Report Number : ICRR0020553

1. Project Data

Project ID	Project Name
P118375	ROAD UPGRADE & MODERN
Country	**Practice Area(Lead)**
Belarus	Transport & ICT

L/C/TF Number(s)	Closing Date (Original)	Total Project Cost (USD)
IBRD-79710	30-Nov-2014	150,000,000.00
Bank Approval Date	**Closing Date (Actual)**	
11-Nov-2010	31-May-2016	

	IBRD/IDA (USD)	Grants (USD)
Original Commitment	150,000,000.00	0.00
Revised Commitment	146,109,213.18	0.00
Actual	146,109,213.18	0.00

Prepared by	Reviewed by	ICR Review Coordinator	Group
Victoria Alexeeva	George T. K. Pitman	Christopher David Nelson	IEGSD (Unit 4)

2. Project Objectives and Components

a. Objectives

Original Objective

According to the Loan Agreement (November 19, 2010, p.5) and the Project Appraisal Document (p.7), the project development objective was:

"to reduce transport costs for road users on the upgraded sections of the M5 Road, and to introduce electronic tolling in the Republic of Belarus as an efficient cost recovery mechanism.".

Revised Objective

According to the Amendment to Loan Agreement (September 16, 2013, p.1), the objective was:

"to reduce transport costs for road users on the upgraded sections of the M5 road and introduce a modern

axle-load control system in Belarus as a tool to increase road sector sustainability."

b. Were the project objectives/key associated outcome targets revised during implementation?
Yes

Did the Board approve the revised objectives/key associated outcome targets?
Yes

Date of Board Approval
21-Feb-2013

c. Will a split evaluation be undertaken?
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d. Components

Original Components

1. Road Upgrading (appraisal estimate US$131 million; actual cost US$134.3 million) included reconstruction of the existing 2 (two) lanes of the M5 Road Section and construction of 2 (two) additional lanes to the M5 Road Section, including construction of about 6 (six) two-level interchanges, seven overpasses, 4 (four) new bridges, and two pedestrian underpasses.

2. Modernization of Road Tolling System (appraisal estimate US$18 million; n/a) included supply and installation of a modern electronic road tolling system based on microwave technology on a 109 km section (from km 22 to km 131) of the M5 Road between Minsk and Bobrujsk, including supply of equipment such as (i) on-road tolling equipment, (ii) specialized vehicles and equipment for control purposes, (iii) a centralized data processing center, (iv) software and computers, and (v) on-board devices for vehicles.

3. Road Sector Institutional Support (appraisal estimate US$1.0 million; actual cost US$1.06 million) comprised strengthening of the institutional capacity of road sector institutions of the Borrower by providing technical assistance and training, including training on the new electronic tolling system; (ii) support to BELGIPRODOR for updating its economic evaluation tools for road projects, including training on HDM4 and procurement of software licenses; (iii) support to improve the capacity of local institutions involved in supervision of road works to carry out supervision under FIDIC rules; (iv) Technical assistance to BELAVTODOR in carrying out benchmarking and harmonization of Belarusian road construction, repair and maintenance standards and expenditure levels against and in accordance with European and international standards; (v) support for carrying out the project audits; and vi) other minor project-related technical assistance, training and/or goods to support capacity building and Government institutions in the road sector.

Revised Components

2. Axle-Load Monitoring and Control System (actual US$10.4 million). Provision of support for the design and installation of an axle-load monitoring and control system on non-tolled roads in Belarus

(Weight-in-Motion system).

3. Road Sector Institutional Support. Technical assistance was geared towards management of a modern axle load monitoring and control system.

e. Comments on Project Cost, Financing, Borrower Contribution, and Dates

Project cost: The total project cost at completion was US$146 million, slightly lower than the appraisal estimate of US$150 million due to exchange rate fluctuations.
***Financing*:** The project was fully financed through an IBRD Loan of US$150 million, of which US$ 146.11 million were disbursed. The reduction in the US$ value of the Loan was due to currency fluctuations in the Special Drawing Rights, the currency of the Loan.
Borrower: Contribution from the Borrower was neither planned nor given.
Dates: The project restructuring was approved on February 21, 2013 to replace a modern electronic e-tolling system for trucks with an axle load monitoring and control system (Weigh-in-Motion (WIM)) due to the Government's decision to proceed with the e-tolling system through a public-private partnership, outside the project scope. The related activities and indicators were revised accordingly. The project was designed for four years with the closing date of November 30, 2014 that was extended twice by a total of 18 months to May 31, 2016. The first extension was for 12 months and the second extension was for an additional six months to complete the WIM system under revised Component 2. The delay is mainly attributed to the following factors (i) defining technical specifications of the system; (ii) concluding contract negotiations due to unresolved issues on availability of counterpart payments of VAT; (iii) protracted negotiations with an operator of the e-tolling system on integration issues, and (iv) procurement related issues (see Section 11, Procurement).

3. Relevance of Objectives & Design

a. Relevance of Objectives

Original Objectives
Belarus serves as a transit corridor between the European Union and Russia. Russia is the dominant trade partner for Belarus, and Europe was the second most important trading region that represented 21.6 percent of imports and 44 percent of exports at appraisal in 2008. The Trans-European Corridor II (Berlin – Warsaw – Minsk - Moscow) passes through the territory of Belarus, and the project-supported M1/E30 highway is part of Corridor II, connecting the EU and Russia. The objectives are highly relevant to the country priorities in the road sector stated in the Government's program "Roads of Belarus 2006 – 2015". Sustainability of funding for roads was one of the key issues to be addressed by the Government in the transport sector. The abolition of the National Road Fund in early 2010 and the continued effects of the global financial and economic crisis in 2008 and 2009 exerted downward pressure on the Government budget. The objectives remained relevant to the World Bank Group's Country Partnership Strategy Fy14-17 that focused on improvements in

efficiency, quality and sustainability of public infrastructure.

Revised Objectives
The sub-objective of introducing an efficient cost recovery mechanism was revised to introducing a tool to increase road sector sustainability, which was highly relevant to the Ministry of Transport's road sector sustainability and asset management strategy as well as the Bank's strategy in the country.

Rating	Revised Rating
Substantial	Substantial

b. **Relevance of Design**

Original design
The linkages between the outputs, outcomes and the related objectives were clear. Upgrading of the selected road section was expected to reduced vehicle operating costs and the number of fatalities, thus reducing transport costs. The electronic tolling was to serve as a mechanism for cost recovery in the road sector; the formulation of the related sub-objective, however, should have referred to an outcome rather than an output.

Revised design
The revised design was substantially relevant to the revised objectives. The revised sub-objective followed the original objective in formulation with reference to a specific system. An axle load monitoring and control system was to help the Government address the problem of road deterioration due to overloaded trucks. The enforcement of axle load requirements would protect the road assets from premature deterioration and result in longer road pavement life, thus increasing sustainability of road infrastructure.

Rating	Revised Rating
Substantial	Substantial

4. Achievement of Objectives (Efficacy)

Objective 1

Objective
To reduce transport costs for road users on the upgraded sections of the M5 Road.

Rationale
Outputs

- 52.7 km of the M5 road (km 65-93 and km 106-131) were upgraded from a 2-lane (Category 2) road to a

4-lane (Category 1B) motorway, as planned. As a result of upgrade, the road roughness (measured through the International Roughness Index) improved from 3.2 to 1.14 (target <2). Wider medians and shoulders were built in line with EU standards; six two-level interchanges, seven overpasses, four bridges, two pedestrian underpasses and bypasses were constructed.

- Training was provided to the local road institution for civil engineering research and design of highways (Belgiprodor) on the Highway Design and Maintenance (HDM-4) software, and to the road center (Beldocenter) for the supervision of road works under the International Federation of Consulting Engineers' (FIDIC) rules.

Outcome

- Vehicle operating cost reduced by 14% by June 2015, which significantly surpassed the original target of 6%.
- The number of fatalities between 2011-2015 reduced from 9 to 5 (in line with the target) from the 2010 baseline of 12. In addition, the number of people injured were 16, 22, and 15 in years 2011, 2012 and 2013 respectively, and were 8 and 9 in 2014 and 2015.

Rating
High

Objective 2
Objective
To introduce electronic tolling in the Republic of Belarus as an efficient cost recovery mechanism.

Rationale
Outputs
The functional design of a modern electronic tolling system was carried out under the project. However, the Government decided to accelerate the full implementation of the tolling system, outside the project support, proceeding with signing a public private partnership contract with a leading European firm for the supply and installation on about 2,600 km of major highways (the proposed pilot under the project was 109 km on the M5 road). The e-tolling system BelToll has been in operation since August 1, 2013 covering 1,512 km of the national road network in Belarus and is being expanded. As of July 2015, more than 220,000 vehicles had been registered by the system of more than 90 automatic stations.
Outcome
The e-tolling system introduced by the Belarus government on the national road network serves as a cost recovery mechanism generating sustainable financing for the road network and infrastructure. For 2015, the estimated revenues were BYR 537 billion (US$434 million).

Rating
Substantial

5. Efficiency

Economic and Financial analysis
Economic analysis was undertaken at both appraisal and at project closure for the civil-works components.
Road upgrade
An ex-ante economic internal rate of return (EIRR) of the Bank-financed section of the M5 road (52.7 km) was estimated at 21.1 percent with a net present value (NPV) of the US$159 million discounted at 12 percent. The main estimated benefits were savings in vehicle operating costs, reduced travel time costs, and reduction in accident rate. The ex-post economic analysis followed the same methodology based on the HDM software developed by the Bank. The ex-post EIRR was estimated at 15.9 percent with the actual discounted NPV of the project at US$ 36 million. The lower EIRR was due to the increase in the investment costs (by 12 percent over appraisal estimates) and traffic reduction in 2010-2015 for reasons that included weaker than expected domestic economic growth, worsening of the political and economic relations between the Russian Federation and the European Union, and conflict in Ukraine. These reduced benefits were partly compensated by better than expected roughness and road safety improvements.
Road tolling system
At appraisal, a comparative financial analysis was carried out for different tolling options that included 11 combinations of different technologies and toll levels. Based on the feasibility study, it was recommended introducing a tolling system based on microwave technology, with retention and upgrade of the existing tolling system on the M1/E30 road. The activity was dropped from the project support during implementation.
Axle load monitoring and control system
A feasibility study carried out by the Borrower was reviewed by the Bank team to confirm technical and operational feasibility of the planned axle load monitoring and control system. The proposed technological option was to implement weigh-in-motion devices embedded in the pavement of all major roads that carry large numbers of trucks. These devices were combined with vehicle recognition technology and with ICT technology.

Cost effectiveness
The ICR does not offer comparison of unit costs for similar types of road works in the country or region.

Administrative/ Operational inefficiencies
The project experienced process delays related to the axle load monitoring and control system that included procurement aspects and defining technical specifications of the system. While the project was completed within the estimated costs, procurement problems necessitated a project extension of 18 months.

Efficiency Rating
Substantial

a. If available, enter the Economic Rate of Return (ERR) and/or Financial Rate of Return (FRR) at appraisal and the re-estimated value at evaluation:

	Rate Available?	Point value (%)	*Coverage/Scope (%)
Appraisal	✓	21.10	87.00 ☐Not Applicable
ICR Estimate	✓	15.90	92.00 ☐Not Applicable

* Refers to percent of total project cost for which ERR/FRR was calculated.

6. Outcome

Original Objectives: Relevance of the original objectives and design is rated substantial. The achievement of the project's first objective reduction in transport costs is rated high, and the achievement of the second objective is rated substantial, as the Government could develop the e-tolling system outside the project support. There were minor shortcomings in operation's efficiency that is rated substantial. The outcome rating is Satisfactory.

Revised Objectives: Relevance of the revised objectives and design is rated substantial. The achievement of the second revised objective is rated substantial, as the axle load system is operational and there is evidence provided with relation to the intended results.There were minor shortcomings in operation's efficiency that is rated substantial. The outcome rating is Satisfactory.
As the achievement of the project both under the original and revised objectives is rated Satisfactory, the overall outcome rating is Satisfactory.

a. Outcome Rating
Satisfactory

7. Rationale for Risk to Development Outcome Rating

Financial. The condition of the road network is generally good, which is due in large part to the adequate allocation of resources for road maintenance over the past decades. Maintenance arrangements are in place. The state operates several enterprises for road design, planning, research, standards, maintenance, and construction. Following a number of years of declining sector revenues, the Government undertook important steps towards sustainable sector finance and introduced substantial increases in sector revenues and budget allocations for the road sector. In addition to revenues form the e-tolling system and minor revenues from axle-

load fees, the Government introduced a new vehicle fee in 2014 that increase revenues by about BYR 2.3 trillion (US$147 million) that accounted for 71% of total road fund revenues in 2015. The revenues were spent mostly to finance expenditures on construction (39%), capital and current maintenance (20% and 2%) of the republican road corridors and local roads.

Institutional. The local capacity to plan, manage and maintain its road infrastructure is well developed in Belarus. The Government is committed to implementing and enforcing the WIM system. There is a moderate risk for the system's maintenance and its integration with the existing electronic tolling system that require technically qualified staff and close coordination between multiple stakeholders.

a. Risk to Development Outcome Rating

Modest

8. Assessment of Bank Performance

a. Quality-at-Entry

Project design was based on the Bank's experience in road projects, and road tolling in particular, in FSU and new EU member countries. The arrangement for procurement, financial management, and environmental/social safeguards were adequate. Most risks were adequately identified, with the overall rating as moderate. Bank experience in Belarus showed that technical capacity was generally high, and that implementation could proceed satisfactorily given the supportive governance environment and track record of good governance. While the project design was simple, there were shortcomings in the M&E design that did not identify the indicator and related target expected from the installation of the e-tolling system serving as an efficient cost recovery mechanism.

Quality-at-Entry Rating

Moderately Satisfactory

b. Quality of supervision

Supervision was carried out at regular intervals in the areas of environment and social safeguards, financial management and procurement. Mission oversight in each area was supplemented by training and assistance when requested. The Bank carried out a series of fiduciary and technical training programs. The Bank team closely monitored the contract on the supply and installation of the WIM system that experienced delays for a number of reasons, including delays in defining technical specifications and protracted negotiations on the system integration with e-tolling. When the M&E design was revised in relation to the new activity added during project restructuring in 2013, it did not identify the indicator and target to demonstrate the actual outcome of the axle-load control system as a tool for increasing road sector sustainability. However, the related evidence was collected at project completion.

Quality of Supervision Rating
Moderately Satisfactory

Overall Bank Performance Rating
Moderately Satisfactory

9. Assessment of Borrower Performance

a. Government Performance
The Government's ownership and commitment were strong to the project. The Government enforced an axle load control and a number of complementary reforms to improve sustainability of the road sector. All covenants were compiled with. The Government funded the supervision of road works under Component 1 carried out by specialized state agencies. It also implemented the e-tolling system with a larger scope planned under the project. There was, however, delay in effectiveness of eight months due to delays in getting agreement to process the Value Added Tax (VAT) exemption. There was a high-level Government interference in project management, in particular redirecting the activities of Belarusian sub-contractors that slowed down construction works on M5, which were still completed within the project original frame. Also, the decision to drop e-tolling was done without consulting the Bank.

Government Performance Rating
Moderately Satisfactory

b. Implementing Agency Performance
A Project Implementation Team was created within the Republican Unitary Enterprise Minskavtodor-Center (MA-C), one of the subsidiaries of the Roads Department *Belavtodor* under the Ministry of Transport and Communication. It consisted of experienced officials from Belavtodor, MA-C, and other road sector agencies who were assigned to work on the various aspects of project preparation and implementation. Fiduciary compliance was good, audit reports were submitted on time and auditor's opinions unqualified, environmental and social oversight was carried out with due diligence. There were, however, delays in defining technical specification of the system and protracted negotiations with operator of e-tolling system on integration issues for the axle-load system.

Implementing Agency Performance Rating
Moderately Satisfactory

Overall Borrower Performance Rating
Moderately Satisfactory

10. M&E Design, Implementation, & Utilization

a. M&E Design

The outcome indicators for the road upgrade under Component 1 were appropriately targeted to measure reduction in vehicle operating costs and improvements in road safety. The indicators for the electronic road toll system under Component 2 were well designed to capture the output; there were, however, no outcome targets identified for the e-tolling system serving as a cost recovery mechanism.

Similarly, the revised Component 2 activity and objective did not capture the outcome for installation of the WIM system as a tool to increase road sector sustainability. A better measurement of the actual outcome from axle load control would include such indicators as the percentage reduction of overweight vehicles, the number of enforcement actions taken, or the actual utilization of the new WIM system as measured by the number of measurements generated.

MINSKAVTODOR-Center (MA-C) was responsible for the collection of the project's performance indicator data and analysis of the results.

b. M&E Implementation

MA-C collected and reported on the requisite data at regular intervals.

c. M&E Utilization

The intermediate results indicators were used to track physical progress of civil works and capacity development. The data needed for monitoring of the selected indicators was part of the data normally collected by the Belarusian government departments and agencies.

M&E Quality Rating

Modest

11. Other Issues

a. Safeguards

This was an Environmental Category "B" project classified under World Bank Operational Policy 4.01-Environmental Assessment, as (i) construction works were to be essentially confined to the existing right-of-way which was fully owned by the State, (ii) there was no resettlement of people or businesses; and land acquisition was limited to transfer of land between different State agencies, (iii) the potential environmental impacts of the project were not expected to be significant or only of a temporary nature (PAD, Annex 10). The project implementation was in full compliance with the EMP and the environmental management in this project was exceptional, as stated in the ICR (p.16). Contractors of civil works were prepared and

addressed emerging environmental issues properly. The civil works were carried out within existing rights of way, except for the bypass of the village of Sosnovy (about 5.7 km long) and at the village of Boyary, where the road alignment was moved by about 50 meters from the existing road in order to increase the distance between the road and the nearest houses. In both of these cases, the construction was on land owned by the State and did not have any adverse impact on community or private land use.

b. Fiduciary Compliance

Financial Management. The design of financial management (FM) relied on the existing institutional FM systems of the departments of MA-C and using the existing institutional mechanisms of financial management. The FM arrangements in Belavtorod and MA-C were acceptable and the FM capacity was sufficient that satisfied the Bank's requirements. Audit reports were completed on time, and the auditor's opinions for the financial statements for each year were unqualified (ICR, p.17).

Procurement. All contracts were subject to prior review by the World Bank. Frequent implementation reviews were carried out by the World Bank project team that included technical staff, financial management specialists and procurement accredited staff. Training was conducted to help the implementing agency to improve its capacity in procurement under the World Bank guidelines. Under the revised Component 2, the procurement process for both the design consultancy services and the subsequent procurement of equipment for the axle load monitoring and control system suffered from delays. In particular, there were delays in defining technical specifications of the system and a highly rated consultant did not follow up with contract negotiations and there was a need to proceed with the next qualified bid.

c. Unintended impacts (Positive or Negative)

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d. Other

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12. Ratings

Ratings	ICR	IEG	Reason for Disagreements/Comment
Outcome	Satisfactory	Satisfactory	---
Risk to Development Outcome	Modest	Modest	---
Bank Performance	Moderately Satisfactory	Moderately Satisfactory	---

Borrower Performance	Moderately Satisfactory	Moderately Satisfactory	---
Quality of ICR		Substantial	---

Note
When insufficient information is provided by the Bank for IEG to arrive at a clear rating, IEG will downgrade the relevant ratings as warranted beginning July 1, 2006.
The "Reason for Disagreement/Comments" column could cross-reference other sections of the ICR Review, as appropriate.

13. Lessons

Three lessons were selected from a list of seven lessons identified by the ICR with some adaptation, as follows:

- **There is a need for sufficient flexibility in project design**. In a case of a sophisticated client country, project design as reflected in legal documents needs to consider introducing sufficient flexibility to allow minor changes without major restructuring and complex approval processes.
- **Monitoring and evaluation design may benefit from relying on the existing data monitoring systems.** For this project, most of the M & E system relied on data already routinely collected - the data needed for monitoring the selected indicators was of the type that was normally collected by the government departments and agencies and thus were easily monitored.
- **The lowest contract bids are not always cost-effective and may incur additionla costs during implementation**. Based on the experience from Belarus and more widely in the region, some contractors may present very low prices in winning bids and afterwards delay the execution of works through requests for variations. In addition, when large international contractors obtain awards, they tend to sub-contract a significant portion of works to local contractors. It is important to verify the past performance of contractors in the region, and be aware of differences between local legislations and the Bank’s standard procurement policies.

14. Assessment Recommended?

No

15. Comments on Quality of ICR

The ICR is concise and outcome-oriented. It is comprehensive and offers useful insights into the issues that affected project implementation. The report also provides an important critical assessment of the project's M&E design. Lessons are evidence- based.

a. Quality of ICR Rating
Substantial