks that may have the greatest impact on the success of implementation, the dynamics of system adoption, the achievement of planned benefits, and the long-term sustainability of the solution.

The assessment was carried out using a qualitative approach frequently employed in feasibility studies and analyses of investment projects. For each identified risk, the following were assessed:

- the probability of risk occurrence;
- the magnitude of consequences in the event of its occurrence.

The probability has been classified as low, medium, or high, whilst the consequences have been assessed according to their potential impact on regulatory compliance, the operation of the eCMR system, the realisation of the eCMR introduction project, the achievement of financial and economic benefits, and the establishment of regional interoperability.

The results of the assessment are presented in Table 11.3-1.

Table 11.3-1: Assessment of the Probability and Consequences of Identified Risks

Risk	Likelihood	Impact	Risk Level
Regulatory Uncertainty and Delays in Legislative Alignment	Medium	High	High
Insufficient Institutional Coordination	Medium	High	High
Low eCMR Adoption Rate Among Users	High	High	High
Non-Alignment with the Future eFTI Environment	Low	High	Medium
Limited Interoperability with Other Systems	Medium	Medium	Medium
Cyberattacks and Information Security Incidents	Medium	High	High
Data Loss or Corruption	Low	High	Medium
Technical Issues Affecting the eCMR System	Medium	Medium	Medium
Increase in Capital Expenditure (CAPEX)	Medium	Medium	Medium
Increase in Operating Expenditure (OPEX)	Medium	Medium	Medium
Implementation Delays	Medium	Medium	Medium
Uneven eCMR Adoption Across the WB6 Region	Medium	Medium	Medium
Insufficient User Knowledge	High	High	High
Legal Uncertainty	High	Medium	High

Within the regulatory risks, particular consideration was also given to the status of the international legal framework for the application of the electronic consignment note. At the time of preparation of this study, it has not been established that the procedure for the accession of the Republic of Serbia to the Additional Protocol to the CMR Convention on the Electronic Consignment Note (eCMR Protocol) has been concluded. For this reason, this circumstance has been considered within the risk analysis as a potential regulatory factor that may affect the dynamics of the full application of the eCMR system in international road transport.

The results presented demonstrate that the greatest significance attaches to risks that may affect the degree of eCMR acceptance, institutional support, regulatory compliance, and system security. These risks directly affect the realisation of the benefits identified in the financial and economic analysis, including time savings in documentation processing, the reduction of administrative costs, and the increase in the efficiency of transport processes.

Of particular significance is the fact that the risks of a low system adoption rate and a reduction in expected benefits have also been identified as key parameters of the sensitivity analysis conducted within the financial analysis of the project.

Table 11.3-2: Risk Matrix

Impact / Likelihood	Low	Medium	High
High	Non-Alignment with the Future eFTI Environment	Regulatory Risks; Insufficient Institutional Coordination	Low eCMR Adoption Rate; Insufficient User Knowledge; Cyberattacks and Information Security Incidents
Medium	Data Loss or Corruption	Limited Interoperability; CAPEX; OPEX; Implementation Delays	Legal Uncertainty
Low	—	—	—

On the basis of the assessment results, risks have been assigned to three priority groups.

High Priority

This category encompasses risks that may significantly jeopardise the success of the eCMR introduction project or lead to a substantial reduction in expected benefits. These are primarily regulatory risks, institutional risks, risks associated with system acceptance by users, and information security risks.

Medium Priority

This group comprises risks that may affect the dynamics of implementation, the level of operational efficiency, or the costs of system operation, but whose effects can be relatively successfully controlled through appropriate management measures.

Low Priority

Within the conducted analysis, a significant number of risks with simultaneously low probability and limited consequences has not been identified. The reason for this is that the majority of risks relate to key elements of the digital transformation of the transport sector and cross-border data exchange. For this reason, low-priority risks have not been separately analysed, but are encompassed within the framework of regular operational project monitoring.

The assessment results confirm that the eCMR introduction project does not carry risks that could call into question its overall justification, but indicate the need for systematic management of critical risks throughout all phases of implementation. For this reason, the subsequent section defines the mitigation measures and risk monitoring mechanisms that are to ensure the stable and sustainable application of the eCMR system.

11.4. Mitigation Measures

The identified risks and the results of their assessment indicate that the success of the eCMR introduction project depends on the timely planning and implementation of measures that will reduce the probability of risk events occurring or mitigate their potential consequences.

The mitigation measures have been defined in accordance with the results of the preceding analyses, the characteristics of the adopted solution, the expected implementation model, and the identified

risks that may affect regulatory compliance, the operation of the eCMR system, the achievement of financial and economic benefits, and the establishment of regional interoperability.

Table 11.4-1: Mitigation Measures for Identified Risks

Risk Category	Key Risk	Proposed Mitigation Measures	Responsible Entity	Implementation Phase
Regulatory	Delays in Legislative Alignment	Timely monitoring of developments in the national and international regulatory framework, preparation of the necessary primary and secondary legislation, and coordination with the competent authorities.	Ministry of Construction, Transport and Infrastructure (MCTI), Ministry of Justice, Government of the Republic of Serbia	Preparation and Implementation
Institutional	Insufficient Institutional Coordination	Establishment of an inter-institutional working group; regular coordination meetings; and clear allocation of responsibilities.	MCTI, Customs Administration, Serbian Chamber of Commerce	Preparation and Implementation
Organisational	Low eCMR Adoption Rate	Pilot projects; phased system deployment; and direct support to users.	MCTI, Serbian Chamber of Commerce, Professional Associations	Implementation
Organisational	Insufficient User Knowledge and Awareness	Training programmes, webinars, user guides, awareness campaigns, and demonstration projects.	MCTI, Serbian Chamber of Commerce, Business Associations	Preparation and Implementation
Change Management	Resistance to Organisational Change	Implementation of change management programmes; user involvement during the pilot phase; and promotion of good practices.	MCTI, Business Associations, Transport Operators	Implementation
Technical	Technical Issues and Limited Interoperability	Phased implementation; system testing; application of open standards; and development of future integration through APIs.	Platform Operator, IT Service Providers	Implementation and Operation
Technical	Non-Alignment with the eFTI Environment	Continuous monitoring of the evolution of European standards and planning of future integrations.	MCTI, Platform Operator	Implementation and Development
Information Security	Cyberattacks and Compromise of Data Integrity	Access controls; electronic signatures; backup procedures; security audits; and Security Operations Centre (SOC) monitoring.	Platform Operator	Implementation and Operation
Information Security	Data Loss or Corruption	Disaster Recovery Plan (DRP); backup data centres; and regular data integrity verification.	Platform Operator	Operation
Financial	Increase in CAPEX	Phased investment; project scope control; and independent cost review.	MCTI, Project Team	Preparation and Implementation
Financial	Increase in OPEX	Continuous monitoring of operating expenditure and optimisation of licences and infrastructure.	Platform Operator	Operation
Market	Insufficient Participation of Supply Chain Partners	Involvement of freight forwarders, transport operators and consignors during the pilot phase, together with measures to encourage early adoption.	MCTI, Serbian Chamber of Commerce, Associations	Preparation and Implementation
Regional	Uneven eCMR Adoption Across the WB6 Region	Cooperation through CEFTA, the Transport Community and regional initiatives, combined with the gradual development of cross-border interoperability.	MCTI, Regional Institutions	Implementation and Development

The analysis demonstrates that the most significant risks do not relate to the technical feasibility of the solution, but primarily to regulatory preparation, institutional coordination, the level of user

awareness, and the dynamics of system acceptance by transport chain participants. For this reason, particular significance attaches to measures relating to communication, user training, pilot implementation, and change management. At the same time, technical and security risks can be successfully controlled through the application of standard information system management mechanisms and a phased approach to implementation. The set of measures thus defined constitutes the basis for risk management throughout all phases of project realisation and is directly linked to the institutional responsibilities and the Change Management Plan presented in Chapter 13.

The measures presented are preventive in character and are directed towards reducing the probability of risk occurrence, as well as towards limiting their consequences in the event that a risk event does occur. Of particular significance are the activities relating to institutional coordination, user information, and training, given that the preceding analyses have demonstrated that the degree of eCMR acceptance represents one of the most important factors for the success of the project.

In addition to the measures set out above, the establishment of a continuous risk monitoring process throughout all phases of the eCMR introduction project is recommended. Such an approach enables the timely identification of new risks, the updating of assessments, and the adaptation of management measures in accordance with the development of the regulatory, technological, and business environment.

The risk register should be updated periodically throughout all phases of project realisation, in accordance with regulatory, technological, and organisational changes.

With the application of the proposed measures, a significant reduction in exposure to critical risks and an increase in the probability of successful eCMR system implementation may be expected, as well as the achievement of the planned financial, economic, and operational benefits identified in the preceding chapters of the study.

Table 11.4-2: Risk Monitoring Indicators

Risk	Indicator
Low eCMR Adoption Rate	Percentage of Users Using eCMR
Insufficient User Knowledge	Number of Trained Users
Legal Uncertainty	Number of Adopted Regulations
Insufficient Institutional Coordination	Number of Coordination Meetings
Limited Interoperability	Number of Successfully Integrated Systems
Cyberattacks and Information Security Incidents	Number of Information Security Incidents

The proposed mitigation measures constitute the basis for the definition of institutional responsibilities, change management activities, and monitoring mechanisms that are elaborated in greater detail in Chapter 13 – Implementation Plan.

11.5. Sensitivity Analysis

In addition to the identification and assessment of individual risks, a sensitivity analysis has also been conducted for the purposes of this study in order to assess the impact of changes in key parameters on

the results of the eCMR introduction project. The sensitivity analysis complements the financial and economic analysis and enables an assessment of the project's resilience to unfavourable changes in baseline assumptions.

The parameters of the sensitivity analysis are aligned with the assumptions used in the cost-benefit analysis (Chapter 10 – Economic Analysis), in order to assess the impact of risks on the economic indicators ENPV, ERR, and the B/C ratio.

The starting point of the analysis is constituted by the adopted financial model, the eCMR adoption scenario, the estimates of investment and operational costs, and the projected financial and economic benefits presented in the preceding chapters. Particular attention has been devoted to the parameters directly linked to the risks identified in Sections 11.2 and 11.3.

For the purposes of the analysis, scenarios have been considered encompassing the reduction of benefits, the increase in costs, the slower adoption of the system, and limited regional interoperability.

Table 11.5-1: Sensitivity Analysis Scenarios

Scenario	Parameter Change	Potential Impact
S1	20% Reduction in Expected Benefits	Reduced Financial and Economic Benefits and an Extended Payback Period.
S2	20% Increase in Capital Expenditure (CAPEX)	Higher Initial Investment Requirements and Reduced Financial Viability.
S3	20% Increase in Operating Expenditure (OPEX)	Reduced Net Benefits During the Operational Period.
S4	Slower eCMR Adoption by Users	Delayed Realisation of Benefits and Slower Achievement of the Projected Level of System Adoption.
S5	Limited Regional Interoperability	Reduced Cross-Border Benefits and Slower Integration with the Wider eFTI Environment.

The results of the analysis demonstrate that the eCMR introduction project is most sensitive to the dynamics of system adoption by users and to the level of realised benefits. The reason for this lies in the fact that the expected financial and economic benefits are directly linked to the number of processed eCMR documents and the degree of digitalisation of transport processes.

On the other hand, a moderate increase in investment and operational costs has a more limited impact on the overall justification of the project, given that the preceding analyses have identified significant direct and indirect benefits arising from the reduction of administrative costs, time savings, and the increase in the efficiency of business processes.

The regional interoperability scenario is of particular significance, as the full effects of transport documentation digitalisation are most pronounced in conditions of cross-border data exchange and the gradual integration with the broader eFTI environment. Although the project remains justified in the national scenario as well, a greater degree of regional connectivity contributes to additional increases in benefits and a faster realisation of positive effects.

On the basis of the analysis conducted, it may be concluded that the eCMR introduction project demonstrates a satisfactory level of resilience to moderate changes in key parameters. Although certain risks may affect the dynamics of realisation and the scope of achieved benefits, the results of the analysis indicate that none of the scenarios considered calls into question the fundamental justification for the introduction of the eCMR system, provided that the risk mitigation measures defined in the preceding section are implemented.

The results of the sensitivity analysis confirm the findings of the financial and economic analysis that the project retains positive effects even under moderately unfavourable scenarios.

The results of the survey confirmed that the system adoption rate is one of the most sensitive project parameters, which further confirms the justification for including the scenario of slower eCMR adoption in the sensitivity analysis. This finding corroborates the survey result according to which 58.3% of respondents do not use digital systems for transport documentation management, indicating that the dynamics of digital transformation represent one of the key success factors of the project.

11.6. Development Scenarios

The development scenarios represent a synthesis of the results of the previously conducted risk analysis and sensitivity analysis. Their objective is to present the possible outcomes of the realisation of the eCMR introduction project depending on the degree of implementation success, system acceptance by users, institutional support, and the level of regional interoperability.

The scenarios have been defined on the basis of the adopted analysis parameters, the results of the financial and economic analysis, and the risks identified in the preceding sections of this chapter. Particular account has been taken of the factors that may affect the dynamics of eCMR adoption, the achievement of planned benefits, and the integration with the broader eFTI environment¹³.

Three reference development scenarios have been considered for the purposes of the study.

Table 11.6-1: Development Scenarios for the eCMR Introduction Project

Scenario	Key Characteristics	Expected Outcomes
Pessimistic	Slower Regulatory Preparation, Limited Institutional Coordination, Lower eCMR Adoption Rate, and Limited Regional Cooperation.	Slower Realisation of Benefits, Extended Payback Period, and Limited Cross-Border Benefits.
Reference (Base Case)	Implementation in Accordance with the Adopted Implementation Plan, Gradual Increase in the Number of Users, and Steady Development of Interoperability.	Achievement of the Majority of the Planned Financial, Economic and Operational Benefits.
Optimistic	Strong Institutional Support, High eCMR Adoption Rate, and Accelerated Integration with the Regional and European Digital Environment.	Maximisation of Benefits, Faster Digitalisation of Transport Processes, and Greater Regional Benefits.

¹³ Regulation (EU) 2020/1056 on electronic freight transport information (eFTI); Additional Protocol to the Convention on the Contract for the International Carriage of Goods by Road concerning the Electronic Consignment Note (eCMR Protocol).

The pessimistic scenario assumes that certain identified risks are partially materialised, primarily in the area of regulatory preparation, system acceptance by users, and regional cooperation. In such circumstances, the realisation of the eCMR introduction project would be slowed, and the expected benefits would be achieved gradually over a longer period of time. This scenario corresponds to the finding that 33.3% of respondents are currently not ready to transition to eCMR within the next 12 months.

The reference scenario represents the baseline scenario on which the financial and economic analysis is based. It assumes a gradual increase in the eCMR adoption rate, stable development of the eCMR system, and the achievement of the majority of benefits identified in the preceding chapters. The reference scenario is considered the most probable outcome of project realisation and is further supported by the results of the survey and the stakeholder analysis. This scenario is aligned with the results of the stakeholder analysis, which demonstrated that the key actors — the MCTI, the Customs Administration, carriers, and freight forwarders — have a high level of interest and a significant influence on the success of implementation.

The optimistic scenario assumes faster system adoption by carriers, freight forwarders, and other transport chain participants, as well as more successful integration with regional initiatives and the future eFTI environment. In that case, a faster reduction in administrative costs, a greater volume of electronic data exchange, and additional increases in economic benefits are expected.

The results of the analysis demonstrate that the reference scenario is the most probable, whilst the optimistic scenario represents the potential for additional increases in benefits through accelerated digitalisation and regional interoperability. At the same time, even under the conditions of the pessimistic scenario, no undermining of the fundamental justification of the eCMR introduction project is expected, but rather primarily a slowing of the implementation dynamics and a delay in certain benefits.

Considering all the analysed scenarios, it may be concluded that the eCMR introduction project possesses a satisfactory degree of resilience to the identified risks and that there is a realistic basis for the successful implementation of transport documentation digitalisation in the Republic of Serbia, with the potential for additional strengthening of benefits through the gradual inclusion of the Western Balkans countries and integration with the European digital transport environment.

11.7. Conclusion of the Risk Analysis

The risk analysis conducted demonstrates that the project for the introduction of eCMR in the Republic of Serbia and the Western Balkans countries entails certain regulatory, institutional, technical and technological, organisational, financial, and cross-border risks, which are characteristic of projects involving the digital transformation and modernisation of the transport sector. At the same time, the analysis has confirmed that none of the identified risks constitutes an obstacle that could call into question the fundamental justification for the realisation of the project.

The most significant risks relate to the dynamics of eCMR adoption by economic operators, regulatory and institutional coordination, as well as ensuring an appropriate level of information security and future interoperability with the broader eFTI environment. However, the results of the analysis demonstrate that these risks can be successfully managed through the application of appropriate management measures, the timely preparation of the regulatory framework, continuous user support, and a phased approach to implementation.

The sensitivity analysis confirmed that the eCMR introduction project is most sensitive to the system adoption rate and the level of realised benefits, whilst moderate deviations in investment and operational costs do not have a decisive impact on its overall justification. At the same time, the development scenarios demonstrate that even under less favourable conditions, the achievement of a significant portion of the planned benefits is expected, whilst a greater degree of regional cooperation and interoperability further increases the effects of transport documentation digitalisation.

The results of the survey demonstrated that the greatest risks are not of a technological nature, but rather relate to the level of user awareness, legal certainty, the degree of involvement of transport chain partners, and the dynamics of system adoption. At the same time, the high level of interest in pilot implementation indicates that these risks can be successfully mitigated through phased implementation, training programmes, and change management activities.

On the basis of the analyses conducted, it may be concluded that the eCMR introduction project possesses a satisfactory level of resilience to the identified risks and that the real preconditions exist for its successful realisation. With the application of the proposed risk mitigation measures, continuous monitoring of key parameters, and gradual integration with the regional and European digital transport environment, the successful achievement of the planned financial, economic, and social benefits is expected, which further confirms the justification for the introduction of eCMR as a strategic instrument for the digitalisation of the transport and logistics sector in the Republic of Serbia and the Western Balkans countries.

Considered from the perspective of risk management, the greatest challenges of the project are not of a technical nature, but rather relate to change management, the building of user confidence, regulatory certainty, and inter-institutional coordination. For this reason, the activities of user information, training, pilot implementation, and phased system introduction are considered the key prerequisites for the successful implementation of the project.

12. ENVIRONMENTAL AND SOCIAL IMPACT

The impacts of the eCMR introduction project on the environment and society have been analysed through four interrelated dimensions: environmental effects, social effects, effects on the economy, and effects on public administration. Given that this is a digital transformation project, the dominant impacts relate to more efficient use of resources, the improvement of business processes, and the strengthening of institutional capacities.

12.1. Environmental Effects

The eCMR introduction project has a predominantly positive impact on the environment, primarily through the digitalisation of transport documentation, the reduction of paper use, and the improvement of the efficiency of transport processes. Unlike infrastructure projects, which may have direct impacts on land, water resources, biodiversity, or air quality, the eCMR introduction project is a digital transformation project whose environmental effects are largely indirect and derive from the optimisation of administrative and logistical processes.

Although the project does not entail significant direct environmental interventions, its effects are consistent with the principles of the digital and green transition promoted through the policies of the European Union, including more efficient use of resources and the reduction of administrative material consumption.

According to the adopted analysis parameters, approximately 1.5 million CMR documents are processed annually in the Republic of Serbia, whilst the regional scenario for the Western Balkans countries (WB6) encompasses approximately 3.25 million documents per annum. The replacement of paper consignment notes with electronic documents enables a significant reduction in the use of paper, printing materials, and physical document archiving.

For the purposes of the environmental impact analysis, the assumption has been adopted that one paper CMR consignment note encompasses on average four sheets, corresponding to the most commonly used IRU form in international road transport. Based on the estimated volume of approximately 1.5 million CMR documents per annum in the Republic of Serbia, the paper-based system entails the use of approximately 6 million sheets of paper per year. In the Western Balkans regional scenario (WB6), with approximately 3.25 million documents per annum, the estimated consumption amounts to approximately 13 million sheets of paper per year. The transition to eCMR enables the gradual elimination of the majority of this consumption, with additional benefits arising from the reduced need for printing, physical distribution, and document archiving.

A dedicated life cycle assessment (LCA) has not been conducted within this study, and it was therefore not possible to precisely quantify savings in natural resources. It is expected that the gradual replacement of approximately 1.5 million paper CMR documents per annum in the Republic of Serbia will have a measurable positive effect on the reduction of paper consumption and associated administrative resources.

In addition to the direct reduction in resource consumption, the eCMR introduction project contributes to the rationalisation of transport processes. The faster exchange of data between carriers, consignors, consignees, and the competent institutions reduces administrative delays, accelerates the processing of consignments, and enables more efficient management of transport flows. Although the primary objective of the project is not the reduction of greenhouse gas emissions, it is expected that the shortening of documentation processing times and improved data availability will indirectly contribute to the reduction of unnecessary delays and inefficiencies in the transport chain.

The particular significance of the project lies in the fact that eCMR represents one of the prerequisites for the further digitalisation of the transport sector and the gradual alignment with the European concept of electronic freight transport information (eFTI). In this way, the conditions are created for future integrations and the application of advanced solutions that may further contribute to the optimisation of transport flows, more efficient use of vehicle fleets, and the reduction of the negative environmental impacts of transport.

An overview of the key environmental effects of the eCMR introduction project is presented in Table 12.1-1.

Table 12.1-1: Overview of Environmental Effects of the eCMR Introduction Project

Impact Area	Expected Impact	Impact Assessment
Paper Consumption	Reduction in the Use of Paper Documentation	Positive
Toner and Printing Material Consumption	Reduced Need for Printing and Copying Documents	Positive
Document Archiving	Reduced Need for Physical Archive Space	Positive
Administrative Logistics	Reduction in the Physical Exchange of Documents	Positive
Efficiency of Transport Processes	Faster Processing and Availability of Data	Positive
CO ₂ Emissions from Administrative Activities	Indirect Reduction as a Result of Process Digitalisation	Moderately Positive
ICT Infrastructure Energy Consumption	Increased Use of Digital Infrastructure Resources	Neutral to Moderately Negative
Biodiversity, Land and Water Resources	No Significant Direct Impacts	Neutral

The data presented in the table indicate that the dominant environmental effects of the project are of a positive character and relate primarily to more rational use of resources and the digitalisation of business processes. The potential negative impacts are limited to the increased use of ICT infrastructure and the electricity consumption required for the operation of the eCMR system, but these are considered negligible in comparison with the benefits arising from the elimination of paper documentation and the improvement of the efficiency of transport processes.

On the basis of the analysis conducted, it may be concluded that the eCMR introduction project has no significant negative environmental impacts, whilst simultaneously contributing to the achievement of the objectives of the digital and green transition of the transport sector. The overall environmental effects of the project are assessed as positive, both at the national level in the Republic of Serbia and in the broader regional context of the Western Balkans countries. The project is aligned with the "digital

by default" principle and indirectly contributes to the objectives of the green and digital transition of the transport sector.

12.2. Social Effects

The eCMR introduction project has significant positive social effects, manifested primarily in the improvement of the operational efficiency of transport chain participants, the increase in the transparency of business processes, and the promotion of the digital transformation of the transport sector. Unlike infrastructure projects, which may have direct social consequences for local communities, employment, or land use, the eCMR introduction project operates primarily through the modernisation of administrative and business procedures.

In the preceding chapters of the study, the challenges associated with the use of paper transport documentation have been identified, including manual data entry, limited information availability, the possibility of errors, and increased administrative burdens on transport process participants. The realisation of the eCMR introduction project creates the conditions for simpler information exchange, faster data access, and greater reliability of transport documentation.

The results of the survey conducted for the purposes of this study further confirm the existence of these challenges. 58.3% of respondents indicated that they do not use digital systems for transport documentation management, whilst a significant number of respondents identified the lack of knowledge and information as one of the key barriers to digitalisation. At the same time, the majority of respondents expressed interest in additional information and potential participation in pilot projects, indicating the existence of a favourable basis for the further digital transformation of the sector.

One of the most significant social effects relates to the reduction of the administrative burden on employees in transport and logistics companies. According to the adopted analysis parameters, the time required to process one paper CMR document amounts to approximately 20–23 minutes, whilst the use of eCMR reduces this to 5–9 minutes, representing an average time saving of approximately 60%. This saving enables employees to devote more time to higher value-added activities, whilst simultaneously reducing the need for repetitive administrative tasks.

A positive effect is also expected in terms of transparency and legal certainty. Electronic documentation enables easier tracking of consignment status, data availability to authorised participants, and simpler verification of document authenticity. Functionalities such as electronic signing, audit trail recording, and QR verification further contribute to data reliability and reduce the risk of errors, document loss, or misuse.

The eCMR introduction project also plays an important role in the development of digital competencies in the transport and logistics sector. The application of electronic documentation encourages the use of modern digital tools and the gradual transformation of business processes, which is consistent with the broader objectives of the digitalisation of the economy and public administration. Although the implementation of the system requires certain user training and adaptation activities, the long-term effects are expected to be positive and to contribute to an increase in the digital maturity of the sector. This effect is of particular significance in view of the findings of the SWOT analysis and the Risk Analysis, in which limited digital maturity and insufficient user awareness were identified as among the most significant challenges for the successful implementation of eCMR.

The particular significance of the project lies in the strengthening of trust between transport chain participants. Greater information availability, standardised processes, and the possibility of faster data verification contribute to the improvement of cooperation between carriers, consignors, consignees,

and the competent institutions. At the same time, the project represents an important step towards establishing the conditions for future cross-border exchange of transport information in accordance with the eFTI framework and regional initiatives for the facilitation of trade and transport.

On the basis of the preceding analyses, including the results of the survey, the SWOT analysis, the stakeholder analysis, and the risk analysis, the key social effects expected during the implementation and operation of the eCMR system have been identified. An overview of the effects is presented in Table 12.2-1.

Table 12.2-1: Overview of Social Effects of the eCMR Introduction Project

Impact Area	Expected Impact	Impact Assessment
Administrative Burden on Users	Reduced Processing Time and Manual Workload	Positive
Employee Efficiency	Increased Productivity and Improved Work Organisation	Positive
Process Transparency	Greater Data Availability and Traceability	Positive
Legal Certainty	More Reliable and Easily Verifiable Documentation	Positive
Risk of Errors and Document Loss	Reduction in the Number of Administrative Errors	Positive
Digital Competencies	Development of Knowledge and Skills for the Use of Digital Tools	Positive
Trust Among Stakeholders	Improved Cooperation and Information Exchange	Positive
Need for User Training	Initial Adaptation and Training Costs	Moderately Negative
Employment	No Significant Direct Impact on Overall Employment	Neutral
Digital Transformation of the Sector	Increased Digital Maturity and Readiness for the eFTI Environment	Positive

Source: Authors' analysis based on the results of the survey, SWOT analysis, stakeholder analysis, risk analysis, and economic analysis conducted for the purposes of the Feasibility Study for the Introduction of eCMR.

The data presented in the table demonstrate that the social effects of the eCMR introduction project are predominantly positive and that the greatest benefits are expected in the area of increased work efficiency, transparency, and legal certainty. Particular note is made of the effects relating to the increase in users' digital competencies, the strengthening of trust between transport chain participants, and the creation of prerequisites for the broader application of electronic data exchange in accordance with the European eFTI framework. The potential challenges are largely limited to the

initial implementation period, during which it will be necessary to carry out user training and support activities to ensure the successful adoption of new business procedures.

On the basis of the analysis conducted, it may be concluded that the eCMR introduction project has a positive social impact both on transport sector participants and on the broader process of digital transformation of the economy and public administration. The improvement in efficiency, transparency, and information availability is expected to contribute to the creation of a more modern, reliable, and competitive transport environment in the Republic of Serbia and the Western Balkans countries. These effects simultaneously constitute an important prerequisite for the successful integration of the Republic of Serbia and the Western Balkans countries into the future European environment for electronic transport data exchange based on eCMR and eFTI standards. At the same time, the results of the stakeholder analysis and the survey indicate that the full social effects will be achieved only if implementation is accompanied by a systematic programme of user training, communication, and change management, as provided for in Chapter 14. Similar positive effects are expected at the level of the Western Balkans region as well, particularly in the area of cross-border exchange of transport information and the improvement of cooperation between transport chain participants.

12.3. Effects on the Economy

The eCMR introduction project has a significant positive impact on the economy of the Republic of Serbia and the Western Balkans countries, primarily through the increase in the efficiency of transport and logistics processes, the reduction of administrative costs, and the improvement of conditions for the development of cross-border trade. As presented in the preceding chapters of the study, transport and logistics represent an important segment of economic activity and one of the key prerequisites for the functioning of supply chains, both at the national and regional levels.

In the existing system based on paper documentation, a significant portion of the resources of carriers, freight forwarders, and other economic operators is engaged in the preparation, processing, exchange, and archiving of transport documents. The introduction of eCMR leads to the simplification of these procedures, the reduction of manual work, and the faster availability of data to all authorised participants in the transport process. The results of the survey conducted for the purposes of this study confirm the existence of significant potential for the improvement of business processes. The survey demonstrated that 58.3% of respondents do not use digital systems for transport documentation management, whilst a significant portion of administrative activities continues to rely on paper documentation and manual data processing. These findings indicate that the scope for increasing efficiency and productivity in the transport and logistics sector remains substantial.

According to the adopted analysis parameters, the average cost of processing one paper CMR document amounts to approximately €7.20, whilst the application of eCMR reduces this to approximately €2.00. In this way, a direct saving of approximately €5.20 per document is achieved. On the assumption that approximately 1.5 million CMR documents are processed annually at the national level, the estimated direct annual benefit amounts to approximately €7.8 million. According to the adopted economic model, the total annual economic benefits of the national scenario are estimated at approximately €16.8 million. The aforementioned benefits constitute the basis of the national scenario cost-benefit analysis presented in Chapter 10 – Economic Analysis. At the same time, the results of the stakeholder analysis and the survey indicate that the dynamics of realising these benefits will depend on the speed of system adoption by economic operators and the success of change management activities. This conclusion is further confirmed by the risk analysis, in which the system

adoption rate was identified as one of the key factors affecting the realisation of the projected economic benefits.

In addition to the direct financial effects, the eCMR introduction project has a positive impact on the productivity of the transport sector. According to the adopted analysis parameters, the average time required to process one document is reduced from 20–23 minutes to 5–9 minutes, representing a saving of approximately 60%. This enables more rational use of human resources, faster execution of transport operations, and more efficient management of business processes. Additional positive effects are expected through the reduction of administrative errors, faster availability of transport documentation, and the acceleration of invoicing and service payment collection processes, which was also identified as one of the significant expected benefits in the survey.

Significant effects are also expected in the area of international trade. The electronic exchange of transport data enables faster document preparation, simpler information exchange between transport chain participants, and a better basis for future interoperability in accordance with the eFTI framework. Although the project does not entail direct integration with other national and international systems in the initial implementation phase, the technical and organisational basis is established for future connectivity with the broader digital transport environment. This aspect is of particular significance in the context of the gradual application of the eFTI regulatory framework of the European Union and the process of digitalisation of transport corridors in the Western Balkans region.

The particular significance of the project is reflected in the regional context. According to the adopted WB6 scenario, approximately 3.25 million CMR documents are processed annually across the Western Balkans. In the event of the gradual application of eCMR at the regional level, additional benefits are expected through the increase in the efficiency of cross-border transport, the reduction of administrative barriers, and the improvement of the economic connectivity of the region. The results of the survey further confirm the existence of a favourable basis for the realisation of these effects, given that 83.3% of respondents expressed interest in additional information or potential participation in eCMR implementation pilot projects. Based on the adopted analysis parameters, the potential direct benefit at the Western Balkans level is estimated at approximately €16.9 million per annum, whilst the potential total economic benefit may reach approximately €36.4 million per annum.

The volume of documents encompassed by the analysis further confirms the significance of the project, given that the digitalisation potential encompasses approximately 1.5 million documents per annum in the Republic of Serbia and approximately 3.25 million documents at the level of the Western Balkans region.

At the same time, the SWOT analysis and the risk analysis demonstrated that the full economic effects of the project depend on several prerequisites, including the degree of system acceptance by economic operators, the level of digital maturity of users, the establishment of an appropriate regulatory framework, and the development of interoperability with other digital platforms. For this reason, the economic benefits of the project should be viewed as the result of gradual implementation and the gradual attainment of full system functionality.

On the basis of the results of the economic analysis, the cost-benefit analysis, the survey, and the accompanying analyses conducted within the study, the key economic effects of the eCMR introduction project have been identified.

Table 12.3-1: Overview of Key Economic Effects of the eCMR Introduction Project

Impact Area	Expected Impact	Indicative Indicator
Document Processing Costs	Reduction in Administrative Costs	€7.20 → €2.00 per document
Direct Savings	Direct Financial Benefit per Document	≈ €5.20
Labour Productivity	Reduction in Document Processing Time	≈ 60%
National Economic Impact	Annual Direct Financial Benefits	≈ €7.8 million
National Economic Impact	Total Annual Economic Benefits	Up to ≈ €16.8 million
Digitalisation Potential in Serbia	Scope of eCMR Adoption	≈ 1.5 million documents annually
Sector Competitiveness	Faster and More Efficient Transport Processes	Positive Impact
Cross-Border Trade	Simplified Exchange of Transport Data	Positive Impact
Digital Maturity of the Sector	Greater Readiness for the eFTI Environment and Future Interoperability	Positive Impact
Illustrative Digitalisation Potential in the WB6	Scope of eCMR Adoption at the Regional Level	≈ 3.25 million documents annually
Illustrative Regional Potential (WB6)	Annual Direct Financial Benefits	≈ €16.9 million
Illustrative Regional Potential (WB6)	Total Annual Economic Benefits	≈ €36.4 million
Regional Cooperation and Interoperability	Improved Connectivity and Data Exchange	Positive Impact

Source: Authors' analysis based on the economic analysis, cost-benefit analysis, survey results, SWOT analysis, and risk analysis conducted for the purposes of the Feasibility Study for the Introduction of eCMR.

The data presented in the table confirm that the most significant project benefits arise from cost reduction and productivity increases, whilst additional positive effects are expected through the improvement of the competitiveness of the transport sector and the gradual strengthening of regional economic integration. Particular note is made of the benefits arising from the reduction of administrative costs, increased productivity, and the acceleration of the digital transformation of the transport and logistics sector. Viewed as a whole, the eCMR introduction project contributes to the creation of a more favourable business environment and more efficient functioning of supply chains.

On the basis of the analysis conducted, it may be concluded that the effects on the economy are markedly positive. The digitalisation of transport documentation is expected to contribute to the reduction of business costs, the increase in the productivity and competitiveness of economic operators, as well as the strengthening of regional connectivity and alignment with contemporary European trends in the digitalisation of transport and logistics. At the same time, the full realisation of these benefits is contingent upon the successful implementation of change management activities, user training, and the gradual increase in the eCMR adoption rate, as presented in the stakeholder analysis, the risk analysis, and the Change Management Plan.

12.4. Effects on Public Administration

The eCMR introduction project has significant positive effects on the work of public administration, primarily through the improvement of the efficiency of administrative procedures, the increase in data availability and quality, and the creation of prerequisites for the further digitalisation of the transport sector. As presented in the preceding chapters of the study, the existing system based on paper documentation entails a significant volume of manual data processing and a limited capacity for their timely exchange between different institutions and transport process participants.

The results of the survey conducted for the purposes of this study demonstrated that 58.3% of respondents do not use digital systems for transport documentation management, whilst the majority of participants continue to use paper-based procedures as the primary model for transport data exchange. These findings indicate that there is significant scope for increasing the efficiency of communication between the business sector and the competent institutions through the application of electronic documentation.

The realisation of the eCMR introduction project enables faster access to relevant information on consignments, carriers, and transport operations, contributing to increased operational efficiency of the competent authorities. Electronic documentation enables simpler searching, verification, and archiving of data, whilst simultaneously reducing the administrative burden associated with the handling of paper documents.

The particular significance of the project lies in the possibility of improving control and supervisory activities. Electronically available data enable faster document verification and easier monitoring of the status of transport operations. Functionalities such as electronic signing, audit trail recording, and QR verification increase the reliability and traceability of data, contributing to greater process transparency and more efficient conduct of supervisory activities.

These functionalities enable faster detection of irregularities, simpler monitoring of documentation status, and a reduction in the administrative time required for the control of transport operations.

Positive effects are also expected in the work of customs authorities. Although the project does not entail direct integration with customs information systems in the initial phase, the establishment of electronic transport documentation constitutes an important prerequisite for the future development of interoperable solutions and more efficient data exchange in accordance with the European eFTI framework. In this way, the conditions are created for the gradual improvement of cross-border procedures and the strengthening of regional cooperation in the area of transport and trade.

This aspect is of particular significance given that customs procedures and document verification were identified in the survey as among the most frequent causes of delays at border crossings. This finding further confirms the economic justification for the development of electronic transport data exchange and its potential contribution to more efficient cross-border transport operations.

An additional benefit of the project lies in the improvement of the statistical and analytical capacities of public administration. The establishment of a structured set of electronic data and a single source of reliable information on transport flows enables simpler data collection, searching, and analysis, which may contribute to higher-quality public policy planning, transport infrastructure development, and the monitoring of the effects of measures in the areas of traffic, logistics, and international trade. At the same time, the prerequisites are created for the development of more advanced analytical tools, the monitoring of key performance indicators (KPIs), and data-driven decision-making.

In the broader context of the digital transformation of the public sector, the eCMR introduction project represents one of the steps towards the modernisation of administrative procedures and the gradual transition to electronic management of transport documentation. At the same time, the project is aligned with European trends in transport digitalisation and creates the basis for future inclusion in the broader eFTI environment and the development of cross-border electronic transport information exchange.

At the same time, the SWOT analysis, the stakeholder analysis, and the risk analysis demonstrated that the full institutional effects of the project depend on the successful coordination of the competent institutions, the degree of system acceptance by users, the development of interoperability, and the successful implementation of change management activities. For this reason, the institutional benefits of the project should be viewed as the result of the gradual digital transformation of the transport ecosystem.

On the basis of the institutional analysis, the survey results, the SWOT analysis, the stakeholder analysis, and the risk analysis, the key effects of the eCMR introduction project on public administration have been identified. An overview of the effects is presented in Table 12.4-1.

Table 12.4-1: Overview of Effects of the eCMR Introduction Project on Public Administration

Impact Area	Expected Impact	Impact Assessment
Administrative Procedures	Faster Processing and Improved Availability of Documentation	Positive
Data Management	Simplified Data Retrieval and Archiving	Positive
Inspection and Supervisory Activities	Enhanced Traceability and Easier Data Verification	Positive
Customs Procedures	Foundation for the Future Enhancement of Data Exchange	Positive
Statistical and Analytical Capacity	Higher-Quality Data for Policy-Making	Positive
Institutional Transparency	Greater Reliability and Availability of Information	Positive
Interoperability with the eFTI Environment	Establishment of the Preconditions for Future Integration	Positive
Need for Organisational Adaptation	User Training and Adaptation of Procedures	Moderately Negative
Inter-Institutional Coordination	Faster Data Exchange Among Institutions	Positive
Policy Development Support	Evidence-Based Decision-Making Supported by KPI Indicators	Positive

Source: Authors' analysis based on the institutional analysis, survey results, SWOT analysis, stakeholder analysis, and risk analysis conducted for the purposes of the Feasibility Study for the Introduction of eCMR.

The data presented in the table demonstrate that the effects on public administration are predominantly positive and that the most significant benefits are expected in the area of the efficiency of administrative procedures, data quality, and support for control functions. Particular note is made of the effects relating to the quality of data management, support for control functions, the development of analytical capacities, and the strengthening of inter-institutional cooperation. The potential challenges are largely limited to the initial implementation phase, during which it will be necessary to carry out organisational adaptation and user training activities.

On the basis of the analysis conducted, it may be concluded that the eCMR introduction project has a positive institutional effect and contributes to the modernisation of public administration operations. Electronic transport documentation is expected to enable more efficient administrative procedures, higher-quality data management, and the gradual alignment with European standards for transport digitalisation and electronic transport information exchange. At the same time, the full realisation of these effects is contingent upon the development of institutional capacities, the continuous training of

users, and the successful implementation of the change management activities provided for in Chapter 13.

12.5. Conclusion of the Impact Analysis

The analysis conducted demonstrates that the eCMR introduction project has predominantly positive effects in all areas examined and that it represents a significant step towards the digital transformation of the transport and logistics sector in the Republic of Serbia and the Western Balkans countries.

In the area of the environment, the positive effects are manifested primarily in the reduction of paper documentation use, more rational use of resources, and the gradual reduction of the need for physical document archiving and transport. Although the environmental effects are not the primary driver of the project, their contribution to the objectives of sustainable development and digitalisation is not negligible.

The social effects of the project are reflected in the increase in the transparency of business processes, greater legal certainty, the reduction of the risk of errors and document loss, and the improvement of users' digital competencies. The results of the survey and the analyses conducted indicate that there is significant potential for the further digitalisation of the sector, but also a need for continuous user training and support during the implementation process.

The most significant positive effects are expected in the economic domain. The economic analysis and the cost-benefit analysis demonstrated that the digitalisation of transport documentation enables a significant reduction in administrative costs, an increase in productivity, a faster flow of information, and the strengthening of the competitiveness of the transport and logistics sector. In addition to the direct financial benefits, the project creates the prerequisites for more efficient cross-border trade, the development of interoperability, and the gradual inclusion in the European eFTI environment.

Positive effects are also expected in the work of public administration through more efficient administrative procedures, better data quality and availability, the improvement of control functions, and the development of institutional analytical capacities. The establishment of a reliable system for electronic transport data exchange represents an important prerequisite for the modernisation of public administration and the further improvement of transport and customs procedures.

At the same time, the results of the SWOT analysis, the stakeholder analysis, and the risk analysis demonstrated that the full effects of the project depend on several key prerequisites, including the degree of system acceptance by users, the development of digital capacities, efficient inter-institutional coordination, the establishment of interoperability, and the successful implementation of change management activities. For this reason, the positive effects of the project should be viewed as the result of gradual implementation and the gradual attainment of full system functionality.

On the basis of the results of all analyses conducted, it may be concluded that the eCMR introduction project has no significant negative impacts that could call into question its justification. On the contrary, the identified environmental, social, economic, and institutional effects indicate that the project generates significant benefits for the economy, public administration, and transport service users, whilst simultaneously aligning with European trends in the digitalisation of transport and logistics. Accordingly, the overall effects of the project may be assessed as markedly positive and fully consistent with the strategic objectives of the digital transformation of the transport sector.

13. IMPLEMENTATION PLAN

13.1. Phases of Implementation

The implementation of the eCMR introduction project in the Republic of Serbia has been planned as a phased process that enables the gradual digitalisation of transport documentation, controlled risk management, and the continuous engagement of all relevant participants in the transport and logistics chain. This defined approach is based on the results of the legal, institutional, technical-technological, financial, and economic analyses conducted, as well as on the experience of European countries that have already commenced or are in the process of implementing eCMR.

The adopted project variant, which entails the establishment of a national eCMR platform with the capacity for future regional interoperability and gradual alignment with the requirements of the eFTI environment, constitutes the starting basis for implementation. The proposed approach is conceptually aligned with the principles of the eCMR Protocol, Regulation (EU) 2020/1056 (eFTI), and the CEFTA, Transport Community, and Common Regional Market initiatives that support the digitalisation of cross-border transport and trade.

Given the institutional, regulatory, and technical complexity of the project, the implementation has been divided into five interrelated phases encompassing project preparation, system adaptation and configuration, pilot implementation, national roll-out, and the establishment of regional interoperability.

Table 13.1-1 presents the proposed phases of implementation of the eCMR introduction project.

Table 13.1-1: Phases of Implementation of the eCMR Introduction Project

Phase	Primary Objective	Key Deliverables
Phase I – Project Preparation	Establish the Institutional, Regulatory and Organisational Preconditions	Governance Structure Established, Regulatory Framework Aligned, and Implementation Plan Defined.
Phase II – System Configuration and Customisation	Prepare the eCMR System for Operational Deployment	System Configured, Security Mechanisms Established, and Testing Completed.
Phase III – Pilot Implementation	Validate the System Under Real Operating Conditions	Pilot Successfully Completed, Required Improvements Identified, and System Functionality Confirmed.
Phase IV – National Implementation	Gradual Onboarding of All Users Across the Republic of Serbia	Wide-Scale Adoption of eCMR and Continuous Growth in the System Adoption Rate.
Phase V – Regional Interoperability	Enable the Exchange of Electronic Transport Data Across the Region	Cross-Border Cooperation and Interoperability Mechanisms Established.

The first phase encompasses the establishment of the institutional and organisational framework for project implementation. Within this phase, it is necessary to form the project management structure, define institutional responsibilities, align operational procedures, and secure the regulatory prerequisites for the application of the electronic consignment note. Simultaneously, activities are

undertaken to prepare the technical and organisational conditions for the introduction of the system, as well as activities to inform key stakeholders of the objectives and expected effects of the project.

Within the preparatory phase, it is necessary to establish the institutional, organisational, and normative framework for project implementation. This encompasses the definition of the model of institutional governance of the national eCMR platform, the allocation of competences and responsibilities between the project lead, the competent institutions, and other system participants, as well as the determination of how the operational functioning of the platform is to be financed following its establishment. It is simultaneously necessary to assess, and where required, to undertake activities for the further alignment of the national normative framework with the international legal framework for the application of the electronic consignment note. In this context, one of the matters that may be subject to a decision by the competent institutions is the accession of the Republic of Serbia to the Additional Protocol to the CMR Convention on the Electronic Consignment Note (eCMR Protocol), in view of its significance for the full international legal application and recognition of the electronic consignment note in international road carriage of goods. The timely establishment of the institutional governance model, the securing of a sustainable financing arrangement, and normative alignment constitute the key prerequisites for the long-term and stable functioning of the national eCMR system.

The second phase concerns the configuration and adaptation of the eCMR system to national requirements. The eFTI-ready architecture of the national eCMR platform constitutes the starting basis, with eFTI Connect serving as a reference example of an architectural approach designed in accordance with European requirements for interoperability and electronic data exchange. In this phase, localisation of the solution, configuration of business rules, definition of user roles, and the conduct of functional and security testing are carried out. Future integrations with ERP, TMS, WMS, customs, and other information systems are not subject to the initial implementation but constitute the subsequent phase of eCMR system development, following the establishment of the requisite regulatory and organisational prerequisites.

The third phase entails pilot implementation in a limited operational environment. The objective of the pilot phase is to verify system functionality, test the lifecycle of the eCMR document, verify electronic signing procedures, and assess user readiness for the transition to a digital working model. The pilot implementation should encompass representatives of transport companies, logistics operators, consignors, consignees, the competent inspection authorities, and the Customs Administration. The results of the pilot phase constitute the basis for process optimisation and the rectification of identified deficiencies prior to the wider deployment of the system.

The fourth phase relates to national implementation and the gradual inclusion of all user categories. This phase encompasses the organisation of training, the establishment of user support mechanisms, continuous monitoring of system performance, and the conduct of activities aimed at increasing the eCMR adoption rate. The dynamics of the national roll-out are based on the adopted adoption scenario, which provides for eCMR to cover approximately 25% of transport operations in the first year of application, 50% in the second year, 75% in the third, and more than 90% of transport flows encompassed by the system from the fourth year onwards. This system adoption dynamic is aligned with the parameters used in the financial and economic analysis and constitutes the basis for the calculation of expected benefits, cash flows, and economic effects of the project. The adopted gradual adoption scenario does not constitute a forecast based on historical data, but rather a planning assumption developed for the purposes of the financial and economic analysis. The dynamic has been defined on the basis of market analysis results, the experience of other countries, the assessed digital maturity of the transport sector, and the planned phased approach to implementation.

The fifth phase constitutes the final phase of implementation and relates to the establishment of regional interoperability. Given the significance of cross-border transport for the economy of the Republic of Serbia and the Western Balkans countries, the full effects of the project can only be achieved through the electronic exchange of transport documentation between different national systems. This phase provides for the alignment of procedures, data exchange standards, and document verification mechanisms with regional partners, together with the gradual approximation to the requirements of the European eFTI framework.

The phased approach defined in this manner enables the gradual transformation of the existing paper-based model of transport documentation management into a modern digital system, whilst minimising implementation risks and maximising the expected operational, financial, and economic benefits identified in the preceding chapters of the study.

The implementation timeline has been defined with due regard for the risks identified in the Risk Analysis chapter, in particular the risks of regulatory delays, limited system acceptance by users, and risks associated with inter-institutional coordination. The phased approach to implementation enables the gradual mitigation of the aforementioned risks and the continuous adaptation of the project to the results of the pilot implementation.

The planned implementation phases constitute the basis for the gradual increase in the eCMR system adoption rate by users. The system adoption dynamic and the assumptions used in the financial and economic analysis are presented in Section 8.6.

13.2. Stakeholder Analysis

The successful implementation of the electronic consignment note (eCMR) depends on the active participation and coordination of a large number of institutions, economic operators, and other participants in the transport chain. Unlike individual digital solutions applied within a single organisation, eCMR is a system whose effects depend on the degree of acceptance and use by all relevant actors involved in the road carriage of goods process.

The stakeholder analysis has been conducted on the basis of the institutional analysis, the results of the survey conducted for the purposes of this study, and a review of the competences of the institutions and organisations participating in the processes of transport, trade, and cross-border movement of goods.

The results of the stakeholder analysis are directly linked to the findings of the SWOT analysis (Section 4.7) and the Risk Analysis (Chapter 11), which demonstrated that the degree of system acceptance, the level of user awareness, and inter-institutional coordination are among the key factors for the successful implementation of eCMR. For this reason, particular attention has been devoted to the identification of actors that may significantly influence the dynamics of system adoption.

Table 13.2-1 presents the principal categories of stakeholders, their role in the eCMR system, and the assessed level of influence on the implementation process.

Table 13.2-1: Key Stakeholders in the eCMR Implementation Process

Stakeholder	Role in the System	Level of Interest	Level of Influence
Ministry of Construction, Transport and Infrastructure (MCTI)	Policy Lead and Implementation Coordinator	High	High
Customs Administration	Integration with Customs and Cross-Border Procedures	High	High
Ministry of Finance	Support for the Regulatory and Institutional Framework	Medium	High
Transport Operators	Primary Users of the System	High	High
Freight Forwarders	Preparation and Exchange of Transport Documentation	High	High
Consignors and Consignees	Users of Transport and Logistics Services	High	High
IT Service Providers and Platform Operators	Development and Integration of Technical Solutions	Medium	Medium
Serbian Chamber of Commerce and Professional Associations	Support for User Training and Awareness Activities	High	Medium
Inspection Authorities	Regulatory Oversight and Enforcement	Medium	Medium
International Organisations and Development Partners	Expert and Technical Support	Medium	Medium

Source: Authors' analysis based on the institutional analysis, SWOT analysis, risk analysis, and survey results conducted for the purposes of the Feasibility Study for the Introduction of eCMR (N=12).

The analysis demonstrates that the greatest influence on the success of implementation lies with the state institutions responsible for transport and customs procedures, as well as with the economic operators that use transport documentation on a daily basis. The survey results indicate that the business sector recognises the potential benefits of eCMR, whilst simultaneously identifying limited adoption by other transport chain participants as one of the most significant barriers to its introduction.

For the purposes of defining communication priorities, stakeholder engagement, and change management activities, the identified actors have been classified according to their level of influence and level of interest in the project. The results of the classification are presented in Table 13.2-2.

Table 13.2-2: Power–Interest Matrix of Stakeholders

HIGH INFLUENCE	HIGH INTEREST	LOW INTEREST
	Manage Closely	Keep Satisfied
	• Ministry of Construction, Transport and Infrastructure (MCTI) • Customs Administration • Transport Operators • Freight Forwarding Companies • Key Consignors and Logistics Operators	• Ministry of Finance • Inspection Authorities • Other Public Authorities Involved in Regulatory Oversight
LOW INFLUENCE	Keep Informed	Monitor
	• Consignees • Serbian Chamber of Commerce • Professional Associations of Transport Operators and Freight Forwarders • IT Service Providers and Software Solution Providers	• Academic Community • Consulting Organisations • General Public

Source: Authors' analysis.

The Power–Interest matrix demonstrates that particular attention during implementation should be directed towards the group of actors that simultaneously have a high level of influence and a high level of interest in the project. This category includes the Ministry of Construction, Transport and Infrastructure, the Customs Administration, carriers, freight forwarders, and major consignors. These actors should be directly involved in pilot projects, system testing, and the key decision-making process.

The survey results demonstrated that 83.3% of respondents are interested in additional information or potential participation in eCMR implementation pilot projects. This finding confirms the existence of a favourable basis for the engagement of the business sector in the early phases of implementation and indicates that awareness and training activities may significantly influence the dynamics of system adoption.

From the perspective of project management, the establishment of an efficient coordination mechanism between the public and private sectors constitutes a key prerequisite for successful implementation. Particular attention should be devoted to the active involvement of transport companies, freight forwarders, and consignors in the system design and testing process, in order to ensure that the proposed solutions meet the actual needs of users.

On the basis of the analysis conducted, it may be concluded that there is a broad range of stakeholders with a direct interest in the introduction of eCMR, as well as sufficient institutional capacity for project implementation. At the same time, the complexity of the transport chain requires careful planning of communication, change management, and inter-institutional cooperation throughout all phases of implementation. At the same time, the results of the analysis constitute one of the input parameters for defining the system adoption dynamic used in the economic and cost-benefit analysis (Chapter 10).

The results of the stakeholder analysis constitute the basis for the definition of institutional responsibilities (Section 13.3), as well as the communication, education, and change management activities presented in Section 13.5.

13.3. Institutional Responsibilities

The successful implementation of the eCMR introduction project requires a clearly defined allocation of competences, responsibilities, and coordination mechanisms between public sector institutions, economic operators, and other participants in the transport and logistics chain. Given that eCMR represents simultaneously a regulatory, organisational, and digital reform, efficient institutional coordination constitutes one of the key prerequisites for the successful implementation of the project.

The results of the institutional analysis presented in the preceding chapters demonstrate that the Republic of Serbia possesses the institutional capacities necessary for the establishment and management of the national eCMR system. However, the full effects of the project can only be achieved through a clearly defined model of cooperation between the competent authorities, the transport industry, and technology service providers.

For the purposes of efficient coordination, it is recommended that a National Coordination Body for eCMR Implementation be established, bringing together representatives of the Ministry of Construction, Transport and Infrastructure, the Customs Administration, the Office for Information Technology and eGovernment, the Chamber of Commerce and Industry of Serbia, and representatives of the transport industry. The primary task of the body would be the coordination of activities, monitoring of project implementation, risk management, and the proposal of corrective measures throughout all phases of implementation.

The Ministry of Construction, Transport and Infrastructure is identified as the lead institution of the project, with a key role in the coordination of implementation, the alignment of the regulatory framework, cooperation with international organisations, and the monitoring of the achievement of the strategic objectives of the project. Given the significance of cross-border transport, the Ministry also has a central role in the coordination of activities with regional partners and initiatives that support the digitalisation of transport and trade.

For the purposes of this study, the assumption is made that the national eCMR system will be established as national digital infrastructure under the supervision of the competent institutions of the Republic of Serbia, whilst operational maintenance will be entrusted to an authorised technical support provider.

The financing of the operational functioning of the system, including the costs of maintenance, user support, licensing, security updates, and further platform development, must be defined at the time of establishing the final system governance model. For the purposes of this study, the indicative operational cost values presented in the financial analysis have been adopted, whilst the final organisational and financial model will be defined in the subsequent phases of the project.

The governance model of the system following the establishment of the national eCMR platform is based on the separation of strategic, operational, and technical competences. Strategic governance of the system and the definition of development priorities would fall within the competence of the Ministry of Construction, Transport and Infrastructure as the project lead, whilst the competent institutions would participate in the definition of regulatory requirements, interoperability standards, and future functional improvements. Operational management of the system would encompass user administration, platform performance monitoring, incident management, and the coordination of user support, whilst technical maintenance and system development would be entrusted to an authorised technology service provider in accordance with agreed service level agreements (SLAs). Such an arrangement enables a clear allocation of responsibilities, continuity of system operations, and

controlled further development of the platform in accordance with user needs and the requirements of the national and European regulatory framework.

The Customs Administration represents one of the most significant institutional participants, given that a significant portion of the expected project benefits relates to the acceleration of cross-border procedures, the reduction of administrative burdens, and the improvement of transport information exchange. Its role encompasses participation in the pilot implementation, the adaptation of operational procedures, and preparation for future electronic data exchange in accordance with the principles of the eFTI environment.

The Office for Information Technology and eGovernment has a significant role in the area of digital infrastructure, the application of interoperability standards, electronic identification, and coordination with existing national eGovernment platforms. Its participation is particularly important in the system configuration, testing, and future development phases of digital services connected to the eCMR system.

The Chamber of Commerce and Industry of Serbia and professional associations of carriers serve as intermediaries between institutions and the business sector. Their task is to ensure user awareness, organise educational activities, collect feedback, and contribute to the broader acceptance of the system in the transport sector.

Transport companies, logistics operators, freight forwarders, consignors, and consignees represent the primary system users and the drivers of the digital transformation process. Their active involvement during the pilot phase and national implementation is of key importance for achieving the planned adoption rates and realising the expected operational and economic benefits.

Table 13.3-1 presents the principal institutional responsibilities in the project implementation process.

Table 13.3-1: Principal Institutional Responsibilities in the Project Implementation Process

Institution / Organisation	Key Responsibilities
Ministry of Construction, Transport and Infrastructure (MCTI)	Strategic Project Governance, Implementation Coordination, Regulatory Activities, and International Cooperation
Customs Administration	Adaptation of Procedures, Participation in the Pilot Implementation, and Support for Cross-Border Data Exchange
Office for Information Technologies and eGovernment	Digital Infrastructure, Interoperability, Electronic Identification, and Technical Support
Serbian Chamber of Commerce	Business Outreach, Organisation of Training Activities, and User Communication
Inspection Authorities	Regulatory Oversight and Participation in the Testing of Operational Procedures
Transport Operators and Logistics Operators	System Use, Participation in the Pilot Project, Provision of Feedback, and Process Improvement
Technology Service Providers	Configuration, Maintenance, and Technical Support for the eCMR System

In addition to national institutions, regional and international organisations that support the digitalisation of transport and the facilitation of trade play a significant role in the long-term development of the project. In this context, particular significance attaches to the activities conducted within the frameworks of UNECE, CEFTA, Transport Community, and Common Regional Market initiatives, as they constitute the basis for future regional interoperability and the gradual inclusion of the national eCMR system in the broader European eFTI environment.

In order to ensure efficient project management, it is recommended that a dedicated coordination mechanism or inter-institutional working group be established to monitor the implementation of activities, coordinate participants, manage risks, and ensure continuous tracking of achieved results throughout the entire implementation period. Such an approach enables the timely resolution of operational challenges and contributes to the achievement of the planned objectives of the eCMR introduction project.

13.4. Timeline

The eCMR implementation timeline has been defined on the basis of the results of the technical, institutional, economic, and financial analyses, as well as on the experience of European countries that have already implemented or are in the process of introducing the electronic consignment note. The planned implementation dynamic is based on the principle of gradual system introduction, with the aim of ensuring sufficient time for regulatory adaptation, technical preparation, functionality testing, and the development of the necessary user capacities.

Based on the adopted implementation concept, which encompasses the phases of project preparation, system configuration, pilot implementation, national roll-out, and the establishment of regional interoperability, it is envisaged that full operational deployment of eCMR will be achieved during the fourth year of implementation, whilst a further increase in the adoption rate and gradual connectivity with the regional and European digital transport environment are expected in the subsequent period.

The proposed timeframe strikes a balance between the need for rapid digitalisation of transport processes and the need for the gradual introduction of changes in a sector characterised by a large number of small and medium-sized transport enterprises with varying levels of digital maturity.

The planned implementation dynamic is presented in Table 13.4-1.

Table 13.4-1: Project Implementation Timeline

Implementation Phase	Year 1	Year 2	Year 3	Year 4
Project Preparation and Regulatory Alignment	•			
System Configuration and Testing	•			
Pilot Implementation	•	•		
National Implementation		•	•	•
Regional Interoperability			•	•

During the first year of implementation, activities are directed primarily towards the establishment of the institutional and regulatory framework, platform configuration, and the preparation of the pilot

environment. Initial system testing is also conducted during the same period, and users are prepared for the commencement of the pilot implementation.

The second year represents the transition from the development to the operational phase of the project. The pilot implementation is extended to a larger number of participants, whilst activities aimed at preparing the national system roll-out are conducted in parallel. Particular emphasis is placed on training, user support, and the adaptation of procedures on the basis of experience from the pilot phase.

During the third year, a significant expansion of system coverage is envisaged, with the inclusion of the majority of transport companies participating in international road carriage of goods. Activities aimed at establishing the cross-border exchange of electronic transport data with partners in the Western Balkans region are simultaneously commenced.

The fourth year represents the system stabilisation phase and the attainment of full operational functionality. During this period, the completion of the national implementation, the establishment of the basic mechanisms of regional interoperability, and the preparation for gradual inclusion in the future eFTI environment of the European Union are expected.

In addition to the activity implementation timeframe, an eCMR user adoption scenario has been defined for the purposes of the economic and financial analysis. This scenario constitutes the basis for the assessment of future project benefits and is based on the gradual growth in the number of transport operations to be carried out using the electronic consignment note.

Table 13.4-2 presents the planned eCMR system adoption dynamic.

Table 13.4-2: Planned eCMR System Adoption Dynamic

Implementation Year	Estimated Adoption Rate
1	25%
2	50%
3	75%
4	90%
5–10	95%

In accordance with the adopted WB6 scenario, it is expected that, following the establishment of regional interoperability, the electronic exchange of transport documents will gradually encompass cross-border transport flows at the Western Balkans level, which constitutes one of the prerequisites for the realisation of the full economic benefits identified in the economic analysis.

The adoption dynamic presented is aligned with the assumptions used in the cost-benefit analysis and reflects a realistic scenario for the gradual transition from paper-based to electronic transport documentation. It is expected that, following the attainment of a critical mass of users during the third and fourth years of implementation, accelerated system expansion will occur, which is consistent with the experience of countries that have already undergone similar processes of transport documentation digitalisation.

The proposed timeline enables the project to be implemented with a controlled level of risk, the gradual inclusion of all relevant participants, and the securing of the prerequisites for realising the expected operational, financial, and economic benefits identified in the preceding chapters of the study. The planned implementation dynamic is aligned with the expected development dynamic of regional transport digitalisation initiatives within the CEFTA and Transport Community frameworks.

13.5. Monitoring and Evaluation

Monitoring and evaluation constitute the key mechanisms for tracking the implementation of the eCMR introduction project and assessing the degree of achievement of the planned results and benefits. Given that this is a digital transformation project encompassing multiple institutions and a large number of economic operators, it is necessary to establish a system of continuous monitoring that will enable the timely identification of deviations from planned objectives and the taking of corrective measures.

The monitoring system should be established from the outset of implementation and should encompass all project phases, from preparation and pilot implementation through to national roll-out and the establishment of regional interoperability. The data collected should serve not only to track implementation progress, but also to assess the effects of the project in relation to the objectives defined in the preceding chapters of the study, particularly in the part relating to economic benefits, increased efficiency of transport processes, and the reduction of administrative burdens.

Responsibility for the establishment and coordination of the monitoring system should rest with the Ministry of Construction, Transport and Infrastructure, with the active participation of the Customs Administration, the Office for Information Technology and eGovernment, the Chamber of Commerce and Industry of Serbia, and other institutions involved in project implementation. The data necessary for tracking results will be provided through the functionalities of the eCMR system itself, institutional reports, user surveys, and the analysis of operational indicators.

For the purposes of monitoring implementation and measuring the effects of the project, the application of a set of key performance indicators (KPIs), presented in Table 13.5-1, is recommended.

Table 13.5-1: Key Project Performance Indicators (KPIs)

Indicator	Baseline Value	Target Value	Data Source	Monitoring Frequency
Share of eCMR Documents in the Total Number of CMR Documents	0%	≈95%	eCMR Platform	Semi-Annual
Average Transport Document Processing Time	20–23 minutes	<10 minutes	eCMR Platform / User Reports	Semi-Annual
Average Document Processing Cost	€7.20	≈€2.00	Financial Reports and Business Analysis	Annual
Average Direct Financial Benefit per Document	€0	≥€5.20	Financial Analysis	Annual
Number of Administrative Errors in Documentation	Baseline	>50% Reduction	User Reports and System Analysis	Annual
Time Required for Delivery Confirmation	Baseline	>30% Reduction	eCMR Platform	Semi-Annual
Time Required for Service Invoicing	Baseline	>30% Reduction	Users' ERP/TMS Systems	Annual
Number of Institutions and Systems Integrated with the eCMR Platform	0	According to the Implementation Schedule	Coordination Body	Annual
User Satisfaction Level	Not Measured	>80%	User Surveys	Annual
Percentage of Electronically Exchanged Transport Documentation	0%	≈95%	eCMR Platform	Semi-Annual
eCMR Platform Availability	—	≥99.5%	Platform Monitoring System	Daily

The aforementioned indicators are directly linked to the benefits identified in the cost-benefit analysis and constitute the basis for assessing project success throughout the entire implementation and operational period.

In addition to monitoring performance indicators, it is necessary to establish a formal project evaluation process. The evaluation should provide an assessment of the effectiveness of the activities conducted, the degree of achievement of the set objectives, and the justification of the resources invested. In accordance with the good practice of the European Commission and international financial institutions, evaluation at three levels is recommended.

The first level constitutes operational evaluation, conducted continuously through regular activity monitoring, system performance analysis, and periodic project implementation reports. The second level encompasses mid-term evaluation, conducted following the completion of the pilot phase and during national implementation, with the aim of assessing the degree of system adoption and identifying required corrective measures. The third level constitutes final evaluation, conducted following the establishment of full operational system functionality, and encompasses an analysis of the economic, financial, institutional, and social effects of the project.

The monitoring of the realisation of the benefits identified in the preceding chapters of the study is of particular significance, including the reduction of administrative costs, time savings, the reduction of paper documentation use, the increase in the transparency of transport processes, and the improvement of the efficiency of cross-border transport. The results of monitoring and evaluation will constitute the basis for decisions on the further development of the system, the expansion of functionality, and future connectivity with regional and European platforms for electronic transport information exchange.

The establishment of a structured monitoring and evaluation system ensures transparent project management, timely response to identified challenges, and continuous system improvement, thereby creating the prerequisites for the full realisation of the economic and social benefits expected from the introduction of eCMR in the Republic of Serbia and the broader Western Balkans region.

In order to ensure continuous monitoring of project implementation and timely management decision-making, the establishment of a regular reporting system presented in Table 13.5-2 is recommended.

Table 13.5-2: Reporting Matrix

Report	Reporting Frequency	Responsible Entity
Operational Report	Quarterly	Project Team
KPI Report	Semi-Annual	Coordination Body
Implementation Report	Annual	Ministry of Construction, Transport and Infrastructure (MCTI)
Final Evaluation Report	Upon Completion of Full Implementation	Independent Evaluator

The proposed reporting dynamic ensures timely monitoring of implementation progress and constitutes the basis for the implementation of corrective measures in the event of deviations from planned objectives.

13.6. Change Management Plan

The introduction of eCMR does not represent merely a technological modernisation of existing processes, but a comprehensive change in the manner in which transport documentation and business information are created, exchanged, stored, and used. The success of the project therefore depends not only on the quality of the technical solution, but also on the degree of acceptance of the new processes by institutions, transport companies, and other participants in the logistics chain.

The experience of countries that have already commenced the application of eCMR demonstrates that the greatest challenges are not associated with technical implementation, but with organisational

changes, the adaptation of business procedures, and the development of user confidence in electronic documents. For this reason, change management constitutes an integral component of the implementation process and is directly linked to the project implementation phases described in Section 13.1.

The primary objective of the change management plan is to ensure a gradual and controlled transition from the paper-based to the digital model of transport documentation management, whilst minimising resistance to change and ensuring a high degree of system acceptance by users.

The results of the survey conducted for the purposes of this study demonstrated that 41.7% of respondents cited the lack of knowledge and information as one of the main barriers to the introduction of eCMR, whilst 25% of respondents identified employee resistance to change as a potential challenge. These findings confirm the need for a systematic approach to change management throughout all phases of implementation. At the same time, 83.3% of respondents expressed interest in additional information or potential participation in the pilot project, indicating that a favourable basis exists for the gradual acceptance of the system, provided that adequate communication and training activities are undertaken.

The key elements of the plan encompass communication with stakeholders, user training, technical support during implementation, and continuous monitoring of the system acceptance level.

Particular attention must be devoted to the categories of users that will be directly involved in the day-to-day use of eCMR, as the degree to which the projected benefits identified in the economic and financial analysis are realised depends precisely on their readiness to accept the new procedures.

Table 13.6-1 presents the principal user groups and the activities that must be conducted within the change management process.

Table 13.6-1: User Groups and Activities to be Conducted for Change Management Purposes

Target Group	Key Activities
Transport Operators	Awareness Campaigns, User Training, and Technical Support
Drivers	Hands-On Training on the Use of the Mobile Application and Electronic Documents
Freight Forwarders and Logistics Operators	Workshops and Guidance on Business Process Integration
Consignors and Consignees	Presentations on the Benefits of eCMR and New Document Exchange Procedures
Customs Officers and Inspection Authorities	Specialised Training on the Control and Verification of eCMR Documents
Competent Authorities	Coordination Activities, Project Governance, and Performance Monitoring

Source: Authors' analysis based on the stakeholder analysis, risk analysis, and survey results conducted for the purposes of the Feasibility Study for the Introduction of eCMR (N=12).

In order to ensure timely and transparent communication with all stakeholders, it is necessary to establish a structured awareness programme throughout the entire implementation period. The programme should encompass presentations, professional workshops, webinars, user guides, an internet portal with project information, and mechanisms for collecting user feedback. Particular focus of communication activities should be directed towards transport companies, freight forwarders, and consignors, who were identified in the stakeholder analysis as groups with high influence and high interest in the project.

In addition to communication activities, a training programme to be conducted during the pilot phase and continued throughout national implementation is of particular importance. Training should be tailored to different categories of users and should encompass both system functionalities and the changes to business procedures arising from the application of the electronic consignment note. A practical approach to training is particularly important for small and medium-sized transport enterprises, which constitute a significant portion of the transport sector in the Republic of Serbia and the Western Balkans countries.

In the change management process, it is necessary to recognise potential sources of resistance. The most significant risks relate to established habits of using paper documentation, varying levels of user digital maturity, limited staffing capacities of certain institutions, and initial reservations regarding new digital procedures. The aforementioned risks may be mitigated through the gradual introduction of the system, continuous user support, clear communication of benefits, and the active involvement of users in the pilot implementation phase. The aforementioned risks are aligned with the results of the Risk Analysis (Chapter 11), in which insufficient user knowledge, limited digital maturity, and slower system adoption were identified as high-priority risks.

The effectiveness of the activities conducted should be continuously monitored through the indicators defined within the monitoring and evaluation system. It is particularly important to monitor the system adoption rate, the number of active users, the frequency of eCMR document use, and the level of user satisfaction. These indicators enable the timely adaptation of change management activities and constitute an important mechanism for supporting the successful implementation of the project.

In order to ensure continuous monitoring of the success of change management activities conducted, key performance indicators (KPIs) have been defined that enable the measurement of the degree of system acceptance and the effectiveness of communication, training, and user support activities.

Table 13.6-2: Change Management Performance Monitoring Indicators

Indicator	Unit of Measurement
Number of Training Sessions Delivered	Number
Number of Trained Users	Number
Number of Participants in Webinars and Workshops	Number
Number of Active eCMR System Users	Number
Percentage of Active Users Relative to Registered Users	%
User Satisfaction Level	%
Number of User Requests Received and Resolved	Number

Source: Authors' analysis.

The indicators presented constitute the basis for the project monitoring and evaluation system and enable the timely identification of the need for corrective measures in the event of slow system adoption or insufficient user engagement.

Given that one of the strategic objectives of the project is the achievement of a high degree of eCMR adoption and the establishment of the prerequisites for future regional interoperability, change management should not be viewed as a one-off activity, but as a continuous process accompanying all phases of project implementation. Communication, training, user support, and stakeholder engagement activities constitute one of the key prerequisites for achieving the planned eCMR system adoption dynamic presented in Section 8.6, the realisation of the economic benefits identified in the cost-benefit analysis, and the mitigation of the risks presented in Chapter 11. Continuous monitoring of system acceptance indicators enables the timely implementation of corrective measures and ensures the conditions for the successful achievement of national and future regional eCMR application.

Given that the projected financial and economic effects are directly dependent on the degree of eCMR system adoption, change management activities constitute one of the key prerequisites for realising the benefits presented in the financial and economic analysis.

14. CONCLUSIONS AND RECOMMENDATIONS

14.1. Results of the Analysis

The analyses conducted have demonstrated that clear technical, institutional, legal, financial, and economic prerequisites exist for the introduction of the electronic consignment note (eCMR) in the Republic of Serbia. The results of the study confirm that the digitalisation of transport documentation represents a logical and justified step in the process of modernising the transport and logistics sector, aligned with the national strategic objectives of digitalisation and the European regulatory framework.

The analysis of the existing situation demonstrated that a significant proportion of transport documentation continues to be based on paper documents, generating additional administrative costs, slowing the exchange of information, and limiting the possibilities for the digitalisation of transport processes. The results of the survey conducted for the purposes of this study confirm these findings, given that 58.3% of respondents do not use digital systems for transport documentation management, whilst the majority of participants continue to use paper-based procedures as the primary model for transport data exchange.

The analysis of the target state confirmed that the introduction of the eCMR system enables the digitalisation of the entire lifecycle of transport documentation, from document creation to archiving, whilst ensuring legal validity, traceability, and a high level of data security. The proposed model enables the gradual digital transformation of the transport sector without disrupting existing business processes.

The legal and regulatory analysis demonstrated that the Republic of Serbia possesses the basic normative framework necessary for the development of an electronic transport documentation system, including regulations governing electronic documents, electronic identification, trust services, information security, and the protection of personal data. At the same time, the analysis indicated that the question of the accession of the Republic of Serbia to the Additional Protocol to the CMR Convention on the Electronic Consignment Note (eCMR Protocol) represents one of the regulatory aspects that must be considered in the subsequent phases of project preparation and implementation.

The technical and technological analysis demonstrated that the implementation of a system based on eFTI-ready architecture is technically feasible and enables the gradual development from a national platform towards full regional and European interoperability. The proposed solution ensures compatibility with the eCMR Protocol, the eFTI Regulation, the eIDAS framework, and the relevant international standards.

The SWOT analysis demonstrated that the project possesses significant internal strengths reflected in the potential for the reduction of administrative costs, increased efficiency, and enhanced transparency of transport processes. At the same time, weaknesses were identified relating primarily to the limited digital maturity of a portion of users and an insufficient level of awareness of the eCMR concept. The development of the eFTI environment, regional cooperation, and the digitalisation of transport corridors were identified as the most significant opportunities, whilst the key threats relate to the uneven dynamics of system adoption and the limited degree of interoperability in the initial phases of implementation.

The stakeholder analysis confirmed the existence of a broad range of stakeholders with a direct interest in the implementation of eCMR. The greatest influence on the success of the project lies with the competent institutions, carriers, freight forwarders, and consignors. The analysis demonstrated that successful implementation requires a high degree of coordination between the public and private sectors, as well as the active involvement of users in the pilot phases of system development and testing.

The risk analysis demonstrated that the most significant risks are associated with the degree of system acceptance by users, the level of digital maturity of organisations, regulatory coordination, and the development of interoperability with other digital platforms. At the same time, the analysis demonstrated that the identified risks can be successfully mitigated through pilot implementation, change management activities, continuous user training, and the gradual introduction of the system.

The financial analysis demonstrated that the project has the potential to generate significant operational savings through the reduction of administrative costs, the elimination of paper documentation, and increased efficiency in the processing of transport documents. The adopted investment model entails an initial investment of €3 million and annual operational costs of €400,000, with gradual system adoption over the first five years.

The economic analysis confirmed the existence of significant benefits that exceed the direct financial effects. These benefits include the acceleration of logistics processes, the reduction of administrative burdens, increased transparency, improved data quality, the strengthening of the competitiveness of the transport sector, and support for the digital transformation of the economy. The analysis of social, economic, and institutional effects demonstrated that positive project impacts are expected in the majority of the areas examined, with limited and temporary challenges during the initial implementation phase.

A particularly significant finding relates to the potential for the regional application of the eCMR system within the Western Balkans. The analysis of the WB6 scenario demonstrates that the interoperability of national systems can generate additional benefits through the acceleration of cross-border transport, the reduction of administrative barriers, and the enhancement of regional cooperation, thereby creating the prerequisites for future integration into the broader European eFTI environment.

Taken in aggregate, the results of all analyses conducted indicate that the proposed model of a national eCMR platform based on eFTI-ready architecture represents a technically achievable, regulatory-compliant, institutionally feasible, and economically justified solution. At the same time, the analyses demonstrate that the full effects of the project will depend on the successful management of change, the degree of system acceptance by users, and the gradual development of national and regional interoperability.

14.2. Project Justification

On the basis of the results of all analyses conducted, it may be concluded that the project of establishing the national eCMR platform is justified from the technical, institutional, financial, economic, and strategic perspectives. The results of the study demonstrate that the proposed model represents a sustainable solution for the modernisation of transport documentation and an important step in the process of digital transformation of the transport and logistics sector of the Republic of Serbia.

The technical justification of the project is based on the availability of mature technological solutions, the existence of a reference platform, and the application of eFTI-ready architecture that enables the gradual and controlled implementation of the system. The proposed architecture ensures scalability, a high level of information security, and the possibility of future integrations with ERP, TMS, WMS, customs, and other information systems, as well as alignment with the principles of the eCMR Protocol, the eIDAS framework, and the eFTI Regulation, in accordance with the concept examined within this study.

The institutional justification is reflected in the existence of relevant institutions capable of assuming the roles of governance, coordination, and supervision of the project, as well as in the existence of institutional capacities and the possibility of establishing a model of governance, coordination, and oversight of the system. The stakeholder analysis demonstrated that there is a broad range of stakeholders with a direct interest in the implementation of eCMR, whilst the survey results indicate the readiness of the business sector to participate in pilot activities and the process of gradual system adoption.

The financial justification derives from the expected savings arising from the reduction of document processing costs, the elimination of paper documentation, and increased operational efficiency. The adopted investment model entails an initial investment of €3 million and annual operational costs of €400,000, with gradual system adoption over the first five years. The results of the financial analysis demonstrate that the project has the potential to generate sustainable financial benefits over the observed operational period. Additional confirmation of the financial justification of the project is provided by the positive financial net present value (FNPV), the financial internal rate of return (FIRR), which significantly exceeds the adopted discount rate, and the short investment payback period, which confirms the sustainability of the proposed investment model. The financial sustainability of the project is conditional upon the successful realisation of the planned system adoption dynamic, the securing of a model for financing operational costs, and the establishment of an appropriate governance model for the national eCMR platform.

The economic justification of the project has been confirmed through the identified direct and indirect benefits for the economy, the transport sector, and public administration. The analyses demonstrated that the introduction of eCMR contributes to the reduction of administrative costs, increased productivity, the acceleration of logistics processes, the reduction of documentation errors, and the improvement of data quality. In addition to the direct economic effects, the project generates significant social and institutional benefits reflected in the strengthening of transparency, legal certainty, the digital maturity of the sector, and the efficiency of public administration.

The results of the SWOT analysis demonstrated that the strengths and opportunities of the project significantly outweigh the identified weaknesses and threats. At the same time, the risk analysis confirmed that the most significant risks are associated with system acceptance by users, the level of digital maturity, and system interoperability, but also that they can be successfully mitigated through pilot implementation, change management activities, user training, and the gradual introduction of the system. The economic analysis confirmed that the benefits of the project significantly exceed the costs over the entire analysis period, as confirmed by the positive economic net present value (ENPV), the high economic rate of return (ERR), and the favourable benefit-to-cost ratio (B/C).

The strategic justification of the project derives from its alignment with national digitalisation policies, the European regulatory framework, the eFTI initiative, the objectives of sustainable mobility, and the process of Western Balkans regional integration. The project simultaneously represents an important prerequisite for the future inclusion of the Republic of Serbia in the broader European environment for electronic transport information exchange.

In addition to the benefits for economic operators and the transport sector, the project also generates significant benefits for public administration through the improvement of data quality, increased process transparency, more efficient control of transport flows, and the creation of a foundation for the further digitalisation of public services in the area of transport and logistics.

Taken in aggregate, the results of the technical, legal, institutional, financial, economic, and social analyses indicate that the project of establishing the national eCMR platform is justified and represents an investment of strategic importance for the modernisation of the transport sector of the Republic of Serbia. At the same time, the results of the study demonstrate that the full effects of the project will be achieved through phased implementation, continuous change management, the development of interoperability, and the active involvement of all relevant stakeholders.

14.3. Recommendations for Implementation

On the basis of the results of all analyses conducted, the implementation of the eCMR introduction project through a phased approach is recommended, enabling the gradual adoption of the system, efficient risk management, and continuous improvement of functionality. Such an approach is aligned with the results of the SWOT analysis, stakeholder analysis, risk analysis, and survey, which indicate that gradual implementation is the most appropriate model for achieving sustainable results.

The first phase of implementation should encompass the establishment of the institutional framework, the definition of detailed functional and technical requirements, the establishment of project management mechanisms, and the preparation of the technical infrastructure necessary for the implementation of the national eCMR platform. Particular attention should be devoted to the definition of institutional roles and responsibilities, as well as the establishment of coordination mechanisms between the public and private sectors.

Within the preparatory phase, it is also necessary to consider all activities required for the full alignment of the national normative framework with the international and European framework for the application of electronic transport documentation. This includes, inter alia, consideration of the question of the accession of the Republic of Serbia to the Additional Protocol to the CMR Convention on the Electronic Consignment Note (eCMR Protocol), in accordance with the decisions of the competent institutions and the dynamics of the further development of the national eCMR system.

The second phase should be implemented through a pilot project involving a limited number of carriers, freight forwarders, consignors, and competent institutions. The survey results demonstrated that the majority of respondents express interest in additional information or potential participation in pilot activities, which provides a favourable basis for testing the system under real operating conditions. The objective of the pilot phase should be the verification of system functionality, interoperability, security mechanisms, user experience, and operational procedures.

Following the successful completion of the pilot phase, the gradual national roll-out of the system is recommended, with intensive user support, training programmes, and change management activities. It is particularly important to ensure continuous user awareness, technical support, and digital competence-building activities, given that insufficient knowledge and limited digital maturity were identified as key challenges within the SWOT analysis, risk analysis, and survey.

In parallel with the national implementation, the development of integrations with existing ERP, TMS, WMS, customs, and other information systems is recommended, as well as preparation for future data exchange within the eFTI environment. This ensures the long-term sustainability of the project and creates the prerequisites for the gradual development of an interoperable digital transport ecosystem.

In parallel with the preparation of implementation, the definition of the project financing model and the securing of sources of funding for the realisation of the investment are recommended. Given that the project contributes to the digitalisation of transport, the enhancement of cross-border data exchange, and the gradual alignment with the European eFTI environment, potential sources of

financing may include funds from the budget of the Republic of Serbia, European Union programmes, regional digitalisation and trade facilitation initiatives, and other available international financial mechanisms. For the purposes of this study, no specific investment financing structure has been adopted, as the choice of financial mechanism will depend on the available support programmes and the decisions of the competent institutions in the subsequent phases of project preparation.

Particular attention throughout all phases of implementation should be devoted to the following priority areas:

- cybersecurity and data protection;
- the application of data governance principles;
- the development of national and regional interoperability;
- continuous monitoring of KPI indicators;
- systematic risk management;
- the active involvement of the business sector in all project phases;
- training and the strengthening of user digital competences;
- change management activities and communication with stakeholders.

At the regional level, the continuation of cooperation with the institutions of Western Balkans countries, the CEFTA initiative, and the Transport Community organisation is recommended, with a view to the gradual establishment of cross-border eCMR data exchange and future integration with the European digital transport ecosystem. It is particularly important to promote the alignment of technical standards and procedures in order to enable efficient data exchange at the regional level.

Given that the results of all analyses have confirmed the justification of the project, the initiation of activities for the implementation of the national eCMR platform at the earliest possible opportunity is recommended. At the same time, it is necessary to ensure continuous monitoring of results, regular evaluation of the effects achieved, and the gradual adaptation of the system to user needs and the development of the European regulatory and technological environment.

14.4. Final Assessment

On the basis of the results of all analyses conducted, it may be concluded that the introduction of the electronic consignment note (eCMR) in the Republic of Serbia is technically feasible, institutionally implementable, financially sustainable, economically justified, and strategically aligned with the directions of development of the national and European transport system.

The results of the analysis of the existing situation demonstrated that the existing model based on paper documentation generates significant administrative costs, slows the exchange of information, and limits the possibilities for the further digitalisation of transport processes. At the same time, the survey results confirmed the existence of a genuine need for the modernisation of transport documentation, as well as a positive attitude on the part of the business sector towards further digitalisation and participation in pilot activities.

The legal and institutional analyses demonstrated that the Republic of Serbia possesses the basic normative and institutional prerequisites for the development of the national eCMR platform, with the need for further improvement of certain regulatory and organisational aspects during implementation. The proposed eFTI-ready architecture ensures the long-term sustainability of the solution, the possibility of gradual development of functionality, and the prerequisites for future integration with national, regional, and European transport data exchange systems.

During the finalisation of the study, the procedure for the ratification of the eCMR Protocol in the National Assembly of the Republic of Serbia was also initiated, which represents a significant institutional step towards the establishment of the full international legal basis for the application of the electronic consignment note and further confirms the timeliness of the proposed project.

The financial and economic analyses confirmed that the project generates significant benefits through the reduction of administrative costs, increased productivity, the acceleration of logistics processes, the reduction of documentation errors, and the improvement of data quality. In addition to the direct financial effects, the project generates significant social, economic, and institutional benefits reflected in the strengthening of transparency, legal certainty, the digital maturity of the sector, and the efficiency of public administration.

The key results of the study are presented in Table 14.4-1.

Table 14.4-1: Summary of Key Financial and Economic Project Indicators

Indicator	Value
Approved CAPEX	€3,000,000
Approved Annual OPEX	€400,000
Estimated Number of CMR Documents in Serbia	≈ 1.5 million annually
Estimated Number of CMR Documents in the WB6	≈ 3.25 million annually
Financial Net Present Value (FNPV)	€41,077,248
Financial Internal Rate of Return (FIRR)	104.22%
Payback Period	≈ 1.5 years
Estimated Total Annual Economic Benefits (Serbia)	Up to ≈ €16.8 million

Note: The indicators presented relate to the adopted national analysis scenario. The illustrative regional scenario (WB6) is presented within Chapter 10 and Chapter 12 and is not included in the calculated financial and economic project indicators.

The SWOT analysis, stakeholder analysis, and risk analysis demonstrated that the identified weaknesses and risks do not call into question the justification of the project, but rather indicate the need for a carefully planned phased implementation, active change management, continuous user training, and the gradual development of interoperability. The analyses also confirmed that sufficient institutional and market potential exists for the successful introduction of the system, provided that implementation is carried out through a clearly defined model of public-private sector governance and cooperation.

The particular significance of the project is reflected in its regional and European context. By adopting the preferred option — a national eCMR platform based on eFTI-ready architecture with future regional and European interoperability — the Republic of Serbia acquires the opportunity to prepare in a timely manner the institutional and technical framework for integration into the future European eFTI environment. The results of the study indicate that full regional interoperability at the Western Balkans level could generate significant additional benefits through the digitalisation of approximately 3.25 million CMR documents per annum and the further enhancement of cross-border transport flows.

Considering all the aspects analysed, it may be concluded that the expected benefits of the project exceed the identified costs and risks, and that no constraints have been identified that could fundamentally call into question its implementation. On the contrary, the project represents one of the key initiatives for the modernisation of the transport and logistics sector, the enhancement of economic competitiveness, and the improvement of the efficiency of public administration.

In view of the results of the technical, institutional, financial, economic, and social analyses, and the alignment of the project with national and European strategic documents, the initiation of the next project phase is recommended, encompassing the preparation of detailed implementation, the establishment of the institutional framework, and the realisation of the pilot phase as the first step towards the full national application of the eCMR solution. The next phase entails the detailed design of the system, the establishment of the governance model, the securing of financing sources, and the conduct of the pilot implementation prior to the national roll-out of the system.

On the basis of all findings presented in this study, the project of introducing the national eCMR platform is assessed as a justified, sustainable, and strategically significant project of national interest, the implementation of which represents an important step towards the digital transformation of the transport sector of the Republic of Serbia and its gradual integration into the European environment for electronic transport information exchange. Project implementation entails a phased approach, the gradual introduction of the system, and the continuous monitoring of results achieved, in accordance with the recommendations set out in this study.

The particular contribution of this study is reflected in the development of an integrated model for assessing the justification of establishing the national eCMR platform, which combines legal, institutional, technical, financial, and economic analysis, together with the application of an analytical model for assessing the volume of eCMR application in the Republic of Serbia and the Western Balkans region.

Detailed financial and economic calculations, analysis scenarios, and cash flow models are presented in the annexes to the study.

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International Road Transport Union (IRU). *eCMR White Paper – Digitalisation of Road Freight Transport Documentation*. Geneva, IRU.

International Road Transport Union (IRU). *Digital Road Transport and eCMR Deployment Reports*. Geneva, IRU, various editions.

European Commission. *eFTI Architecture and Implementation Framework Documentation*. Brussels, European Commission.

Digital Transport and Logistics Forum (DTLF). *Technical Recommendations for Freight Transport Digitalisation and Interoperability*. Brussels, European Commission.

European Union Agency for Cybersecurity (ENISA). *Cybersecurity Guidelines for Digital Services and Information Systems*. Athens, ENISA.

15.5. Methodological Documents and Guidelines

European Commission. *Guide to Cost-Benefit Analysis of Investment Projects – Economic Appraisal Tool for Cohesion Policy*.

European Commission. *Better Regulation Guidelines and Better Regulation Toolbox*. Brussels.

OECD. *Digital Government and Digital Transformation Frameworks*.

World Bank. *Project Appraisal and Economic Analysis Guidelines*.

International Monetary Fund (IMF). *Public Investment Management Assessment Framework*.

15.6. Statistical and Analytical Sources

For the purposes of the preparation of this study, official statistical and analytical data sources relevant to the transport, logistics, foreign trade, and business process digitalisation sectors were utilised.

Statistical Office of the Republic of Serbia (SORS).

Eurostat Transport Database.

UNECE Statistical Database.

World Bank Open Data.

CEIC Data Database.

Transport Community Market Observatory Reports.

CEFTA Statistical and Trade Facilitation Reports.

Accessed: June 2026.

15.7. Internal Sources and Analytical Materials Used in the Preparation of the Study

*bitsEverywhere d.o.o. *eFTI Connect – Application Description and Functional Specification of the eCMR Platform*. Internal technical documentation, 2025/2026.*

Results of the survey conducted for the purposes of the Feasibility Study for the Introduction of eCMR in the Republic of Serbia and the Western Balkans Countries (N=12).

Analysis of the existing state of transport documentation and business processes in the road transport sector.

Internal analytical models, calculations, and working materials prepared for the purposes of this study:

- *Financial model*
- *Economic model*
- *Financial analysis and cost-benefit analysis*
- *SWOT analysis*
- *Stakeholder analysis*
- *Risk analysis*
- *Sensitivity analysis*
- *Implementation plan*

*Excel financial and economic project model for the *Feasibility Study for the Introduction of eCMR in the Republic of Serbia and the Western Balkans*, version used for the preparation of the financial, economic, and sensitivity analyses. Internal working document of the authors, 2026.*

16. ANNEXES

16.1. SURVEY QUESTIONNAIRE

6/17/26, 9:19 AM

Digitalizacija transportne dokumentacije

Digitalizacija transportne dokumentacije

Trenutno stanje korišćenja CMR dokumenata i spremnost za prelazak na eCMR
Podaci prikupljeni ovom anketom koriste se kao input za studiju „Impact measurement of using eCMR documents instead of paper“ sa ciljem merenja efekata digitalizacije transportne dokumentacije u Republici Srbiji i regionu Zapadnog Balkana. Učešće je dobrovoljno, a podaci se obrađuju agregirano i anonimno za potrebe studije.
Kako popuniti anketu • Označite ☐ kvadratić ispred odgovora koji najbolje opisuje vašu situaciju. • Kod pitanja sa otvorenim odgovorom, upišite odgovor na liniju. • Ukoliko se neko pitanje ne odnosi na vašu firmu, preskočite ga. • Vreme

PODACI O ISPITANIKU

Popunjavanje ovog dela je opciono i koristi se isključivo za potrebe eventualnog kontakta u vezi sa studijom ili pilot projektom.

1. Naziv firme

2. Funkcija/pozicija

3. Ime i prezime (opciono)

4. Email za kontakt (opciono)

5. Veličina kompanije (broj zaposlenih):

- ☐ Manje od 10 zaposlenih
- ☐ 10-49
- ☐ 50-249
- ☐ 250 i više zaposlenih
- ☐ ne želim da odgovorim

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Digitalizacija transportne dokumentacije

A. OSNOVNI PODACI O KORIŠĆENJU CMR DOKUMENTA

6. Da li vaša firma koristi CMR dokumente?

- ☐ Da
- ☐ Ne
- ☐ Povremeno/samo za određene pošiljke

7. Ko u procesu kreira CMR dokument?

- ☐ Pošiljalac (izvoznik/proizvođač)
- ☐ Špediter
- ☐ Prevoznik
- ☐ Other

8. Koliko prosečno vremena trošite na popunjavanje jednog CMR dokumenta?

- ☐ 1-5 minuta
- ☐ 6-15 minuta
- ☐ Preko 15 minuta

9. Koliko CMR dokumenata mesečno izdajete ili koristite?

- ☐ 0-10
- ☐ 11-100
- ☐ 101-1000
- ☐ Preko 1000

10. Glavna tržišta na kojima poslužete:

- ☐ Domaće (Srbija)
- ☐ Region Zapadnog Balkana
- ☐ Evropska unija
- ☐ Treće zemlje (Turska, Rusija, CIS, ostalo)

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Digitalizacija transportne dokumentacije

11. Koliko se vaše vozilo prosečno zadržava na graničnom prelazu?

☐ Manje od 30 minuta

☐ 30 minuta-1 sat

☐ 1-3 sata

☐ 3-6 sati

☐ Preko 6 sati

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Digitalizacija transportne dokumentacije

B. PROFIL FIRME

12. Tip vaše firme:

- ☐ Pošiljalac/izvoznik
- ☐ Špediter
- ☐ Prevoznik
- ☐ Drugo

13. Veličina voznog parka (ako ste prevoznik):

- ☐ 1-5 vozila
- ☐ 6-20 vozila
- ☐ 21-50 vozila
- ☐ Preko 50 vozila
- ☐ Nije primenljivo

14. Tip robe koju prevozite ili šaljete:

- ☐ Opšti tereti
- ☐ ADR (opasne materije)
- ☐ Temperaturno osetljiva roba (hladjenje/grejanje)
- ☐ Farmaceutski proizvodi
- ☐ Prehrambeni proizvodi
- ☐ Drugo

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Digitalizacija transportne dokumentacije

C. TROŠKOVI PAPIRNOG CMR-a

15. Procenjeni mesečni trošak papira, štampe i arhiviranja CMR dokumenata:

- ☐ Do 50 eur
- ☐ 50-200 eur
- ☐ 200-500 eur
- ☐ Preko 500 eur
- ☐ Ne znam/nije praćeno

16. Koliko često se desi da je CMR dokument izgubljen ili oštećen tokom transporta?

- ☐ Nikad
- ☐ Retko (1-2 puta godišnje)
- ☐ Povremeno (mesećno)
- ☐ Često (sedmićno ili češće)

17. Koliko prosećno traje da originalni potpisani CMR dođe nazad do vas nakon isporuke?

- ☐ 1-3 dana
- ☐ 4 -7 dana
- ☐ 1-2 nedelje
- ☐ Preko 2 nedelje
- ☐ Nije primenljivo

18. Da

li ste imali slućajeve odbijanja plaćanja ili spora zbog problema sa CMR dokumentom (nećita k, nepotpun, izgubljen)?

- ☐ Ne, nikad
- ☐ Da, retko (1-2 puta godišnje)
- ☐ Da, povremeno (više puta godišnje)
- ☐ Da, često

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Digitalizacija transportne dokumentacije

D. PROCESI I GREŠKE

19. Koliko često se javljaju greške pri popunjavanju CMR-a (pogrešni podaci, nedostajuća polja)?

- ☐ Veoma retko (manje od 1% pošiljki)
- ☐ Povremeno (1-5% pošiljki)
- ☐ Često (5-15% pošiljki)
- ☐ Veoma često (preko 15% pošiljki)

20. Ko najčešće ispravlja greške na CMR-u?

- ☐ Vozač na licu mesta
- ☐ Dispečer/koordinator prevoza
- ☐ Špediter
- ☐ Niko-dokument ide kakav jeste
- ☐ Drugo

21. Koliko vremena dnevno vaš administrativni radnik troši na obradu CMR dokumenata (unos, a rhiviranje, slanje)?

- ☐ Manje od 1 sata
- ☐ 1 - 3 sata
- ☐ 3 - 6 sati
- ☐ Preko 6 sati

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Digitalizacija transportne dokumentacije

E. GRANIČNI PRELAZI

22. Koje granične prelaze najčešće koristite?

23. Šta je, prema vašem iskustvu, glavni uzrok zadržavanja na granici?

- ☐ Carinske procedure
- ☐ Provera dokumenata
- ☐ Redovi/gužva
- ☐ Fitosanitarna/veterinarska kontrola
- ☐ Inspekcija robe
- ☐ Drugo

24. Koliko često carinski službenik traži dodatna pojašnjenja ili dokumenta zbog CMR-a?

- ☐ Nikad
- ☐ Retko
- ☐ Često
- ☐ Skoro uvek

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Digitalizacija transportne dokumentacije

F. DIGITALIZACIJA -TRENUTNO STANJE I SPREMNOST

25. Da li trenutno koristite digitalni sistem za upravljanje transportnom dokumentacijom (TMS, ERP modul, custom rešenje)?

- ☐ Da
- ☐ Ne
- ☐ Delimično (npr.samo internu evidenciju)
- ☐ Ako da, koji sistem koristite

26. Da li ste čuli za eCMR (elektronski tovarni list) ?

- ☐ Da, dobro sam upoznat/a
- ☐ Da, čuo/la sam za njega, ali ne znam detalja
- ☐ Ne, prvi put čujem

27. Da li ste čuli za eFTI regulativu (EU 2020/1056)?

- ☐ Da, dobro sam upoznat/a
- ☐ Da, čuo/la sam za njega, ali ne znam detalja
- ☐ Ne, prvi put čujem

28. Koliko ste spremni da pređete na eCMR u narednih 12 meseci?

- ☐ Veoma spreman/spremna-aktivno tražimo rešenje
- ☐ Spreman/spremna uz odgovarajuću podršku
- ☐ Neodlučan/neodlučna-potebno mi je više informacija
- ☐ Nisam spreman/spremna u narednih 12 meseci

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Digitalizacija transportne dokumentacije

29. Šta su za vas glavne prepreke za uvođenje eCMR-a?

- ☐ Cena rešenja
- ☐ Tehnička kompleksnost/nedostatak IT podrške
- ☐ Partneri (pošiljaoci, prevoznici, carina) ne koriste eCMR
- ☐ Pravna nesigurnost/nedovoljno definisana regulativa
- ☐ Nedostatak znanja i informacija
- ☐ Otpor zaposlenih na promene
- ☐ Drugo

30. Koji model naplate eCMR rešenja bi vašoj firmi više odgovarao?

- ☐ Naplata po izdatom dokumentu (npr. 0,75 € po CMR-u) – plaćate samo onoliko koliko koristite
- ☐ Fiksna mesečna pretplata (npr. 200 € mesečno, neograničen broj dokumenata) – predvidiv mesečni trošak
- ☐ Kombinovani model (npr. 50 € mesečno za prvih 100 dokumenata + 0,50 € po svakom dodatnom)
- ☐ Nemam jasno mišljenje – zavisi od konkretne ponude

31. U kojoj meri je ova radionica / podrška projekta uticala na odluku vaše kompanije da razmotri, testira ili usvoji eCMR?Question

- ☐ To je bio glavni razlog zbog kojeg smo razmotrili ili usvojili eCMR
- ☐ Značajno je uticala na našu odluku
- ☐ Donekle je uticala na našu odluku
- ☐ Imala je mali uticaj
- ☐ Nije imala uticaja
- ☐ Nismo razmatrali niti usvojili eCMR
- ☐ Ne znam / ne mogu da procenim

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Digitalizacija transportne dokumentacije

32. Da li bi vaša kompanija razmotrila, testirala ili usvojila eCMR i bez ove radionice / podrške projekta?

- ☐ Ne, verovatno to ne bismo uradili
- ☐ Da, ali u kasnijoj fazi
- ☐ Da, ali sa manje informacija ili sigurnosti
- ☐ Da, na isti način i u isto vreme
- ☐ Nismo razmatrali, testirali niti usvojili eCMR
- ☐ Ne znam / ne mogu da procenim

33. Koja vrsta podrške je bila najkorisnija za vašu kompaniju? Moguće je više odgovora

- ☐ Informacije o eCMR-u i eFTI regulativi
- ☐ Demonstracija eCMR rešenja
- ☐ Objašnjenje pravnih ili regulatornih zahteva
- ☐ Objašnjenje operativnih koristi i ušteda troškova
- ☐ Tehničke smernice za implementaciju
- ☐ Mogućnost učešća u pilot projektu
- ☐ Kontakt sa pružiocima usluga ili relevantnim akterima
- ☐ Razmena iskustava sa drugim kompanijama
- ☐ Nijedan vid podrške nije bio koristan

34. Da li je vaša kompanija uložila, ili planira da uloži, u eCMR ili digitalnu transportnu dokumentaciju kao rezultat ove radionice?

- ☐ Da, ulaganje je već realizovano
- ☐ Da, ulaganje je planirano u narednih 6 meseci
- ☐ Da, ulaganje je planirano u narednih 12 meseci
- ☐ Nije uloženo niti planirano ulaganje
- ☐ Prerano je za procenu
- ☐ Ne znam

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Digitalizacija transportne dokumentacije

35. Ako da, koja vrsta ulaganja? Moguće je više odgovora.

- ☐ Pretplata na softver ili licenca
- ☐ Integracija sistema sa TMS / ERP / drugim internim sistemima
- ☐ Obuka zaposlenih
- ☐ IT oprema ili uređaji
- ☐ Vreme internog osoblja za implementaciju
- ☐ Konsultantska ili tehnička podrška
- ☐ Pravna podrška / podrška za usklađenost
- ☐ Other

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Digitalizacija transportne dokumentacije

G. OČEKIVANI BENEFITI I PILOT PROJEKAT

36. Rangirajte očekivane benefite eCMR-a po važnosti (ispomerajte po važnosti od najvažnijeg do najmanje važno)

Brže plaćanje (kraći cash-to-cash ciklus)
Manje grešaka u dokumentaciji
Ušteda vremena na popunjavanju i obradi
Manji troškovi papira, štampe i arhiviranja
Bolja kontrola i transparentnost pošiljki

37. Da li biste bili spremni da učestvujete u pilot projektu eCMR implemetacije?

- ☐ Da, zainteresovani smo
- ☐ Možda, pošaljite nam više informacija
- ☐ Ne, nismo zainteresovani u ovom trenutku

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Digitalizacija transportne dokumentacije

HVALA NA UČEŠĆU

Vaši odgovori biće obrađeni anonimno i u agregiranoj formi, kao deo studije „Impact measurement of using eCMR documents instead of paper“. Ukoliko želite da dobijete rezultate studije po njenom završetku, ostavite svoj email u zaglavlju ankete.

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16.2. SURVEY RESEARCH AND STAKEHOLDER ANALYSIS

16.2.1. Question 7 – Who creates the CMR document in the process?

Original Response	Number	%
Consignor (Exporter/Manufacturer); Freight Forwarder	2	16.7
Consignor (Exporter/Manufacturer)	3	25.0
Freight Forwarder	4	33.3
Consignor (Exporter/Manufacturer); Freight Forwarder; Transport Operator	1	8.3
Consignor (Exporter/Manufacturer); Transport Operator	2	16.7

Table 16.2-1: Original responses to the survey question: Who creates the CMR document in the process?

Total: 12 respondents (100%)

Analytical Processing of Responses

Participant	Number of Mentions	Percentage of Respondents (%)
Consignor (Exporter/Manufacturer)	8	66.7
Freight Forwarder	7	58.3
Transport Operator	3	25.0

Table 16.2-2: Frequency of individual participants in the creation of the CMR document

Analysis

The results indicate that the process of creating the CMR document is decentralised and involves multiple actors. The consignor most frequently appears as the primary actor in this activity (66.7% of respondents), whilst the role of the freight forwarder is present in 58.3% of cases. Carriers are directly involved in document creation in 25.0% of cases.

These results indicate that the future eCMR system must support a multi-actor working model, enabling different participants to create, supplement, and verify transport documentation in accordance with their respective roles in the transport chain.

16.2.2. Question 8 – How much time on average do you spend completing a single CMR document?

B. Table B.1-2. Original Responses

Original Response	Number	%
1–5 minutes	6	50.0
6–15 minutes	5	41.7
More than 15 minutes	1	8.3

Table 16.2-3: Original responses to the survey question: How much time on average do you spend completing a single CMR document?*

Total: 12 respondents (100%)

Analytical Processing of Question 8

Completion Time	Number	%
1–5 minutes	6	50.0
6–15 minutes	5	41.7
More than 15 minutes	1	8.3

Table 16.2-4: Time required to complete a single CMR document

Analysis

Half of the respondents (50.0%) indicated that they spend between one and five minutes completing a single CMR document, whilst 41.7% spend between six and fifteen minutes. Only one respondent (8.3%) indicated that completing the document requires more than fifteen minutes.

The results suggest that the act of completing the document itself does not represent the greatest administrative burden. When considered in conjunction with the results of questions concerning archiving, corrections, document exchange, and waiting for the return of the original CMR, it may be concluded that the largest share of administrative costs arises throughout the entire lifecycle of the document, rather than at the point of its initial completion.

This finding is significant for the cost-benefit analysis, as it indicates that the benefits of the eCMR system are not limited to faster document creation, but relate primarily to the digitalisation of the complete process of exchange, verification, archiving, and tracking of transport documentation.

16.2.3. Question 9 – How many CMR documents do you issue or use per month?

C. Table B.1-3. Original Responses

Original Response	Number	%
0–10	3	25.0
11–100	2	16.7
101–1,000	7	58.3

Table 16.2-5: Original responses to the survey question: How many CMR documents do you issue or use per month?

Total: 12 respondents (100%)

Analytical Processing of Question 9

Number of Documents per Month	Number	%
0–10	3	25.0
11–100	2	16.7
101–1,000	7	58.3

Table 16.2-6: Volume of CMR documentation usage

Analysis

More than half of the respondents (58.3%) indicated that they issue or use between 101 and 1,000 CMR documents per month. A smaller number of respondents use between 11 and 100 documents per month (16.7%), whilst 25.0% use up to 10 documents per month.

The results indicate that the sample is dominated by companies with a significant volume of transport activity and regular use of transport documentation. This increases the relevance of the findings for the analysis of the potential benefits of introducing the eCMR system, as the respondents are directly exposed to the administrative and operational effects of CMR documentation use.

From an economic analysis perspective, the high volume of documents used by the majority of respondents suggests that the effects of digitalisation are likely to be most pronounced amongst medium and large users of transport documentation, where administrative savings are realised across a high number of transactions.

16.2.4. Question 10 – Main markets in which you operate

Table 16.2-7: Original responses to the survey question: Main markets in which you operate

Original Response	Number	%
European Union	6	50.0
Domestic (Serbia); European Union	3	25.0
Domestic (Serbia); Western Balkans Region; European Union	1	8.3
Domestic (Serbia); Western Balkans Region; European Union; Third Countries (Türkiye, Russia, CIS, Others)	1	8.3
European Union; Western Balkans Region	1	8.3

Total: 12 respondents (100%)

Analytical Processing of Question 10

D. Table B.2-4. Representation of Individual Markets

Table 16.2-8: Representation of individual markets

Market	Number of Mentions	% of Respondents
European Union	12	100.0
Domestic (Serbia)	5	41.7
Western Balkans Region	3	25.0
Third Countries (Türkiye, Russia, CIS, Others)	1	8.3

Analysis

All respondents (100.0%) operate in the European Union market, confirming that the sample is strongly oriented towards international road transport and cross-border logistics flows. In addition to the EU market, 41.7% of respondents also operate in the domestic market of the Republic of Serbia, whilst a quarter of respondents (25.0%) are active in the markets of the Western Balkans region.

Only one respondent (8.3%) indicated operations with third countries outside the region and the European Union.

These results are of particular significance for the feasibility study, as they demonstrate that the respondents are directly exposed to international transport flows in which the application of eCMR and the future eFTI regulation will have the greatest effect. The high representation of the European Union market further confirms the relevance of aligning the national eCMR solution with European interoperability requirements and digital transport data exchange standards.

16.2.5. Question 11 – How long on average does your vehicle wait at the border crossing?

E. Table B.1-5. Original Responses

Table 16.2-9: Original responses to the survey question: How long on average does your vehicle wait at the border crossing

Original Response	Number	%
1–3 hours	6	50.0
3–6 hours	3	25.0
More than 6 hours	1	8.3
1–3 hours; More than 6 hours	1	8.3
3–6 hours; More than 6 hours	1	8.3

Total: 12 respondents (100%)

Analytical Processing of Question 11

Table 16.2-10: Frequency of individual time categories

Waiting Time	Number of Mentions	% of Respondents
1–3 hours	7	58.3
3–6 hours	4	33.3
More than 6 hours	3	25.0

Note: Some respondents indicated more than one time category, reflecting varying experiences depending on the border crossing, direction of travel, or type of goods. Accordingly, the sum of percentages exceeds 100%.

Analysis

The largest number of respondents (58.3%) indicated that vehicles wait at border crossings for between one and three hours. At the same time, one third of respondents (33.3%) have experience of waiting times of between three and six hours, whilst a quarter of respondents (25.0%) indicated that in certain cases waiting times extend to more than six hours.

The results indicate that delays at borders remain a significant operational challenge for the transport sector. Whilst eCMR alone cannot eliminate all causes of delay, the digitalisation of transport documentation can contribute to reducing the time required for document verification, information exchange, and the execution of control procedures.

This finding is relevant to the analysis of project benefits, particularly in the area of reducing administrative delays and increasing the efficiency of cross-border transport.

16.2.6. Question 12 – Type of your company

Table 16.2-11: Original responses to the survey question: Type of your company

Original Response	Number	%
Transport Operator	5	41.7
Consignor/Exporter	2	16.7
Freight Forwarder	1	8.3
Freight Forwarder; Transport Operator	4	33.3

Total: 12 respondents (100%)

Analytical Processing of Question 12

Table 16.2-12: Structure of respondents by activity

Company Type	Number of Mentions	% of Respondents
Transport Operator	9	75.0
Freight Forwarder	5	41.7
Consignor/Exporter	2	16.7

Note: Some respondents carry out more than one activity (e.g. freight forwarder and carrier), and accordingly the sum of percentages exceeds 100%.

Analysis

The sample structure indicates that transport companies are dominant among the respondents. Three quarters of respondents (75.0%) are engaged in the carriage of goods, whilst 41.7% are simultaneously active in freight forwarding. A smaller proportion of the sample (16.7%) comprises consignors and exporters.

This sample structure is consistent with the objective of the research, as carriers and freight forwarders are the most significant users of CMR documentation and will be most directly affected by the introduction of the eCMR system.

The results indicate that the findings primarily reflect the views and experiences of operational participants in the transport chain, which further increases the relevance of the survey for assessing the effects of the digitalisation of transport documentation.

16.2.7. Question 13 – Fleet size (if you are a carrier)

F. Table B.1-7. Original Responses

Table 16.2-13: Original responses to the survey question: Fleet size (if you are a carrier)

Original Response	Number	%
1–5 vehicles	2	16.7
6–20 vehicles	4	33.3
More than 50 vehicles	4	33.3
Not Applicable	2	16.7

Total: 12 respondents (100%)

Analytical Processing of Question 13

Table 16.2-14: Structure of respondents by fleet size

Fleet Size	Number	%
1–5 vehicles	2	16.7
6–20 vehicles	4	33.3
More than 50 vehicles	4	33.3
Not Applicable	2	16.7

Analysis

Among the respondents engaged in transport activities, companies of varying sizes are represented. The most prevalent are companies with a fleet of between 6 and 20 vehicles (33.3%), as well as companies with more than 50 vehicles (33.3%). Smaller carriers with up to five vehicles account for 16.7% of the sample.

Two respondents (16.7%) indicated "Not applicable", which is consistent with the preceding question in which they identified themselves as consignors/exporters without their own fleet.

The results demonstrate that both small and large transport operators are represented in the survey, which increases the representativeness of the findings with regard to the potential effects of introducing the eCMR system. Of particular significance is the fact that two thirds of respondents (66.6%) belong to the categories of medium and large carriers (6–20 and over 50 vehicles), among whom the greatest operational and administrative effects of transport documentation digitalisation are anticipated.

16.2.8. Question 14 – Type of goods you transport or consign

Table 16.2-15: Original responses to the survey question: Type of goods you transport or consign

Original Response	Number	%
General Cargo	7	58.3
General Cargo; ADR (Dangerous Goods)	2	16.7
Food Products	1	8.3
Other	1	8.3
General Cargo; Temperature-Controlled Goods (Refrigerated/Heated); Food Products	1	8.3

Total: 12 respondents (100%)

Analytical Processing of Question 14

Table 16.2-16: Representation of individual goods categories

Cargo Category	Number of Mentions	% of Respondents
General Cargo	10	83.3
ADR (Dangerous Goods)	2	16.7
Food Products	2	16.7
Temperature-Controlled Goods	1	8.3
Other	1	8.3

Note: Respondents were able to select more than one goods category, and accordingly the sum of percentages exceeds 100%.

Analysis

The results indicate that companies transporting or consigning general cargo are dominant within the sample structure, as indicated by 83.3% of respondents. A smaller number of respondents operate with specialised goods categories, including dangerous goods (ADR), food products, and temperature-sensitive goods.

This structure is to be expected given the dominance of conventional road freight transport in the region. At the same time, the presence of specialised goods categories indicates that the future eCMR solution must support various types of transport operations and be compatible with the additional regulatory and operational requirements applicable to ADR transport, cold chain supply, and the carriage of food products.

The findings confirm that the potential users of the eCMR system encompass a wide range of transport activities, further underscoring the need for an interoperable and flexible digital solution.

16.2.9. Question 15 – Estimated monthly cost of paper, printing, and archiving of CMR documents

Table 16.2-17: Original responses to the survey question: Estimated monthly cost of paper, printing, and archiving of CMR documents

Original Response	Number	%
Up to EUR 50	2	16.7
EUR 50–200	2	16.7
EUR 200–500	5	41.7
Don't Know / Not Monitored	3	25.0

Total: 12 respondents (100%)

Analytical Processing of Question 15

Table 16.2-18: Estimated monthly costs of paper-based documentation

Cost Category	Number	%
Up to EUR 50	2	16.7
EUR 50–200	2	16.7
EUR 200–500	5	41.7
Don't Know / Not Monitored	3	25.0

The largest number of respondents (41.7%) estimate that they spend between EUR 200 and EUR 500 per month on paper, printing, and archiving of CMR documentation. A further 16.7% of respondents each indicated costs of up to EUR 50 and between EUR 50 and EUR 200 per month respectively.

Of particular significance is the finding that a quarter of respondents (25.0%) do not track or are unaware of the level of these costs. This finding points to limited visibility of administrative costs within a portion of the transport sector, which is a common occurrence in paper-based processes where costs are distributed across multiple organisational units.

The results confirm the existence of direct material costs associated with paper-based documentation. However, for the purposes of the cost-benefit analysis, it is particularly important to emphasise that the costs of paper, printing, and archiving represent only one component of the total costs, whilst the more significant share of the economic benefits of eCMR derives from time savings, faster document processing, reduction of errors, and more efficient management of transport processes.

This finding constitutes one of the direct input parameters for the economic and financial analysis of the project.

16.2.10. Question 16 – How often does it occur that a CMR document is lost or damaged during transport?

Table 16.2-19: Original responses to the survey question: How often does it occur that a CMR document is lost or damaged during transport?

Original Response	Number	%
Never	2	16.7
Rarely (1–2 times per year)	8	66.7
Occasionally (Monthly)	2	16.7

Total: 12 respondents (100%)

Analytical Processing of Question 16

Table 16.2-20: Frequency of loss or damage to CMR documentation

Frequency	Number	%
Never	2	16.7
Rarely (1–2 times per year)	8	66.7
Occasionally (Monthly)	2	16.7

Analysis

The largest number of respondents (66.7%) indicated that the loss or damage of CMR documentation occurs rarely, i.e. one to two times per year. At the same time, 16.7% of respondents stated that such incidents occur occasionally, on a monthly basis, whilst the same percentage indicated that they have never experienced such an occurrence.

The results demonstrate that, whilst the loss or damage of documentation is not a predominant problem, it nonetheless represents a real operational risk within the paper-based system of transport documentation management. The fact that as many as 83.3% of respondents have had at least some experience of document loss or damage indicates that there is scope for improving the reliability and accessibility of transport documents.

The introduction of the eCMR system enables the elimination of the risk of physical document loss, immediate availability of data to authorised participants in the transport process, and reliable electronic archiving. This finding constitutes one of the relevant input parameters for the risk analysis and the assessment of the intangible benefits of the project.

16.2.11. Question 17 – How long on average does it take for the original signed CMR to be returned to you after delivery?

Table 16.2-21: Original responses to the survey question: How long on average does it take for the original signed CMR to be returned to you after delivery?

Turnaround Time	Number	% of Valid Responses
1–3 days	1	9.1
4–7 days	3	27.3
1–2 weeks	7	63.6

Valid responses: 11 | Missing responses: 1

Analytical Processing of Question 17

Table 16.2-22: Time for the return of the original signed CMR document*

Turnaround Time	Number	% of Valid Responses
1–3 days	1	9.1
4–7 days	3	27.3
1–2 weeks	7	63.6

Analysis

The largest number of respondents (63.6%) indicated that between one and two weeks are required for the original signed CMR document to be returned following the delivery of goods. A further 27.3% of respondents indicated a period of four to seven days, whilst only one respondent (9.1%) indicated that the document is received within one to three days.

The results point to a significant time delay in the circulation of paper-based documentation. Given that the original signed CMR is frequently used as proof of service rendered and as the basis for invoicing and payment collection, delays in its return can adversely affect the speed of administrative processing and cash flows within transport companies.

The introduction of the eCMR system enables the near-instantaneous availability of the confirmed transport document to all authorised participants in the process, thereby eliminating the need for the physical transfer of the original. This finding represents one of the most significant arguments in the economic analysis of the benefits of transport documentation digitalisation.

16.2.12. Question 18 – Have you experienced cases of payment refusal or disputes due to problems with the CMR document (illegible, incomplete, lost)?

Table 16.2-23: Original responses to the survey question: Have you experienced cases of payment refusal or disputes due to problems with the CMR document (illegible, incomplete, lost)?

Original Response	Number	%
No, Never	8	66.7
Yes, Rarely (1–2 times per year)	4	33.3

Total: 12 respondents (100%)

Analytical Processing of Question 18

Table 16.2-24: Frequency of disputes or payment refusals due to problems with CMR documentation

Original Response	Number	%
No, Never	8	66.7
Yes, Rarely (1–2 times per year)	4	33.3

Analysis

Two thirds of respondents (66.7%) indicated that they have never experienced cases of payment refusal or disputes resulting from problems with CMR documentation. Nevertheless, one third of respondents (33.3%) indicated that such cases occur rarely, i.e. one to two times per year.

Whilst the frequency is not high, the results demonstrate that paper-based documentation can represent a source of business risk and potential financial consequences. Disputes arising from illegible, incomplete, or lost documents can lead to delays in payment collection, additional administrative costs, and damage to relationships between participants in the transport chain.

The introduction of the eCMR system contributes to reducing these risks through standardised electronic data exchange, validation of the accuracy of entered information, and permanent storage of documentation in digital form. This finding constitutes a relevant input parameter for the risk analysis and the assessment of the indirect economic benefits of the project.

16.2.13. Question 19 – How often do errors occur when completing the CMR (incorrect data, missing fields)?

Table 16.2-25: Original responses to the survey question: How often do errors occur when completing the CMR (incorrect data, missing fields)?

Original Response	Number	%
Very Rarely (Less than 1% of Shipments)	5	41.7
Occasionally (1–5% of Shipments)	5	41.7
Frequently (5–15% of Shipments)	2	16.7

Total: 12 respondents (100%)

Analytical Processing of Question 19

Table 16.2-26: Frequency of errors in completing CMR documentation

Original Response	Number	%
Very Rarely (Less than 1% of Shipments)	5	41.7
Occasionally (1–5% of Shipments)	5	41.7
Frequently (5–15% of Shipments)	2	16.7

Analysis

The results indicate that errors in completing CMR documentation are present among the majority of respondents. Only 41.7% of respondents indicated that errors occur very rarely, i.e. in fewer than 1% of consignments. At the same time, the same proportion of respondents (41.7%) indicated that errors occur occasionally, in 1–5% of consignments, whilst 16.7% of respondents indicated that errors are present in 5–15% of consignments.

Considered together, as many as 58.4% of respondents have experience of errors occurring in more than 1% of transport documents. This indicates that manual document completion continues to represent a significant source of operational inefficiencies and administrative risks.

The introduction of the eCMR system enables the application of pre-defined templates, automatic retrieval of data from existing information systems, and validation of the accuracy of entered data, thereby significantly reducing the likelihood of errors. This finding represents one of the most significant arguments for the introduction of electronic transport documentation and will be used directly in the risk analysis and the assessment of the economic benefits of the project.

16.2.14. Question 20 – Who most commonly corrects errors on the CMR?

Table 16.2-27: Original responses to the survey question: Who most commonly corrects errors on the CMR?

Original Response	Number	%
Driver On Site	5	41.7
Driver On Site; No One – The Document Is Processed as Issued	2	16.7
Driver On Site; Freight Forwarder	1	8.3
Freight Forwarder	4	33.3

Total: 12 respondents (100%)

Analytical Processing of Question 20

Table 16.2-28: Frequency of participation in the correction of errors on CMR documentation

Participant	Number of Mentions	% of Respondents
Driver On Site	8	66.7
Freight Forwarder	5	41.7
No One – The Document Is Processed as Issued	2	16.7

Note: Respondents were able to indicate more than one participant in the error correction process.

Analysis

The results indicate that the correction of errors in CMR documentation most commonly takes place during transport. In two thirds of cases (66.7%), errors are most commonly corrected by the driver on-site, whilst in 41.7% of cases the freight forwarder is also involved in the process.

Of particular significance is the finding that 16.7% of respondents indicated that in certain cases errors are not corrected at all, and the documentation proceeds through the process with existing deficiencies. This finding points to potential risks with regard to data quality, subsequent disputes, and administrative complications.

The results confirm that the existing paper-based system requires significant engagement of human resources for the correction and reconciliation of documentation. The introduction of the eCMR system enables the application of validation mechanisms at the point of data entry, automatic validation of mandatory fields, and a reduction in the need for subsequent manual interventions.

This finding directly supports the anticipated project benefits in the area of error reduction, improvement of data quality, and enhancement of the operational efficiency of transport processes.

16.2.15. Question 21 – How much time per day does your administrative staff spend processing CMR documents (data entry, archiving, sending)?

Table 16.2-29: Original responses to the survey question: How much time per day does your administrative staff spend processing CMR documents (data entry, archiving, sending)?

Original Response	Number	%
Less than 1 hour	5	41.7
1–3 hours	5	41.7
3–6 hours	2	16.7

Total: 12 respondents (100%)

Analytical Processing of Question 21

Table 16.2-30: Daily time spent on CMR documentation processing

Original Response	Number	%
Less than 1 hour	5	41.7
1–3 hours	5	41.7
3–6 hours	2	16.7

Analysis

The results indicate that the administrative processing of CMR documentation represents a significant daily burden for transport companies. A further 41.7% of respondents each indicated that their administrative staff spend less than one hour and between one and three hours per day respectively on activities such as data entry, sending, and archiving of documentation. An additional 16.7% of respondents indicated that between three and six hours per day are required for these activities.

Considered cumulatively, as many as 58.4% of respondents spend at least one hour per day on the administrative processing of CMR documentation, whilst 16.7% spend more than three hours per day. These results confirm the existence of a significant administrative burden associated with paper-based processes.

The introduction of the eCMR system enables the automation of a large proportion of administrative activities, including the creation, exchange, retrieval, and archiving of documentation. Accordingly, this finding represents one of the most important pieces of local evidence for the economic justification of the project and will be used directly in the cost-benefit analysis.

Key Finding for the Study

- 58.4% of respondents spend at least one hour per day processing CMR documentation.
- 16.7% of respondents spend between three and six hours per day.
- The administrative burden represents one of the most significant sources of potential benefits from the implementation of the eCMR system.

16.2.16. Question 23 – What, in your experience, is the main cause of delays at the border?

Table 16.2-31: Original responses to the survey question: What, in your experience, is the main cause of delays at the border?

Original Response	Number	%
Customs Procedures; Phytosanitary/Veterinary Inspection	1	8.3
Customs Procedures; Document Verification; Queues/Congestion; Phytosanitary/Veterinary Inspection	2	16.7
Phytosanitary/Veterinary Inspection	1	8.3
Customs Procedures	1	8.3
Customs Procedures; Document Verification; Queues/Congestion	1	8.3
Customs Procedures; Queues/Congestion	3	25.0
Customs Procedures; Queues/Congestion; Other	1	8.3
Customs Procedures; Queues/Congestion; Phytosanitary/Veterinary Inspection	1	8.3
Queues/Congestion; Customs Procedures	1	8.3
Customs Procedures; Document Verification; Phytosanitary/Veterinary Inspection	1	8.3

Total: 12 respondents (100%)

Analytical Processing of Question 23

Table 16.2-32: Frequency of individual causes of delays at border crossings

Cause	Number of Mentions	% of Respondents
Customs Procedures	11	91.7
Queues/Congestion	8	66.7
Phytosanitary/Veterinary Inspection	5	41.7
Document Verification	4	33.3
Other	1	8.3

Note: Respondents were able to indicate more than one cause simultaneously, and accordingly the sum of percentages exceeds 100%.

Analysis

The results indicate that customs procedures are by far the most significant cause of delays at border crossings, as indicated by 91.7% of respondents. In addition, two thirds of respondents (66.7%) identified queues and congestion as an important factor contributing to delays, whilst 41.7% of respondents highlighted phytosanitary and veterinary inspections.

Document verification was identified as a cause of delay by one third of respondents (33.3%). Whilst it is not the dominant factor relative to customs procedures and physical inspections, this finding is of particular importance for the analysis of the potential benefits of the eCMR system, as it represents a segment of the process upon which digitalisation can have a direct impact.

The results confirm that eCMR alone cannot eliminate all causes of delays at border crossings, but can contribute to reducing the time required for document verification and data exchange, increasing the availability of data to competent authorities, and enabling more efficient execution of control procedures.

Key Findings for the Study

- 91.7% of respondents cite customs procedures as a cause of delay;
- 66.7% of respondents cite queues and congestion;
- 41.7% of respondents cite phytosanitary and veterinary inspections;
- 33.3% of respondents cite document verification.

These results confirm that the digitalisation of transport documentation represents an important, but not the sole, prerequisite for improving the efficiency of cross-border transport.

16.2.17. Question 25 – Do you currently use a digital system for transport documentation management (TMS, ERP module, custom solution)?

Table 16.2-33: Original responses to the survey question: Do you currently use a digital system for transport documentation management (TMS, ERP module, custom solution)?

Original Response	Number	%
Yes	1	8.3
Partially (e.g. Internal Records Only)	4	33.3
No	7	58.3

Total: 12 respondents (100%)

Analytical Processing of Question 25

Table 16.2-34: Level of digitalisation of transport documentation management

Response	Number	%
Yes	1	8.3
Partially	4	33.3
No	7	58.3

Analysis

The results indicate that the level of digitalisation of transport documentation management remains relatively low. More than half of respondents (58.3%) indicated that they do not use any digital system for transport documentation management, whilst 33.3% use partial solutions, primarily for internal records and business monitoring.

Only one respondent (8.3%) indicated that they use a fully digital solution for transport documentation management.

These results suggest that paper-based or partially digitalised processes continue to dominate the transport sector. At the same time, the fact that one third of respondents already use certain digital tools indicates that a foundation exists for the gradual integration of eCMR solutions into existing information systems.

Key Findings for the Study

- 58.3% of respondents do not use digital systems for transport documentation management;
- 33.3% use partially digitalised processes;
- only 8.3% use a fully digital solution.

This finding confirms that there is significant scope for the digital transformation of the sector and represents one of the key arguments for the introduction of eCMR in the Republic of Serbia and the Western Balkans countries.

16.2.18. Question 26 – Have you heard of eCMR (electronic consignment note)?

G. Table B.1-18. Original Responses

Table 16.2-35: Original responses to the survey question: Have you heard of eCMR (electronic consignment note)?

Original Response	Number	%
No, This Is the First Time I Have Heard of It	3	25.0
Yes, I Have Heard of It, but I Am Not Familiar with the Details	7	58.3
Yes, I Am Well Familiar with It	2	16.7

Total: 12 respondents (100%)

Analytical Processing of Question 26

H. Table B.2-18. Level of Awareness of the eCMR Concept

Table 16.2-36: Level of awareness of the eCMR concept

Original Response	Number	%
No, This Is the First Time I Have Heard of It	3	25.0
Yes, I Have Heard of It, but I Am Not Familiar with the Details	7	58.3
Yes, I Am Well Familiar with It	2	16.7

Analysis

The results indicate that awareness of the eCMR concept is present, but that the level of substantive knowledge remains limited. The largest number of respondents (58.3%) indicated that they have heard of eCMR but are not familiar with the details of its application and functioning. A quarter of respondents (25.0%) heard of eCMR for the first time during the survey, whilst only 16.7% indicated that they are well acquainted with the concept.

Considered together, as many as 83.3% of respondents do not possess a sufficient level of practical knowledge of eCMR, indicating the need for information and educational activities prior to the wider implementation of the system.

The results are consistent with the current level of eCMR application in the Western Balkans region and confirm that one of the key prerequisites for successful implementation is the delivery of information, training, and awareness-raising programmes among users.

Key Findings for the Study

- Only 16.7% of respondents are well acquainted with eCMR.
- 58.3% have heard of eCMR but are not familiar with the details.
- 25.0% of respondents had never previously heard of eCMR.

This finding represents one of the most important arguments for planning change management, communication, and training activities within the framework of the eCMR system implementation.

16.2.19. Question 27 – Have you heard of the eFTI Regulation (EU 2020/1056)?

Table 16.2-37: Original responses to the survey question: Have you heard of the eFTI Regulation (EU 2020/1056)?

Original Response	Number	%
No, This Is the First Time I Have Heard of It	7	58.3
Yes, I Have Heard of It, but I Am Not Familiar with the Details	5	41.7

Total: 12 respondents (100%)

Analytical Processing of Question 27

Table 16.2-38: Level of awareness of the eFTI Regulation

Original Response	Number	%
No, This Is the First Time I Have Heard of It	7	58.3
Yes, I Have Heard of It, but I Am Not Familiar with the Details	5	41.7

Analysis

The results indicate a very low level of awareness of the eFTI Regulation (EU 2020/1056) among respondents. More than half of respondents (58.3%) indicated that they are hearing of eFTI for the first time, whilst 41.7% have heard of the Regulation but are not familiar with its specific requirements and implications.

No respondent indicated that they are well acquainted with the eFTI Regulation, pointing to a significant gap between European regulatory initiatives and the level of awareness among the economic operators that will be subject to their application.

This finding is of particular importance given that the eFTI Regulation is one of the key drivers of transport documentation digitalisation in the European Union. Its application will progressively affect transport flows involving the Republic of Serbia and the Western Balkans countries, particularly in the context of international road transport and integration with European logistics chains.

Key Findings for the Study

- 58.3% of respondents have never heard of the eFTI Regulation.
- 41.7% have heard of the Regulation but are not familiar with the details.
- No respondent indicated that they are well acquainted with the eFTI Regulation.

These results indicate the need for systematic information dissemination and education of economic operators regarding the European regulatory changes that will, in the period ahead, shape the digitalisation of transport documentation.

16.2.20. Question 28 – How prepared are you to transition to eCMR within the next 12 months?

I. Table B.1-20. Original Responses

Table 16.2-39: Original responses to the survey question: How prepared are you to transition to eCMR within the next 12 months?

Original Response	Number	%
Ready with Appropriate Support	2	16.7
Undecided – I Need More Information	6	50.0
Not Ready Within the Next 12 Months	4	33.3

Total: 12 respondents (100%)

Analytical Processing of Question 28

Table 16.2-40: Readiness to transition to eCMR

Original Response	Number	%
Ready with Appropriate Support	2	16.7
Undecided – I Need More Information	6	50.0
Not Ready Within the Next 12 Months	4	33.3

Analysis

The results indicate that immediate readiness to transition to eCMR remains limited, but that there is significant potential for system adoption provided that adequate information and support are made available.

Half of respondents (50.0%) indicated that they are undecided and require more information about the eCMR system, whilst 16.7% indicated that they are ready to transition to eCMR provided that appropriate technical, organisational, and institutional support is made available. At the same time, one third of respondents (33.3%) consider that they are not ready to transition within the next 12 months.

Considered together, as many as 66.7% of respondents do not reject the possibility of introducing eCMR, but condition their decision on additional information, training, technical support, or a clearer understanding of the benefits of the system.

Key Findings for the Study

- Only 16.7% of respondents are ready to transition to eCMR in the short term.
- 50.0% of respondents require additional information before making a decision.
- 33.3% are currently not ready to transition.
- A total of 66.7% of respondents represent a potential group of early adopters with appropriate support and communication.

Implications for Implementation

The results indicate that the greatest barrier at present is not necessarily of a technological nature, but relates to a lack of information, experience, and confidence in the new system. Accordingly, the successful implementation of eCMR will require a comprehensive information programme, pilot projects, practical training, and continuous user support during the transition period.

16.2.21. Question 29 – What are, in your view, the main barriers to the introduction of eCMR?

Table 16.2-41: Original responses to the survey question: What are, in your view, the main barriers to the introduction of eCMR?

Original Response	Number	%
Business Partners Do Not Use eCMR; Legal Uncertainty/Inadequately Defined Regulatory Framework	1	8.3
Business Partners Do Not Use eCMR; Lack of Knowledge and Information; Employee Resistance to Change	1	8.3
Business Partners Do Not Use eCMR; Legal Uncertainty/Inadequately Defined Regulatory Framework; Lack of Knowledge and Information; Employee Resistance to Change	1	8.3
Other	2	16.7
Business Partners Do Not Use eCMR	1	8.3
Technical Complexity/Lack of IT Support; Legal Uncertainty/Inadequately Defined Regulatory Framework; Lack of Knowledge and Information	1	8.3
Technical Complexity/Lack of IT Support; Business Partners Do Not Use eCMR; Legal Uncertainty/Inadequately Defined Regulatory Framework; Lack of Knowledge and Information	1	8.3
Business Partners Do Not Use eCMR; Legal Uncertainty/Inadequately Defined Regulatory Framework; Employee Resistance to Change	1	8.3
Lack of Knowledge and Information	2	16.7
Cost of the Solution; Technical Complexity/Lack of IT Support; Business Partners Do Not Use eCMR; Legal Uncertainty/Inadequately Defined Regulatory Framework	1	8.3

Total: 12 respondents (100%)

Analytical Processing of Question 29

Table 16.2-42: Frequency of individual barriers to the introduction of eCMR

Barrier	Number of Mentions	% of Respondents
Business Partners Do Not Use eCMR	7	58.3
Legal Uncertainty/Inadequately Defined Regulatory Framework	5	41.7
Lack of Knowledge and Information	5	41.7
Employee Resistance to Change	3	25.0
Technical Complexity/Lack of IT Support	3	25.0
Other	2	16.7
Cost of the Solution	1	8.3

Note: Respondents were able to indicate more than one barrier simultaneously, and accordingly the sum of percentages exceeds 100%.

Analysis

The results indicate that the most significant barrier to the introduction of eCMR is the lack of adoption among other participants in the transport chain. More than half of respondents (58.3%) consider the key problem to be the fact that partners, including consignors, carriers, freight forwarders, and competent institutions, do not yet use eCMR.

The second group of significant barriers comprises legal uncertainty and insufficiently defined regulation (41.7%), as well as a lack of knowledge and information about the system (41.7%). These results indicate that the principal barriers do not relate to the technology itself, but primarily to the institutional and organisational framework necessary for successful implementation.

A quarter of respondents (25.0%) identify employee resistance to change and technical complexity as potential challenges. At the same time, only one respondent (8.3%) cited the cost of the solution as a significant barrier.

Key Findings for the Study

- 58.3% of respondents consider the main barrier to be the fact that other participants in the supply chain do not use eCMR.
- 41.7% highlight legal uncertainty and an insufficiently defined regulatory framework.
- 41.7% highlight a lack of knowledge and information.
- Only 8.3% of respondents cite the cost of the solution as a key barrier.

Implications for the Project

The results indicate that the success of eCMR implementation will not depend exclusively on the availability of a technical solution, but primarily on:

- the establishment of a clear legal framework;
- the involvement of all relevant participants in the transport chain;
- user training and information programmes;
- pilot projects that will demonstrate the practical benefits of the system.

The finding that cost has not been identified as the primary barrier represents a positive signal for future implementation and indicates that institutional and organisational factors are far more important than the cost of introducing the system.

16.2.22. Question 36 – Rank the expected benefits of eCMR in order of importance

Respondents ranked the following expected benefits of the eCMR system:

1. Faster payment (shorter cash-to-cash cycle)
2. Time savings in document completion and processing
3. Reduction of errors in documentation
4. Lower costs of paper, printing, and archiving
5. Better control and transparency of consignments

Each respondent ranked all five proposed benefits according to their own assessment of importance.

16.2.23. Question 37 – Would you be willing to participate in an eCMR implementation pilot project?

Table 16.2-43: Original responses to the survey question: Would you be willing to participate in an eCMR implementation pilot project?

Original Response	Number	%
Yes, We Are Interested	1	8.3
Maybe, Please Send Us More Information	9	75.0
No, We Are Not Interested at This Time	2	16.7

Total: 12 respondents (100%)

Analytical Processing of Question 37

Table 16.2-44: Willingness to participate in an eCMR pilot project

Original Response	Number	%
Yes, We Are Interested	1	8.3
Maybe, Please Send Us More Information	9	75.0
No, We Are Not Interested at This Time	2	16.7

Analysis

The results indicate a high level of potential interest in participation in an eCMR implementation pilot project. Three quarters of respondents (75.0%) did not reject the possibility of participation, but indicated that they wish to receive additional information about the functioning of the system, expected obligations, and potential benefits.

One respondent (8.3%) expressed immediate readiness to participate in the pilot project, whilst 16.7% indicated that they are not currently interested in participation.

Considered together, as many as 83.3% of respondents demonstrate openness to further consideration of participation in a pilot project, which represents a very positive signal for the future implementation of the eCMR system. The results indicate that potential resistance is not pronounced, but that there is a need for additional information, demonstration of benefits, and practical examples of application.

Key Findings for the Study

- 75.0% of respondents wish to receive additional information about the pilot project.
- 8.3% of respondents are immediately ready to participate.
- Only 16.7% of respondents are currently not interested.
- A total of 83.3% of respondents represent a potential target group for pilot implementation.

Implications for the Project

These results confirm that there is a real basis for launching an eCMR pilot project in the Republic of Serbia. However, prior to the commencement of the pilot phase, it is necessary to ensure:

- information workshops and presentations;
- clearly defined benefits for participants;
- technical and operational support;
- demonstration of the practical application of the system;
- involvement of key actors from the transport chain.

The result is of particular significance as it demonstrates that potential users do not express resistance to the concept of eCMR, but primarily a need for additional information and a greater level of confidence in the proposed solution.

16.2.24. SUMMARY OF SURVEY RESEARCH FINDINGS

Introduction

In the context of the preparation of the Feasibility Study for the Introduction of the Electronic Consignment Note (eCMR) in the Republic of Serbia and the Western Balkans Countries, a survey was conducted among representatives of transport, freight forwarding, and logistics companies. The objective of the research was to assess the current level of CMR documentation use, the degree of digitalisation of business processes, the awareness of economic operators regarding eCMR and eFTI concepts, and the readiness of the sector for the future implementation of electronic transport documentation.

The research involved 12 respondents representing various categories of participants in the transport chain, including carriers, freight forwarders, and consignors of goods.

Respondent Profile

The sample structure indicates the dominance of transport companies, as 75.0% of respondents identified themselves as carriers, whilst 41.7% also carry out freight forwarding activities. A smaller proportion of the sample (16.7%) comprises consignors and exporters.

All respondents operate in the European Union market, whilst 41.7% also operate in the domestic market of the Republic of Serbia, and 25.0% in the markets of the Western Balkans region. This structure confirms that the respondents are directly involved in international transport flows in which the application of eCMR will have the greatest effect.

With regard to company size, both small and large operators are represented. Two thirds of respondents belong to the categories of medium and large carriers with more than six vehicles, indicating the relevance of the findings for the professional transport sector.

Current State of CMR Documentation Management

The results indicate that paper-based documentation continues to dominate among the respondents. More than half of respondents (58.3%) do not use digital systems for transport documentation management, whilst only 8.3% use a fully digitalised solution.

The administrative processing of CMR documentation represents a significant burden for companies. As many as 58.4% of respondents spend at least one hour per day on activities such as completing, sending, and archiving documentation, whilst 16.7% spend between three and six hours per day.

The research demonstrated that errors in completing CMR documents occur among the majority of respondents. More than half of respondents (58.4%) indicated that errors occur in more than 1% of consignments, whilst corrections are most commonly made manually by the driver or the freight forwarder.

Identified Problems of the Paper-Based System

The survey results confirm the existence of several structural problems characteristic of the paper-based model of transport documentation management.

The most significant finding relates to the time required for the return of the original signed CMR document. As many as 63.6% of respondents indicated that they wait between one and two weeks for the return of the document following the delivery of goods.

In addition, 83.3% of respondents have had experience of document loss or damage at least once during their business operations, whilst 33.3% of respondents indicated that they have experienced disputes or payment difficulties as a result of deficiencies in documentation.

These results indicate that the paper-based model creates operational risks manifested in delays, additional administrative activities, and potential financial consequences.

Cross-Border Transport and Border Procedures

The majority of respondents indicated that vehicles wait at border crossings for between one and three hours, whilst a quarter of respondents indicated that in certain cases waiting times extend to more than six hours.

As the most significant causes of delay, respondents identified:

- customs procedures (91.7%);

- queues and congestion (66.7%);
- phytosanitary and veterinary inspections (41.7%);
- document verification (33.3%).

Whilst the electronic consignment note cannot fully eliminate all border delays, the results indicate that there is significant scope for reducing the time required for document verification and data exchange.

Awareness of eCMR and the eFTI Regulation

The research demonstrates that the level of awareness of the eCMR concept is limited. Only 16.7% of respondents indicated that they are well acquainted with eCMR, whilst 58.3% have heard of the concept but are not familiar with the details of its application.

An even more pronounced lack of awareness was observed with regard to the eFTI Regulation (EU 2020/1056). More than half of respondents (58.3%) have never heard of eFTI, whilst no respondent indicated that they are well acquainted with its requirements and significance.

These results indicate that the successful implementation of eCMR will require a comprehensive information and training programme for future users.

Readiness for the Introduction of eCMR

Whilst the level of conceptual awareness is relatively low, the results indicate the existence of significant potential for the adoption of eCMR.

Half of respondents (50.0%) indicated that they require more information before making a decision regarding the introduction of the system, whilst 16.7% indicated that they are ready to transition to eCMR with appropriate support.

Of particular significance is the finding that 83.3% of respondents expressed willingness to consider participation in an eCMR implementation pilot project, which represents a positive signal for the future phases of project realisation.

Main Barriers and Expected Benefits

As the greatest barriers to the introduction of eCMR, respondents indicated:

- the fact that other participants in the supply chain do not use eCMR (58.3%);
- legal uncertainty and an insufficiently defined regulatory framework (41.7%);
- a lack of knowledge and information (41.7%).

On the other hand, the most significant expected benefits of eCMR were ranked as follows:

1. Faster payment and a shorter cash-to-cash cycle;
2. Time savings in document processing;
3. Reduction of errors in documentation;
4. Better control and transparency of consignments;
5. Reduction of paper and archiving costs.

These results indicate that economic operators perceive the greatest benefits not in terms of direct material savings, but in terms of increased operational efficiency and faster circulation of business information.

Conclusion

The results of the survey research demonstrate that the transport sector in the Republic of Serbia and the Western Balkans countries continues to operate to a significant degree on the basis of paper-based documentation and manual administrative procedures. At the same time, numerous problems have been identified relating to document processing times, delays in the return of original documentation, errors in completion, document loss, and limited digitalisation of processes.

The research also demonstrated that there is significant potential for the adoption of eCMR, provided that a clear legal framework, adequate technical support, and a comprehensive user information and training programme are made available.

The findings obtained constitute a relevant basis for the subsequent SWOT analysis, stakeholder analysis, risk analysis, and cost-benefit analysis within the framework of the Feasibility Study for the Introduction of eCMR.

16.3. STAKEHOLDER ANALYSIS OF eCMR INTRODUCTION

16.3.1. Introduction

The stakeholder analysis was conducted with the objective of identifying, categorising, and assessing all relevant stakeholders that may influence the process of establishing and implementing the national eCMR platform in the Republic of Serbia.

The analysis is based on the results of the institutional analysis, technical and technological analysis, survey research, economic analysis, SWOT analysis, and risk analysis conducted for the purposes of this study. Particular account was taken of the requirements of the eCMR Protocol, Regulation (EU) 2020/1056 on Electronic Freight Transport Information (eFTI), and the recommendations of UNECE, IRU, CEFTA, and the Transport Community.

The objective of the analysis is to provide a basis for defining the project governance model, communication activities, change management plan, and the phased implementation of the eCMR system at the national level, with the capacity for future regional connectivity within the Western Balkans framework.

16.3.2. Identification of Stakeholders

Within the framework of the analysis, the key categories of stakeholders with a direct or indirect influence on the establishment and use of the eCMR system were identified.

Table 16.3-1: Key stakeholders

Stakeholder	Primary Role
Ministry of Construction, Transport and Infrastructure	Project Coordination and Management
Customs Administration	Integration with Customs and Cross-Border Procedures
Ministry of Finance	Regulatory and Institutional Support
Inspection Authorities	System Oversight and Compliance Monitoring
Transport Operators	Primary Users of the eCMR System
Freight Forwarders	Management of Transport Documentation
Consignors and Consignees	Business Users of the System
IT Providers and System Integrators	Development and Integration of Technical Solutions
Chamber of Commerce and Industry of Serbia and Professional Associations	Business Outreach, Training and Coordination
CEFTA, Transport Community, UNECE and IRU	Regional and International Support, Interoperability and Exchange of Best Practices

Source: Authors' analysis based on the results of the feasibility study.

16.3.3. Analysis of Influence and Interest

The assessment of stakeholders was carried out using the Power–Interest model to define priorities for communication and engagement during project implementation.

Table 16.3-2: Classification of stakeholders according to the Power–Interest model

Category	Stakeholders
Manage Closely	Ministry of Construction, Transport and Infrastructure; Customs Administration; Transport Operators; Freight Forwarders; Major Logistics Operators
Keep Satisfied	Ministry of Finance; Inspection Authorities; Major Consignors
Keep Informed	Chamber of Commerce and Industry of Serbia; Consignees; IT Providers; Professional Associations
Monitor	Academic Community; Consultants; General Public; International Organizations

Source: Authors' analysis.*

The results indicate that the greatest influence on the success of the project is held by institutions responsible for transport and customs procedures, as well as economic operators who use transport documentation on a daily basis. Their active participation represents the key prerequisite for the successful implementation of the eCMR system.

16.3.4. Survey Research Results and Implications for Stakeholders

The results of the survey research demonstrated that the majority of respondents recognise the potential benefits of transport documentation digitalisation, particularly with regard to the reduction of administrative activities, faster information flows, and the reduction of errors.

At the same time, the results indicate the need for additional information dissemination, education, and practical examples of eCMR system application. Of particular significance is the finding that the majority of respondents expressed interest in additional information and potential participation in pilot projects, which provides a favourable basis for the phased implementation of the system.

The foregoing results confirm the importance of actively involving the business community in all phases of project realisation, from the pilot phase through to full operational application.

16.3.5. Stakeholder Engagement Strategy

On the basis of the results of the analysis, recommended stakeholder management activities were defined.

Table 16.3-3: Recommended approach to stakeholder engagement

Stakeholder Group	Recommended Activities
Government Institutions	Coordination Mechanisms, Working Groups and Steering Committee
Transport Operators and Freight Forwarders	Pilot Projects, Workshops, User Support and Testing
Consignors and Consignees	Awareness-Raising Activities, Promotional Campaigns and Training
IT Sector	Technical Consultations, Integration Testing and Certification
Chamber of Commerce and Professional Associations	Training and Information Dissemination
Regional and International Organizations	Technical, Expert and Coordination Support

Source: Authors' analysis

16.3.6. Conclusion

The stakeholder analysis demonstrates that there is a wide range of institutions, economic operators, and organisations with a direct interest in the establishment and development of the eCMR system. The analysis confirms that the success of the project will not depend exclusively on the technical solution, but primarily on effective coordination of actors, timely communication, and systematic change management.

The results of the analysis are consistent with the findings of the SWOT analysis, risk analysis, and implementation plan. The active participation of institutions, carriers, freight forwarders, and other users during the pilot phase and the phased national roll-out of the system has been identified as the most important prerequisite for successful implementation.

In addition to its national significance, the analysis highlights the importance of regional cooperation. The successful implementation of eCMR in the Republic of Serbia can serve as the foundation for gradual connectivity with the digital transport initiatives of the Western Balkans and further alignment with the European eFTI environment.

Considered comprehensively, the stakeholder analysis confirms the existence of sufficient institutional, market, and technological potential for the establishment of a national eCMR platform and its further development in accordance with the strategic directions of transport digitalisation in the Republic of Serbia and the Western Balkans region.

16.4. RISK ANALYSIS OF eCMR INTRODUCTION

16.4.1. Introduction

The risk analysis was conducted with the objective of identifying, assessing, and defining measures for the management of risks that may affect the establishment and implementation of the national eCMR platform in the Republic of Serbia.

The analysis is based on the results of the legal and institutional analysis, technical and technological analysis, financial and economic analysis, survey research findings, stakeholder analysis, and SWOT analysis conducted for the purposes of this study. Particular account was taken of the requirements of the eCMR Protocol, Regulation (EU) 2020/1056 on Electronic Freight Transport Information (eFTI), and the recommendations of UNECE, IRU, and other relevant organisations.

The objective of the analysis is to provide a basis for planning risk mitigation measures, change management activities, and the phased implementation of the system.

16.4.2. Risk Assessment Methodology

The risk assessment was carried out using a qualitative approach based on the assessment of the likelihood of risk occurrence and the potential impact on project implementation.

Risks were grouped into the following categories:

- regulatory and institutional risks;
- organisational risks;
- technical and technological risks;
- user acceptance risks;
- cybersecurity risks;
- regional and interoperability risks.

16.4.3. Identified Risks

Table 16.4-1: Identified project risks

Risk Category	Risk Description	Likelihood	Impact	Risk Level
Regulatory	Delay in Amending or Adopting the Required Legislation	Medium	High	Medium-High
Institutional	Insufficient Coordination Among Institutions Involved in the Project	Medium	High	Medium-High
Organizational	Resistance to Change Among Some System Users	Medium	Medium	Medium
Technical	Delay in Integration with Existing Information Systems	Medium	Medium	Medium
User-Related	Insufficient Knowledge of eCMR and eFTI Concepts	High	Medium	Medium-High
Cybersecurity	Security Incidents or Unauthorized Access to Data	Low	High	Medium
Interoperability	Different Pace of Digitalization Across the Western Balkan Countries	Medium	Medium	Medium

Source: Authors' analysis based on the results of the feasibility study.

16.4.4. Risk Mitigation Measures

For each identified risk, appropriate management and mitigation measures were defined.

Table 16.4-2: Risk mitigation measures

Risk Category	Mitigation Measures
Regulatory and Institutional Risks	Establishment of an Interinstitutional Working Group and Regular Coordination Among Competent Authorities
Organizational Risks	Implementation of a Phased Approach and Active Change Management
Technical Risks	Early Integration Testing and Pilot Projects
User Adoption Risks	Training, Workshops and User Support
Cybersecurity Risks	Implementation of Security Standards, Access Controls and Regular Security Assessments
Regional Risks	Cooperation with CEFTA, the Transport Community and Other Regional Initiatives

Source: Authors' analysis.

16.4.5. Risks and Survey Research Results

The results of the survey research indicated that the greatest challenges are not associated with the technical feasibility of the solution, but with the level of user awareness, organisational readiness for change, and the need for additional training and support.

At the same time, the expressed interest of economic operators in pilot projects and further information represents a significant factor in reducing risk during implementation.

These results are consistent with the findings of the stakeholder analysis and SWOT analysis, which identified change management as one of the key prerequisites for the successful realisation of the project.

16.4.6. Residual Risk and Project Acceptability

Following the application of the proposed mitigation measures, the majority of identified risks can be reduced to an acceptable level.

None of the identified risks has been assessed as critical, nor does any represent an obstacle to project realisation. The remaining risks are primarily associated with the dynamics of system adoption, coordination among stakeholders, and the degree of regional interoperability.

The results of the financial analysis, economic analysis, and sensitivity analysis demonstrate that the project retains positive viability indicators even under less favourable development scenarios, further confirming its resilience to the identified risks.

16.4.7. Conclusion

The risk analysis demonstrates that the risks associated with the implementation of the national eCMR platform are real and manageable. The most significant risks relate to change management, the level of user awareness, institutional coordination, and the dynamics of digitalisation in the broader regional environment.

At the same time, the analysis confirms that adequate measures exist for mitigating the identified risks and that the institutional, technical, and market prerequisites for project realisation are largely in place.

Considered overall, the results of the risk analysis confirm the conclusions of the financial analysis, economic analysis, SWOT analysis, and stakeholder analysis that the establishment of a national eCMR platform is justified, feasible, and sustainable, subject to the application of the recommended phased implementation approach and continuous monitoring of risks during project realisation.

16.5. SWOT ANALYSIS OF eCMR INTRODUCTION

16.5.1. Introduction

The SWOT analysis of the introduction of the electronic consignment note (eCMR) was prepared on the basis of the results of the existing situation analysis, legal and institutional analysis, technical and technological analysis, financial analysis, economic analysis, risk analysis, stakeholder analysis, and the survey research conducted for the purposes of this study.

The analysis is based on the requirements of the Protocol Additional to the Convention on the Contract for the International Carriage of Goods by Road (eCMR Protocol), Regulation (EU) 2020/1056 on Electronic Freight Transport Information (eFTI), and the relevant recommendations of UNECE, the European Commission, IRU, and other international organisations supporting the digitalisation of transport documentation.

The objective of the SWOT analysis is to identify the key internal and external factors that may influence the successful implementation of the national eCMR platform in the Republic of Serbia, as well as its future connectivity with the regional and European digital transport ecosystem.

16.5.2. SWOT Matrix

Table 16.5-1: SWOT analysis of eCMR introduction

STRENGTHS	WEAKNESSES
Clearly identified financial, operational and economic benefits of eCMR implementation.	Limited awareness of the eCMR concept and the eFTI Regulation among some user groups.
Availability of a European regulatory framework supporting the digitalization of transport documentation.	Uneven level of digital maturity across different categories of users.
Well-developed ICT infrastructure and the ability to integrate with existing ERP, TMS and other business systems.	Dependence of some businesses on paper-based documentation and manual procedures.
Significant participation of Serbia in international transport and logistics flows.	Limited change management capabilities within certain organizations.
Demonstrated interest of the business community in digitalization and participation in pilot projects.	Limited practical experience with cross-border exchange of electronic transport documentation.
OPPORTUNITIES	THREATS
Alignment with the eFTI Regulation and European digital transport corridors.	Different pace of digitalization and regulatory readiness across the countries of the region.
Reduction of administrative costs, processing time and delays in business processes.	Insufficient involvement of all stakeholders in the transport chain in the digitalization process.
Reduction in the number of errors, disputes and document loss.	Resistance to organizational and business changes among some user groups.
Enhancement of cross-border data exchange and interoperability across the Western Balkans.	Potential cybersecurity and data protection challenges.
Positioning Serbia as a regional leader in the digitalization of transport documentation.	Delays in regulatory or institutional activities required for the full implementation of the system.

Source: Authors' analysis based on the results of the feasibility study, survey research, stakeholder analysis, and risk analysis.

16.5.3. SWOT Strategic Analysis

Table 16.5-2: SWOT strategic guidelines

Strategy Type	Strategic Guidelines
SO Strategies (Strengths + Opportunities)	• Leverage the existing European regulatory framework to accelerate the implementation of the national eCMR platform. • Build on existing technological capabilities and integration with ERP, TMS and other business systems. • Capitalize on the business community's interest in pilot projects and the gradual expansion of the system. • Position Serbia as a regional hub for the development and interoperability of eCMR solutions across the Western Balkans.
WO Strategies (Weaknesses + Opportunities)	• Implement awareness-raising and training programmes on the eCMR and eFTI concepts. • Promote the digitalization of small and medium-sized transport enterprises. • Develop technical support mechanisms and change management programmes. • Utilize CEFTA and the Transport Community regional initiatives to facilitate knowledge transfer and the exchange of best practices.
ST Strategies (Strengths + Threats)	• Utilize the existing technical and institutional foundation to reduce implementation risks. • Ensure the active participation of public institutions, the business community and professional associations throughout the implementation process. • Develop interoperable solutions resilient to different rates of digitalization across the region. • Establish cross-border data exchange mechanisms enabling the gradual integration of the Western Balkan countries into a common digital ecosystem.
WT Strategies (Weaknesses + Threats)	• Implement the project through a phased approach supported by pilot projects. • Conduct continuous awareness-raising and user training activities. • Strengthen institutional capacities for change management and project performance monitoring. • Establish a risk management framework, performance indicator monitoring and corrective measures throughout the implementation process.

Source: Authors' analysis based on the SWOT analysis, stakeholder analysis, risk analysis, and survey research findings.

16.5.4. Conclusion

The results of the SWOT analysis indicate that favourable conditions exist for the establishment of a national eCMR platform in the Republic of Serbia. The most significant advantages of the project derive from the clearly identified financial, operational, and economic benefits, the existence of a European regulatory framework, and the possibility of integration with the existing information systems of transport chain participants.

The analysis demonstrates that the key challenges are not primarily of a technological nature, but are associated with the digital maturity of users, the need for education, change management, and the gradual involvement of all relevant stakeholders. These findings are consistent with the results of the stakeholder analysis, risk analysis, and implementation plan presented in the study.

In addition to its national significance, the SWOT analysis highlights the significant potential for the development of regional interoperability at the Western Balkans level. The successful implementation of eCMR in the Republic of Serbia can serve as the foundation for the gradual establishment of cross-border digital exchange of transport documentation and further alignment with the European digital transport environment.

Considered overall, the SWOT analysis confirms the study's conclusion that the anticipated benefits of eCMR introduction significantly outweigh the identified risks and limitations, and that the phased implementation of a national eCMR platform represents a justified and realistic direction for the digital transformation of the road transport sector in the Republic of Serbia.

16.6. FINANCIAL MODEL OF THE eCMR INTRODUCTION PROJECT

16.6.1. Introduction

This annex contains a summary presentation of the financial model used to assess the financial viability of the project for the introduction of the national eCMR platform in the Republic of Serbia.

The model was developed for the purposes of the preparation of the Feasibility Study and constitutes the basis for the calculation of the indicators presented in Chapter 9 – Financial Analysis. The financial model is based on projected investment costs, operational costs, revenues from system use, and the expected dynamics of solution adoption over the period under analysis.

The financial model was developed primarily for the Republic of Serbia as the subject of analysis of this study. At the same time, the project was also considered in the broader Western Balkans context, having regard to the significance of cross-border road transport, the CEFTA environment, and the future possibilities of regional eCMR system interoperability.

The model was developed in a Microsoft Excel environment and encompasses the calculation of cash flows, discounted cash flows, profitability indicators, and sensitivity analysis.

16.6.2. Basic Model Assumptions

Table 16.6-1 presents the basic assumptions used in the financial model.

Table 16.6-1: Key Assumptions of the Financial Model

Indicator	Value
Analysis Period	10 years
Initial Investment (CAPEX)	EUR 3,000,000
Annual Operating Expenditure (OPEX)	EUR 400,000
Discount Rate	5%
Calculation Method	Discounted Cash Flow (DCF)
Currency	EUR
Estimated Number of CMR/eCMR Documents in Serbia (Annual)	1,500,000
Estimated Number of CMR/eCMR Documents in the Western Balkans (Annual)	3,250,000
eCMR Cost per Document	EUR 2.00
Average Paper CMR Cost per Document	EUR 7.20
Average Processing Time for a Paper CMR	23 minutes
Average Processing Time for an eCMR	9 minutes
Estimated Time Reduction	≈60%
Implementation Potential in Serbia	High
Implementation Potential in the Western Balkans	High

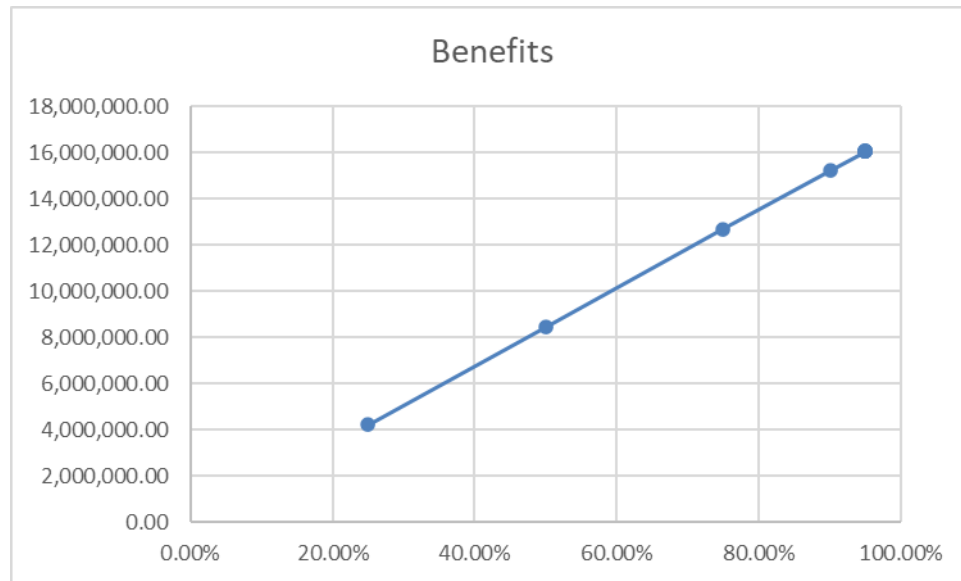
Source: Authors' calculations based on the project financial model, survey research findings, internal analytical models, and publicly available statistical data (Statistical Office of the Republic of Serbia, Eurostat, UNECE, Transport Community, and World Bank), with the application of interpolation, projections, and expert assumptions.

16.6.3. System Adoption Dynamics

The financial model is based on the assumption of gradual adoption of the eCMR system by users during the initial years of project implementation.

Table 16.6-2: Projected System Adoption Rate and Adoption Chart

Year	Adoption Rate
1	25%
2	50%
3	75%
4	90%
5–10	95%



Source: Authors' calculations.

This adoption dynamic is based on the findings of the survey research, the stakeholder analysis, and the proposed phased implementation approach presented in Chapter 14.

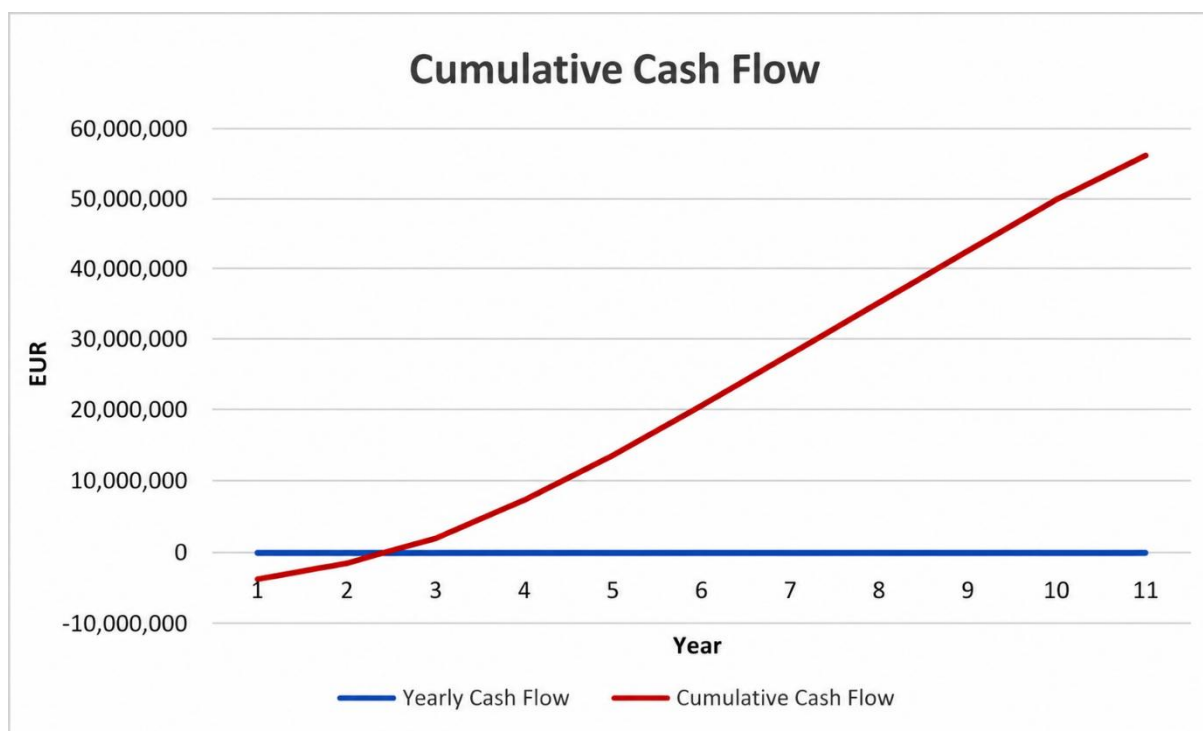
16.6.4. Projected Cash Flows

On the basis of the defined assumptions, annual project cash flows were established, encompassing investment costs, operating costs, and projected revenues from system utilisation.

Table 16.6-3: Projected Financial Flows of the eCMR Introduction Project in the Republic of Serbia

Year	Adoption	Benefits	OPEX	Net CF	Discounted CF	Cumulative
0	0.00	0.00	0.00	-3,000,000.00	-3,000,000.00	-3,000,000.00
1	0.25	1,950,000.00	400,000.00	1,550,000.00	1,476,190.48	-1,450,000.00
2	0.50	3,900,000.00	400,000.00	3,500,000.00	3,174,603.17	2,050,000.00
3	0.75	5,850,000.00	400,000.00	5,450,000.00	4,707,914.91	7,500,000.00
4	0.90	7,020,000.00	400,000.00	6,620,000.00	5,446,290.38	14,120,000.00
5	0.95	7,410,000.00	400,000.00	7,010,000.00	5,492,518.43	21,130,000.00
6	0.95	7,410,000.00	400,000.00	7,010,000.00	5,230,969.93	28,140,000.00
7	0.95	7,410,000.00	400,000.00	7,010,000.00	4,981,876.12	35,150,000.00
8	0.95	7,410,000.00	400,000.00	7,010,000.00	4,744,643.93	42,160,000.00
9	0.95	7,410,000.00	400,000.00	7,010,000.00	4,518,708.50	49,170,000.00
10	0.95	7,410,000.00	400,000.00	7,010,000.00	4,303,531.91	56,180,000.00

Figure 16.6-1 Cumulative Cash Flow of the eCMR Introduction Project in the Republic of Serbia



Source: Authors' calculations based on the project financial model.

16.6.5. Financial Indicators

On the basis of the discounted cash flows, the key indicators of the financial viability of the project were calculated.

Table 16.6-4: Key Financial Indicators

Indicator	Value
Financial Net Present Value (FNPV)	EUR 41,077,247.77
Financial Internal Rate of Return (FIRR)	104.22%
Return on Investment (ROI)	802.57%
Payback Period	< 1 year

Source: Authors' calculations based on the project financial model.*

The results demonstrate that the project achieves a significantly positive net present value, a very high internal rate of return, and a short investment payback period. The values obtained confirm a high degree of financial viability of the project.

16.6.6. Regional Context of the Western Balkans

Although the project financial model was developed primarily for the Republic of Serbia as the subject of analysis of this study, the project has also been examined in the broader context of the Western Balkans, having regard to the significance of cross-border road transport, regional trade, and the digitalisation of transport documentation.

The Western Balkans countries are characterised by strong transport and trade linkages, a high share of road transport in total freight carriage, and considerable reliance on international transport corridors. In such an environment, the electronic consignment note (eCMR) constitutes one of the key mechanisms for enhancing the efficiency of cross-border logistics processes and for the gradual alignment with the European eFTI ecosystem.

The findings of the analysis indicate that the benefits identified for the Republic of Serbia – including the reduction of administrative costs, shorter document processing times, a decrease in errors and disputes, and increased transparency of transport processes – could also be realised in the broader regional environment, particularly within the CEFTA trade area and through initiatives implemented by the Transport Community, UNECE, and the European Commission.

At the same time, owing to the absence of uniform and comparable data for all countries in the region, a separate financial model for the Western Balkans has not been developed. Instead, the region has been examined as a potential area for future system expansion and interoperability following the successful implementation of the national eCMR platform in the Republic of Serbia.

Table 16.6-5: Indicative Volume of Transport Documentation and Processing Costs in the Western Balkans Region

Indicator	Value
Estimated Number of CMR/eCMR Documents per Year	3,250,000
Average Paper CMR Cost per Document	EUR 7.20
Average eCMR Cost per Document	EUR 2.00
Average Savings per Document	EUR 5.20
Estimated Annual Cost Under a Fully Paper-Based System	EUR 23,400,000
Estimated Annual Cost Under a Fully Digital System	EUR 6,500,000
Estimated Total Annual Savings	EUR 16,900,000

Source: Authors' calculations based on the project financial model, analytical models developed for the purposes of the study, survey research findings, and available data on road transport in the Western Balkans region.*

The data presented in the table are indicative in nature and serve to illustrate the potential scale of benefits that could be realised across the Western Balkans region. Although the project financial model was developed for the Republic of Serbia as the primary subject of analysis, the results indicate that the digitalisation of transport documentation and the application of the eCMR concept could yield significant operational and economic benefits in the broader regional environment as well.

Accordingly, Serbia constitutes the primary subject of the financial analysis, whilst the Western Balkans represents the strategic development and interoperability context within which the gradual expansion of the benefits of transport documentation digitalisation and future cross-border exchange of eCMR data are anticipated.

16.6.7. Linkage with the Economic Analysis

The financial model serves as the basis for the further economic analysis presented in Chapter 10 and Annex 17.7. Whereas the financial analysis examines the effects from the perspective of the project and its owner, the economic analysis also encompasses the broader benefits for the economy, the transport sector, and society as a whole.

Accordingly, the results of the financial model were used as the starting point for the development of the economic model, the Cost–Benefit Analysis, and the sensitivity analysis.

16.6.8. Conclusion

The financial model demonstrates that the project for the introduction of a national eCMR platform is financially viable and sustainable. The positive value of the FNPV indicator, the FIRR value significantly exceeding the applied discount rate, the high return on investment, and the short payback period confirm the project's capacity to generate sufficient financial benefits to cover investment and operating costs.

The results of the financial model serve as the basis for the economic analysis, the sensitivity analysis, and the assessment of the overall viability of the project presented in the subsequent annexes and chapters of the study.

16.7. Economic Model and Cost–Benefit Analysis

16.7.1. Introduction

This annex contains a concise overview of the economic model and the Cost–Benefit Analysis (CBA) used to assess the broader economic effects of the introduction of a national eCMR platform in the Republic of Serbia.

The economic model constitutes an extension of the financial model presented in Annex 17.6 and Chapter 9. Whereas the financial analysis examines the project from the perspective of the investment proponent, the economic analysis encompasses the benefits accruing to the economy, the transport sector, public administration, and other participants in the transport chain.

The model was developed in accordance with the Cost–Benefit Analysis principles for investment projects applied by the European Commission, the World Bank, and other international financial institutions.

16.7.2. Key Assumptions of the Economic Model

Table 16.7-1 presents the key assumptions used in the development of the economic model.

Table 16.7-1: Key Assumptions of the Economic Model

Indicator	Value
Analysis Period	10 years
Discount Rate	5%
Initial Investment (CAPEX)	EUR 3,000,000
Annual Operating Expenditure (OPEX)	EUR 400,000
Methodology	Cost–Benefit Analysis (CBA)
Benefit Assessment Approach	Direct Benefits + Wider Benefits
Total Economic Benefit for the Republic of Serbia	EUR 16,800,000
Scope of Analysis	Republic of Serbia
Regional Context	Western Balkans

Source: Authors' calculations based on the project economic model.

16.7.3. Structure of Economic Benefits

The economic model is based on the Direct Benefits + Wider Benefits approach, which encompasses the direct and broader economic benefits arising from the introduction of the eCMR system.

Direct benefits include:

- reduction of administrative costs;
- reduction of paper documentation costs;
- time savings in the processing of transport documents;
- reduction of costs associated with corrections and reprocessing of documentation.

Wider economic benefits include:

- increased efficiency of transport and logistics processes;
- faster flows of information and goods;
- reduction of delays and disputes;
- increased transparency of the transport chain;
- support for the digitalisation of the transport sector and alignment with the eFTI concept.

On the basis of the calculations performed, the total economic benefit for the Republic of Serbia has been estimated at €16,800,000, which constitutes the basis for the formulation of economic flows and the calculation of Cost–Benefit Analysis indicators.

16.7.4. Projected Economic Flows

On the basis of the defined assumptions, the economic flows of the project were established, encompassing investment costs, operating costs, and economic benefits realised over the analysis period.

Within the Excel model, the following were calculated separately:

- direct economic effects;
- wider economic benefits;
- net economic cash flows;
- discounted economic flows.

Item	Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10
CAPEX	-3,000,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
OPEX	0.00	400,000.00	400,000.00	400,000.00	400,000.00	400,000.00	400,000.00	400,000.00	400,000.00	400,000.00	400,000.00
Adoption Rate	0.00	0.25	0.50	0.75	0.90	0.95	0.95	0.95	0.95	0.95	0.95
Direct Benefits	0.00	1,950,000.00	3,900,000.00	5,850,000.00	7,020,000.00	7,410,000.00	7,410,000.00	7,410,000.00	7,410,000.00	7,410,000.00	7,410,000.00
Wider Benefits	0.00	2,250,000.00	4,500,000.00	6,750,000.00	8,100,000.00	8,550,000.00	8,550,000.00	8,550,000.00	8,550,000.00	8,550,000.00	8,550,000.00
Total Benefits	0.00	4,200,000.00	8,400,000.00	12,600,000.00	15,120,000.00	15,960,000.00	15,960,000.00	15,960,000.00	15,960,000.00	15,960,000.00	15,960,000.00
Net Economic CF	-3,000,000.00	3,800,000.00	8,000,000.00	12,200,000.00	14,720,000.00	15,560,000.00	15,560,000.00	15,560,000.00	15,560,000.00	15,560,000.00	15,560,000.00
Discount Factor	1.00	0.95	0.91	0.86	0.82	0.78	0.75	0.71	0.68	0.64	0.61
Discounted Economic CF	-3,000,000.00	3,619,047.62	7,256,235.83	10,538,818.70	12,110,180.43	12,191,667.15	11,611,111.57	11,058,201.50	10,531,620.47	10,030,114.74	9,552,490.23
Discount Factor	0.05										

Table 16.7-2: Projected Economic Flows of the Project

Source: Authors' calculations based on the project economic model.

16.7.5. Results of the Cost–Benefit Analysis

On the basis of the economic model, the key economic indicators of the project's viability were calculated.

Table 16.7-3: Key Economic Indicators of the Project

Indicator	Value
Economic Net Present Value (ENPV)	EUR 95,499,488.23
Economic Rate of Return (ERR)	194.12%
Benefit–Cost Ratio (B/C)	16.68
Present Value of Benefits (PV Benefits)	EUR 101,588,182.20
Present Value of Costs (PV Costs)	EUR 6,088,693.97

Source: Authors' calculations based on the project economic model.*

The economic model is based on the estimated total economic benefit of €16,800,000, which encompasses the direct and broader economic effects of the introduction of the eCMR system. On the basis of the projected economic flows and the application of a discount rate of 5%, a positive Economic Net Present Value (ENPV) of €95,499,488.23 was obtained.

The present value of economic benefits (PV Benefits) amounts to €101,588,182.20, whilst the present value of economic costs (PV Costs) amounts to €6,088,693.97. The Economic Rate of Return (ERR) of 194.12% significantly exceeds the applied discount rate, whilst the Benefit-to-Cost ratio (B/C) of 16.68 demonstrates that the economic benefits substantially outweigh the total economic costs of the project.

The results obtained unequivocally confirm the high economic viability of the project and indicate that the introduction of a national eCMR platform generates significant benefits for the economy, the transport sector, and public administration.

16.7.6. Regional Context of the Western Balkans

Although the economic model was developed for the Republic of Serbia as the primary subject of analysis, the results indicate that similar economic effects could be realised in the broader regional environment as well.

For the purposes of the indicative regional analysis, an estimate of approximately 3.25 million CMR/eCMR documents per annum in the Western Balkans region was used. With average costs of €7.20 per paper CMR document and €2.00 per eCMR document, the potential benefits of digitalising transport documentation at the regional level could be significant.

Table 16.7-4: Indicative Economic Potential of Transport Documentation Digitalisation in the Western Balkans Region

Indicator	Value
Estimated Number of Documents per Year	3,250,000
Average Paper CMR Cost per Document	EUR 7.20
Average eCMR Cost per Document	EUR 2.00
Average Savings per Document	EUR 5.20
Estimated Annual Savings	EUR 16,900,000

Source: Authors' calculations based on analytical models developed for the purposes of the study.*

The data presented in the table are indicative in nature and do not constitute a separate economic model for the region; rather, they serve to illustrate the potential scale of economic benefits that could be realised across the Western Balkans through the wider application of the eCMR concept.

Table 16.7-5: Indicative Comparison of the Economic Potential of the Republic of Serbia and the Western Balkans Region

Indicator	Serbia	WB6 (Indicative)
Estimated Number of Documents per Year	1,500,000	3,250,000
Estimated Total Economic Benefit	EUR 16,800,000	EUR 36,400,000

Source: Authors' calculations based on the project economic model and analytical estimates for the Western Balkans region.*

The value for the Western Balkans region represents an indicative analytical estimate derived by proportional scaling of the economic benefits established for the Republic of Serbia on the basis of the ratio of transport documents. No separate economic model has been developed for the region, nor have separate ENPV, ERR, and B/C indicators been calculated.

16.7.7. Linkage with the Sensitivity Analysis

The economic model serves as the basis for the sensitivity analysis and project development scenarios presented in the subsequent annex. Scenarios involving different system adoption dynamics, cost variations, and changes in expected benefits were examined in order to assess the robustness of the project against potential changes in the operating environment.

16.7.8. Conclusion

The economic model and Cost–Benefit Analysis demonstrate that the project for the introduction of a national eCMR platform generates significant economic benefits for the transport sector, the economy, and public administration. The values of the ENPV, ERR, and B/C indicators convincingly confirm the economic viability of the project and demonstrate that the expected benefits substantially outweigh the required investment.

The findings of the analysis confirm the conclusions of Chapter 10 – Economic Analysis and provide additional evidentiary basis for the recommendation of the phased implementation of a national eCMR platform in the Republic of Serbia, with the possibility of future regional connectivity and interoperability with the Western Balkans countries.

16.8. Sensitivity Analysis and Project Development Scenarios

16.8.1. Introduction

The sensitivity analysis constitutes a complement to the financial and economic analysis of the project and is intended to assess the robustness of the results to changes in key input parameters. The analysis was conducted on the basis of the financial model (Annex 17.6), the economic model and Cost–Benefit Analysis (Annex 17.7), and the results presented in Chapters 9 and 10 of the Feasibility Study.

The objective of the analysis is to determine the extent to which changes in key assumptions may affect the financial and economic viability of the project for the introduction of a national eCMR platform.

16.8.2. Key Parameters of the Analysis

Within the sensitivity analysis, the parameters with the greatest influence on the project results were examined:

- eCMR system adoption rate;
- level of investment costs (CAPEX);
- level of operating costs (OPEX);
- number of documents processed;
- level of direct benefits realised;
- level of wider economic benefits realised.

16.8.3. Project Development Scenarios

For the purposes of risk and uncertainty assessment, three project development scenarios were defined.

Table 16.8-1: Project Development Scenarios

Scenario	Key Assumption
Conservative	Slower System Adoption and Lower Realized Benefits
Base Case	Implementation in Accordance with the Adopted V7 Model
Optimistic	Faster System Adoption and Higher Realized Benefits

Source: Authors' analysis.

Table 16.8-2: Qualitative Project Development Scenarios

Parameter	Conservative Scenario	Base Case Scenario	Optimistic Scenario
eCMR System Adoption	Slower than planned	In accordance with the V7 model	Faster than planned
Number of Users	Lower	As planned	Higher
Economic Benefits	Lower	In accordance with the V7 model	Higher
Financial Performance	Reduced	In accordance with the V7 model	Improved
Regional Interoperability	Slower development	Planned development	Accelerated development

Source: Authors' analysis based on the project financial and economic model.

16.8.4. Results of the Sensitivity Analysis

The results of the analysis indicate that the most sensitive project parameters are the system adoption dynamics and the scale of economic benefits realised. Conversely, moderate changes in investment and operating costs have a limited impact on the overall viability of the project.

In all scenarios examined, the project retains positive characteristics and remains financially and economically viable, indicating a high degree of robustness of the project model.

For the purposes of assessing the project's resilience, scenarios involving increases in investment costs, reductions in expected benefits, and slower system adoption were analysed.

Table 16.8-3: Indicative Results of the Economic Model Sensitivity Analysis

Scenario	ENPV (EUR)	B/C Ratio	Assessment
Base Case	95,499,488.23	16.68	Reference Scenario
CAPEX +20%	94,899,488.23	15.19	Low Risk
Benefits -20%	75,181,851.79	13.34	Medium Risk
Slow Adoption	85,340,670.01	15.01	Medium Risk

Source: Authors' calculations based on the economic model sensitivity analysis.*

*Note: The results presented constitute an indicative sensitivity analysis based on the variation of key economic model parameters. The scenarios do not represent separately developed economic models; rather, they serve to assess the project's robustness to changes in input assumptions.

16.8.5. Regional Dimension

Although the sensitivity analysis was conducted for the Republic of Serbia as the primary subject of the study, the results indicate that similar trends would be present in the broader Western Balkans region as well. The greater volume of transport flows and cross-border operations further increases the potential benefits of digitalising transport documentation.

An indicative estimate based on the results of the economic model suggests that the total economic benefit at the level of the Western Balkans region could reach approximately €36.4 million, which further underscores the importance of cross-border cooperation, interoperability, and the gradual expansion of the eCMR concept in the region.

16.8.6. Conclusion

The sensitivity analysis demonstrates that the project for the introduction of a national eCMR platform retains its financial and economic viability even under less favourable assumptions. The greatest influence on the results is exerted by the system adoption dynamics and the scale of benefits realised, whilst the project exhibits a high degree of resilience to changes in investment and operating costs.

The findings of the analysis confirm the conclusions of the financial model, the economic model, the Cost–Benefit Analysis, and the Risk Analysis, and provide additional basis for the recommendation to implement a national eCMR platform in the Republic of Serbia and to establish its future connectivity with the regional digital transport ecosystem. The fact that the project retains positive economic indicators even in scenarios of increased costs or reduced benefits further confirms its long-term sustainability and viability.

16.9. Project Implementation Plan (Gantt)

16.9.1. Introduction

This annex contains a concise overview of the implementation plan for the project for the introduction of a national eCMR platform in the Republic of Serbia. The implementation plan is based on the findings of the analysis of the existing state, the SWOT analysis, the stakeholder analysis, the Risk Analysis, the financial and economic model, and the recommendations defined in Chapter 14 – Implementation Plan.

The objective of this annex is to present the proposed sequence of activities, the implementation timeline, and the key phases of the development and introduction of the eCMR system.

16.9.2. Fundamental Approach to Implementation

The implementation of the national eCMR platform is planned through a phased approach that enables the gradual introduction of the system, controlled risk management, and the continuous engagement of all relevant stakeholders.

The proposed implementation model encompasses:

- the preparatory phase and the establishment of the governance structure;
- analysis and detailed solution design;
- platform development and integration;
- pilot implementation;
- national system roll-out;
- operational support and further development.

16.9.3. Key Project Phases

Table 16.9-1 presents the key phases of project implementation.

Table 16.9-1: Key Project Implementation Phases

Phase	Duration (Months)
Project Initiation and Governance Establishment	1–2
Detailed Analysis and System Design	2–4
Platform Development and Integration	4–10
Testing and Pilot Implementation	10–14
Nationwide System Rollout	14–20
Operational Support and Continuous Improvement	Ongoing

Source: Authors' analysis.*.

16.9.4. Gantt Implementation Plan

The planned implementation schedule is based on the phased approach to implementation, with activities arranged so as to enable the gradual introduction of the system, controlled risk management, and the timely engagement of all relevant stakeholders.

Table 16.9-2 presents the indicative activity schedule for the project.

Table 16.9-2: Indicative Gantt Implementation Plan

Activity	M1– M2	M3– M4	M5– M10	M11– M14	M15– M20
Establishment of the Project Governance Structure	•				
Detailed Analysis and Requirements Specification		•			
Platform Development and System Integration			•		
Testing and Pilot Implementation				•	
Nationwide System Rollout					•
Training and Change Management	•	•	•	•	•
Operational Support and Performance Monitoring					•

Source: Authors' analysis based on the Project Implementation Plan.

Activity	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	M16	M17	M18	M19	M20
Project Management	■	■																		
Analysis and Requirements Specification			■	■																
Platform Development					■	■	■	■	■	■										
System Integration					■	■	■	■	■	■										
Testing											■	■	■	■						
Pilot Project											■	■	■	■						
Nationwide System Rollout															■	■	■	■	■	■
User Training	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Support and Performance Monitoring															■	■	■	■	■	■

Legend:

■ – Activity in Progress

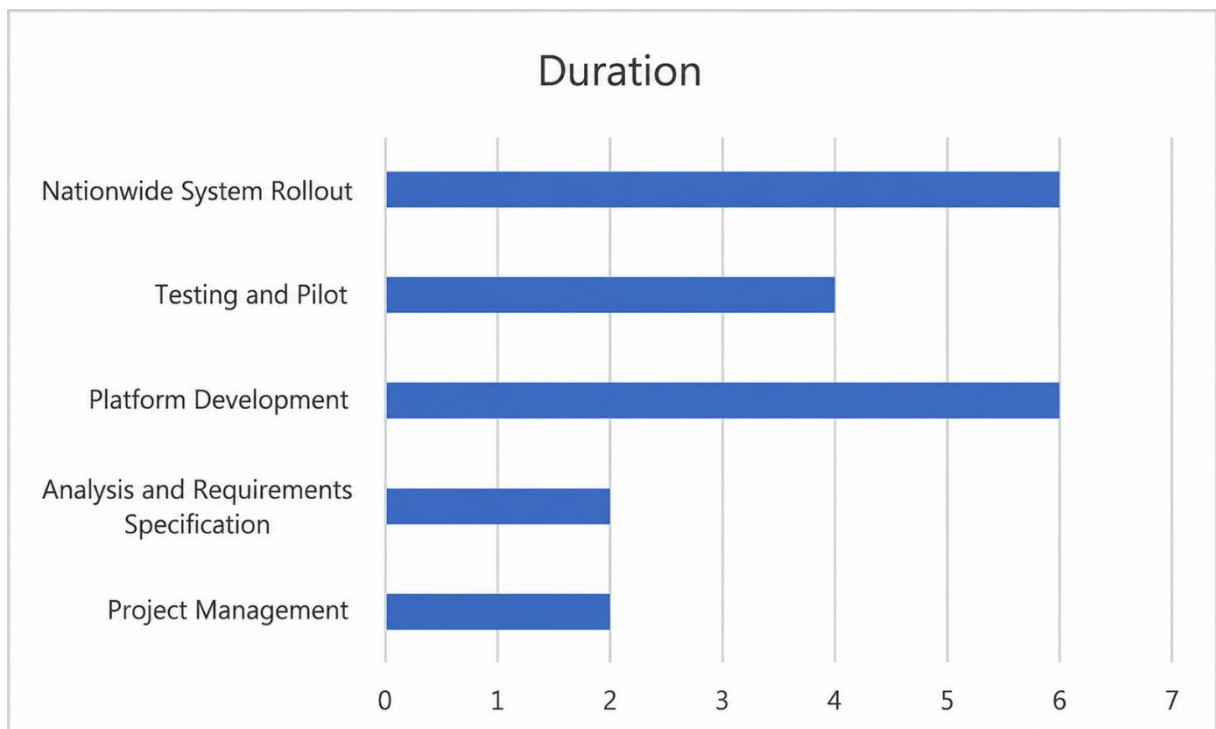


Figure 16.9-1: Indicative Gantt Chart of Project Implementation

Source: Authors' analysis based on the Project Implementation Plan.

The Gantt chart illustrates the logical sequence and temporal dependencies of activities throughout the project implementation period. Particular significance attaches to the platform development, pilot implementation, and national system roll-out activities, whilst user training and change management activities are conducted throughout the entire implementation period.

The proposed timeline also enables the gradual preparation for future regional interoperability with the Western Balkans countries in accordance with the eFTI concept and the recommendations of the Transport Community and the European Commission.

16.9.5. Key Project Milestones

The following key milestones have been identified for the project implementation period:

Table 16.9-3: Key Project Milestones

Milestone	Planned Timeline
Project Governance Structure Established	M2
System Requirements Specification Approved	M4
Platform Development Completed	M10
Pilot Project Completed	M14
Start of Nationwide System Rollout	M15
Full Operational Deployment	M20

Source: Authors' analysis based on the Project Implementation Plan.*

These milestones constitute the basis for monitoring progress and managing project implementation.

16.9.6. Linkage with the Financial and Economic Model

The proposed implementation timeline is aligned with the assumptions used in the financial model (Annex 17.6), the economic model and Cost–Benefit Analysis (Annex 17.7), and the sensitivity analysis (Annex 17.8).

The gradual introduction of the system is directly linked to the projected eCMR platform adoption dynamics, which constitute one of the key parameters of the financial and economic viability of the project.

The implementation schedule is aligned with the projected system adoption rate of 25% in the first year, 50% in the second year, 75% in the third year, 90% in the fourth year, and 95% from the fifth year onwards, as presented in the project financial model.

16.9.7. Conclusion

The proposed implementation plan enables the controlled and gradual introduction of the national eCMR platform with the active engagement of institutions, business entities, and other stakeholders. The phased approach to implementation contributes to risk reduction, more effective change

management, and the gradual realisation of the benefits identified in the financial, economic, and organisational analysis of the project.

The implementation plan constitutes the operational framework for the realisation of the recommendations of this study and the basis for the future national and regional expansion of the eCMR system in accordance with the eFTI concept and the transport digitalisation processes in the Republic of Serbia and the Western Balkans region.

The planned approach to implementation also enables future regional connectivity with the Western Balkans countries, which is consistent with the results of the economic analysis and the estimated regional benefits of approximately €36.4 million per annum.



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