ADB

Technical Assistance Consultant's Report

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Kazakhstan: Managing for Development Results in the Transport Sector of Kazakhstan

FINAL REPORT

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Asian Development Bank

CURRENCY EQUIVALENTS

(as of 26 April 2016)

Currency Unit	–	Kazakhstan Tenge (KZT)
KZT 1.00	=	$ 0.0029
$1.00	=	KZT 337.7

NOTE

In this report, "$" refers to US dollars.

ABBREVIATIONS

AADT	–	Average Annual Daily Traffic
AC	–	Asphalt Concrete
ADB	–	Asian Development Bank
AIIB	–	Asian Infrastructure Investment Bank
BAKAD	–	Great Almaty Ring Road
CAREC	–	Central Asia Regional Economic Cooperation
CC	–	Cement Concrete
CE	–	Centre-East corridor
COR	–	Committee of Roads
CS	–	Centre-South corridor
CW	–	Centre-West corridor
DEP	–	Road sub-depot
DEU	–	Road depot
DRSU	–	Road Repair and Construction Unit
EBRD	–	European Bank for Reconstruction and Development
GDP	–	Gross Domestic Product
HR	–	Human Resources
IDB	–	Islamic Development Bank
IRI	–	International Roughness Index
JICA	–	Japanese International Cooperation Agency
JSC	–	Joint Stock Company
KPI	–	Key Performance Indicators
KZT	–	Kazakhstan Tenge
LPU	–	Tree planting nursery
MfDR	–	Management for Development Results
MID	–	Ministry of Investment and Development
MNE	–	Ministry of National Economy
MOF	–	Ministry of Finance
MOTC	–	Ministry of Transport and Communications
OECD	–	Organization for Economic Co-operation and Development
PCU	–	Passenger Car Units
PPP	–	Public-Private Partnerships
RAMS	–	Road Asset Management System
RB	–	Regular Budget
RBM	–	Results-Based Management
RSE	–	Republican State Enterprise
TRACECA	–	Transport Corridor Europe-Caucasus-Asia
US	–	United States
WEF	–	World Economic Forum
WEWC	–	Western Europe - Western China corridor
WHO	–	World Health Organization

EXECUTIVE SUMMARY

1. This Executive Summary has been prepared to provide the Committee of Roads (COR) and other stakeholders that are active in the road sector in Kazakhstan, with a summarized overview of the findings and recommendations of the Asian Development Bank funded small-scale capacity development technical assistance (S-CDTA) "*Managing for Development Results (MfDR) in the Transport Sector of Kazakhstan*". The aim of Managing for Development Results (MfDR) is to help public organizations achieve the results laid down in the strategic objectives and goals of government programs. The notion of result in MfDR is associated with the social change produced by the government's actions and not just with the activities or the products that contribute to this change. Rather than taking these activities or the resulting outputs as parameters for evaluating government activity, the MfDR approach focuses on the outcomes and impact of those outputs on society and the economy. The ADB technical assistance aims to strengthen the roads sector management in Kazakhstan through establishment of an MfDR framework that provides clear linkages between planning, budgeting, program and project implementation, and monitoring of development results. The technical assistance has the following three outputs:

- MfDR principles institutionalized and operationalized in the Ministry of Investment and Development (MID)
- Roads subsector results-based framework developed in line with national planning objectives
- Monitoring and evaluation (M&E) system developed to support results-based planning, budgeting and monitoring in the roads subsector

2. This Executive Summary starts by looking at the current situation in Kazakhstan's road sector, describing the institutional setup and the status of the republican road sector, the funding of different interventions in the republican road network, and the existing strategic policies and plans and their relation to the road sector. The second part looks at the proposed MfDR approach, presenting the proposed Key Performance Indicators (KPI) to be used in Kazakhstan's road sector, describing how the MfDR approach may be applied in the different steps of the management cycles (planning, budgeting, implementing and monitoring), and presenting the proposed institutionalization of the approach within COR and other road sector stakeholders.

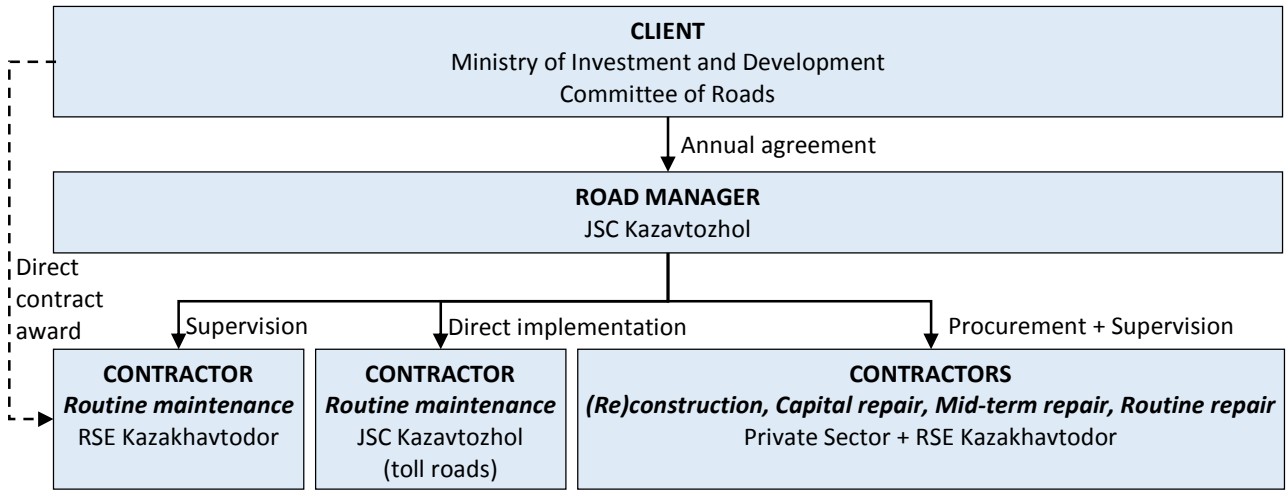
Institutional setup

3. The republican road sector in Kazakhstan falls under the responsibility of the Ministry of Investment and Development (MID) that acts as the *Client* for the republican road network through its Committee of Roads (COR). Daily management and supervision of republican road works has been transferred to the Joint Stock Company JSC Kazavtozhol, which acts as the *Road Manager* and is responsible for procurement and contract supervision on behalf of the government. Works consist of construction and reconstruction contracts that fall under the development budget, and capital, mid-term and routine repairs as well as routine maintenance (summer and winter) that fall under the recurrent budget. All works are tendered out to contractors by Kazavtozhol through open bidding, except routine maintenance (summer and winter) that is directly awarded to the Republican State Enterprise RSE Kazakhavtodor or carried out by Kazavtozhol (in the case of toll roads).

4. As part of its functions, COR also provides targeted transfers to Akimats at oblast and district level for the (re)construction and repair of local roads. There are furthermore 14 zhollaboratories (one in each oblast) that report to COR and are responsible for quality control of (re)construction and repair works in republican roads, local roads and streets in as far as these are carried out with COR budget. The Joint Stock Company JSC KazdorNII is a design and research institute under COR that is contracted through open tender to carry out diagnostics and technical research, and to review technical regulations for the road sector. Development partners active in the road sector in Kazakhstan include the World Bank, the Asian Development Bank (ADB) and the European Bank for

Reconstruction and Development (EBRD), with the Asian Infrastructure Investment Bank (AIIB) expected to become involved in the near future.

Figure 1 Division of roles for the republican road network



The republican road network

5. Of the 100,000 km of roads in Kazakhstan, approximately a quarter (23,700 km) are republican roads under the responsibility of COR. Paved roads form 92% of the republican road network, although this includes a large portion of so-called black gravel roads. Technical category I or II roads make up 27% of the republican road network, with this percentage expected to more than double by 2020 as a result of the reconstruction works planned under the Transport Strategy 2020 and the Nurly Zhol program. The road numbering does not appear to reflect the new strategic importance of certain republican roads, and it is suggested to make the necessary adjustments to distinguish between strategic republican roads to be upgraded to category I or II, and other republican roads.

6. Road conditions are reported to be fairly good, with 32% of republican roads reported to be in good condition and 49% in satisfactory condition in 2014. However, the condition rating is based on a quick drive over by an inspection committee and is not based on objective measurements, making the ratings very subjective and subject to error. Surface defect measurements carried out during the 2014 autumn survey indicate an average of 17 m^2 of potholes per lane-kilometer of republican road (equivalent to a pothole of 30cm diameter in every 2 metres of road for a two-lane road). This was after Kazakhavtodor had reportedly carried out 1.5 million m^2 of patching in the same year (equivalent to approximately 1% of the paved surface area of republican roads). When other surface defects are included, these figures become significantly higher, implying that road conditions are not as good as they are reported to be.

7. Although surface defects are being treated annually through routine maintenance, this is not the case for roughness, where the amount of capital and mid-term repairs being carried out is insufficient to counteract the deterioration process. It is expected that roughness data will show road conditions to be much worse than currently reported. Whilst roughness data is currently not collected on a regular basis, this is likely to change, with COR investing in road survey vehicles that will allow regular collection of data on road roughness and surface defects. A road asset management system (RAMS) is also being developed with support from World Bank, which will facilitate assessment of road conditions and will assist COR with maintenance planning and budget management.

8. Road safety is becoming an important issue, with a road traffic fatality rate of 21.9 deaths per 100,000 people in 2013, double the level in Uzbekistan and 4 times the level in Western Europe.

However, this figure is distorted by the low vehicle ownership in Kazakhstan, with road traffic fatality rates per 100,000 registered motor vehicles reaching 71.8, which is over 15 times higher than Western European countries. Blackspots are recorded by Kazakhavtodor, which reported over 200 locations in the republican road network with 2 or more accidents in 2014. Regulations exist for recording and treating blackspots, but these activities need to be carried out in a more structured manner in order to improve road safety.

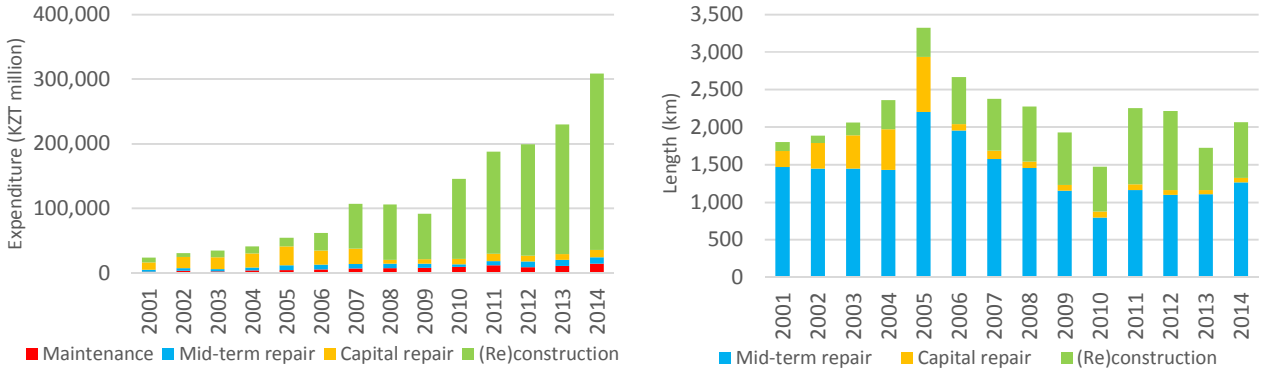
Road sector funding

9. COR's budget is divided into budget subprograms that reflect COR's main activities. Budgets are increasing sharply, doubling between 2011 and 2016. Most of this increase is aimed at (re)construction works, however, with repair and maintenance budgets only showing a 30% increase in the same period. Expenditure on republican road (re)construction has increased by an average of 30% per year since 2001, although higher investment costs have resulted in a significantly lower increase in the length of (re)construction works carried out. (Re)construction budgets allowed an average of 800 km of (re)construction works to be carried out annually over the past 5 years.

10. In the case of capital repairs, budgets have hardly changed, with the length of capital repairs reducing by an average of 10% per year since 2001. Budgets for mid-term repairs have only increased slightly, resulting in a decrease in the length of mid-term repairs carried out each year. In 2014, only 5% of the republican road network received mid-term maintenance, implying that republican roads receive mid-term maintenance on average only once every 20 years instead of the normally recommended 5-7 years. Altogether, pavement renewal only adds up to some 2,000 km per year, less than 10% of the republican road network, implying an unavoidable deterioration of pavement conditions over time.

11. Allocations for routine maintenance have increased slightly, and although Kazakhavtodor carries out routine maintenance throughout the republican road network, this does not address all the needs. Earlier studies estimate that the maintenance and repair budget needs to be tripled in order to ensure proper coverage of needs. Due to a lack of mid-term and capital repairs, roads in poor condition are being kept open through routine maintenance, resulting in very high amounts of patching work (1.5 million m^2 in 2014) and diverting the already limited routine maintenance funding away from roads in good condition and from winter maintenance. Such routine patching of roads in poor condition is a very inefficient use of funding, and should be avoided in favor of increased allocations to mid-term and capital repairs. These results show that there is an urgent need to increase funding for repair and maintenance, and to improve the allocation of that funding towards the maintenance and mid-term repair of roads in good to fair condition.

Figure 2 Republican road network expenditure and length



12. Most of the funding for republican roads comes from the Republican Budget and from external loans. For 2016 and 2017, significant contributions are also foreseen from the National Fund in

support of planned reconstruction works under the Nurly Zhol program. Funding from road user charges is on the increase, with 211 km of toll road introduced in 2013 and nearly 7,000 km of toll roads planned for 2020. This is expected to provide an annual revenue of KZT 41 billion, equivalent to the current repair and maintenance budget. However, the use of this funding is restricted to the toll roads where it was collected and may only be used for maintenance (Section 5, Road Law # 245, 2001). Any remaining funds are to be transferred to the Republican Budget. It is recommended to expand the use of the toll revenue to also include repairs and to permit use of toll revenue in other non-tolled republican roads, thus ensuring that these road user charges benefit the road sector. This is in line with the planned concession for the Almaty ring road, where the required investments will be repaid through availability payments from government. These payments will be largely covered from expected toll revenue, which will cover maintenance costs, repair costs and even a large portion of the construction costs.

13. Although a Road Fund existed in the past with revenue from a fuel tax and other road user charges, this was later abolished. Currently the only road user charges that can be considered to contribute to the financing of the republican road network include transit fees for trucks, roadside advertising on republican roads and toll revenue[1]. Fines for overloading on republican roads are also being introduced, and should be included as republican road user charges. These road user charges currently cover 16% of all repair and maintenance expenditure for republican roads (including toll roads). With the planned increase in toll revenue, it is expected that this percentage will increase to nearly 60% by 2020.

Strategy policies and plans

14. Kazakhstan has a wide range of strategic policies and plans. For the road sector the most important of these are the Transport Strategy 2020, the MID Strategic Plan 2014-2018 and the Nurly Zhol program. These strategy documents define the activities to be carried out and the results to be achieved and there are plans to consolidate these documents into one strategic document. These are defined through various indicators and related targets. Most of these indicators are output indicators that define the direct results to be achieved through different activities (e.g. the length of road to be reconstructed, the area of land to be acquired, etc.). Although the strategy documents also include outcome indicators that define the development results to be achieved through the combination of different outputs (e.g. the condition of the republican road network, the user satisfaction with the republican road network), these are more limited. Furthermore, many of the outcome indicators are not strictly related to the road sector, lack targets or do not have a defined date by which they are to be achieved.

15. The different strategy documents also include lists of priority republican roads that are to be upgraded to category I or II. The lists are not exactly the same in all documents, and tend to focus only on those roads that still need to be upgraded, excluding roads that have previously been upgraded. To provide a better overview of the priority roads that require category I or II in the longer term and to facilitate monitoring of progress, it is recommended to define a core republican road network. This core republican road network would include all the priority republican roads that are already category I or II or that are to be upgraded to category I or II in the near future. This core republican road network could be defined through ministerial resolution or decree, allowing for easy reference in strategy documents and annual plans. In doing so, it is recommended to use the road codes as unique identifiers. Based on the lists included in the different strategy documents, a draft core republican road network is defined below. This covers a total network of just over 14,000 km, 46% of which is already in category I or II.

[1] There is also an annual vehicle tax, but this is collected by local authorities and as such is not available to the national government.

Table 1 Core republican road network as included in strategy documents

Road	Code	Length (km)	Corridor	Transport Strategy 2020	MID Strategic Plan 2018	Nurly Zhol
(China) Khorgos - Almaty - Shymkent - Tashkent (Uzbekistan)	A2	1,197	WEWC	X	X	X
Shymkent - Kyzylorda - Aktobe - Uralsk - Samara (Russia)	M32	2,029	WEWC	X	X	X
Taskesken - Bakhty (China)	A8	187		X	X	X
(Russia) Omsk - Pavlodar - Maikapshagai (China)	M38	1,099	CE	X	X	X
Atyrau - Aktau	A33	798		X	X	X
Aktau - Bekdash (Turkmenistan)	A34	115		X	X	X
Aktobe - Martuk (Russia)	A24	102	WEWC	X	X	X
Great Almaty ring road (as a concession - BAKAD)	-	65		X		
Almaty - Karaganda - Astana - Kostanay - Chelyabinsk (Russia)	M36	2,032	CS	X	X	X
Astana - Shiderty	P4	243	CE	X	X	X
Shiderty - Pavlodar	A17	184	CE	X	X	X
Astana - Arkalyk - Shalkar - Beineu - Aktau	-	1,652	CW	X	X	X
Almaty - Ust-Kamenogorsk	A3	1,036		(X)	X	X
Astana - Petropavlosk - Russia	A1	452		X	X	X
Uralsk - Kamenka (Russia)	A29	100				X
Usharal - Dostyk (China)	A7	184		X		X
Kyzylorda - Zhezkazgan - Karaganda	A17	925				X
Aktobe - Atyrau - Astrakhan (Russia)	A27	871		X	X	X
Uralsk - Atyrau	A28	487				X
Merki - Shyganak	P29	273				X
Beineu - Kungirot (Uzbekistan)	P1	84				X
Astana south-western bypass	-	31			X	
Total		**14,146**				

WEWC: Western Europe - Western China, CS: Centre-South, CE: Centre-East, CW: Centre-West

MfDR and Key Performance Indicators (KPI)

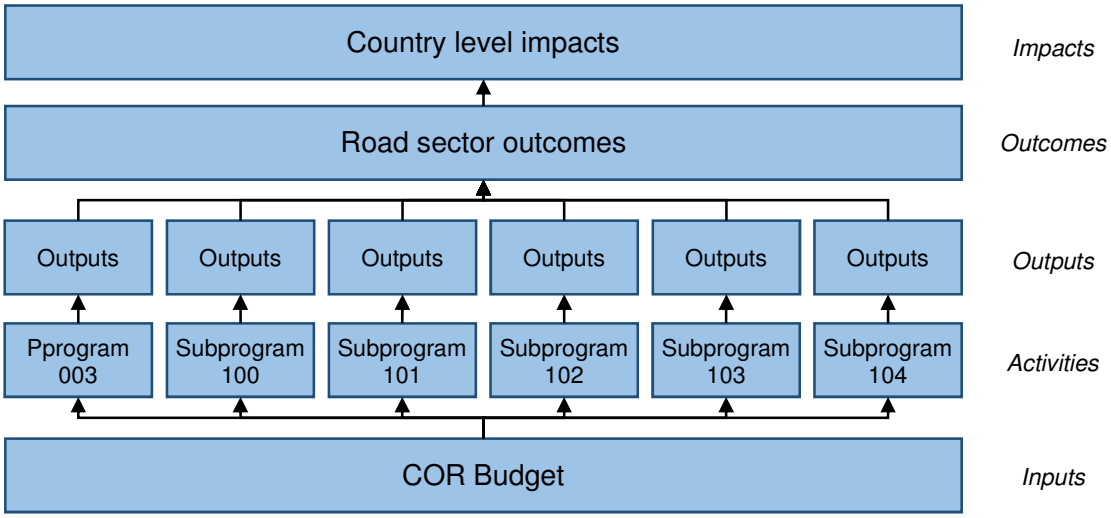
16. Managing for Development Results (MfDR) is designed to improve program delivery and strengthen management effectiveness, efficiency and accountability. It sets out clear expected results for program activities, establishes performance indicators to monitor and assess progress towards achieving the expected results and enhances accountability of the organization as a whole. MfDR seeks to overcome what is commonly called the “activity trap”, i.e. getting so involved in the details of day-to-day activities that the ultimate objectives are being forgotten.

17. Such management based on results is receiving increasing attention in Kazakhstan. The new government of President Nazarbayev recently presented the 100 steps for the implementation of 5 institutional reforms, several of which look at results-based management. This includes the reformatting of strategic plans to focus on achieving key performance indicators, giving greater autonomy to state bodies in organizing operations to achieve agreed targets, requiring heads of state bodies to publicly present annual achievements of key indicators, auditing state bodies based on their achievement of strategic plans, and even introducing performance-based remuneration against the fulfillment of strategic plans. With support from the World Bank, the Ministry of National Economy has introduced results-based formats for strategic plans and for annual budget requests. The introduction of an MfDR approach in the road sector clearly links up with these government initiatives and is consistent with the recently introduced results-based formats for strategic plans and annual budget requests.

18. MfDR is centered on the clear notion of causality. The theory is that a specific combination of inputs and activities leads logically to a predefined set of outputs, outcomes and impacts. These changes are generally shown in the ‘results chain’ or ‘results-based framework,’ which clearly

illustrates the cause and effect relationships. MfDR demands that managers regularly analyze the degree to which their activities and outputs have the reasonable probability of achieving the desired outcomes and impact, and to make continuous adjustments accordingly to ensure that results are achieved.

Figure 3 Results chain for the road sector



19. **Inputs** refer to the resources (labor, funding, materials, etc.) that are allocated. **Activities** refer to the methods that are used to transform these inputs into outputs (e.g. reconstruction, routine maintenance, condition surveys). **Outputs** are the direct results of the activity (e.g. length of road reconstructed). Generally there is a relatively clear relationship between the inputs and the outputs for a specific activity (e.g. m^3 of asphalt per kilometre of reconstructed road, cost per kilometre of mid-term repair). **Outcomes** refer to the short- or medium term development results that are caused by the outputs (e.g. improvement in road network condition, increase in traffic volumes, reduction in travel times, reduction in travel costs). **Impacts** refer to the medium- or long-term changes to society for the country as a whole (e.g. economic growth, improved education standard, reduced poverty, etc.).

20. A central element of the MfDR approach is the definition of a set of key performance indicators and related targets that define the outputs and outcomes to be achieved. These indicators and the related targets need to be measurable (allowing objective assessment of achievement) and time bound (defining by when they are to be achieved). A central task in this technical assistance has been the identification of a set of suitable indicators and the definition of appropriate targets. This has been done on the basis of existing indicators and targets included in the various strategy documents, taking into account available data and their collection methods.

21. The result is a set of eight (8) output indicators related to the budget subprograms of COR, and 6 outcome indicators related to the COR budget program as a whole. The outcome indicators are related to road condition, road standards, road safety, road user satisfaction and road financing. The different indicators are based on existing indicators, introducing amendments where this was deemed necessary to ensure proper representation of the desired outputs and outcomes or to improve the reliability of the indicator and its underlying data. The resulting set of indicators and targets is presented below. These all make use of readily available data, except for the road roughness indicator which requires roughness data that will only become available in the course of 2016.

Table 2 Proposed output and outcome indicators and targets

	Proposed indicator	2012	2013	2014	2015	2016	2017	2018	2019	2020
OUTCOME INDICATORS	Percentage of the republican paved road network with an IRI <= 5.0 (%)									
	Area of surface defects (potholes) per lane-kilometre (m^2/lane-km)		19	17	16	15	13	12	10	8
	% of the core republican road network in category I or II (%)	37%	41%	46%	54%	58%	64%	69%	75%	80%
	Number of untreated blackspots in the republican road network (#)	(119)	123	202	200	180	160	140	120	100
	Score for the World Economic Forum Quality of Roads indicator (#)	2.7	2.8	3.0	3.1	3.3	3.4	3.5	3.7	3.8
	% of republican road repair and maintenance expenditure covered by road user charges (%)	12%	16%	16%	21%	31%	42%	50%	52%	58%
OUTPUT INDICATORS	**003**: Length of fully completed republican road (re)construction (km)	260	1,043	597	340	531	816	700		
	100: Length of completed republican road repairs (km)	1,164	1,165	1,140	1,136	1,248	1,352	1,136		
	100: % of paved republican road network covered by instrumental examination (%)	-	-	-	-	50%	80%	85%	90%	95%
	101: % of republican road (re)construction and repair length checked for quality (%)				95%	95%	95%	95%	95%	95%
	101: % of local road (re)construction and repair length checked for quality (%)				95%	95%	95%	95%	95%	95%
	102: % of planned (re)construction, repair and maintenance works in republican roads completed (%)	85%	109%	88%	95%	95%	95%	95%	95%	95%
	103: Length of fully completed local road and street (re)construction (km)	63	156	155	112	125	121	125		
	104: Length of completed local roads repairs (km)	623	588	22	53	95	133			

The MfDR management cycle

22. The MfDR management cycle consists of four main steps. The first step is **results-based planning**, which involves the definition of the direct results (outputs) and development results (outcomes) to be achieved and how this will be done (inputs and activities). In Kazakhstan the strategic plan forms the basis for results-based planning. The MID Strategic Plan was recently reviewed, amending it to the new results-based format provided by MNE. It is strongly recommended that the proposed MfDR indicators are included in the new Strategic Plan, thus ensuring that the indicators properly reflect the outputs and outcomes to be achieved, and that they involve reliable data that is readily available (or will be in the near future). The set of proposed targets for these indicators will need to be completed for the full planning period up to 2020, and may be amended as considered necessary by COR. It is important that the COR input to the MID Strategic Plan include the output targets for the different budget subprograms, as well as outcome targets for the budget program as a whole

23. **Results-based budgeting** involves the linkage of budgets and financing to the results that are planned to be achieved, as well as the allocation of the budget to the different activities (subprograms). As a basis for results-based budgeting, MNE has provided a results-based format for the budget request, which includes tables for indicating targets and required budgets for each

subprogram. For the budget subprograms, the form allows output indicators (direct results) to be entered with targets for each year of the planning process. This is complemented by budget allocations for each year, allowing easy comparison of targets and budgets. For the development budget program, the subprograms are based on the source of funding instead of the type of activity. Here it is recommended to include all funding sources in a single form, especially since some targets are related to co-financing from different sources. There is also a separate form for the budget program as a whole, involving outcome indicators (development results) instead of output indicators. However, this does not allow annual targets to be entered in a tabulated format, complicating the comparison of budgets and outcome targets. Although COR has two budget programs (004 for development and 091 for recurrent expenditure), it is recommended to include both in a single budget program form, as the outcome indicators and targets refer to the combined outcomes of both budget programs.

24. **Results-based implementation** involves the administration, technical design, procurement and contract management needed to ensure proper implementation. For republican road works this is largely the responsibility of Kazavtozhol, while for the targeted transfers for local roads and streets the Akimats are responsible for management. In the case of quality control the zhollaboratories are responsible for implementation, while Kazakhavtodor[2] and KazdorNII are contracted to implement some of the activities. To facilitate the achievement of the output indicators, some of the responsibility for achieving the targets may be delegated to these stakeholders through performance agreements. These performance agreements basically define the outputs to be achieved against a predefined budget or contract amount, with penalties or rewards in case of poor or very good performance. Such performance agreements are already in place in some cases, and will need to be amended to reflect the proposed MfDR indicators and targets. It is not recommended to include the outcome indicators as part of the performance agreement, as the stakeholders do not currently have sufficient autonomy or capacity to ensure achievement of the targets. Performance agreements may also be introduced in contracts with contractors, with several development partners planning to introduce some form of performance-based maintenance contracts. However, the current legal separation of roles for maintenance (Kazakhavtodor) and repairs (contractors) makes this difficult to implement without legislative changes[3].

25. **Results-based monitoring** requires the regular review of results (outputs and outcomes) and the comparison to targets. This is done with the aim of assessing progress, as well as to identify any problems with the plan, the budget or the implementation, allowing adjustments to be made where necessary. The monitoring results may also be used to provide transparency and accountability to civil society regarding the use of funds and the results achieved (as foreseen in the 100 steps of the government). In comparing the results to the targets, it is important that the targets not be adjusted, but that any difference be properly explained and justified. Although targets for future years may be adjusted (e.g. in view of reduced budgets), this should not be done for current and previous years where the budget and related targets have already been agreed. A problem that was identified during this assignment is the significant number of discrepancies between different data sources as a result of the large number of reports and spreadsheets flowing between COR and Kazavtozhol, Kazakhavtodor, the zhollaboratories, the Akimats and KazdorNII. To avoid this situation, it is recommended to introduce a web-based project management system where relevant data is collected centrally and made available to each of the stakeholders. Such a system may also be configured to prepare different reports to respond to the needs of COR and other stakeholders, including annual reporting of the MfDR indicators as part of the progress reports on achievements of the MID Strategic Plan. Initially such a system may be developed in Excel and/or Access with a plan to procure Commercial of the Shelf (COTS) software that would be suitable for operational road sector management by all the key stakeholders in Kazakhstan. This would be improve monitoring and

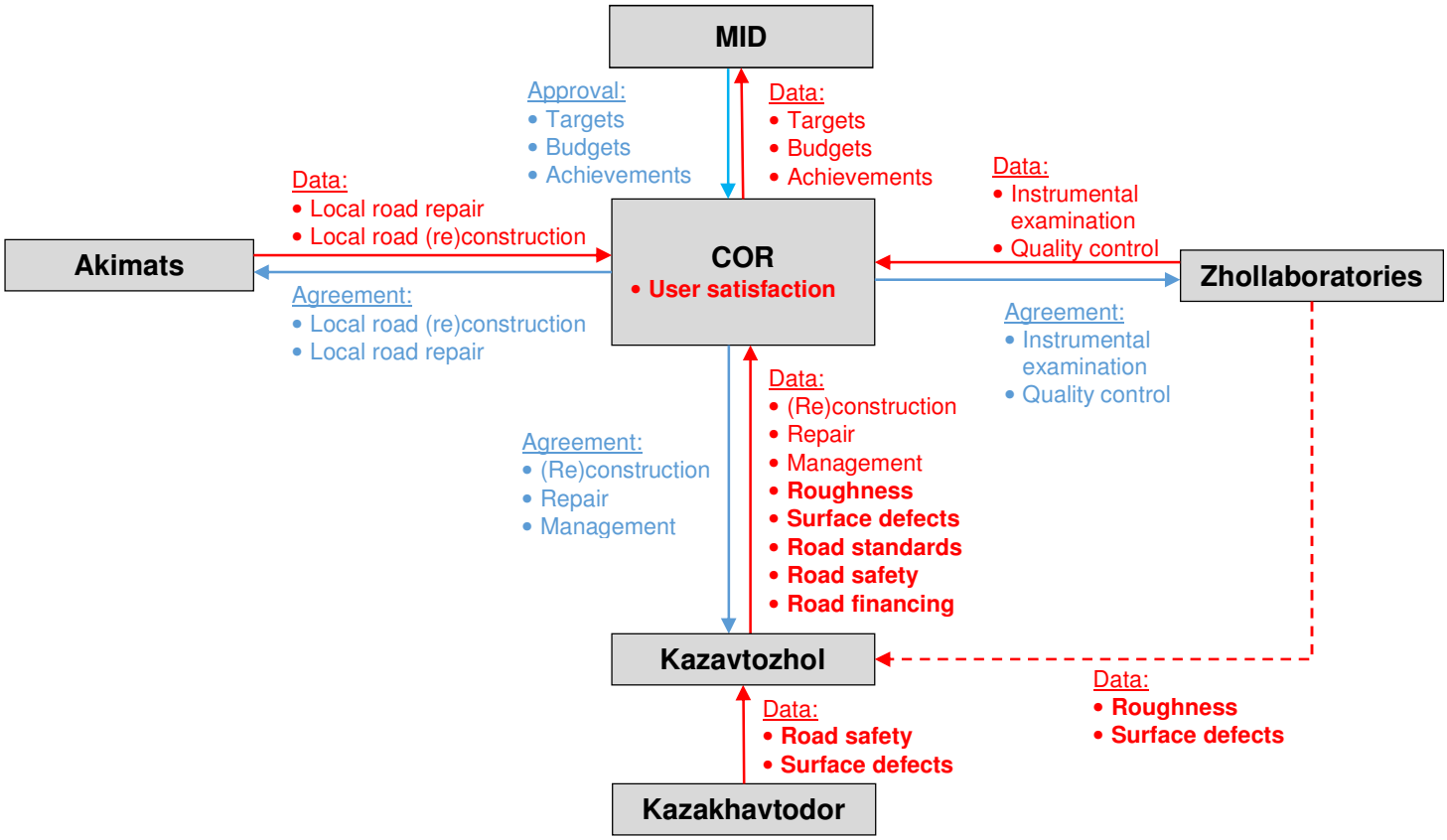
[2] Kazakhavtodor has been nominated for privatization, and as a result its relationship with COR may change.
[3] Legislative changes will need to include provisions for performance agreements.

provide a basis for improved evaluation with more accurate data that may be used to generate reports for each level of management. This will need to be supported by the strengthening of IT skills in COR.

Institutional arrangements for MfDR

26. Although COR is considered to be responsible for achieving the different MfDR targets and for reporting on achievements, other stakeholders will be involved in different stages of the process (as is the case now). Figure 4 sets-out the institutional arrangements for setting the MfDR targets, for data collection and compilation, and for calculating the indicators and reporting on achievements. The structure shows that COR performs a key role in this process.

Figure 4 Delegation of responsibilities and flow of data for MfDR indicators



27. Within COR, several different departments are involved in the planning, budgeting, implementation and monitoring of achievements, complicating coordination and reducing effectiveness. To improve the entire management cycle of planning, budgeting, implementation and monitoring, it is strongly recommended to establish a **strategic management department** in COR that would be responsible for preparing strategic plans, determining suitable funding sources and preparing results-based budget requests. It would also coordinate the collection of data and receive progress reports from other stakeholders, allowing it to monitor progress and report on achievements.

CONTENTS

TABLES

FIGURES

I. INTRODUCTION

28. This report was prepared under the small-scale capacity development technical assistance (S-CDTA) "*Managing for Development Results (MfDR) in the Transport Sector of Kazakhstan*". The technical assistance aims to strengthen the roads sector management through establishment of an MfDR framework that provides clear linkages between planning, budgeting, program and project implementation, and monitoring development results. It will help develop the institutional and human capacity of the Republic of Kazakhstan's Ministry of Investment and Development (MID)[4] to apply managing for development results (MfDR) principles in transport sector management and thus effectively implement the transport sector development strategy to 2020. The S-CDTA has three outputs:

- MfDR principles institutionalized and operationalized in the Ministry of Investment and Development (MID)
- Roads subsector results-based framework developed in line with national planning objectives
- Monitoring and evaluation (M&E) system developed to support results-based planning, budgeting and monitoring in the roads subsector

29. The team of consultants involved in carrying out this assignment consists of the following members. Copies of the Terms of Reference for each consultant are attached in Appendix I.

- Vasily Banschikov — Result-Based Planning and Monitoring (Team Leader)
- Serge Cartier van Dissel — Transport (Roads) Sector Specialist
- Daulet Aspanbetov — Monitoring and Evaluation Expert
- Assylbek Orazymbetov — Transport (Roads) Sector Expert

30. This Final Report forms the third report prepared under this technical assistance. The report is divided into two sections. The first section provides an overview of the current situation in the road sector in Kazakhstan, looking at the institutional setup, the characteristics of the road network and the amounts and sources of road sector financing and expenditure. It goes on to describe the existing strategic policies and plans in Kazakhstan, and how these relate to the road sector. This section analyzes the performance of the road sector and the usefulness of existing performance indicators.

31. The second section looks specifically at the MfDR approach and what form this may take for the road sector in Kazakhstan, identifying appropriate output and outcome indicators and linking up with the results-based budgeting approach being introduced by the government with support from the World Bank. Based on the proposed set of key performance indicators, a results-based framework is introduced in line with national planning objectives, and a system for monitoring and evaluation is presented in support of results-based planning, budgeting and monitoring in the roads sector. The final chapter looks at the operationalization and institutionalization of the MfDR approach in the Committee of Roads (COR) and other stakeholders in the road sector in Kazakhstan.

32. Although it is possible to read the two sections independently, it is highly recommended to read them together as the description of the current status provided in the first section provides much of the analysis and justification for the key performance indicators introduced in the second section, the application of these indicators in the management cycle, and their institutionalization with COR and the other road sector stakeholders.

33. In the preparation of this report, three missions to Kazakhstan were carried out by the TA team. The people met during these missions are listed in Appendix II.

[4] Originally the technical assistance focused on the Ministry of Transport and Communications (MOTC), but this has since merged into the Ministry of Investment and Development (MID).

SECTION 1:

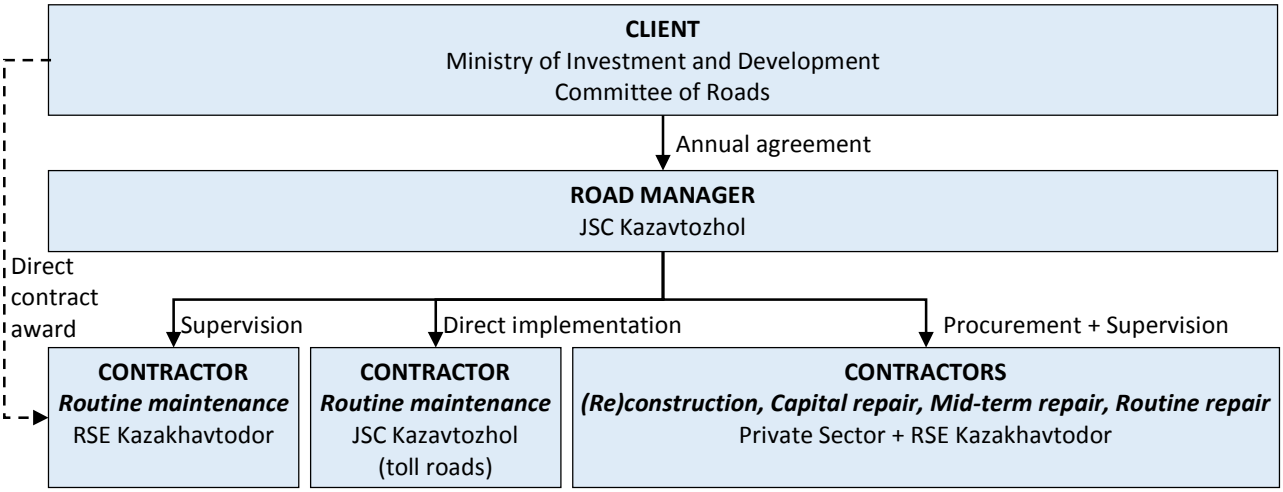
CURRENT STATUS

II. INSTITUTIONAL SETUP

34. Over the years, Kazakhstan has gradually introduced a division of roles regarding ownership, management and works implementation in the road sector in line with international best practice. The republican road network in Kazakhstan falls under the responsibility of the Ministry of Investment and Development (MID) that acts as the *Client* for the republican road network through its Committee of Roads (COR). Daily management and supervision has been transferred to the Joint Stock Company JSC Kazavtozhol, which acts as the *Road Manager* and is responsible for procurement and contract supervision on behalf of the government. The formal management arrangement between COR and Kazavtozhol is based on three separate contracts: (i) budget program 003 for road network development, (ii) budget program 091 for recurrent costs in the road network and (iii) budget sub-program 102 related to the management services provided by Kazavtozhol[5]. Works consist of construction and reconstruction contracts that fall under the development budget, and capital, mid-term and routine repairs as well as routine maintenance (summer and winter) that fall under the recurrent budget. All works are tendered out by Kazavtozhol through open bidding, except routine maintenance that is directly awarded to the Republican State Enterprise RSE Kazakhavtodor.

35. Although the division of roles is quite well progressed, there are still some issues. The contracts with Kazakhavtodor are reportedly issued by COR instead of Kazavtozhol, although supervision and inspection are carried out by Kazavtozhol. Also, in the case of toll roads, routine maintenance is carried out directly by Kazavtozhol with the depots transferred to it from Kazakhavtodor.

Figure 5 Division of roles for the republican road network



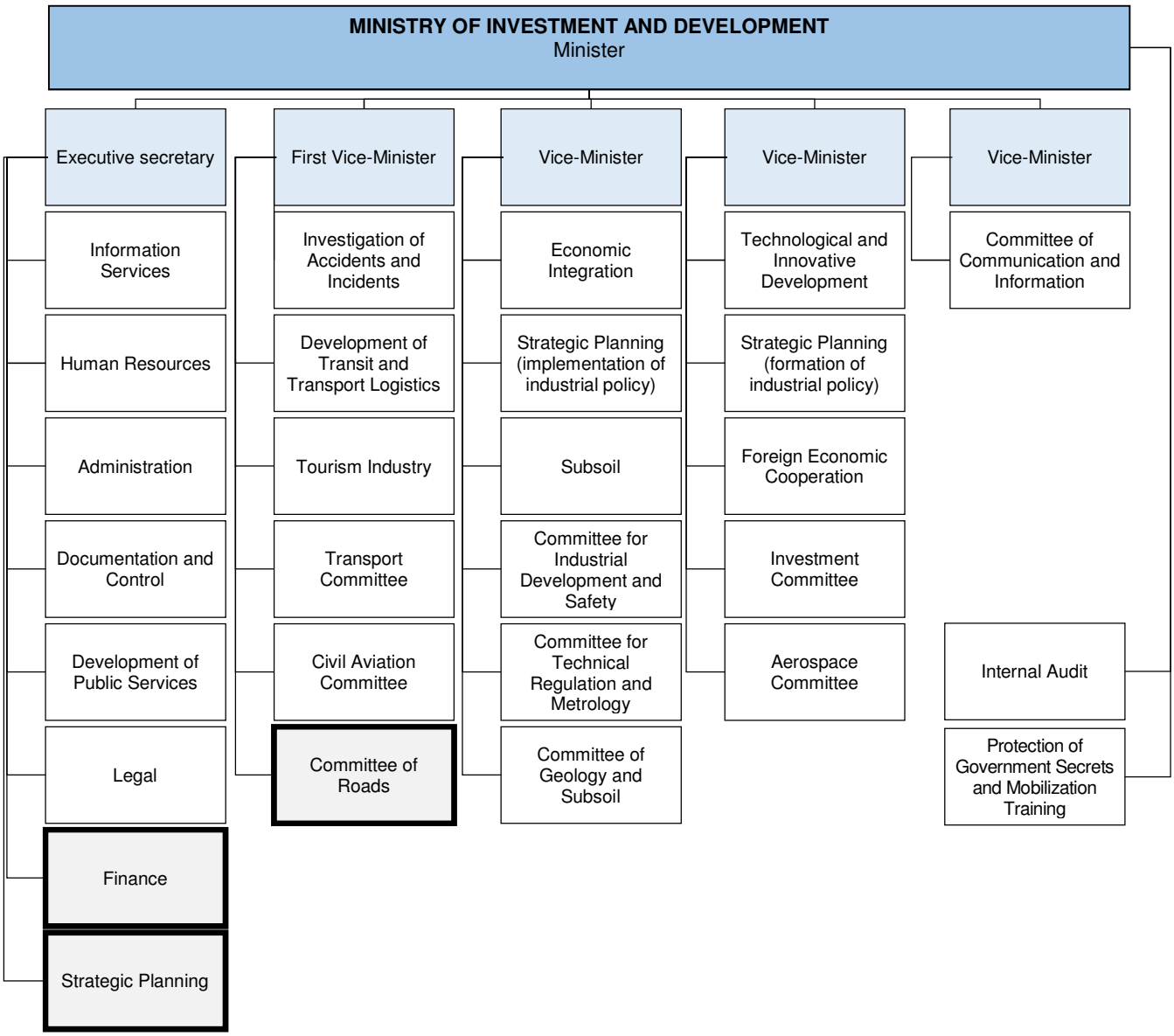
36. These arrangements are likely to change as Kazakhavtodor was recently nominated for privatization. The final structure of Kazakhavtodor's privatization is yet to be decided, but the proposed changes are likely to have a significant impact on the road maintenance arrangements. The extent of these changes will depend on the ownership and corporate structure adopted. For example, the impact will be different if Kazakhavtodor is split into 14 oblast units, 5 regional units or one national unit. Similarly, it is not yet clear whether Kazakhavtodor will be allowed to compete for larger mid-term and capital repair works under the new structure, and whether other contractors will be allowed to compete for routine (summer and winter) maintenance works in the republican road network. In any case, Kazakhavtodor's restructure will likely result in more autonomy to operate on a more commercial basis, which will introduce more competition and allow new contracting modalities such as performance based contracting to be introduced.

[5] This budget sub-program formally falls under budget program 091, but is contracted separately.

A. Ministry of Investment and Development

37. The **Ministry of Investment and Development (MID)** was created in 2014 as the successor of the Ministry of Transport and Communications (MOTC) together with several other government units. It is responsible for policy development and the management of international and republican roads (oblast and local roads are managed by Akimats at oblast and district level). Apart from the Committee of Roads (COR), the departments under MID that are most relevant for this technical assistance include the Finance Department that consolidates the ministerial budget request and the Strategic Planning Department that consolidates the strategic policy documents on behalf of the ministry.

Figure 6 Organizational structure of the Ministry of Investment and Development (MID)

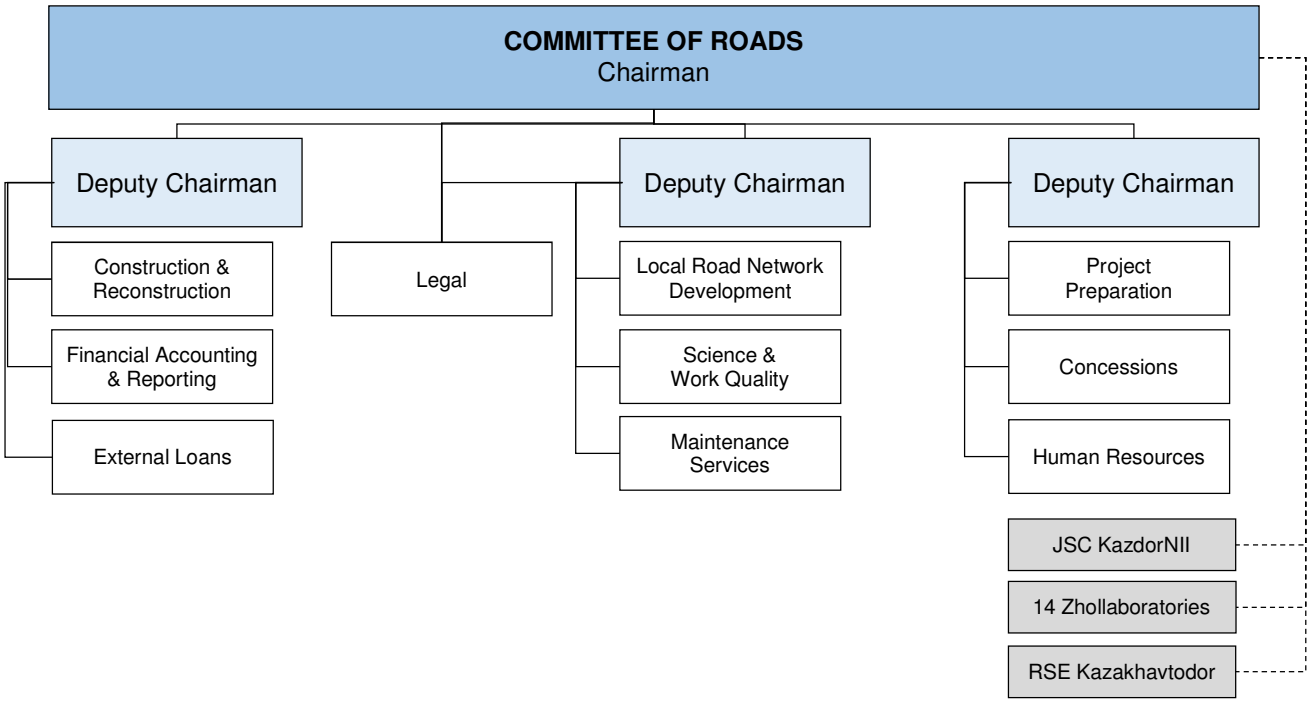


B. Committee of Roads

38. Under MID, the republican road sector is managed by the **Committee of Roads (COR)**, which is a republican state institution created in 2006 as the successor to the Committee for Transport Infrastructure Development (CTID). COR is funded from the republican budget and is responsible for the management of the republican road network, including the 6 international road corridors. COR is responsible for implementing public policies, international cooperation regarding roads, development and harmonization of technical regulations and national standards and ensuring compliance with these, investment and social policy in the road sector, naming and indexing of public roads, registration of oblast roads, funding of the national operator (Kazavtozhol), examining the quality of works, overseeing the establishment and operation of toll roads, and traffic management activities. COR also provides budget transfers to oblasts and the cities of Astana and Almaty for the development, repair and maintenance of local roads. The COR has a total of 62 staff (excluding the staff of the subordinate units KazdorNII, Kazakhavtodor and the zhollaboratories). The staff is distributed over 10 divisions:

- The **Construction and Reconstruction Division** is responsible for the implementation of the state policy regarding road development, developing annual, medium- and long-term plans, preparing feasibility studies, monitoring work quality, and coordination regarding international treaties related to the road sector.
- The **Financial Accounting and Reporting Division** is responsible for monitoring budget implementation, monitoring financial procedures for foreign loans, monitoring accounting and reporting, preparing financial plans and financial statements, and implementing reliable accounting.
- The **External Loans Division** is responsible for implementing and monitoring of external loan projects (including co-financing) and for the implementation of concession projects.
- The **Maintenance Services Division** is responsible for organizing capital, mid-term and routine repair as well as summer and winter routine maintenance of the republican road network, monitoring of road conditions, accounting and analysis of traffic accidents, developing relevant technical standards, proposing funding levels and sources, and preparing annual programs for Kazavtozhol and Kazakhavtodor.
- The **Local Road Network Development Division** is responsible for the development of local road programs, developing annual, medium- and long-term plans for local road development in coordination with oblasts and the cities of Astana and Almaty, approving local road transfers and related performance agreements for the development, repair and maintenance of local roads, and approving registration as oblast roads.
- The **Concession Division** is responsible for developing proposals and preparing tender documentation for concession projects.
- The **Legal Division** is responsible for developing normative legal acts.
- The **Human Resources Division** is responsible for human resource administration.
- The **Project Preparation Division** is responsible for enforcing norms and standards in road projects, the conclusion of international agreements, analysis of design decisions, development of methodologies for pricing and design, preparation of construction documents for investment projects, and land acquisition for construction.
- The **Science & Work Quality Division** is responsible for quality control of completed road works and of the materials used, research activities, development and approval of technical standards, coordination of the zhollaboratories in each of the oblasts, coordination of the activities of KazdorNII, and general coordination of technical support and supervision services.

Figure 7 Organizational structure of the Committee of Roads



C. Zhollaboratories

39. COR used to have offices in each of the 14 oblasts, but these were taken over by Kazavtozhol in 2013. At oblast level COR now only has the 14 **zhollaboratories**. These are republican state institutions (RSI) created in 2005 by resolution #1305, which are formally responsible for quality control of road works (construction and repair) and materials in the republican road network and in oblast and district roads where financing is provided through targeted transfers from the republican budget. Each zhollaboratory has an average of 17 staff, of which approximately half are managers and technical staff (including a materials engineer, 2 works engineers and 3 assistant engineers). The zhollaboratories are authorized to test materials and test compliance with standards and specifications, evaluate compliance of production procedures to design requirements and technical regulatory documents, and selective examination of the quality of road works using instrumental methods of control. However, in practice the focus is on material testing, and quality control of completed works is limited, even though the zhollaboratories need to formally approve the completed works before payments can be made.

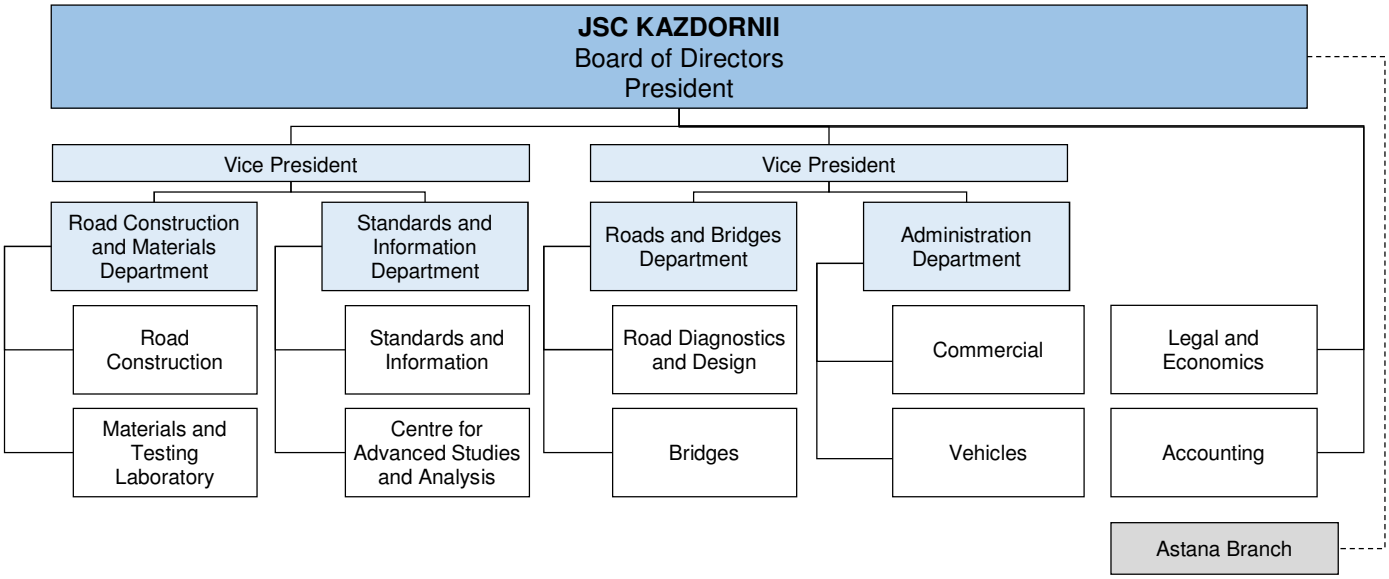
D. KazdorNII

40. Under COR there is also the design and research institute **JSC KazdorNII** situated in Almaty, which is responsible for preparing national norms and regulations, testing new technologies and materials, diagnostics of roads and bridges, preparing financing norms and prices for repairs and maintenance, preparing project designs and estimates, technical supervision of capital and mid-term repair works, and professional development of road sector workers. KazdorNII has a total of 98 staff members, spread over 4 departments. Because KazdorNII is a joint stock company, work is tendered out through open tendering. With the opening of border due to the Eurasian Economic Union, competition from companies from Russia and Belarus is likely to increase.

41. As road sector planning and decisions are initiated by MID through COR, it would be beneficial for KazdorNII to have a much stronger senior management presence in Astana. This is especially

important with the development of RAMS where KazdorNII's skills would be extremely beneficial in working with COR (including the zhollaboratories), Kazavtozhol and the project consultant to ensure that technical skills are transferred and KazdorNII is involved in data collection, analysis and reporting.

Figure 8 Organizational structure of KazdorNII

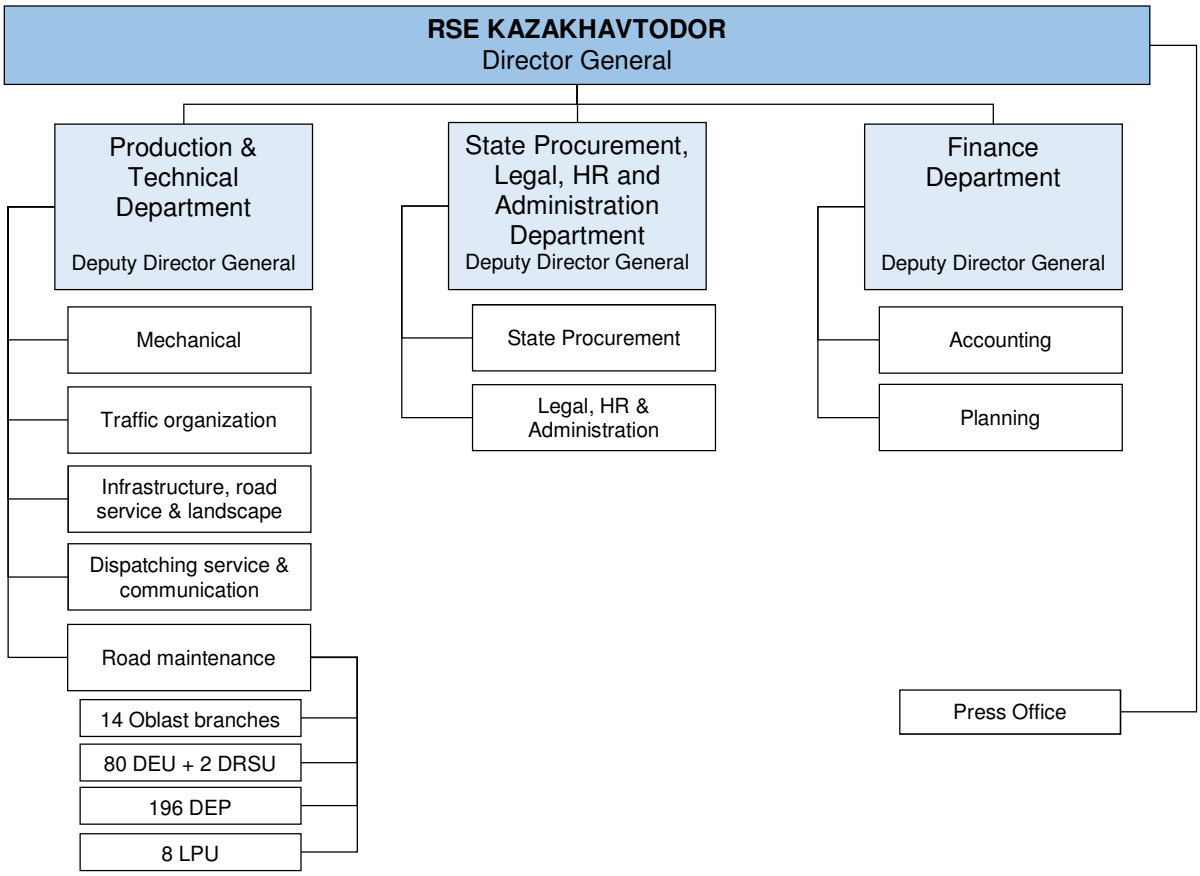


- The **Road Construction and Materials Department** provides technical support during the piloting of new technologies and carries out technical supervision of capital and mid-term repair works. It furthermore carries out scientific research and prepares technical regulations for the road sector.
- The **Standards and Information Department** develops and refines specifications and technical documentation for the road sector, maintains an electronic database of regulations, provides skills training for the road sector, and implements policies on quality management.
- The **Roads and Bridges Department** carries out research work, provides recommendations on improving construction and maintenance performance, develops industry regulations and software products, prepares designs for bridge construction and repair, and carries out technical diagnosis of road and bridge condition.
- The **Administrative Department** manages the mobile diagnostic vehicles and laboratory equipment vehicles, and supports the other departments.

E. Kazakhavtodor

42. The Republican State Enterprise RSE Kazakhavtodor was created by Decree #1266 in 1998 with responsibility for management of international and republican roads. In 2000 the responsibility of Kazakhavtodor was changed to include only the supply of maintenance services, with all management functions transferred to CTID and later COR. Kazakhavtodor has its own bank accounts and balance sheets. It can create subsidiaries (Branch State Enterprises - BSE) and enter into joint ventures. One BSE was created for the management of the toll road (BSE Kazakhavtodor-Kokshetau), but this was later transformed into Kazavtozhol. According to its Charter, the purpose of Kazakhavtodor is carrying out maintenance works, landscaping and routine repairs of public roads. It is furthermore allowed to assist in the development of technical and investment policies and the drafting of regulations and technical standards. It may produce and sell aggregates and other road construction materials.

Figure 9 Organizational structure of Kazakhavtodor



43. Decree #1527 issued in 2000, nominated RSE Kazakhavtodor as the sole contractor for routine maintenance (summer and winter) and landscaping of international and republican roads. As such, Kazakhavtodor acts as *Contractor* for routine maintenance. It is also allowed to compete for routine repair contracts, but is by law not allowed to participate in bids for larger works in order to avoid unfair competition. Kazakhavtodor also competes for routine maintenance and routine repair contracts in local roads. However, in open tenders it has to compete with approximately 300 competent road contractors, and as a result its income is largely limited to COR payments for routine maintenance of republican roads. Kazakhavtodor has 14 subsidiary oblast enterprises, 80 depots (DEUs), two road repair and construction units (DRSU) in Akmola and Pavlodar oblasts[6], 196 subdepots (DEPs), and 8 tree planting nurseries (LPU). Kazakhavtodor has more than 3,270 staff members, approximately half of which are directly involved in road maintenance implementation.

44. The planned privatization of Kazakhavtodor will transform it into one or more contracting companies. It is expected that, once privatized, Kazakhavtodor will be allowed to compete for mid-term and capital repair contracts (in as far as it has the required technical qualifications to do so), but also that other contractors will be allowed to compete for routine (summer and winter) maintenance contracts in the republican road network. This opening up to competition may be introduced gradually, in order to protect Kazakhavtodor during the initial period after privatization.

[6] These function more or less as a DEU, but have asphalt mixing plants.

F. Kazavtozhol

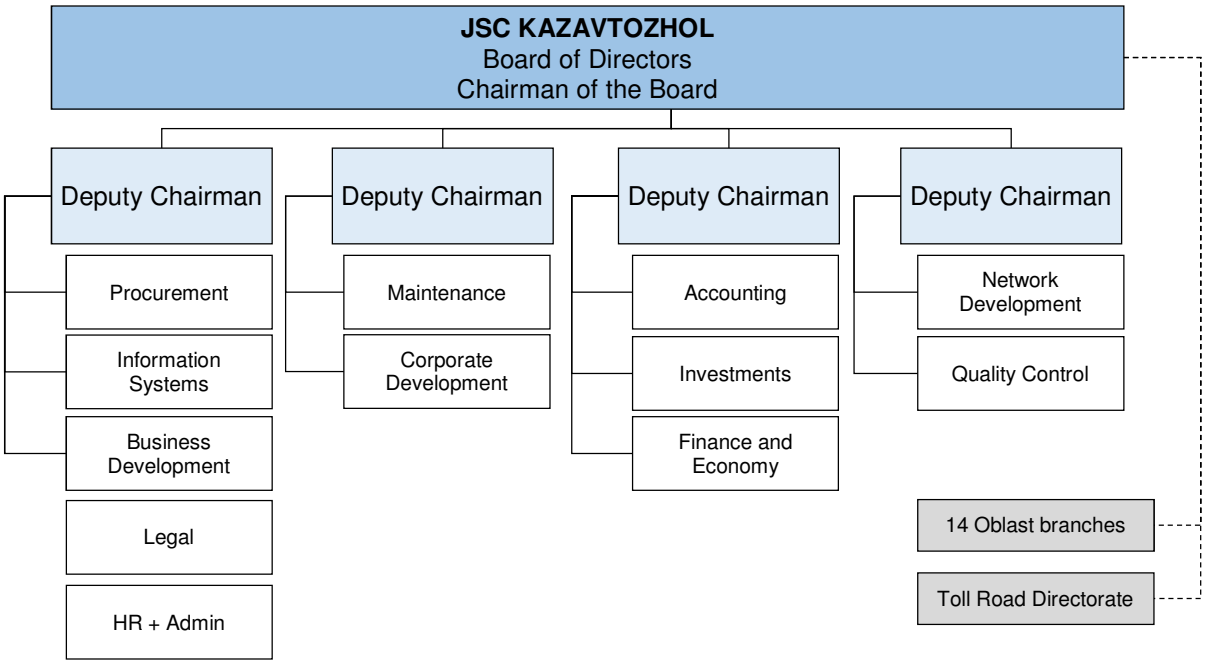
45. The Joint Stock Company **JSC Kazavtozhol** was created by Decree #79 in 2013 to act as a national operator for all republican roads. Kazavtozhol is responsible for the procurement and supervision of (re)construction and repair works (capital, mid-term and routine repairs) and acts as *Road Manager* for the republican road network (previously all procurement was carried out by the procurement division under MOTC). Routine maintenance (summer + winter) contracts are signed with Kazakhavtodor directly by COR, although Kazavtozhol carries out the contract management and supervision.

46. Kazavtozhol is also responsible for the management of tolled roads, including toll collection and maintenance. For the 211 km of toll road currently in existence, Kazavtozhol has taken over the relevant DEUs and DEPs from Kazakhavtodor that are organized into a Toll Road Directorate, and carries out the routine maintenance directly using toll revenue. This introduces a conflict of interest as Kazavtozhol acts as both the *Manager* responsible for supervision and inspection, and the *Contractor* responsible for implementation.

47. The toll road network is planned to be expanded to 7,000 km of technical category I and II roads. Discussions are going on about how the implementation of routine maintenance in toll roads should be organized. If the routine maintenance of all 7,000 km would be carried out directly by Kazavtozhol (taking over DEUs and DEPs from Kazakhavtodor), the conflict of interest would only become greater. A preferable option would be to return the responsibility for routine maintenance of toll roads back to Kazakhavtodor, or to tender out these works to the private sector, removing the conflict of interest and ensuring a clear division of roles. Kazavtozhol would still be responsible for managing the contracting of routine maintenance in these roads, using the toll revenue to finance such works.

48. Kazavtozhol has 673 staff members, most of which are based in the oblast offices (306 staff) or in the Toll Road Directorate (261 staff). Kazavtozhol was recently transferred and is now under the responsibility of JSC National Company Kazakhstan Temir Zholy (KTZ - the railway company), which in turn is a subsidiary of the National Welfare Fund "Samruk-Kazyna". This appears to have been done to create more distance between COR and Kazavtozhol, allowing Kazavtozhol to be run more as a commercial business. As a result of this transfer to KTZ, the structure of Kazavtozhol has been amended, giving more importance to corporate development. Kazavtozhol has also started expressing its desire to expand its toll road operations by making amendments to the Road Law to permit the introduction of tolls in category III roads and to allow the use of (future) toll revenue to finance the introduction of new toll systems, purchase maintenance equipment, and finance maintenance in non-tolled roads.

Figure 10 Organizational structure of Kazavtozhol



G. Development partners

49. The **Asian Development Bank (ADB)** has two ongoing multitranche financing facilities, one for the Western Europe - Western China (WEWC) corridor (CAREC 1 - $700 million including co-funding from the Japanese International Cooperation Agency - JICA, and the Islamic Development Bank - IDB) and one for the international corridor in western Kazakhstan linking Aktau to Turkmenistan and Uzbekistan (CAREC 2 - $800 million). Additional projects include a bypass for the WEWC corridor at Taraz (CAREC 1 - $95 million) and the section of the international corridor linking Shymkent to Tashkent in Uzbekistan (CAREC 3 - $85 million). A new project under preparation is planned to pilot performance-based road maintenance in 1,000 km of republican roads. Technical assistance is provided to the government to introduce a Managing for Development Results (MfDR) approach in the road sector.

50. The **World Bank** is currently supporting the road sector in Kazakhstan through two projects financing over 1,400 km of (re)construction of the Western Europe - Western China (WEWC) corridor (CAREC 1) with a total budget of over $3 billion. In September 2014 the government approved the World Bank loan in the amount of $3.2 billion for (i) the reconstruction of the Centre-South road corridor (CS: Karaganda - Burybaytal section, 676 km) at a cost of $2.570 billion, of which the loan covers $2.183 billion; and (ii) the Centre-West road corridor (CW: Astana - Beineu section, 793 km) at a cost of $1.176 billion, of which the loan covers $1.0 billion. The World Bank is also providing support to improving road safety and road management, including the development of a Road Asset Management System (RAMS). The World Bank is furthermore involved in the introduction of results-based budgeting with the Ministry of National Economy (MNE) and the Ministry of Finance (MOF), and the piloting of the approach in the road sector with COR.

51. The **European Bank for Reconstruction and Development (EBRD)** is also financing the Western Europe - Western China (WEWC) corridor (CAREC 1 - $180 million) and the international corridor connecting Shymkent to Uzbekistan (CAREC 3 - $197 million). EBRD is furthermore supporting public-private partnerships in the road sector, the development of the road agency Kazavtozhol, restructuring of Kazakhavtodor and the introduction of competition in routine road

maintenance. It is also planning a performance-based maintenance pilot in the toll road between Astana and Schuchinsk.

52. The new **Asian Infrastructure Investment Bank (AIIB)** is expected to provide significant funding for the road sector in Kazakhstan. After the re-election of President Nazarbayev, the new government issued the 100 steps to be taken in support of the Nurly Zhol programme and the Strategy 2050. In these steps the AIIB is mentioned as a financing institute for the investments in road infrastructure linking China to Russia and to the Caspian Sea.

III. THE REPUBLICAN ROAD NETWORK

53. This chapter looks at the existing road network in Kazakhstan, focusing on republican roads. It looks specifically at the existing road length, the technical category, the surface type, the road condition, the importance of road transport in Kazakhstan, and road safety.

A. Road length

54. Kazakhstan has a total road length of just under 100,000 km. Roughly one quarter of the roads in Kazakhstan are republican roads, with the rest consisting of oblast roads and district roads. The road density is only 3.5 km/100km^2, putting Kazakhstan amongst the 20 countries with the lowest road densities in the world (these 20 countries consist primarily of sparsely populated African countries). In comparison, Mongolia's road density is only slightly lower, while Russia has a 50% higher road density. However, the low road density is a reflection of the low population density of these countries, and does not necessarily reflect a need for new construction.

Table 3 Road network length in Kazakhstan (km) (as per January 2014)

	Republican		Oblast		District		Total	Land area	Road density
Oblast	km	%	km	%	km	%	km	km^2	km/100km^2
Akmola	2,247	29%	2,657	34%	2,965	38%	**7,869**	146,219	5.38
Aktobe	1,838	28%	1,099	17%	3,602	55%	**6,539**	300,629	2.18
Almaty	2,521	27%	5,905	62%	1,048	11%	**9,474**	223,924	4.23
Atyrau	994	33%	973	32%	1,089	36%	**3,056**	118,631	2.58
East Kazakhstan	3,421	29%	3,186	27%	5,236	44%	**11,843**	283,226	4.18
Jambyl	1,073	21%	2,241	43%	1,918	37%	**5,232**	144,264	3.63
West Kazakhstan	1,283	20%	1,861	29%	3,383	52%	**6,527**	151,339	4.31
Karaganda	2,776	31%	3,549	40%	2,522	29%	**8,848**	427,982	2.07
Kostanay	1,419	15%	2,208	23%	5,898	62%	**9,525**	196,001	4.86
Kyzylorda	1,109	33%	274	8%	1,971	59%	**3,354**	226,019	1.48
Mangystau	1,036	40%	1,035	40%	539	21%	**2,610**	165,642	1.58
Pavlodar	1,515	27%	1,184	21%	2,964	52%	**5,664**	124,800	4.54
North Kazakhstan	1,469	16%	2,427	27%	5,103	57%	**8,999**	97,993	9.18
South Kazakhstan	784	11%	4,330	60%	2,065	29%	**7,179**	117,249	6.12
TOTAL	**23,485**	**24%**	**32,929**	**34%**	**40,304**	**42%**	**96,717**	**2,723,918**	**3.55**

Source: COR

55. The republican road network includes 6 international corridors with a total length of approximately 8,250 kilometres. These serve mainly as international transit routes between China, Kyrgyzstan, Uzbekistan, Turkmenistan and Russia, and onwards to Europe. They form part of international agreements under Asian Highways, Transport Corridor Europe-Caucasus-Asia (TRACECA), and Central Asia Regional Economic Cooperation (CAREC), amongst others.

Table 4 International corridors in Kazakhstan

International corridor	Road code	Length (km)	Traffic (vpd)
• UZBEKISTAN (Tashkent) - Shymkent - Taraz - Almaty - Khorgos - CHINA (Urumqi)	A2	1,137	> 7,000
• Shymkent - Kyzylorda - Aktobe - Uralsk - RUSSIA (Samara)	M32	2,048	> 3,000
• Almaty - Karaganda - Astana - Petropavlosk - RUSSIA (Chelyabinsk/Omsk)	M36 / A1 / M51	1,669	> 500
• RUSSIA (Astrakhan) - Atyrau - Aktau - TURKMENISTAN (Turkmenbashi)	A27 / A33 / A34	1,420	> 1,800
• RUSSIA (Omsk) - Pavlodar - Semey - Maikapshagai - CHINA (Altay)	M38	1,105	> 1,500
• Astana - Kostanay - RUSSIA (Chelyabinsk)	M36 / P36	879	> 1,300

Source: Consultant's processing of data

56. Road numbering in Kazakhstan gives the prefix M to international roads that pass through different countries, the prefix A to strategic republican roads and the prefix P to other republican roads. Local road codes are given the prefix K. There are some issues with the current road codes that need to be updated to reflect changes made to the republican road network. For instance, the international corridor M36 from Astana to Kostanay has a section with the prefix P (P36) where a different alignment has been used. The strategic policy documents also identify certain other sections with prefix P that are considered priority republican roads (P1 from Beineu to Uzbekistan and P4 that forms part of the Centre-East route). The road codes should be amended to reflect the strategic importance of these roads, ensuring that the main international corridors have the prefix M, and that all strategic republican roads have the prefix A. The international corridors and most important republican roads are shown in the map below. The most important roads that have been included for reconstruction in the current Nurly Zhol program or earlier strategy documents (e.g. Strategy 2020, Transport Strategy 2020) have been highlighted.

Figure 11 Map of the main republican roads in Kazakhstan

WEWC: Western Europe - Western China, CS: Centre-South, CE: Centre-East, CW: Centre-West
Source: Consultant's processing of COR data

B. Technical road categories

57. In Kazakhstan, 5 technical road categories are distinguished according to the technical standards *SNIP RK 3.03-09-2006*. Categories I to IV are applicable to republican roads, while categories III to IV are applicable to local roads.

Table 5 Technical road categories in use in Kazakhstan (SNIP RK 3.03-09-2006)

Technical category	Ia	Ib	II	III	IV	V
Number of lanes	4 or more	4 or more	2	2	2	1
Lane width (m)	3.75	3.75	3.75	3.50	3.00	4.50
Minimum shoulder strip (m)	≥ 0.75	≥ 0.75	0.75	0.50	0.50	-
Shoulder (m)	3.75	3.75	3.75	2.50	2.0	1.75
Design traffic level (PCU)	>14,000	>14,000	6,000-14,000	2,000-6,000	200-2,000	<200
Design traffic level (AADT)	>9,000	>7,000	3,000-7,000	1,000-3,000	100-1,000	<100
Design speed (km/h)	150/120	150/100	120/100	100/80	80/60	60/40

Source: COR

58. Two-thirds of the republican roads are currently category III, with most of the remainder either category class I or category II (very few republican roads are category IV or V).

Table 6 Republican road length by technical class (km) (as per January 2015)

Oblast	Total	Technical class (km)					Bridges (m)		Pipe culvert (m)	
		I	II	III	IV	V	Units	Length	Units	Length
Akmola	**2,261**	343	335	1,425	121	37	117	7,841	1,192	24,693
Aktobe	**1,894**	42	458	1,394	-	-	101	5,534	1,038	19,810
Almaty	**2,529**	242	843	1,214	192	38	215	8,589	2,737	59,378
Atyrau	**990**	7	-	919	63	1	55	3,443	254	3,761
East Kazakhstan	**3,414**	10	437	2,231	729	7	251	8,106	2,652	54,453
Jambyl	**1,237**	294	765	178	-	-	79	2,699	874	19,931
West Kazakhstan	**1,287**	3	143	1,141	-	-	48	4,754	439	8,037
Karaganda	**2,773**	69	154	2,457	93	-	113	6,095	1,601	29,781
Kostanay	**1,410**	39	143	1,178	50	-	25	2,049	696	11,920
Kyzylorda	**1,107**	246	517	344	-	-	80	4,387	396	10,980
Mangystau	**1,033**	-	10	761	262	-	2	95	379	5,915
Pavlodar	**1,510**	93	647	744	26	-	23	1,895	493	9,018
North Kazakhstan	**1,468**	55	273	1,067	73	-	21	1,629	515	9,247
South Kazakhstan	**786**	300	94	278	114	-	120	4,605	863	21,696
TOTAL	**23,699**	**1,743**	**4,819**	**15,331**	**1,723**	**83**	**1,250**	**61,721**	**14,129**	**288,619**
	100%	7%	20%	65%	7%	0%				

Source: COR

59. Kazakhstan has been focusing on upgrading its most important republican roads in the past years, specifically the 6 international corridors linking to neighboring countries. In recent years, the focus has shifted somewhat to internal connections to facilitate domestic trade. The roads that have already been upgraded to category I or II or that are planned to be upgraded under the Transport Strategy 2020, MID Strategic Plan 2018 or the Nurly Zhol program are listed below.

Table 7 Roads planned for reconstruction to category I or II

Road	Code	Length (km)	Corridor	Transport Strategy 2020	MID Strategic Plan 2018	Nurly Zhol
(China) Khorgos - Almaty - Shymkent - Tashkent (Uzbekistan)	A2	1,197	WEWC	X	X	X
Shymkent - Kyzylorda - Aktobe - Uralsk - Samara (Russia)	M32	2,029	WEWC	X	X	X
Taskesken - Bakhty (China)	A8	187		X	X	X
(Russia) Omsk - Pavlodar - Maikapshagai (China)	M38	1,099	CE	X	X	X
Atyrau - Aktau	A33	798		X	X	X
Aktau - Bekdash (Turkmenistan)	A34	115		X	X	X
Aktobe - Martuk (Russia)	A24	102	WEWC	X	X	X
Great Almaty ring road (as a concession - BAKAD)	-	65		X		
Almaty - Karaganda - Astana - Kostanay - Chelyabinsk (Russia)	M36	2,032	CS	X	X	X
Astana - Shiderty	P4	243	CE	X	X	X

Road	Code	Length (km)	Corridor	Transport Strategy 2020	MID Strategic Plan 2018	Nurly Zhol
Shiderty - Pavlodar	A17	184	CE	X	X	X
Astana - Arkalyk - Shalkar - Beineu - Aktau	-	1,652	CW	X	X	X
Almaty - Ust-Kamenogorsk	A3	1,036		(X)	X	X
Astana - Petropavlosk - Russia	A1	452		X	X	X
Uralsk - Kamenka (Russia)	A29	100				X
Usharal - Dostyk (China)	A7	184		X		X
Kyzylorda - Zhezkazgan - Karaganda	A17	925				X
Aktobe - Atyrau - Astrakhan (Russia)	A27	871		X	X	X
Uralsk - Atyrau	A28	487				X
Merki - Shyganak	P29	273				X
Beineu - Kungirot (Uzbekistan)	P1	84				X
Astana south-western bypass	-	31			X	
Total		**14,146**				

WEWC: Western Europe - Western China, CS: Centre-South, CE: Centre-East, CW: Centre-West
Source: Consultant's processing of COR data

60. The Transport Strategy 2020 includes an indicator on the percentage of category I and II republican roads, with targets of 36% by 2016 and 48% by 2020. By the end of 2014, actual percentages of category I and II republican roads reached only 27%. To achieve the targets, an additional 2,000 km of republican roads need to be upgraded to category I or II by 2016, and nearly 5,000 km by 2020. Based on the total length of republican roads to be reconstructed as presented in

61. Table 7, an additional 7,500 km still needs to be reconstructed to category I or II. This should be compared to the total 7,867 km of republican roads reconstructed in the period 2001-2014, an average of 560 km per year. Although recent annual lengths of reconstruction have been higher (nearly 800 km per year over the past 5 years), it is unlikely that the targets will be reached without additional funding.

62. The upgrading of roads to category I or II does not appear to be based on traffic volumes in most cases. There are 316 traffic count stations spread throughout Kazakhstan, but there is no proper referencing system to allocate traffic counts to specific road sections and traffic data for specific road sections is not readily available. Many of the important republican roads have traffic volumes of between 2,000 and 3,000 AADT, warranting upgrading to category II. However, several roads planned for reconstruction still have traffic volumes of 1,000 - 2,000 AADT, warranting only category III. Only a few roads have traffic volumes exceeding 6,000 AADT where upgrading to category I would be warranted. It appears that much of the upgrading is based on the desire to ensure proper connectivity between important cities or oblast capitals and between different parts of the country, as a way of stimulating international and domestic trade and economic development of remote areas.

Table 8 Traffic levels in some important republican road sections (as per June 2015)

Road corridor	Road section	AADT
Centre-South	Astana - Temirtau (M36)	3,939
	Karaganda - Almaty (M36)	3,240
Centre-East	Astana - Pavlodar (P4 + A17)	3,660
	Pavlodar - Semey (M38)	2,434
	Semey - Kalbatau (M38)	1,904
	Kalbatau - Ust-Kamenogorsk (A3)	2,963
Centre-West	Astana - Yrgyz	1,000
	Beineu - Shetpe (A33)	1,217
	Shetpe - Aktau (A33)	4,352
Almaty - Ust-Kamenogorsk	Almaty - Kapshagay (A3)	23,375

Road corridor	Road section	AADT
	Kapshagay - Taskesken (A3)	3,134
	Taskesken - Kalbatau (A3)	2,009
	Kalbatau - Ust-Kamenogorsk (A3)	2,963
Astana-Petropavlovsk	Astana - Petropavlovsk (A1)	3,630
Kyzylorda - Zhezkazgan - Karaganda	Kyzylorda - Zhezkazgan (A17)	1,146
	Zhezkazgan - Karaganda (A17)	1,146
Uralsk - Kamenka - Russia	Uralsk - Kamenka - Russia (A31)	2,095
Usharal - Dostyk	Usharal - Dostyk (A7)	1,671
Astrakhan - Atyrau - Turkmenistan	Astrakhan - Atyrau (A27)	2,360
	Zhetybai - Zhanaozen (A34)	3,479
Aktobe - Atyrau	Dossor - Aktobe (A27)	5,499
Almaty - Shymkent	Uzynagash - Otar (A2)	5,000

Source: COR

C. Surface type

63. A large portion of the road network in Kazakhstan has traditionally been paved. The paved portion has declined from 94% in 2003 to 89% in 2013 as a result of new construction of unpaved roads. In the case of the republican roads, 92% are paved[7]. The remainder have a gravel surface, with only a very small length of earthen republican roads. Over half the paved republican road network has an asphalt concrete surface, while the republican roads with lower traffic volumes have surface treatments or a black gravel surface.

64. The required surface type is defined by the technical category that is in turn determined by the traffic volume (SNIP RK 3.03-09-2006). The allowable surface types for the different technical categories are indicated below. Assuming that the surface type complies with the technical category of the different roads, this implies that all category I and II roads have an asphalt concrete (AC) or cement concrete (CC) surface, that a third of the category III roads has an AC or CC surface and the remaining two-thirds have a surface treatment or black gravel surface, and that almost all category IV and V roads are unpaved (mainly gravel). As such the surface types correspond well to the standards.

Table 9 Republican road length by surface type (km) (as per January 2015)

Oblast	Total	Asphalt Concrete	Cement Concrete	Surface Treatment	Black gravel[8]	Gravel	Earth
Akmola	**2,261**	1,451	109	411	194	59	37
Aktobe	**1,894**	1,143	-	382	267	102	-
Almaty	**2,529**	1,261	-	-	1,214	27	27
Atyrau	**990**	536	-	390	29	18	17
East Kazakhstan	**3,414**	558	-	-	2,495	354	7
Jambyl	**1,237**	469	350	-	418	-	-
West Kazakhstan	**1,287**	828	21	195	-	240	3
Karaganda	**2,773**	1,008	-	1,424	-	341	-
Kostanay	**1,410**	670	-	554	94	92	-
Kyzylorda	**1,107**	766	-	-	264	59	18
Mangystau	**1,033**	542	-	137	24	301	29
Pavlodar	**1,510**	555	-	673	224	56	3
North Kazakhstan	**1,468**	1,468	-	-	-	-	-
South Kazakhstan	**786**	347	122	-	317	-	-
TOTAL	**23,699**	**11,601**	**602**	**4,166**	**5,540**	**1,649**	**141**
	100%	49%	3%	18%	23%	7%	1%

[7] It must be noted that some sections of republican roads classified as paved have lost all pavement.
[8] Black gravel refers to a mix of natural gravel or crushed stone with bitumen that is mixed either on-site or off-site, spread over the road and compacted.

Source: COR

Table 10 Technical road categories in use in Kazakhstan (SNIP RK 3.03-09-2006)

Technical Category	Asphalt Concrete	Cement Concrete	Surface Treatment	Black gravel	Gravel	Earth
I	√	√				
II	√	√				
III	√	√	√	√		
IV			√	√	√	√
V					√	√

Source: COR

D. Road condition

65. Road conditions in Kazakhstan are determined on the basis of visual surveys carried out in spring and autumn. The autumn survey takes place after the repairs have been carried out during the summer months and serves as the basis for determining the road condition and for preparing the maintenance budgets for the next year. The spring survey takes place after the snow has melted and serves primarily to adjust the detailed maintenance work programme to include any additional damage caused during the winter and by melting snow. The surveys are carried out by a commission with representatives from the traffic police, from Kazavtozhol (as a representative of the Committee of Roads), and Kazakhavtodor.

66. The road condition surveys are regulated by the *Instructions for evaluating the quality of public roads during spring and autumn surveys* (ПР РК 218-19-01). These instructions define how to calculate road condition indicators for different road elements, as well as a complex indicator for the road as a whole. However, these indicators represent the average condition of a road section or road network - they simply represent the percentage of the road length that is considered defect-free, weighted for the different defects and road elements. The instructions do not define road condition categories or how to determine the length of road in different condition categories. Reportedly this is done on the basis of the visual assessment of the road during a drive over by the commission of Traffic Police, Kazavtozhol and Kazakhavtodor representatives, whereby each kilometre is marked as being either good, satisfactory or unsatisfactory. This appears to be a purely subjective assessment, without proper regulations defining the criteria for each category.

67. According to the road condition data provided by COR, 32% of the republican road network was in good condition at the start of 2014, with only 19% in poor condition. However, there are significant differences between the oblasts in terms of overall republican road conditions, with as much as 50% in good condition in Pavlodar oblast, and as much as 40% in poor condition in Atyrau oblast. The data furthermore shows an improvement compared to the start of 2013, with a net increase in the length of roads in good condition of 400 km. However, some oblasts see road conditions becoming poorer. Some oblasts also see dramatic shifts in the percentage of republican roads in good or satisfactory condition, putting the reliability of the data into question.

Table 11 Republican road length by condition (km) (as per January 2014)

Oblast	Total	Good			Satisfactory			Unsatisfactory		
		km	% 2014	% 2013	km	% 2014	% 2013	km	% 2014	% 2013
Akmola	**2,247**	898	40%	39%	1,001	45%	42%	348	16%	19%
Aktobe	**1,838**	447	24%	21%	714	39%	40%	677	37%	39%
Almaty	**2,521**	602	24%	18%	1,691	67%	71%	228	9%	11%
Atyrau	**994**	238	24%	38%	360	36%	20%	396	40%	42%
East Kazakhstan	**3,421**	811	24%	23%	1,552	45%	45%	1,058	31%	32%
Jambyl	**1,073**	309	29%	29%	748	70%	70%	16	1%	1%

Oblast	Total	Good			Satisfactory			Unsatisfactory		
		km	% 2014	% 2013	km	% 2014	% 2013	km	% 2014	% 2013
West Kazakhstan	**1,283**	360	28%	27%	743	58%	58%	180	14%	15%
Karaganda	**2,776**	1,185	43%	50%	1,009	36%	28%	582	21%	22%
Kostanay	**1,419**	606	43%	41%	453	32%	32%	360	25%	27%
Kyzylorda	**1,109**	55	5%	8%	1,054	95%	92%	-	0%	0%
Mangystau	**1,036**	510	49%	13%	474	46%	82%	52	5%	6%
Pavlodar	**1,515**	761	50%	56%	573	38%	31%	181	12%	13%
North Kazakhstan	**1,469**	346	24%	31%	873	59%	44%	250	17%	25%
South Kazakhstan	**784**	359	46%	7%	299	38%	72%	126	16%	21%
TOTAL	**23,485**	**7,487**	**32%**	**30%**	**11,544**	**49%**	**49%**	**4,454**	**19%**	**21%**

Source: COR

68. The overall increase in republican roads in good condition from 30% in 2013 to 32% in 2014 should be compared to the targets set in the Transport Strategy 2020 and the Ministry of Investment and Development (MID) Strategic Plan 2014-2018 of reaching 38% of republican roads in good condition by 2016 and 48% by 2020. Similarly, the increase in republican roads in good or satisfactory condition from 79% in 2013 to 81% in 2014 should again be compared to the targets of 86% of republican roads in good or satisfactory condition by 2016, 87% by 2018 and 89% by 2020. At the current rate of improvement, it is unlikely that these targets will be met.

69. In the case of oblast and district roads, the roads are in worse condition. Only 18% of oblast roads and 10% of district roads were in good condition at the start of 2014, while the percentages of roads in good or satisfactory condition were respectively 53% and 43%[9].

Table 12 Oblast road length by condition (km) (as per January 2014)

Oblast	Total	Good		Satisfactory		Unsatisfactory	
	km	km	%	km	%	km	%
Akmola	**2,657**	825	31%	771	29%	1,061	40%
Aktobe	**1,099**	406	37%	176	16%	517	47%
Almaty	**5,905**						
Atyrau	**973**	299	31%	72	7%	602	62%
East Kazakhstan	**3,186**	757	24%	1,974	62%	455	14%
Jambyl	**2,241**	122	5%	1,574	70%	545	24%
West Kazakhstan	**1,861**	125	7%	606	33%	1,130	61%
Karaganda	**3,549**	1,339	38%	1,293	36%	917	26%
Kostanay	**2,208**	241	11%	1,150	52%	817	37%
Kyzylorda	**274**	88	32%	108	39%	79	29%
Mangystau	**1,035**	301	29%	393	38%	341	33%
Pavlodar	**1,184**						
North Kazakhstan	**2,427**	282	12%	1,191	49%	954	39%
South Kazakhstan	**4,330**	1,302	30%	1,920	44%	1,108	26%
TOTAL	**32,929**	**6,087**	**18%**	**11,228**	**34%**	**8,526**	**26%**

Source: COR

Table 13 District road length by condition (km) (as per January 2014)

Oblast	Total	Good		Satisfactory		Unsatisfactory	
	km	km	%	km	%	km	%
Akmola	**2,965**	223	8%	1,566	53%	1,176	40%
Aktobe	**3,602**	135	4%	1,405	39%	2,062	57%
Almaty	**1,048**						

[9] It must be noted that condition data was not available for Almaty and Pavlodar oblasts.

Oblast	Total	Good		Satisfactory		Unsatisfactory	
	km	km	%	km	%	km	%
Atyrau	**1,089**	282	26%	147	13%	660	61%
East Kazakhstan	**5,236**	503	10%	3,005	57%	1,728	33%
Jambyl	**1,918**	306	16%	774	40%	838	44%
West Kazakhstan	**3,383**	68	2%	406	12%	2,909	86%
Karaganda	**2,522**	190	8%	654	26%	1,678	67%
Kostanay	**5,898**	123	2%	2,778	47%	2,997	51%
Kyzylorda	**1,971**	539	27%	434	22%	998	51%
Mangystau	**539**	115	21%	166	31%	258	48%
Pavlodar	**2,964**						
North Kazakhstan	**5,103**	998	20%	1,377	27%	2,728	53%
South Kazakhstan	**2,065**	403	20%	716	35%	946	46%
TOTAL	**40,304**	**3,885**	**10%**	**13,428**	**33%**	**18,979**	**47%**

Source: COR

70. The survey that forms the basis of the condition assessment is quite subjective. Anecdotal evidence suggests that roads are often in poorer condition than reported, and the significant variations in road condition between one year and the next in some oblasts seems to corroborate the lack of reliability of the condition data.

71. Apart from the quick visual survey to determine the road condition categories, more detailed measurements are carried out on a kilometre-by-kilometre basis to determine the volume of surface defects. The types of defects that are surveyed are indicated in the table below. Cracks are also identified, distinguishing between longitudinal, diagonal, crocodile and transverse cracks, but these are not recorded in the country overview (nor is much attention given to treating them until they develop into more serious defects).

Table 14 Volume of surface defects (autumn survey 2014)

Oblast	Potholes		Ruts	Depressions		Heaving	Breaks		Corru-gation	Sliding	Delami-nation	Edge break
	m^2	%	m (%)	m^2	%	m (%)	m^2	%	m^2 (%)	m (%)	m^2 (%)	m
Akmola	57,254			37,445								85,216
Aktobe	628		651	719		683	651		651	651	651	653
Almaty	1,967			4,699								24,060
Atyrau	65,626		138,326	111,288		16,053			28,625		40.0%	190,575
E. Kazakhstan	90,898		59,195	1,689,014					482,300			130,765
Jambyl	442		40,610	453		22,781			39,681			40,636
W. Kazakhstan	13,929		3.06%	10,182					2.80%			15,420
Karaganda	56,939	0.3%	28,040	22,430	0.1%	1,665			360	-	42,950	49,339
Kostanay	141,905		32,140	52,712		19			22,600	13.0%	392	27,834
Kyzylorda	7,680			270								400
Mangystau	267		570	1,986					103		1,705	616
Pavlodar	5,692		0.56%	5,332		3507	4,830		1.7%	0.6%	1.4%	1,995
N. Kazakhstan	363,486	21.5%	20.21%	880,143	11.1%				20.72%		11.4%	384,770
S. Kazakhstan	311			609								64,300
Autumn 2014	**807,024**			**2,817,282**			**5,481**					**1,016,579**
Spring 2014	1,555,781			4,047,797								1,131,246
Autumn 2013	901,376			2,977,691			12,892					977,942
Spring 2013	824,852			3,631,638								772,748

Source: Kazakhavtodor

72. One of the problems being faced with the survey data is that in several cases different measurement units are allowed, and as a result different oblasts report in different units, making it impossible to calculate totals for the country. This should be corrected in the regulation, ensuring only

reporting in metres or square metres rather than percentage, as this makes it easier to determine volumes of work required. Hereby it is recommended to express the defects in m^2 where appropriate, converting longitudinal defects to area by assigning a standard width (e.g. 2x40 cm for rutting). This is common practice in other countries and allows for easy estimation of the required surface repairs. Another problem is that not all defect types are properly recorded in each oblast, nor is the full length of road surveyed. As a result, the total values are only a part of the total requirements. Nevertheless, the volumes of required surface repairs are very high, especially in certain oblasts. This is partly the result of including roads in poor condition where patching is no longer economically justified, and where capital or mid-term repairs are required.

73. Although the measurement of surface defects potentially has good basis for monitoring deterioration and estimating required patching and crack sealing work, the current measurement methods do not make the resulting data appropriate for this purpose. COR is currently acquiring survey vehicles to carry out measurements of the surface conditions in republican roads. These may provide more accurate and uniform data, although it is not clear what defects can actually be measured with these vehicles.

74. A different problem is that the road condition is determined only on the basis of surface defects. Although surface defects are a good indicator of the amount of routine maintenance to be carried out to the road surface and the related costs of doing so, they are not a proper indicator of the effect of the road condition on the road user costs and the general costs of road transport to the economy. Routine maintenance and repairs to seal cracks and patch potholes help to prevent further damage to the road, but do little to reduce the roughness of the road which has the most impact on road user costs. This was evident during a visit of several roads, where most surface defects were found to be sealed, but roughness was found to be very high. This is why internationally roughness is generally used to determine road conditions, as this is a more suitable indicator of the effect of road conditions on road user costs and the costs of road transport to the economy.

75. Kazakhstan has defined condition categories on the basis of roughness (IRI) in its regulations *Methods for measuring the roughness of bases and surfaces* (CT PK 1219-2003). These regulations define road condition categories based on roughness, with different thresholds set according to the road surface type and the traffic level of the road concerned. Although it is common to have different thresholds depending on the surface type, generally only a distinction between paved and unpaved roads is made. It is uncommon to vary the thresholds for the condition categories based on traffic levels (especially since road conditions can influence traffic volumes). Although it may be desirable to set a different target for roads with more traffic (lower roughness), this should not affect the road condition categories. For general monitoring of road conditions, it is recommended to simplify the road condition categories.

Table 15 Road condition according to IRI (m/km)

Traffic	Excellent	Good	Satisfactory	Unsatisfactory
AC/CC				
AADT≤2500	≤3.6	≤4.2	≤4.7	>4.7
2500<AADT≤3000	≤3.4	≤3.7	≤4.1	>4.1
3000<AADT≤4500	≤3.1	≤3.6	≤3.8	>3.8
AADT>4500	≤2.6	≤3.1	≤3.4	>3.4
Surface treatments				
AADT≤1000	≤4.3	≤5.0	≤5.6	>5.6
1000<AADT≤1500	≤4.0	≤4.4	≤5.0	>5.0
1500<AADT≤2500	≤3.6	≤4.3	≤4.8	>4.8
2500<AADT≤3000	≤3.6	≤4.2	≤4.7	>4.7
Black gravel				
AADT≤500	≤5.0	≤5.9	≤6.6	>6.6
500<AADT≤700	≤4.6	≤5.3	≤6.0	>6.0

Traffic	Excellent	Good	Satisfactory	Unsatisfactory
700<AADT≤1000	≤4.3	≤5.0	≤5.6	>5.6
Gravel				
AADT≤500	≤6.5	≤7.6	≤8.7	>8.7
500<AADT≤1000	≤5.9	≤6.7	≤7.8	>7.8
Tracks				
All traffic levels	≤7.1	≤8.3	≤9.5	>9.5

Source: *Methods for measuring the roughness of bases and surfaces* (CT PK 1219-2003)

76. Roughness is currently not being used to determine the condition of the republican road network due to the lack of roughness data. Roughness data is being collected for some roads, but this is generally only available in reports and is not entered into a central database (reportedly KazdorNII has some 4,000 km of roughness data available for the past 6 years). In several oblasts there are survey vehicles available that are capable of carrying out roughness surveys, and COR is planning to provide all oblasts with such survey vehicles. However, these vehicles are currently mainly used to check roughness of recently completed road sections, rather than general network condition surveys.

77. The World Bank is currently providing support to COR to develop a road asset management system (RAMS). This RAMS will require road roughness data to operate properly, and will form a proper system for processing the data to be collected by the different survey vehicles. It is expected that by the end of 2016 roughness data will have been collected for a portion of the republican road network and entered into the republican road database. This will allow condition categories to be determined based on roughness data.

78. The RAMS consultants are dealing with all the key road sector players identified in this report. However, institutional arrangements for collecting the RAMS data, managing the data (including quality control), and analyzing the data have not yet been agreed upon. This poses a significant risk that the RAMS will not be sustainable after the consultant's inputs end in December 2016, and makes it unlikely that the benefits expected from the system will be achieved. There is a need for an accountable structure that will operate, sustain, develop and maintain the system. Without the establishment of a dedicated RAMS unit with adequate national staff and operating resources, there is a real risk that the system will fail. International experience has furthermore shown that the development of a sustainable RAMS and its integration into decision-making processes requires continued support for at least 5-10 years.

E. Road transport

79. The number of registered vehicles is growing rapidly. The number of registered passenger vehicles has grown by an average of 12% per year since 2001. For trucks and buses the percentage is lower, respectively 7% and 5% per year.

Table 16 Registered vehicles in Kazakhstan ('000 vehicles)

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Passenger cars	1,149	1,204	1,405	1,745	2,183	2,577	2,657	3,088	3,554	3,643	3,678
Buses	61	63	66	75	83	89	95	94	98	97	101
Trucks	223	225	282	312	359	414	411	398	414	429	450
Total	**1,433**	**1,492**	**1,753**	**2,132**	**2,626**	**3,080**	**3,162**	**3,579**	**4,066**	**4,169**	**4,230**

Source: Ministry of Internal Affairs

80. Road transport has also grown steadily. The freight transport volume (in tons) has grown by an average of 9% per year since 2001 and 12% per year since 2008, while the freight transport turnover (in ton-kilometres) has grown by an average of 14% per year since 2001 and 18% per year since 2008.

Table 17 Freight transport volume and turnover

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Freight transport(million tons)	1,318	1,445	1,511	1,583	1,667	1,721	1,688	1,972	2,476	2,718	2,983
Freight turnover (million ton-km)	40,158	43,910	47,123	53,816	61,459	63,481	66,254	80,261	121,074	132,297	145,347

Source: Ministry of Internal Affairs

81. Passenger transport volumes have also risen significantly with an average 10% growth per year in passenger numbers since 2001 and 15% annual growth since 2008. Passenger transport turnover (in passenger-kilometres) has grown by an average of 12% per year since 2001 and by 18% per year since 2008.

Table 18 Passenger transport numbers and turnover

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Passenger transport (million passengers)	6,190	6,559	6,961	7,470	7,750	7,928	8,692	10,594	13,259	14,688	15,757
Passenger turnover (million ton-km)	55,676	59,291	63,831	70,429	72,224	73,900	81,040	103,981	135,965	151,331	166,361

82. There are significant differences by oblast. In terms of freight transport volumes, Karaganda and East Kazakhstan are the most important. However, in terms of freight turnover Atyrau, Kyzylorda, Pavlodar, East Kazakhstan and Almaty are the most important. Passenger numbers are highest in Almaty, while passenger kilometres are highest in Karaganda.

Table 19 Road transport by oblast (2013)

Oblast	Freight transport (million tons)	Freight turnover (million ton-km)	Passenger transport (million passengers)	Passenger turnover (million passenger-km)
Akmola	122	4,768	1,235	5,539
Aktobe	62	5,265	188	10,958
Almaty	159	6,875	517	8,842
Atyrau	83	18,282	135	1,019
West Kazakhstan	39	2,634	349	5,572
Jambyl	88	2,726	672	4,391
Karaganda	677	9,665	1,883	27,530
Kostanay	300	9,883	1,318	12,729
Kyzylorda	106	14,106	212	3,861
Mangystau	211	5,886	71	3,297
South Kazakhstan	133	7,617	1,787	11,221
Pavlodar	83	15,640	908	18,648
North Kazakhstan	49	3,223	378	3,103
East Kazakhstan	553	13,088	1,298	16,982
Astana	124	6,822	1,647	13,800
Almaty	194	18,867	3,160	18,868
Total	**2,983**	**145,347**	**15,757**	**166,361**

Source: Ministry of Internal Affairs

F. Road safety

83. After significant annual increases in the number of accidents and fatalities in the early 2000's, accident and fatality numbers actually reduced in the period 2008-2011. However, in recent years they have increased again. 2013 has seen nearly a doubling in the number of accidents and injuries compared to 2012, although the number of fatalities has remained more or less the same (this may be

the result of a change in reporting). The World Health Organization puts the reported fatality figures higher than presented by the government (3,379 fatalities in 2010 compared to 2,797 reported by government). Most likely this is because the WHO includes injured people who die within 30 days of the crash. Most fatalities are drivers of 4-wheeled vehicles (61%) followed by pedestrians (24%).

84. WHO reports a road accident fatality rate of 21.9 deaths per 100,000 people. This is high, and should be compared to 11.3 in Uzbekistan and rates of around 5 in Western Europe. However, when looking at the road accident fatality rate per 100,000 motor vehicles, the road accident fatality rate in Kazakhstan is 71.8 based on the number of vehicles reported in Table 16 (excluding motorcycles). This is 30% higher than Russia (55.4) and around 15 times higher than Western Europe (in the order of 5).

Table 20 Road traffic accidents, fatalities and injuries

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Accidents	14,013	15,302	14,517	16,038	15,942	13,739	12,534	12,008	11,955	14,168	23,359
Fatalities	2,754	3,136	3,374	4,271	4,365	3,351	2,898	2,797	2,449	3,022	3,037
Injuries	16,951	18,794	17,422	19,389	18,951	16,400	14,788	13,878	22,902	17,488	29,872

Source: Ministry of Internal Affairs

85. Road safety is largely dependent on traffic regulations and the enforcements of these, which fall under the responsibility of respectively the Committee for Administrative Police and the Traffic Police. However, safety engineering also has an influence on road safety. Responsibility for safety engineering is shared between the Committee for Administrative Police and the Committee of Roads. For road safety engineering, it is important to record blackspots, which are specific locations or specific road sections where repeated accidents, injuries or fatalities have been recorded over a period of a few years, thus indicating that the road infrastructure is part of the cause of the accidents.

86. In Kazakhstan these blackspots are referred to as “bottlenecks”, and the instructions *ПР РК 218-31-03* describe how to determine, record and eliminate these “bottlenecks”. The instructions define “bottlenecks” as locations with 2 or more accidents in the past year, or 3 or more accidents in the past 5 years (for urban areas the figures are respectively 5 or more and 10 or more). The definition of “bottlenecks” does not look at the seriousness of the accidents, and whether or not there were any fatalities or serious injuries. The length of a single road section that may be considered a “bottleneck” depends on the type of accident risk, and varies from 50 to 250 metres.

87. It is important to note that besides locations with a concentration of accidents, “bottlenecks” also refer to locations where technical conditions reduce the flow of vehicles, causing a potential danger to road users. This includes bends with a small radius, steep slopes, serious roadway deformation, narrow bridges, slippery surfaces, etc. In practice this second definition is used to include road sections in poor condition. Although a lower priority is given to this second category of “bottlenecks”, this dual definition results in large lists of “bottlenecks”, only a portion of which can be considered blackspots.

88. The recording of accidents is stated to be the responsibility of the traffic police, while the recording of “bottlenecks” is defined as a joint responsibility of the traffic police and the road authorities. For each identified “bottleneck”, the main characteristics are recorded, and filed as requiring attention, planned for elimination, or deregistered (after elimination of the problem). The oblast branch of the road authority (COR) is stated to be responsible for preparing a program for the elimination of the “bottlenecks” (in practice this would be the responsibility of Kazavtozhol, but it appears to have delegated the responsibility to Kazakhavtodor). The priority of “bottlenecks” is calculated based on the number of accidents in relation to traffic levels, the length of the road section concerned and the period in which the accidents took place. Where this indicator exceeds a certain threshold, the “bottleneck” is considered dangerous. For 2014 a total of 218 blackspots were recorded, involving 575 accidents resulting in 204 injured and 842 deaths. It must be noted here that this only

involves locations with more than one accident during 2014 (not all accidents), and does not include blackspots defined as locations with three or more accidents in the past 5 years (this analysis does not appear to be made at present). It must further be noted that in Aktobe oblast blackspots were recorded as long sections of road where the poor condition was considered the cause of various accidents. It is clear that the recording of blackspots needs to be improved, including the linkage between accident data from different years and the follow-up regarding the elimination or mitigation of blackspots identified in previous years.

Table 21 Blackspots in republican roads (2014)

Oblast	Blackspots	Accidents	Injuries	Fatalities
Akmola	18	40	13	64
Aktobe	4	31	15	67
Almaty	79	219	78	267
Atyrau	-			
East Kazakhstan	10	21	6	41
Jambyl	12	36	16	42
West Kazakhstan				
Karaganda	16	36	12	68
Kostanay	16	34	18	41
Kyzylorda	-			
Mangystau	2	5	2	5
Pavlodar	20	48	9	85
North Kazakhstan	4	9	9	12
South Kazakhstan	37	96	26	150
Total 2014	**218**	**575**	**204**	**842**
Total 2013	123	245	84	343

Source: Kazakhavtodor

IV. ROAD SECTOR FUNDING

89. This chapter looks at the road sector funding available from central level. It focuses on funding available for republican roads, but also looks briefly at funding from central government that is transferred to oblasts for local roads as this also forms part of the COR budget. It starts by analyzing the road sector budget made available to COR, followed by an analysis of the road sector expenditure by COR. It goes on to look more closely at the development funding and how this is allocated, and subsequently does the same for the funding for repair and maintenance. Separate attention is given to the funding of toll roads, concessions, road user charges and the transfer of funds for local roads to local authorities.

A. Road budget

90. The budget made available to COR consists of several budget programs and subprograms. Although there have been some minor changes over time, with the latest renumbering of budget (sub)programs introduced in 2015, the budget (sub)programs have remained largely the same. Budget program 003 belongs to the development budget, while budget program 091 belongs to the recurrent budget. Budget program 003 does not have any subprograms and is related to the construction and reconstruction of republican roads. Budget program 091 has 5 subprograms related to repair and maintenance, quality control, management services, budget transfers for construction and reconstruction of local roads, and budget transfers for repairs to local roads. The budget is funded from the general Republican Budget of the government, the National Fund[10], and from external loans. Up till now the financing from external loans is only used for (re)construction of republican roads. Funding from the National Fund is only provided in exceptional cases (2015 and 2016).

- **Budget program 003** is used for construction and reconstruction works in republican roads. It is subdivided into different subprograms depending on the source of financing and whether it concerns co-financing of externally financed projects.
    - **Budget subprogram 004** is financed from foreign loans.
    - **Budget subprogram 005** is financed from domestic resources.
    - **Budget subprogram 016** is financed from state budget co-financing for foreign loans.
    - **Budget subprogram 017** is financed from National Fund co-financing for foreign loans.
    - **Budget subprogram 032** is financed from target transfers from the National Fund
- **Budget program 091** is used for repair and maintenance of republican roads, quality control, management, and budget transfers for local roads. It is subdivided into different subprograms depending on the kind of activities involved.
    - **Budget subprogram 100** is used to finance all repair and maintenance of republican roads as well as related diagnostics and instrumental examination. It covers all costs of capital, mid-term and routine repairs that are tendered out by Kazavtozhol, as well as the costs of routine maintenance and landscaping that is carried out by Kazakhavtodor. It also includes the costs related to diagnostics and instrumental examinations that are carried out by KazdorNII and the zhollaboratories.
    - **Budget subprogram 101** is used to finance quality control activities related to (re)construction and repairs that are carried out by the zhollaboratories.
    - **Budget subprogram 102** is used to finance the services of Kazavtozhol in managing and supervising the different road sector contracts. This budget subprogram was only introduced in 2013.
    - **Budget subprogram 103** is used for budget transfers to oblasts and to the cities of Astana and Almaty for financing construction and reconstruction of local roads.

[10] The National Welfare Fund "Samruk-Kazyna" is a sovereign wealth fund and joint stock company that owns many important companies in the country, including the rail company Kazakhstan Temir Zholy. It is funded from surplus revenue from taxes on the development of oil, gas and mineral reserves. These funds are used to prevent any potential negative impact of changes in the world markets on economic growth of the country.

Originally the local authorities were free to use these funds as they pleased, but now a performance agreement is signed with COR regarding the use of these funds.

- **Budget subprogram 104** is used for budget transfers to oblasts and to the cities of Astana and Almaty to finance capital and mid-term repair of priority projects in local roads.

91. The budget allocations for COR are presented in the table below for the period 2011-2018 (where applicable, previous budget (sub)program numbers are presented in brackets). In the period 2011-2015 the budget has grown by an average of 8% per year. Most of this increase is the result of an increased allocation to the (re)construction of republican roads. In 2017 a drastic reduction in funding is foreseen for the budget allocation to (re)construction of republican roads, with a complete stop on funding from the National Fund. Significant budget reductions are also foreseen for the transfers for (re)construction of local roads, while allocations to repairs and maintenance are expected to remain more or less the same.

Table 22 Budget for Committee of Roads 2011-2018 (KZT million)

	Budget subprogram	2011 Actual	2012 Actual	2013 Actual	2014 Actual	2015 Actual	2016 Planned	2017 Planned	2018 Planned
003	**Road development**	**157,702**	**172,528**	**200,260**	**231,158**	**303,847**	**304,665**	**167,309**	**186,020**
	004 From external loans	99,864	106,758	113,694	92,615	73,910	152,383	149,911	178,938
	005 From domestic sources	41,122	43,646	65,971	126,186	37,702	5,064		
	016 Co-financing of external loans from the Republican Budget	16,717	22,124	20,595	12,357	14,235	23,918	17,396	7,082
	017 Co-financing of external loans from the National Fund	-	-	-	-	-	-	-	-
	032 From the National Fund	-	-	-	-	178,000	123,300	-	-
091	**Repair and management**	**141,828**	**126,949**	**125,767**	**122,668**	**108,124**	**96,939**	**81,884**	**73,278**
	100 (004) Repairs, maintenance, landscaping, diagnostics and instrumental examination	31,836	26,997	28,798	34,966	41,000	41,000	41,000	41,000
	101 (005) Quality assurance for road construction and repairs	241	340	389	407	635	444	444	444
	102 (007) Construction, reconstruction, repair and maintenance services	-	-	586	1,880	1,974	1,745	1,745	1,745
	103 (006) Local transfers to oblasts, Astana and Almaty	90,533	77,390	72,793	78,220	59,398	49,250	31,959	30,890
	104 (020) Local transfers for capital and mid-term repair	18,323	19,412	20,401	4,894	3,617	4,500	6,736	-
	(021) Local transfers for land acquisition	895	2,810	2,800	2,301	1,500	-	-	-
	TOTAL	**299,529**	**299,477**	**326,027**	**353,827**	**411,971**	**401,604**	**249,193**	**260,099**

Source: Ministry of Finance, COR draft budget request 2016-2018 approved by MID in December 2015

92. In 2015 Kazavtozhol reportedly managed approximately KZT 340 billion for (re)construction, repair and maintenance (although some KZT 10 billion was directly awarded to Kazakhavtodor). For this service it received a payment of just under KZT 2 billion (budget subprogram 102, formerly 007). This implies a management cost of 0.6% of the investment cost.

93. A road fund was created by Supreme Council Resolution in 1991. It received tax from enterprises (0.5% of revenue), a fuel tax of KZT 3.0 per liter, and a freight vehicle tax for transit vehicles over 10 tons. It was operative from 1992-1994. It was reestablished by Decree #2701 in 1995, but was abolished by Law #324-1 in December 1998.

B. Republican road expenditure

94. A review of the expenditure on republican roads since 2001 shows a dramatic increase in funding for (re)construction, averaging over 30% per year. This is accompanied by an average increase in length of (re)construction of 15%. The length of road (re)constructed in 2014 is over 5 times as long as it was in 2001 (3% of the total republican road length), and is already lower than its peak in 2011-2012. Average expenditure per kilometre has increased sixfold from KZT 60 million/km in 2001 to KZT 360 million/km in 2014. In part this is due to the larger scope of the (re)construction works being carried out.

95. In comparison, the expenditure on capital repair (rehabilitation) has hardly changed at all, and after an initial increase, expenditure decreased from 2006 onwards. The length of capital repair has actually reduced by 10% per year on average. The length of capital repair in 2014 was only a quarter of what it was in 2011, covering only 0.2% of the total republican road length. This is partially explained by the increased attention to reconstruction and upgrading to higher technical standards. Given the relatively low traffic levels in Kazakhstan, this raises the question whether higher standards are necessary for all republican roads. Average expenditure per kilometre on capital repairs has increased fourfold from KZT 50 million/km in 2001 to nearly KZT 200 million/km in 2014.

96. Expenditure on mid-term repair (periodic maintenance) has only increased by an average of 10% per year. This increase has not even been sufficient to counter cost increases, and the length of mid-term maintenance works has actually reduced slightly over the review period. The coverage in 2014 is 200 km less than it was in 2001. In 2014 only 5% of the republican road network received mid-term maintenance. This implies that republican roads receive mid-term maintenance once every 20 years on average. It may be clear that this is insufficient, with paved roads requiring mid-term maintenance once every 5-7 years on average. This would require a three- to fourfold increase in the budget allocation to mid-term maintenance.

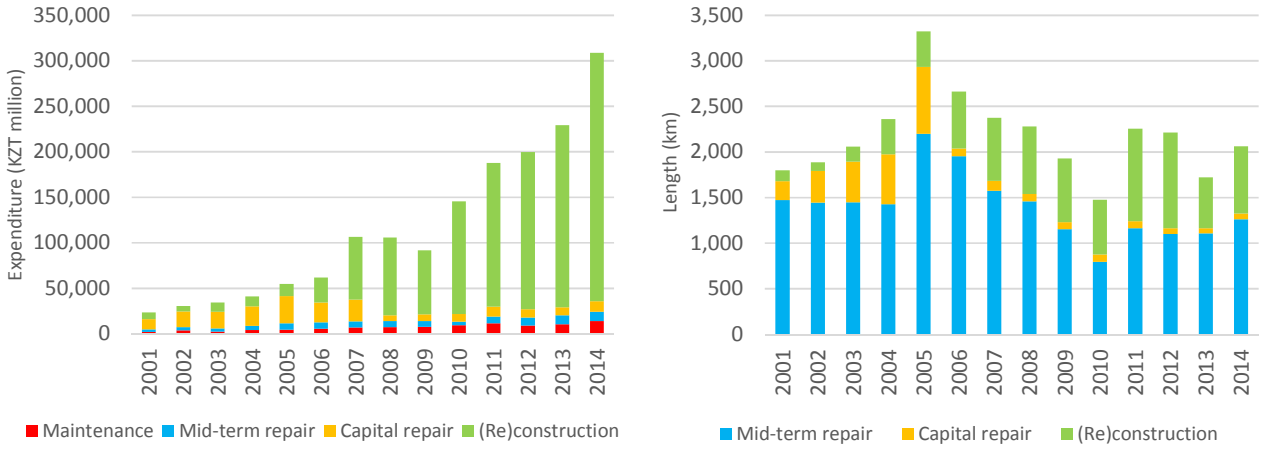
97. Allocations to routine repair and maintenance have increased by an average of 16% per year. Reportedly this allows the coverage of the full republican road network, but anecdotal evidence suggests that available funding is spread over the entire network without addressing all the needs. Especially winter maintenance and the summer maintenance of roads in good condition suffer from an emphasis on patching of roads in poor condition.

Table 23 Republican road network expenditure and length

Year	Maintenance	Mid-term repair		Capital repair		(Re)construction		Other	Total
	(KZT million)	(KZT million)	(km)	(KZT million)	(km)	(KZT million)	(km)	(KZT million)	(KZT million)
2001	2,049	2,960	1,471	11,042	211	7,687	119	418	23,738
2002	3,851	3,421	1,445	17,602	347	5,674	92	1,965	30,548
2003	2,439	3,640	1,448	18,348	443	9,984	168	220	34,411
2004	4,214	4,306	1,428	21,574	546	10,945	386	687	41,039
2005	4,490	7,328	2,200	29,589	734	13,501	391	106	54,908
2006	5,522	7,122	1,955	21,704	84	27,694	626	406	62,042
2007	6,977	6,649	1,573	24,113	112	68,888	688	141	106,627
2008	7,409	6,837	1,459	6,130	82	85,355	736		105,732
2009	7,788	6,412	1,155	7,118	76	70,567	700		91,885
2010	9,538	3,763	794	8,649	83	123,681	600	1,750	147,381
2011	11,683	7,085	1,164	11,072	77	157,722	1,013	1,995	189,557
2012	9,000	9,000	1,099	9,000	65	172,529	1,051		199,529
2013	10,710	9,548	1,107	9,000	58	200,260	557	2,330	231,848
2014*	14,000	10,562	1,265	11,318	59	272,998	740		308,878

* Planned amounts Source: COR

Figure 12 Republican road network expenditure and length



98. The graphs above show that despite significant increases in road sector funding (funding in 2014 was 13 times higher than in 2001), the length of road receiving pavement renewal has remained more or less the same at 2,000 km per year. This is less than 10% of the road network, implying a gradual deterioration of road pavements due to ageing. To correct this, more focus should be given to mid-term repairs in order to ensure that pavements are rejuvenated and costly capital repairs are avoided. At the same time, the need for the very costly reconstruction works and upgrading to category I or II should be questioned, in light of the limited funding available and the relatively low traffic volumes in Kazakhstan. Many of these reconstruction works may be postponed till later years, after traffic levels have risen, freeing up funds for capital repair of these roads (to the current technical category) and mid-term repair.

C. Development funding for republican roads

99. Over the past decade, budget allocations to the development of the republican road network have focused on the 6 international road corridors listed in Table 4. Most external loans have also focused on these roads. Especially the so-called Western Europe - Western China corridor (WEWC) has received much investment in recent years. It combines the international corridors I and II, running from Khorgos on the border with China through Almaty to Shymkent, where it links with the road from Uzbekistan and continues on through Kyzylorda and Aktobe to Uralsk on the border with Russia. In China the road links up with highways to Urumqi, in Uzbekistan it links to the highway to Tashkent, while in Russia the road links up with highways to Yekaterinburg, Moscow and Europe. It forms part of the Asian Highways network, TRACECA and CAREC. Several different development partners have contributed to the reconstruction of this corridor, including ADB, the World Bank, EBRD, IDB and JICA. External loans are also financing reconstruction to the international corridor III between Almaty and Astana, and corridor IV running from Astrakhan in Russia through Atyrau and Aktau to Bekdash in Turkmenistan.

100. Although the international corridors provide interregional connections in north-south direction, connecting almost all oblast capitals (the exception being Ust-Kamenogorsk), they do not provide proper east-west connections. With the lower oil prices and a general slowdown of the economy, Kazakhstan is starting to give more attention to domestic linkages in an aim to ensure country-wide connectivity and to stimulate the economy through domestic trade.

101. The Transport Strategy 2020 and the MID Strategic Plan 2014-2018 distinguish three main domestic corridors connecting Astana to the south (Almaty), the east (Pavlodar) and the west (Aktau). The Centre-South corridor links the main cities of Astana and Almaty through Karaganda. It forms part

of the international corridor III, but attention is focused on the domestic linkage rather than the international transit. The Centre-East (CE) corridor connects Astana with Pavlodar and Ust-Kamenogorsk, and will run largely over existing alignments, although reconstruction of the P4 and a section of the A17 will be required to link up with the M38. The Centre-West corridor links Astana through Arkalyk and Beineu to the port of Aktau and largely involves a new alignment. The exact alignment is not yet certain, and may link to the M32 near Shalkar and run directly onwards from there to Beineu, or alternatively link up to the M32 near to Aktobe and connect to Beineu through the A27 and A33.

102. Although most of the roads included in the planned republican road development budget 2015-2017 are international connections, they are no longer solely international transit routes. More than half the planned budget is allocated to the Centre-South and Centre-East corridors, and the road linking Almaty to Ust-Kamenogorsk (A3) also receives significant funding (these three roads receive nearly two-thirds of the planned budget).

Table 24 Planned republican road development budget for 2016-2018 (KZT million)

Road	Year			Total	Subprogram*				
	2016	2017	2018		004	005	016	017	032
CS:Astana-Karaganda-Almaty (M36)	63,000	92,700	74,245	**229,945**	153,236	-	13,709	63,000	153,236
CE:Astana-Pavlodar-UstKamenogorsk	60,532	-	-	**60,532**	-	-	-	60,532	-
WEWC:Khorgos-Almaty-Shymkent-Samara (A2+M32)	137,188	23,027	11,400	**171,615**	145,978	3,000	22,637	-	145,978
Almaty-Ust-Kamenogorsk (A3)	9,450	-	-	**9,450**	-	-	-	9,450	-
Beineu-Aktau (A33)	38,471	-	-	**38,471**	31,731	2,358	4,382	-	31,731
Astana-Petropavlovsk-Chelyabinsk (A1)	11,083	-	-	**11,083**	-	2,789	-	8,294	-
Kyzylorda-Pavlodar-Omsk (A17+M38)	-	-	-	**-**	-	-	-	-	-
Zhetybay-Zhanaozen-Bekdash (A34)	0,004	10,376	10,376	**20,756**	18,262	4	2,490	-	18,262
Samara-Aktobe-Atyrau-Astrakhan (A28+A27)	2,424	10,000	7,000	**19,424**	14,960	-	2,040	2,424	14,960
CW:Astana-Arkalyk-Beineu-Aktau	2,000	27,732	83,000	**112,732**	109,222	-	1,510	2,000	109,222
Omsk-Pavlodar-Maikapshaga (M38)	0,012	-	-	**0,012**	-	0,012	-	-	-
Usharal-Dostyk(A7)	-	-	-	**-**	-	-	-	-	-
Southwestern bypass Astana	0,019	-	-	**0,019**	-	0,019	-	-	-
Uralsk-Kamenka-Russia(Ozinki)(A29)	5,600	-	-	**5,600**	-	-	-	5,600	-
Ust-Kamenogorsk-Ziryanovsk-Karagai-Rakhmanov	0,026	-	-	**0,026**	-	0,026	-	-	-
Zhezkazgan-Yesil-Petropavlovsk (A16)	-	-	-	**-**	-	-	-	-	-
Astana-Kostanay-Chelyabinsk (M36)	2,412	-	-	**2,412**	-	2,412	-	-	-
Taskesken-Bakhty (A8)	-	-	-	**-**	-	-	-	-	-
Schuchinsk-Zerenda	-	-	-	**-**	-	-	-	-	-
Beineu-Akzhigit (P1)	-	-	-	**-**	-	-	-	-	-
Total	**332,221**	**163,835**	**186,021**	**682,078**	**473,388**	**10,620**	**46,769**	**151,300**	**473,388**

* 004: External loans, 005: Republican Budget, 016: Co-financing from Republican Budget, 017: Co-financing from National Fund, 032: Target Transfer from National Fund.
Source: COR

103. The focus of domestic connectivity was further strengthened in the President's address to the nation "Nurly Zhol" (path of light) in November 2014. This program identifies 5 macro-regions (Astana, Almaty, Central & Eastern, Western, and Northern) and their related hubs (Astana, Almaty, Shymkent, Ust-Kamenogorsk and Aktobe). For the road sector it aims to improve the connectivity between these hubs. The domestic focus is apparent in the major road programs identified by Nurly Zhol.

Table 25 Planned republican road sector budget allocations under the Nurly Zhol program (KZT million)

Road	Length	Year					Total	Source		
	(km)	2015	2016	2017	2018	2019		RB	NF	Loans
CS:Astana-Karaganda-Almaty(M36)	1,318	70	125	178	174	180	**728**	113	97	517
CE:Astana-Pavlodar-Ust-Kamenogorsk(P4-A17-M38)	952	86	83	62	60	60	**351**	149	202	
CW:Astana-Arkalyk-Aktobe-Beineu-Aktau	1,651	30	102				**133**	16	72	490
Almaty-Ust-Kamenogorsk(A3)	853	25	35				**60**	116	127	
Astana-Petropavlosk-Chelyabinsk(A1)	586	15	16				**31**	23	49	
Kyzylorda-Karaganda-Pavlodar-Uspenka(A17)	940	3	5				**8**		188	
Zhezkazgan-Yesil-Petropavlovsk (A16)	940	3	4				**7**	2	150	
Zhetybay-Zhanaozen-Bekdash (A34)	73		6				**6**		5	26
South western bypass Astana	31	3	6				**9**		12	
Uralsk-Kamenka-Russia(Ozinki)(A29)	100	3	6				**9**		30	
Usharal-Dostyk(A7)	184	0	8				**8**		7	41
Uzynagash-Otar(A2)	98	0	9				**9**		7	39
Total	**7,726**	**239**	**406**	**240**	**234**	**240**	**1,359**	**420**	**946**	**1,113**

Source: COR

104. Apart from the focus on the Centre-South, Centre-East and Centre-West road corridors, the program also includes the road linking Almaty to Ust-Kamenogorsk (A3), and the road from Kyzylorda to Karaganda (A17). These are roads aimed at providing an east-west connection to complement the mainly north-south international corridors.

105. The Nurly Zhol program and earlier policy documents provide direction for road development, listing the roads to be reconstructed. However, such lists tend to exclude the roads which have already been reconstructed, which are not reflected in the strategic plans. To strengthen planning, ideally the policy documents should provide a list of all priority roads, both those that have already been reconstructed, and those that have yet to be reconstructed. This would provide more consistency between different strategy documents, and also show progress over time. Such a comprehensive list of priority republican roads that are to be upgraded to category I or II can be seen as the core republican road network. (Re)construction works will be focused on the sections of the core republican road network requiring such works. It is recommended to identify the core road network through a decree, with future programmes and strategy documents referring to the decree. The definition of the core road network may be linked to concepts such as the macro regions and their hubs presented in the Nurly Zhol program. As an initial definition of the core republican road network, the list of roads currently planned for upgrading to category I or II in the different strategy documents may be used, as presented in the table below. This gives a republican core road network of approximately 14,000 km.

Table 26 Proposed republican core road network for (re)construction to category I or II

Road	Code	Length (km)	Corridor	Transport Strategy 2020	MID Strategic Plan 2018	Nurly Zhol
(China) Khorgos - Almaty - Shymkent - Tashkent (Uzbekistan)	A2	1,197	WEWC	X	X	X
Shymkent - Kyzylorda - Aktobe - Uralsk - Samara (Russia)	M32	2,029	WEWC	X	X	X
Taskesken - Bakhty (China)	A8	187		X	X	X
(Russia) Omsk - Pavlodar - Maikapshagai (China)	M38	1,099	CE	X	X	X
Atyrau - Aktau	A33	798		X	X	X
Aktau - Bekdash (Turkmenistan)	A34	115		X	X	X
Aktobe - Martuk (Russia)	A24	102	WEWC	X	X	X
Great Almaty ring road (as a concession - BAKAD)	-	65		X		
Almaty - Karaganda - Astana - Kostanay - Chelyabinsk (Russia)	M36	2,032	CS	X	X	X
Astana - Shiderty	P4	243	CE	X	X	X
Shiderty - Pavlodar	A17	184	CE	X	X	X
Astana - Arkalyk - Shalkar - Beineu - Aktau	-	1,652	CW	X	X	X

Road	Code	Length (km)	Corridor	Transport Strategy 2020	MID Strategic Plan 2018	Nurly Zhol
Almaty - Ust-Kamenogorsk	A3	1,036		(X)	X	X
Astana - Petropavlosk - Russia	A1	452		X	X	X
Uralsk - Kamenka (Russia)	A29	100				X
Usharal - Dostyk (China)	A7	184		X		X
Kyzylorda - Zhezkazgan - Karaganda	A17	925				X
Aktobe - Atyrau - Astrakhan (Russia)	A27	871		X	X	X
Uralsk - Atyrau	A28	487				X
Merki - Shyganak	P29	273				X
Beineu - Kungirot (Uzbekistan)	P1	84				X
Astana south-western bypass	-	31			X	
Total		**14,146**				

WEWC: Western Europe - Western China, CS: Centre-South, CE: Centre-East, CW: Centre-West
Source: Consultant's processing of COR data

106. As mentioned in the Nurly Zhol State Program, it will take time to carry out the required works. This means that funds will need to be focused on certain roads or road sections, with other works being delayed till future years. This requires prioritization of roads and road sections, something which does not exist at present. Currently it seems that funds are spread around, although some prioritization is taking place with some roads receiving significantly more funding than others. The Nurly Zhol program and other policy documents do not, however, provide clear criteria for prioritizing investments and for selecting which roads will be upgraded or rehabilitated first. Without such prioritization criteria, there is a risk that investment funds get spread over many roads and that less important roads get prioritized as a result of political pressure.

107. There is a need for an objective prioritization mechanism, preferably one that prioritizes roads based on the economic benefits they would have for the country. The combination of a well-defined list of core republican roads and their prioritization would facilitate the implementation of the program, and would allow the introduction of a Managing for Development Results approach regarding road network development. Without such clear targets in terms of a road list and related priorities, it is very difficult to monitor whether the investments being made are in line with the plan or not.

D. Maintenance funding for republican roads

108. In Kazakhstan distinction is made between routine maintenance, routine repair, mid-term repair and capital repair. Routine maintenance includes summer and winter maintenance of the carriageway, bus stops, rest areas, barriers and fences, lighting and communication devices, as well as landscaping. Pavement maintenance under routine maintenance is limited to repairing defects that are less than 5% of the pavement area in a 1 km section and consume less than 150 tons of asphalt per kilometre. Where pavement repairs exceed these limits, they fall under routine repair. Routine repair also includes resurfacing of continuous road sections of up to 500 m in length to correct roughness and deformation (route method). Mid-term repairs include renewal of the surface or pavement wearing layer over longer stretches of road with the aim of prolonging the life of the road, but exclude any reinforcement to the road base. Capital repair involves renewal of the pavement structure, without upgrading of the technical category and with a maximum realignment of 25% of the road length.

109. The thresholds for pavement repairs under routine maintenance are very high. On a 7 metre wide category III road, the allowable repairs amount to 350 m^2 per kilometre, equivalent to nearly 5,000 potholes of 30 centimetres in diameter (5 potholes for every metre of road). It may be clear that in roads in such a condition, routine maintenance is no longer the best option for carrying out repairs. In this context the function of routine repairs is not clear, as mid-term repairs using seals and overlays would be much more cost efficient and effective. Although routine repairs allow the repair of complete

sections of roads of up to 500 metres in length, this is not considered a suitable option for roads where the pavement has deteriorated to that stage. Instead, it creates a tendency to repair the road in 500 metre sections. It is strongly recommended to amend the thresholds to more realistic levels, putting greater focus on mid-term repairs.

110. The republican road maintenance budget is more or less evenly spread between routine maintenance, mid-term repairs (periodic maintenance) and capital repairs (rehabilitation). Allocations to routine repairs are minimal, implying that most surface patching is carried out under routine maintenance by Kazakhavtodor (this is possible in light of the high thresholds for pavement repairs under routine maintenance). In 2014 a total of 1.5 million square metres of patching was reportedly carried out by Kazakhavtodor, equivalent to 1% of the total paved republican road surface. Such high levels of patching are economically inefficient, and the pavement damage is better addressed through seals and overlays carried out as part of mid-term repairs.

111. The great emphasis on patching of roads in poor condition is redirecting routine maintenance funding away from roads in good condition, which subsequently deteriorate faster. Especially crack sealing is reportedly receiving insufficient attention. It is also leaving insufficient funding available for proper winter maintenance, with only limited salt treatment being applied. However, even with better allocation of available routine maintenance funding, funding would still be insufficient. The report on *Road Maintenance System Improvement* estimates that applying current prices to the 2003 Decree #423 on road maintenance would require budgets for routine maintenance in the order of KZT 30 billion instead of the KZT 11 billion budgeted for 2015.

Table 27 Republican road maintenance budgets (KZT million) and length (km) for 2011-2015

Oblast	Maintenance	Routine repair	Mid-term repair		Capital repair		Other	Total
	KZT million	KZT million	KZT million	km	KZT million	km	KZT million	KZT million
Akmola	1,440	-	1,188	99	-			2,628
Aktobe	800	-	462	80	287			1,549
Almaty	1,100	-	1,084	41	-			2,184
Atyrau	400	-	207	30	873	8		1,480
East Kazakhstan	1,550	-	2,300	216	1,327	8		5,177
Jambyl	600	-	532	26	-			1,132
West Kazakhstan	600	-	610	28	3,041	18		4,251
Karaganda	1,150	-	1,100	125	2,000	20		4,250
Kostanay	450	-	1,409	92	1,529	7		3,387
Kyzylorda	750	-	191	22	353			1,294
Mangystau	250	-	586	51	1,299	28		2,135
Pavlodar	950	-	1,067	134	2,701	11		4,718
North Kazakhstan	760	-	1,528	75	806			3,094
South Kazakhstan	400	-	385	19	366			1,151
Total 2015	**11,200**	**-**	**12,649**	**1,037**	**14,581**	**100**	**436**	**38,866**
Total 2014	15,502	175	8,953	1,106	10,087	102	1,163	35,880
Total 2013	8,150	-	7,643	1,112	8,846	58	2,361	27,000
Total 2012	9,581	-	8,581	1,210	8,757	65	81	27,000
Total 2011	11,553	-	7,085	1,184	11,116	79	2,130	31,884
Average %	**35%**	**0%**	**28%**		**33%**		**4%**	**100%**

Source: COR

112. The overall maintenance budget has changed very little over the past 10 years, and the lengths of mid-term and capital repairs have also changed little. As explained earlier, the approximately 1,000 km of mid-term repairs carried out each year are insufficient to ensure timely maintenance of a road network of 23,600 km. Under such a regime, the average interval between two mid-term repairs would be over 20 years, while 5-7 years is generally the norm for paved roads. The report on *Road Maintenance System Improvement* estimates that according to the norms, funding for

mid-term repairs should be in the order of KZT 35 billion rather than the KZT 13 billion currently allocated.

Table 28 Republican road maintenance budgets for 2011-2015 (KZT million)

Budget type	2011	2012	2013	2014	2015
Maintenance	11,553	9,581	8,150	15,502	11,200
Current repairs	-	-	-	175	-
Mid-term repairs	7,085	8,581	7,643	8,953	12,649
Capital repairs	11,116	8,757	8,846	10,087	14,581
Subtotal	**29,754**	**26,919**	**24,639**	**34,717**	**38,430**
Passports	-	-	-	487	-
Diagnostics	130	50	132	379	359
Development of standards	-	-	-	91	-
Equipment	2,000	-	-	-	-
New technologies	-	-	696	-	-
Identification documents	-	-	-	22	32
Astana-Schuchinsk toll road	-	-	-	185	30
Other	-	-	-	-	15
Contingency	-	31	1,534	-	-
Subtotal	**2,130**	**81**	**2,361**	**1,163**	**436**
Total	**31,884**	**27,000**	**27,000**	**35,880**	**38,866**

Source: COR

E. Toll roads

113. Toll roads are regulated by the Law on Roads, by resolution #134 from January 2007 and resolution # 872 from September 2008. Currently there is only one toll road in Kazakhstan, running for 211 km from Astana to Schuchinsk (A1). It is an open toll road with automated toll booths at the start in Astana and at the other end in Schuchinsk. The road is managed by Kazavtozhol which collects the toll revenue and uses this for the operation of the toll collection system and the maintenance of the road. Collected toll revenue amounted to KZT 1.0 billion in 2014.

114. Expenditure consists mainly of the costs of maintenance that is carried out directly by the two DEUs under the Toll Road Directorate of Kazavtozhol, forming over 70% of total expenditure. Other expenditure includes lighting, automated registration, services technology, the toll booths themselves and subcontracting of works to the private sector. Total expenditure in 2014 amounted to KZT 1.2 billion, exceeding toll revenue by 16% - the difference of KZT 165 million was funded from the Republican Budget. However, the situation is an improvement compared to 2013, when expenditure amounted to KZT 896 million and toll revenue amounted to KZT 559 million, resulting in expenditure exceeding revenue by 60%. Deficits are covered from the COR maintenance budget. For 2015 it is expected that the deficit will only amount to only KZT 30 million as traffic levels increase.

Table 29 Toll revenue and expenditure in 2014 (KZT million)

Month	Toll revenue	Expenditure						
		Maintenance by Kazavtozhol	Lighting	Automated registration	Services technology	Toll booths	Sub-contracting	TOTAL
January	**50.5**	120.8	3.5	8.3	-	3.3	14.5	**150.3**
February	**49.7**	96.1	-	5.7	16.1	-	-	**117.9**
March	**67.9**	64.9	-	5.6	5.2	5.0	-	**80.7**
April	**80.0**	84.8	-	4.8	0.1	15.0	-	**104.8**
May	**100.8**	83.3	4.3	2.4	0.1	1.0	3.6	**94.7**
June	**105.5**	130.0	5.4	1.9	0.1	17.6	137.6	**292.6**
July	**118.3**	58.4	8.5	2.4	0.1	5.0	0.2	**74.6**
August	**124.1**	35.7	2.2	1.6	0.1	5.0	0.2	**44.9**

Month	Toll revenue	Expenditure						
		Maintenance by Kazavtozhol	Lighting	Automated registration	Services technology	Toll booths	Sub-contracting	TOTAL
September	**107.5**	31.1	7.3	2.1	0.1	9.9	0.2	**50.7**
October	**94.6**	34.8	8.2	2.9	-	5.0	-	**50.9**
November	**78.3**	62.1	-	3.2	0.3	6.1	0.4	**72.2**
December	**69.7**	60.9	9.6	4.5	0.5	2.5	0.2	**78.3**
Total	**1,046.9**	**862.9**	**48.9**	**45.5**	**23.1**	**75.4**	**156.9**	**1,212.8**

Source: COR

115. The Transport Strategy 2020 aims to have 10% of category I and II roads under tolls by 2016, and 55% by 2020. Based on current lengths of category I and II roads this translates respectively to 650 km and 3,600 km. At the same time the Transport Strategy 2020 sets targets for the length of self-financing roads to reach 841 km by 2016 and 6,186 km by 2020. These are understood to include both toll roads and concessions, implying some 200 km of concession roads by 2016 and some 2,500 km by 2020. In recent discussions with COR, the government expressed its plans to extend the toll road coverage to 7,000 km of technical category I and II roads (this is understood to include concessions). On category I roads, both cars and trucks would pay tolls, while on category II roads only trucks would pay tolls. This is expected to raise toll revenue to KZT 41 billion per year by 2022. This is still significantly short of the KZT 88.9 billion in annual toll revenue set as a target in the Transport Strategy 2020.

Table 30 Planned toll road extension and revenue

Year	2014	2015	2016	2017	2018	2019	2020	2021	2022
Length (km)	211	211	901	2,586	4,356	4,729	6,186	6,646	6,953
Revenue (KZT million)	1,074	3,489	7,766	15,846	23,476	25,902	32,749	37,430	41,200

Figure 13 Map of planned toll roads in Kazakhstan

116. It is clear that the current toll rates and traffic levels will only allow coverage of routine maintenance and repairs. In some of the more trafficked roads, toll revenue may also be sufficient to

cover (part of) the mid-term repair costs. However, it is unlikely that the toll revenue will be is sufficient to cover any significant investments related to reconstruction or capital repair. For the planned concession contract for the Almaty ring road, toll revenue is expected to cover approximately 70% of the initial construction costs, but this involves average traffic volumes of 35,000 vehicles per day, and toll rates for cars that are five times higher than in the Astana-Schuchinsk toll road.

117. Until recently, toll revenue could only be used for toll road maintenance. Any remaining toll revenue was to be deposited in the Republican Budget. As a result of legislation changes, toll revenue can now be used for (a) repairs and maintenance of toll roads, (b) repayment of loans for the construction of toll roads, (c) management fees for operating toll roads, (d) procurement and maintenance of equipment for toll roads. Although this is considered a good development, allowing a wider usage of road user charges for road management, the procurement of equipment should not be included, as this may lead to the stockpiling of equipment. Instead, the maintenance and repair of toll roads would be better outsourced to a third party (either private contractors or Kazakhavtodor), with the contract price including any costs of equipment.

118. In addition to the above, Kazavtozhol has also expressed its desire to introduce tolling for trucks to category III roads. This is not considered appropriate. Tolling is only one means of collecting road user charges, and is generally not considered the most efficient means. Especially in roads with low traffic volumes, the investment and operation costs are too great to allow any meaningful revenue. Even in the Astana-Schuchinsk toll road, toll system operation forms over 10% of total expenditure. This percentage will only be higher as toll revenue is lower. For financing road maintenance and repairs on roads with lower traffic volumes, other road user charges may be more efficient (e.g. a heavy vehicle tax or fuel tax).

F. Concession contracts

119. COR has been trying to introduce a concession contract for the construction of the Big Almaty Ring Road (BAKAD), which would provide connections between the different sections of the Western Europe - Western China corridor (A2) linking Khorgos (China border) to Shymkent and the Uzbekistan border, the Centre-South corridor linking to Astana, and the A3 linking to Ust-Kamenogorsk. It would avoid transit traffic going through the city, as well as providing quick connections between different parts of Almaty. The planned alignment consists of 66 km of category Ia road with 4 lanes and some sections with 6 lanes, as well as 12 interchanges and several overpasses.

120. As per February 2016, the selection of the winning bid was imminent, from amongst several bids for the construction and management of BAKAD received from international companies and consortia. The current concession contract is planned to run for 30 years, with construction to be completed by 2019. Under the current concession contract, investments by the concessionaire are to be repaid through availability payments financed from the Republican Budget, starting after full completion of the construction works (there will be no partial commissioning). The availability payments cover initial construction costs, operation costs and all repair and maintenance costs. In case of poor performance of the concessionaire, penalties will be applied to the availability payments. Toll revenue will be collected by the concessionaire and paid into the Republican Budget. Under this system, all risks of traffic volumes are taken by government. This is different from previous tender rounds where toll revenue was foreseen to form part of the payment to the concessionaire, putting the traffic risk on the concessionaire and leading to a lack of interest during the bidding.

121. Tolls are based on fixed rates for use of the ring road, irrespective of distance (payment is for each entry). Toll rates are set at KZT 200 for cars and KZT 400 for trucks. The toll rates per kilometre for cars are approximately 5 times higher than those applied in other toll roads (Astana-Schuchinsk), while for trucks they are approximately half those in other toll roads (assuming an average distance travelled per entry of 40km). Toll revenues are estimated to cover approximately 80% of the

availability payments with an estimated 75,000 entrances per day (average of 35,000 vehicles per day using any given road section). As such, the coverage goes way beyond that in other toll roads where only routine repair and maintenance are covered by toll revenue.

G. Road User Charges

122. As mentioned earlier, tolls form only one type of road user charge. Road user charges can be defined as payments by road users related to the use of the road. These charges may consist of usage charges such as tolls or fuel tax (related to the degree of use of the road), or access charges such as vehicle registration fees (related only to road access, not to the degree of usage).

123. In Kazakhstan the following user charges have been identified that are related to road use. The excise taxes on vehicles and lubricants cannot strictly be considered road user charges, as they are not necessarily related to road use. These excise taxes may have been imposed with other purposes in mind. Customs duties on vehicles also cannot be strictly considered to be road user charges, as similar duties are imposed on other luxury items. Vehicle fees and licenses are generally used to cover the expenses of the services provided (driver's license, license plates, roadworthiness certificate, etc.), and therefore can also not be considered as funding for the road sector. Although the annual vehicle tax can be considered a road user charge, it is collected at local level and as such is not available for the republican road network.

Table 31 User charges related to road use (KZT million)

Type of road user charge	2009	2010	2011	2012	2013	2014		
	Total	Total	Total	Total	Total	Total	RB	LB
Excise tax on vehicles	3,312	1,864	2,111	3,351	4,208	4,352	4,207	145
Excise tax on petroleum products	20,508	21,039	20,790	22,612	24,139	25,221	5,523	19,698
Customs duties on vehicles	61,379	40,246	52,548	65,309	134,694	158,499	158,499	-
Vehicle fees and licenses	6,304	7,560	9,406	7,975	9,346	9,979	9,448	531
Vehicle tax	17,521	26,262	29,975	30,961	36,029	38,844	-	38,844
Toll revenue					559	1,047	1,047	
Transit fee	1,273	1,428	1,885	2,699	3,554	4,303	4,303	-
Fees for roadside advertising	3,247	3,723	4,664	5,016	2,992	304	302	2
Total	**113,544**	**102,122**	**121,379**	**137,924**	**215,521**	**242,549**	**183,329**	**59,220**

Note: RB= Republican Budget, LB= Local Budget
Source: Ministry of Finance

124. This leaves the toll revenue, the transit fee (paid by international freight vehicles for use of the road network in Kazakhstan) and the fees for roadside advertising. A fourth road user charge for the republican road network may be the overloading fees, but as these are not yet being collected, they are not represented here. The total revenue of the three road user charges in 2014 came to KZT 5,654 million. Revenue from roadside advertising used to be considerably higher, but has dropped in recent years. Although only the toll revenue is earmarked for the road sector (at least in as far as it is used for operation and maintenance of toll roads), the other road user charges should also be taken into account as they provide additional funding to the Republican Budget, which allows the Ministry of Finance to allocate greater budgets to COR. If compared to the 2014 repair and maintenance budget (including expenditure on operation and maintenance for the Astana-Schuchinsk toll road), the three road user charges provide 16% of all repair and maintenance expenditure for republican roads. With the increase in tolled road length, this percentage will increase considerably. Other road user charges may also be introduced (e.g. a fuel tax or heavy vehicle tax), to ensure complete coverage of repair and maintenance costs.

H. Local roads

125. Local roads are managed by the oblast and district authorities (Akimats). They receive targeted transfers from central government for this purpose, which are complemented by allocations from local budgets and other central government transfers (targeted transfers from COR only form a small portion of total local road funding). These targeted transfers used to be unrestricted, but now agreements are signed between the oblasts and COR regarding the use of the funds. The amount of the transfers has been gradually increasing in size, and now amounts to nearly KZT 100 billion. Despite most of the transfer budget being under budget subprogram 103 (formerly 006) for (re)construction of local roads, it appears that a large part of this budget is in fact used for capital repairs. This makes sense as the low volumes of traffic on local roads will not require upgrading to a higher technical category or new construction. However, it appears to put into question the proper use of the budget (sub)programs and should be changed to reflect the requirements.

Table 32 Local road expenditure and length

Year	Maintenance	Mid-term repair		Capital repair		(Re)construction		Total
	(KZT million)	(KZT million)	(km)	(KZT million)	(km)	(KZT million)	(km)	(KZT million)
2001	2,118	1,050	670	681	53	115		**3,964**
2002	2,162	1,163	707	810	33	204	12	**4,339**
2003	2,775	1,157	537	1,814	105	357	17	**6,103**
2004	3,789	2,105	701	2,544	109	238	23	**8,676**
2005	3,911	1,847	541	1,825	65	458	12	**8,041**
2006	3,287	2,821	569	1,844	127	1,010	54	**8,962**
2007	7,041	6,555	961	7,438	294	6,646	191	**27,680**
2008	7,266	6,865	1,388	20,335	616	14,053	196	**48,519**
2009			3,869		783		276	**98,410**
2010			3,025		556		211	**20,969**
2011	8,616		2,406	47,718	435	17,620	210	**73,954**
2012			3,040		399		183	**82,732**
2013	12,881	14,673	1,628	28,730	454	18,882	189	**75,165**
2014	13,024	17,844	1,345	38,335	504	23,388	184	**92,591**

Source: COR

V. STRATEGIC POLICIES AND PLANS

126. Kazakhstan has a series of strategic policies and plans related to the road sector. The most relevant of these are listed below. These strategy documents define the impact, outcomes and outputs to be achieved in the road sector as well as in other sectors. An overview of the indicators from these strategy documents that are relevant to the road sector is provided in Appendix IV.

- **Strategy 2030** - *Strategy for development of the Republic of Kazakhstan until the year 2030* (October 1997)
- **Strategy 2020** - *Strategic Development Plan of the Republic of Kazakhstan 2020* (February 2010)
- **Strategy 2050** - *Strategy Kazakhstan 2050* (December 2012)
- **Transport Strategy 2020** - *State Program for the Development and Integration of the Infrastructure of the Transport System of the Republic of Kazakhstan until 2020* (January 2014)
- **MID Strategic Plan 2018** - *Strategic Plan of the Ministry of Investment and Development of the Republic of Kazakhstan for 2014 - 2018* (December 2014)
- **Nurly Zhol** - *State Program for Infrastructure Development "Nurly Zhol" for 2015-2019* (April 2015)

A. Strategy 2030

127. The Strategy 2030 was introduced in the President's address to the nation in October 1997. One of the 7 priority areas involves infrastructure, particularly transport and communications. The development of transport infrastructure is aimed at improving national security, political stability and economic growth. The development of the republican road network is focused on international transit, with concessions seen as a means of financing part of the required investments. The development of the local road network is also seen as a priority, converting them to paved standard.

B. Strategy 2020

128. The Strategy 2020 was approved by Decree #922 in February 2010. It identifies infrastructure development as one of the means of ensuring sustained economic growth. The strategy calls for institutional reforms and the liberalization of the road sector. It aims to link all major towns and cities in Kazakhstan by a modern road network, giving particular attention to local roads. By 2020 it aims to double the international transit volume, amongst other things through the (re)construction of 16,400 km of republican roads, starting with the Western Europe - Western China corridor. By 2015, 85% of republican roads and 70% of local roads are to be in good or satisfactory condition. By 2012, toll roads and private sector investments are to be introduced. Annual reports are to be submitted to monitor the compliance with the targets.

Table 33 Strategy 2020 indicators and targets for the road sector

Indicator	Unit	2012	2014	2015	2020
Length of (re)constructed republican roads	km				16,400
Increase in volume of international transit compared to 2010	%				200%
Percentage of republican roads in good or satisfactory condition	%			85%	
Percentage of local roads in good or satisfactory condition	%			70%	
Percentage of Western Europe - Western China corridor reconstructed	%		100%		
Introduction of pay system in republican road network	Yes/No	Yes			

Source: Strategy 2020

C. Strategy 2050

129. The Strategy 2050 was introduced in the President's address to the nation in 2012 and was worked out in Decree #449 in December 2012. It introduces the overarching goal for Kazakhstan to become one of the 30 most developed countries of the world by 2050. With respect to infrastructure, it

introduces the double goal of integrating the national economy to the global environment, and linking up the different oblasts of the country. Although the focus remains on international transit routes (increasing transit volumes twofold by 2020 and tenfold by 2050), it introduces the concept of "infrastructure centres" to act as hubs in different parts of the country.

D. Transport Strategy 2020

130. The Transport Strategy 2020 was approved through Decree #725 in January 2014 in response to the Strategy 2020 and the Strategy 2050. It is the main policy document for the road sector, and includes several goals and indicators. The main purpose of the Transport Strategy 2020 is defined as creating modern transport infrastructure, integrating it to the international transport system and improving the international transit potential. Apart from international integration, the main target indicators include the development of transport infrastructure in the oblasts and quality transport links to villages and small towns. Other indicators look at an increase in the volume and turnover of freight and passenger transport. The Transport Strategy 2020 identifies the lack of international integration and oblast connectivity as main problems in the road sector, together with a lack of sufficient maintenance and repair for the ageing road infrastructure. The Transport Strategy 2020 identifies 8 main tasks for the road sector.

- **Task 1** - Improve interregional communication through the (re)construction of the roads listed below. It also includes the (re)construction of over 1,000 km of local roads.
  - Western Europe - Western China (A2 + M32)
  - Centre-South: Astana - Almaty (M36)
  - Centre-East: Astana - Pavlodar (P4 + A17)
  - Center-West: Astana - Arkalyk - Beineu - Aktau
  - Astana - Kostanay - Chelyabinsk (M36 + P36)
  - Astana - Petropavlosk (A1)
  - Taskesken - Bakhty (A8)
  - Omsk - Pavlodar - Maikapshagai (M38)
  - Almaty - Usharal - Dostyk (A3 + A7)
  - Astrakhan - Atyrau - Aktobe (A27)
  - Atyrau - Aktau - Turkmenistan (A33 + A34)
  - Aktobe - Martuk (A24)
  - Great Almaty ring road (as a concession)
- **Task 2** - Reduce the maintenance backlog by repairing over 10,000 km of republican roads and nearly 14,000 km of local roads. This is expected to remove the backlog by 2035. It also aims to introduce performance-based contracts and use IRI as an indicator for road condition.
- **Task 3** - Improve road sector financing by improving planning procedures, increasing the length of toll roads to over 6,000 km to generate KZT 88.9 billion by 2020, introduce concession contracts, and increase external loans for road sector financing.
- **Task 4** - Improve road management through the introduction of a road asset management system and other intelligent systems for monitoring traffic and weather.
- **Task 5** - Improve technical and regulatory policies and harmonize national and international norms.
- **Task 6** - Introduce 400 additional roadside services by converting existing facilities and building new ones with private sector participation.
- **Task 7** - Increase participation by civil society by introducing information portals and by carrying out road user surveys.
- **Task 8** - Improving human resources for the road sector.

131. The Transport Strategy 2020 also includes an extensive set of road sector specific indicators and targets. The most important of these are related to user satisfaction (ranking according to the Quality of Road index of the World Economic Forum as well as public satisfaction surveys), road

condition (percentage of republican and local roads in good condition based on the results of the road condition surveys carried out in autumn), road financing (according to the length and percentage of tolled category I and II roads), and road use (based on the volume of transit goods transported through Kazakhstan in tons). Other indicators look at outputs in terms of the length of road (re)constructed and repaired, the length of technical category I and II roads, the number of roadside services, and the coverage of the road asset management system.

Table 34 Transport Strategy 2020 indicators and targets for the road sector

Indicator	Unit	2016	2020
Percentage of republican roads in good and satisfactory condition	%	86	89
Percentage of republican roads in good condition	%	38	48
Complex index for republican roads	%	80	90
Percentage of oblast and district roads in good and satisfactory condition	%	72	78
Percentage of oblast and district roads in good condition	%	23	28
Percentage of technical category I+II republican roads	%	36	48
Percentage of republican roads that are complex index defect-free	%	80	90
Length of self-financing (toll) roads	km	841	6,186
Share of toll roads of total length of category I+II republican roads	%	10	55
Annual toll collection	KZT billion		88.9
Volume of transit goods transported by road in Kazakhstan	million tons	2.3	3.5
Length of republican road (re)construction	km	2,932	5,703
Length of oblast and local road (re)construction	km	659	1,124
Length of capital and mid-term repairs in republican roads	km	4,170	10,195
Length of capital and mid-term repairs in oblast and district roads	km	4,366	12,601
Percentage of republican roads with roadside services	%	25	76
Coverage of automated road asset management	km	8,000	23,485
Public satisfaction with paved public roads	%	58	70
Share of updated regulatory technical documents	%	66	78
Proportion of personnel qualified with technical specialties	%	17	40

Source: Transport Strategy 2020

E. MID Strategic Plan 2018

132. The MID Strategic Plan 2018 was prepared by the Ministry of Transport and Communications and approved by Resolution #1561 in December 2013. It was closely linked to the Transport Strategy 2020 and was until recently used as the MID Strategic Plan for activities that formerly fell under MOTC. A new MID Strategic Plan was prepared and approved by Resolution #1248 in December 2015, and incorporates the new Nurly Zhol State Programme. By 2015, the Plan aims to achieve an average of 85% of roads of national importance and 70% of local roads satisfactory condition. By 2020, the MID Strategic Plan also foresees the construction and reconstruction of 16,000 km of republican roads. It plans to complete works in all 6 international corridors, with a focus on the reconstruction of the Western Europe - Western China corridor, and republican road sections connecting the capital to oblast centres.

- Almaty - Astana - Petropavlosk (M36 + A1)
- Western Europe - Western China: Samara - Shymkent (M32)
- Omsk - Pavlodar - Maikapshagai (M38)
- Astrakhan - Atyrau -Aktau - Turkmenbashi (A27 + A33 + A34)
- Western Europe - Western China: Tashkent - Shymkent - Almaty - Khorgos (A2)
- Aktobe - Martuk
- Astana - Kostanay - Chelyabinsk (M36 + P36)
- Taskesken - Bakhty (A8)

- Almaty - Ust-Kamenogorsk (A3)
- Astana - Shiderty - Pavlodar (P4 + A17)
- Kurty - Burylbaytal (M36)
- Centre-South: Astana - Karaganda - Kurty - Kapshagai - Almaty (M36 + A3)
- Centre-East: Astana - Pavlodar - Semey - Kalbatau - Ust-Kamenogorsk (P4 + A17 + M38 + A3)
- Centre-West: Astana - Arkalyk - Shalkar - Beineu - Aktau (largely new alignment)
- Astana - Temirtau (M36)
- Astana south-western bypass
- Schuchinsk – Zerenda

133. The MID Strategic Plan basically consists of an extended set of indicators and targets to complement those of the Transport Strategy 2020. The main indicators are related to user satisfaction (ranking according to the Quality of Road index of the World Economic Forum), road condition (percentage and length of republican and local roads in good condition based on the results of the road condition surveys carried out in spring and autumn), and road financing (length of toll roads and road sector budgets). There is also an indicator related to the strengthening of the zhollaboratories, but this lacks measurable targets. Other indicators look at outputs in terms of the length of road (re)constructed and repaired.

Table 35 MID Strategic Plan 2014-2018 indicators and targets for the road sector

Indicator	Unit	2014	2015	2016	2017	2018
Road quality	WEF ranking	113	107	106	104	102
Percentage of republican roads in good and satisfactory condition	%	83		86		87
Length of republican roads in good and satisfactory condition	km	19,466		20,196		20,437
Percentage of local roads in good and satisfactory condition	%	68		72		76
Length of local roads in good and satisfactory condition	km	50,273		53,231		56,188
Volume of transit freight	million tons	18.5		22.0		26.5
Income from transit freight	KZT billion	165		205		240
Introduction of tolls in republican roads	km	211	211	655	3,772	4,878
Budget for republican road reconstruction	KZT million	272,998		304,665	167,308	186,021
Budget for republican road repair and maintenance	KZT million	35,880		96,939	81,884	73,278
Budget for local road transfers	KZT million	35,880		40,880		
Strengthening of oblast zhollaboratories	Yes/No	Yes				
Length of WEWC road corridor still requiring reconstruction	km	157		18		-
Length of republican roads (re)constructed	km	1,896		3,101		3,900
Length of republican roads repaired	km	3,552		6,010		7,600
Length of local roads (re)constructed	km					10,000

Source: MID Strategic Plan 2014-2018

134. The MID Strategic Plan also includes specific output indicators for each budget (sub)program. These are related to the length of (re)construction and repairs, the unit cost per kilometre, the length of road works where quality control is carried out, and the number of quality observations issued. However, in many cases the targets are missing or only entered up to 2016. In addition, many of the budget (sub)programs have changed since the MID Strategic Plan was prepared, and the plan will need to be adjusted to account for this.

F. Nurly Zhol

135. The "Nurly Zhol" (path of light) program for the period 2015-2019 was introduced in the President's address to the nation in November 2014 and worked out in a State Program that was approved by Decree #1030 in April 2015. The State Program identifies 5 macro-regions (Astana, Almaty, Central & Eastern, Western, and Northern) and their related hubs (Astana, Almaty, Shymkent, Ust-Kamenogorsk and Aktobe). For the road sector it aims to improve the connectivity between these hubs, functioning as rays. This will reduce the economic distance between businesses and between oblasts, reducing regional disparities and stimulating domestic trade and the economy. The State Program identifies the following major road programs:

- Centre-South: Astana - Karaganda - Almaty (M36)
- Centre-East: Astana - Pavlodar - Ust-Kamenogorsk (P4 + A17 + M38)
- Centre-West: Astana - Arkalyk - Shalkar - Beineu - Aktau
- Almaty - Ust-Kamenogorsk (A3)
- Astana - Petropavlosk - Russia (A1)
- Zhezkazgan - Petropavlosk (A16) - (this road was later removed)
- Uralsk - Kamenka (A29)
- Usharal - Dostyk (A7)
- Kyzylorda - Zhezkazgan - Karaganda (A17)
- Aktobe - Atyrau - Astrakhan (A27)
- Uralsk - Atyrau (A28)
- Merki - Shyganak (P29)
- Beineu - Kunigorot (Uzbekistan)

136. The Nurly Zhol State Program does not include many indicators, and only one indicator that is related to the road sector. This looks at the average travel time between the 5 city hubs. This is understood to mean the sum of the average travel times between Astana and each of the 4 hubs of Almaty, Shymkent, Ust-Kamenogorsk and Aktobe.

Table 36 Nurly Zhol State Program 2015-2019 indicators and targets for the road sector

Indicator	Unit	2015	2017	2019
Average travel time between hubs	hours	115	108	72

Source: Nurly Zhol State Program 2015-2019

G. Core republican road network

137. Based on the different strategy documents described above, a network of priority republican roads can be identified. These are included to greater or lesser degree in each of the strategy documents. They are considered important either because of the high traffic volumes, because of their connections to neighboring countries, and/or because they provide important connections between the different oblasts. Together these roads can be considered to form the core republican road network that will be upgraded to technical category I or II.

Table 37 Core republican road network as included in strategy documents

Road	Code	Length (km)	Corridor	Transport Strategy 2020	MID Strategic Plan 2018	Nurly Zhol
(China) Khorgos - Almaty - Shymkent - Tashkent (Uzbekistan)	A2	1,197	WEWC	X	X	X
Shymkent - Kyzylorda - Aktobe - Uralsk - Samara (Russia)	M32	2,029	WEWC	X	X	X
Taskesken - Bakhty (China)	A8	187		X	X	X
(Russia) Omsk - Pavlodar - Maikapshagai (China)	M38	1,099	CE	X	X	X
Atyrau - Aktau	A33	798		X	X	X
Aktau - Bekdash (Turkmenistan)	A34	115		X	X	X

Road	Code	Length (km)	Corridor	Transport Strategy 2020	MID Strategic Plan 2018	Nurly Zhol
Aktobe - Martuk (Russia)	A24	102	WEWC	X	X	X
Great Almaty ring road (as a concession - BAKAD)	-	65		X		
Almaty - Karaganda - Astana - Kostanay - Chelyabinsk (Russia)	M36	2,032	CS	X	X	X
Astana - Shiderty	P4	243	CE	X	X	X
Shiderty - Pavlodar	A17	184	CE	X	X	X
Astana - Arkalyk - Shalkar - Beineu - Aktau	-	1,652	CW	X	X	X
Almaty - Ust-Kamenogorsk	A3	1,036		(X)	X	X
Astana - Petropavlosk - Russia	A1	452		X	X	X
Uralsk - Kamenka (Russia)	A29	100				X
Usharal - Dostyk (China)	A7	184		X		X
Kyzylorda - Zhezkazgan - Karaganda	A17	925				X
Aktobe - Atyrau - Astrakhan (Russia)	A27	871		X	X	X
Uralsk - Atyrau	A28	487				X
Merki - Shyganak	P29	273				X
Beineu - Kungirot (Uzbekistan)	P1	84				X
Astana south-western bypass	-	31			X	
Total		**14,146**				

WEWC: Western Europe - Western China, CS: Centre-South, CE: Centre-East, CW: Centre-West

Note: The road Schuchinsk-Zerenda has not been included here as it is planned to be reconstructed for the EXPO 2017, not for longer term strategic purposes.

Source: Consultant's processing of COR data

SECTION 2:

MFDR APPROACH

VI. MFDR AND KEY PERFORMANCE INDICATORS

138. This section looks in detail at the Managing for Development Results (MfDR) approach, and how this may be applied to the road sector in Kazakhstan. After an initial introduction to the MfDR approach, it looks at the Key Performance Indicators.

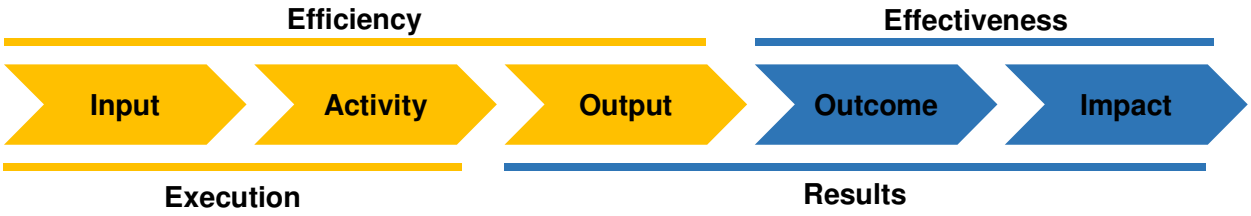
A. The MfDR approach

139. The Monterrey Conference on Financing for Development in 2002 focused attention on management strategies used to achieve development results, and as a consequence the concept of Managing for Development Results (MfDR) emerged. MfDR is a participatory approach to program planning and monitoring. It focuses on achieving defined and measurable results. It is designed to improve program delivery and strengthen management effectiveness, efficiency and accountability. The MfDR system aims at responding to these issues by setting out clear expected results for program activities, by establishing performance indicators to monitor and assess progress towards achieving the expected results and by enhancing accountability of the organization as a whole. MfDR seeks to overcome what is commonly called the "activity trap", i.e. getting so involved in the details of day-to-day activities that the ultimate objectives are being forgotten.

140. MfDR arose in developing countries as a tool for accelerating the pace of development. The end goal of MfDR is to help public organizations achieve the results laid down in the strategic objectives and goals of government programs. The notion of result in MfDR is associated with the social change produced by the state's actions and not just with the activities or the products that contribute to this change. Rather than taking these activities or the resulting outputs as parameters for evaluating government activity, the MfDR approach focuses on the outcomes and impact of those outputs on society and the economy.

141. MfDR is centered on the clear notion of causality. The theory is that a specific combination of inputs and activities leads logically to a predefined set of outputs, outcomes and impacts. These changes are generally shown in the 'results chain' or 'results-based framework,' which clearly illustrates the cause and effect relationships. MfDR demands that managers regularly analyze the degree to which their activities and outputs have the reasonable probability of achieving the desired outcomes and impact, and to make continuous adjustments accordingly to ensure that results are achieved.

Figure 14 Results Chain



142. **Inputs** refer to the resources (labor, funding, materials, etc.) that are allocated. **Activities** refer to the methods that are used to transform these inputs into outputs (e.g. reconstruction, routine maintenance, condition surveys). **Outputs** are the direct result of the activity (e.g. length of road reconstructed). Generally there is a relatively clear relationship between the inputs and the outputs for a specific activity (e.g. m^3 of asphalt per kilometre of reconstructed road, cost per kilometre of mid-term repair). **Outcomes** refer to the short- or medium term changes to society as a result of the outputs (e.g. improvement in road network condition, increase in traffic volumes, reduction in travel times, reduction in travel costs). **Impacts** refer to the medium- or long-term changes in living conditions (e.g. economic growth, improved education standard, reduced poverty, etc.).

143. The great change proposed by MfDR is to put the desired development results (outcomes and impact) into first place and, accordingly, define the best possible combination of inputs, activities and outputs to achieve those results. This approach differs fundamentally from the traditional approach, which takes the available inputs (physical and financial) and the actual or known activities or processes, and then defines the results accordingly.

144. This is also clear in Kazakhstan, where most of the existing indicators focus on outputs: the direct results of the different activities as included under the separate budget sub(programs). The risk is that such a focus on outputs and output indicators distracts from the actual objective of economic and social development through improved road transport. To avoid this risk, it is important to also clearly define the desired outcomes and the related indicators. Such outcomes are generally the combined result of different outputs, but are also affected by external factors to a certain degree. A clear example is road condition. The desired outcome is to have improved road conditions, whereby specific targets may be set for future years. This improvement is achieved through a combination of different outputs: reconstruction, capital repair and mid-term repair provide new pavements in good condition, while routine maintenance aims to slow down the deterioration process and avoid serious damage. At the same time, the road network will deteriorate further, whereby pavement age, pavement condition, traffic volume, overloading, weather, topography, etc. are all factors that will influence the degree of deterioration. As such, the outcome is not fully under the control of COR, as it would be in the case of an output indicator looking at the length of road reconstructed or repaired. However, COR is able to define the impact of the reconstruction and repair works on road conditions, and is able to estimate the impact of routine maintenance on road deterioration. They are therefore in a position to estimate the outcome of their work on road conditions, and to plan targets, define budget requirements, manage project and programme implementation, and monitor achievements. This is in essence Managing for Development Results.

145. With the presentation of the 100 steps for the implementation of 5 institutional reforms by President Nazarbayev in April 2015, the government has put a lot of emphasis on results-based management. The fifth institutional reform looks at creating a transparent and accountable state, and includes 4 steps directly related to results-based management and performance indicators. Step 91 calls for greater autonomy to be given to state bodies in implementing their activities to achieve the targets that have been agreed with them, making indicators the basis of planning. Step 92 talks about reformatting strategic plans to become more in line with state programs and to aim more at achieving key performance indicators. Step 93 introduces a new system of auditing, where assessment of state programs is carried out every year, and assessment of the efficiency of state bodies is carried out every year according to the strategic plans and their related indicators and targets. Step 95 requires heads of state bodies to carry out annual public presentations regarding the achievement of key indicators of strategic plans and territorial development plans. Under the first institutional reform regarding the building of a professional government machine, step 6 is also related to results-based management. It introduces performance-based remuneration for government staff, whereby the performance of government authorities is measured against the fulfillment of the strategic plans. These steps and the work of the Ministry of National Economy on introducing new formats for results-based strategic plans and results-based budget requests, shows a desire on the part of the government to introduce results-based management and to incorporate an MfDR approach. Work carried out in cooperation with COR staff under this technical assistance, provides a basis for COR to adopt some of the results-based planning, budgeting and reporting commencing in 2016 and even more so in 2017 with the preparation of the new 2017-2019 budget request.

B. Key Performance Indicators (KPI)

146. The most important part of an MfDR approach are the indicators and the related targets that describe the direct results (outputs) and development results (outcomes) to be achieved. These indicators and targets should be measurable in order that achievement of the targets can be verified

and so that progress can be monitored. The targets should also be time-bound (defining the moment when the target is to be achieved - what needs to be done by when). Outcome indicators are the most important for results-based planning, as they describe what we actually want to achieve (for instance, we may be repairing roads, but this is not our objective - what we actually want to achieve are roads in better condition). These outcome indicators are also referred to as key performance indicators (KPI). These are complemented by output indicators that relate to the combination of outputs needed to achieve the desired outcomes. These are also important as they tell us to what degree we are complying with the design of the results-based plan.

147. The strategic policy documents in Kazakhstan include many different indicators as described in Chapter V and presented in Appendix IV. However, not all of these indicators are specific to the road sector. Furthermore, most of the road sector indicators are output indicators that look at the length of road (re)constructed or repaired, or the number of hectares of land acquired. There are also several outcome indicators, but some of these are not measurable, do not have specific targets, or these targets are not time-bound. Several outcome indicators are not optimal for use as outcome indicators because they do not properly reflect the desired outcome. This section will look at existing and new outcome indicators that reflect desired outcomes for the road sector, focusing on the 5 outcomes listed below. In doing so, it takes into account the strategic policy documents described in Chapter V, especially the indicators included in those documents.

Table 38 Outcomes for the road sector

Overall outcome:	• Road connectivity and sustainability improved
Lower level outcomes:	• Improved road network condition • Improved road network standards • Improved road network safety • Improved road user satisfaction • Sustainable road network financing

1. Road network condition

148. Road network condition is one of the most commonly used outcome indicators. The ultimate objective of improved road conditions is to reduce the transport costs for road users. Improved road conditions allow vehicles to travel faster and with less wear and tear, reducing transport costs to road users and to the economy as a whole.

a. Roughness

149. Road condition is included as an indicator in the different strategic policy documents in Kazakhstan. However, the current definition of this indicator in Kazakhstan makes it unsuitable as an outcome indicator. Currently road condition is defined by the volume of surface defects. As explained in section III.D, the current surface defect condition data is not very reliable and the condition categories are not properly defined. More importantly, although surface defects are a good indicator of the required routine pavement maintenance (pothole patching, crack sealing) and the costs of such maintenance, they are not a proper indicator of transport costs. Sealing of cracks and patching of potholes may reduce surface defects, but they do little to reduce roughness. And it is increased roughness that has been proven to be one of the main causes of high transport costs. A proper outcome indicator for road condition should therefore be based on reducing road roughness. This is also what is seen in most other countries, where road roughness is generally used as the indicator for road condition. In some cases, road roughness is combined with surface defects and other road defects to form a more integrated indicator, but even in these cases roughness continues to be an important part of the road condition indicator.

150. The regulations CT PK 1219-2003 already define road condition categories based on roughness, using the international roughness index (IRI). However, as explained in section III.D, it is not clear why these condition categories are dependent on traffic volumes. Also, most countries do not make distinction between different pavement types in defining the road condition (although there may a distinction between paved and unpaved roads). Rather than adjusting the regulations, it is recommended to define the desired road condition category directly in the indicator, by setting a maximum IRI threshold. Almost all republican roads are paved, with 56% of paved republican roads with an AC/CC surface, 19% with a surface treatment and 25% with a black gravel pavement. Most republican roads fall in the lowest or second lowest traffic category listed in Table 15. As a result, based on the thresholds presented in Table 15, it is proposed to use a maximum average roughness of IRI≤5.0 to define republican paved roads in good or satisfactory condition. This should be applied to the paved republican road network.

Table 39 Proposed outcome indicator for road condition (roughness)

Percentage of the republican paved road network with an IRI ≤ 5.0 (%)

$$\frac{Total\ length\ of\ paved\ republican\ road\ sections\ with\ IRI \leq 5.0\ (km)}{Total\ length\ of\ the\ paved\ republican\ road\ network\ (km)}$$

151. The only problem with this indicator is the collection of data for its calculation. IRI data is being collected in some cases, but is not readily available. However, as explained earlier, the World Bank is currently supporting COR in the development of a road asset management system (RAMS). This system will necessarily require regular collection of IRI data and its entry into a road database. KazdorNII and the zhollaboratories also have survey vehicles capable of collecting roughness data, and surveys are planned to take place once or twice a year. This combination means that IRI data will become readily available in the short-term, making the calculation and use of this indicator straightforward. Targets cannot yet be set as there is no baseline data on roughness. Once baseline data becomes available in the course of 2016 as a result of the RAMS development, this may be used to set targets for the indicator, making use of the RAMS system to determine suitable targets in light of expected budgets for repair and maintenance and planned reconstruction works.

Table 40 Proposed targets for the outcome indicator for road condition (roughness)

Proposed indicator	2012	2013	2014	2015	2016	2017	2018	2019	2020
Percentage of the republican paved road network with an IRI <= 5.0 (%)	-	-	-	Targets may be set once the RAMS is operational					

b. Surface defects

152. It is recommended to also use a second indicator that looks specifically at surface defects. This indicator may be used in the meantime while the data from the survey vehicles is not yet available, or at least not for the whole republican road network. Although the indicator is not a good reflection of the effect of road conditions on road user costs and transport costs for the economy, it is a good reflection of the required routine maintenance and of the performance of Kazakhavtodor (or any other contractor carrying out routine maintenance). As such it complements the roughness indicator presented above. It must be stressed, however, that it should not replace the roughness indicator, but that it should be used as a complementary indicator.

153. As explained in section III.D, the data on surface defects currently being collected is not always useable as different units of measurement are used by different oblasts. In addition, not all oblasts appear to be collecting data for all defect types distinguished in Kazakhstan. The most reliable data appears to be the data on potholes. Kazakhavtodor is also required to patch at least 60% of the identified potholes in the first two months after the winter season, and data on the volume of patching

carried out annually by Kazakhavtodor also appears to reflect the volume of required pothole repairs. It is therefore recommended to base the indicator on this surface defect type. At a later stage it may be decided to expand the indicator to also include other surface defect types. This decision will depend to a certain degree on the types of defects that will be measured by the survey vehicles, and for which reliable data will be available (this is currently being determined by the RAMS consultants). To take account of the fact that some roads have more than 2 lanes, the indicator will be expressed in terms of the average area of potholes per lane-kilometre. Data on the area of potholes and the length of lane-kilometres is already available, making the calculation of this indicator straightforward. For the calculation of the area of potholes, the data from the autumn survey should be used.

Table 41 Proposed outcome indicator for road condition (surface defects)

Area of surface defects (potholes) per lane-kilometre (m^2/lane-km)

$$\frac{Total\ area\ of\ surface\ defects\ (potholes)\ in\ the\ paved\ republican\ road\ network\ (m^2)}{Total\ length\ of\ paved\ lanes\ in\ the\ republican\ road\ network\ (lane-km)}$$

154. The proposed targets for this indicator are presented in the table below. These baseline values for 2012-2014 have been set on the basis of recorded data on areas of potholes as reported by Kazakhavtodor and lane-kilometres of paved republican roads as reported by Kazavtozhol. The proposed targets for 2015 onwards will need to be further discussed with COR.

Table 42 Proposed targets for the outcome indicator for road condition (surface defects)

Proposed indicator	2012	2013	2014	2015	2016	2017	2018	2019	2020
Area of surface defects (potholes) per lane kilometre (m^2/lane-km)		19	17	16	15	13	12	10	8

Note: Data for 2012-2014 reflects actual achievements. Data for 2015-2020 reflects planned targets.
Source: Transport Strategy 2020, COR draft budget request 2016-2018, consultant's processing of collected data

2. Road network standards

155. Road network standards are closely linked to the capacity of the road and the safety of the road. Using proper standards linked to the traffic levels of the road concerned, avoids congestion, reduces travel time and ensures proper safety standards. Most of the (re)construction works in the republican road network have been aimed at introducing higher technical standards and bringing the road to a higher technical category. The Transport Strategy 2020 includes an indicator that looks at the percentage of republican roads in technical category I or II.

156. However, not all republican roads need to be brought to category I or II, as many republican roads have very low traffic levels and have only local importance. It is therefore recommended to define a subset of roads for which the upgrading to category I or II is desirable, thus allowing the outcome to be defined as the upgrading of this entire subset of roads in the medium term. This allows the indicator to be used as an outcome indicator, rather than an output indicator related only to the additional length of road upgraded to category I or II each year (as is currently the case).

157. This subset may be defined as the core republican road network. This core network may consist of all republican roads where traffic levels require upgrading to category I or II (basically roads with between 2,000-3,000 AADT or more), as well as other roads where upgrading to category I or II is considered desirable, even if traffic levels do not yet warrant this. In practice the core network has already been defined in the different strategy documents, as presented in Table 37. The outcome indicator would then look at the percentage of this core republican road network that has been upgraded to category I or II. The ultimate target would be to upgrade the entire core republican road network (achieve a percentage of 100%). This is different from the current indicator which looks at the

percentage of the entire republican road network in category I or II, where the ultimate target would be around 60%. Focusing on the core republican road network clarifies the target, and ensures that the upgrading is focused on the core republican road network instead of other roads.

Table 43 Proposed outcome indicator for road standards

Percentage of the core republican road network in technical category I or II (%)

$$\frac{Length\ of\ core\ republican\ roads\ in\ category\ I\ or\ II\ (km)}{Total\ length\ of\ the\ core\ republican\ road\ network\ (km)}$$

158. The data on technical category is already being collected by COR. However, the calculation of this indicator would require the republican core network to be defined. This is considered desirable anyway, as it may form the basis for prioritizing investments in strategic plans and annual plans. Rather than including slightly changing lists of roads in every strategic document, a core network can be defined by decree (and updated when necessary), with strategic plans aiming to bring the entire core road network to the desired technical category and condition over a medium-term period. An initial proposal for the core republican road network is provided in Table 37.

159. The proposed targets for this indicator are presented in the table below. The baseline values are based on actual data from Kazavtozhol and COR, while the targets have been set on the basis of existing targets for category I or II roads as included in the Transport Strategy 2020, complemented by targets for reconstruction as set in the draft COR budget request for 2016-2018. These proposed targets will need to be further discussed with COR.

Table 44 Proposed targets for the outcome indicator for road standards

Existing indicator	2012	2013	2014	2015	2016	2017	2018	2019	2020
% of republican road network in category I or II (%)			27%		36%				48%
Length of ongoing republican road (re)construction (km)	1,051	557	702	776	-	-	65		
Length of completed republican road reconstruction (km)	260	1,043	597	340	531	816	700		
Proposed indicator	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
% of the core republican road network in category I or II (%)	37%	41%	46%	54%	58%	64%	69%	75%	80%

Note: Data for 2012-2014 reflects actual achievements. Data for 2015-2020 reflects planned targets.
Source: Transport Strategy 2020, COR draft budget request 2016-2018, consultant's processing of collected data

3. Road network safety

160. Road safety is also a much-used outcome in many countries. Of course road safety is to a large extent dependent on safety regulations and enforcing compliance with these, which are the responsibility of respectively the Committee for Administrative Police and the Traffic Police. However, safety engineering is also important in some cases, especially where the road design, road standard or road condition are part of the cause of the accidents. In this case COR would be responsible for improving road safety by improving the engineering.

161. Such locations where accidents occur as a result of poor engineering are generally referred to as blackspots (in Kazakhstan these are referred to as "bottlenecks"). Where accidents occur in the same location repeatedly, it can be assumed that the road engineering is in part to blame. Such blackspots can then be addressed through an investigation of the location, and implementation of engineering improvements to reduce or even eliminate the safety risk (this may involve safety signage,

safety measures such as guardrails, pavement improvements and redesign of certain sections of road, etc.).

162. Procedures for the identification of blackspots already exist (ПР РК 218-31-03), and blackspots are already being recorded by Kazakhavtodor and reported to Kazavtozhol and COR. Given that the desired outcome is the treatment and elimination of these blackspots, it is recommended to look at the number of recorded bottlenecks in republican roads that have not yet been treated. The term "blackspot" is used here instead of the term "bottleneck" that is used in Kazakhstan, with the aim of distinguishing the accident-related bottlenecks from other bottlenecks that describe road sections that are determined to form a safety risk (and which generally consist of many road sections in poor condition). As such, the indicator only looks at the accident-related bottlenecks.

Table 45 Proposed outcome indicator for road safety

Number of untreated blackspots in the republican road network (#)
$Number\ of\ accident-related\ bottlenecks\ as\ recorded\ by\ Kazakhavtodor\ that\ have\ not\ yet\ been\ treated$

163. The procedures for identifying and recording blackspots already exist, and blackspots are already being recorded by Kazakhavtodor. The records of Kazakhavtodor appear to only look at the accidents that occurred in the previous year, however, excluding possible untreated blackspots remaining from previous years as well as blackspots defined as locations with 3 or more accidents over a period of 5 years. Although it is recommended to improve the reporting to also include these other blackspots, the current data on blackspots (identifying locations with 2 or more accidents in the past year) can already be used as the basis for this indicator.

164. The proposed targets for this indicator are presented in the table below. The baseline values have been set on the basis of recorded data on locations in the republican road network with 2 or more accidents in the previous year as collected by Kazakhavtodor. The proposed targets will need to be further discussed with COR.

Table 46 Proposed targets for the outcome indicator for road safety

Proposed indicator	2012	2013	2014	2015	2016	2017	2018	2019	2020
Number of untreated blackspots in the republican road network (#)	(119)	123	202	200	180	160	140	120	100

Note: Data for 2012-2014 reflects actual achievements. Data for 2015-2020 reflects planned targets.
Source: Kazakhavtodor, consultant's processing of collected data

4. Road user satisfaction

165. Road user satisfaction is also a common indicator used internationally to measure performance. This is generally based on road user satisfaction surveys. The Transport Strategy 2020 mentions the introduction of road user satisfaction surveys and information portals, and even includes targets for the degree of satisfaction of road users with paved republican roads. A road user satisfaction questionnaire is currently being prepared, but it will still be a while before the survey can be used to plan and monitor performance as the survey still needs to be tested and baseline data collected.

166. At the moment the only user satisfaction survey being carried out is the World Economic Forum's *Executive Opinion Survey*, which is carried out in function of the *Global Competitiveness Report*. The survey is held with business leaders in each country (230 businesses from Kazakhstan responded to the survey for the 2014 report). In Kazakhstan the survey is carried out in collaboration with the National Analytical Centre. The survey includes a Quality of Roads indicator, where the interviewees are asked the question: "*In your country, how would you assess the quality of roads? [1 =*

extremely underdeveloped—among the worst in the world; 7 = extensive and efficient—among the best in the world]". The score for this indicator is based on the responses, which are weighted according to the importance of the business sector for the GDP and corrected for any deviations (e.g. extremes from a limited number of responses).

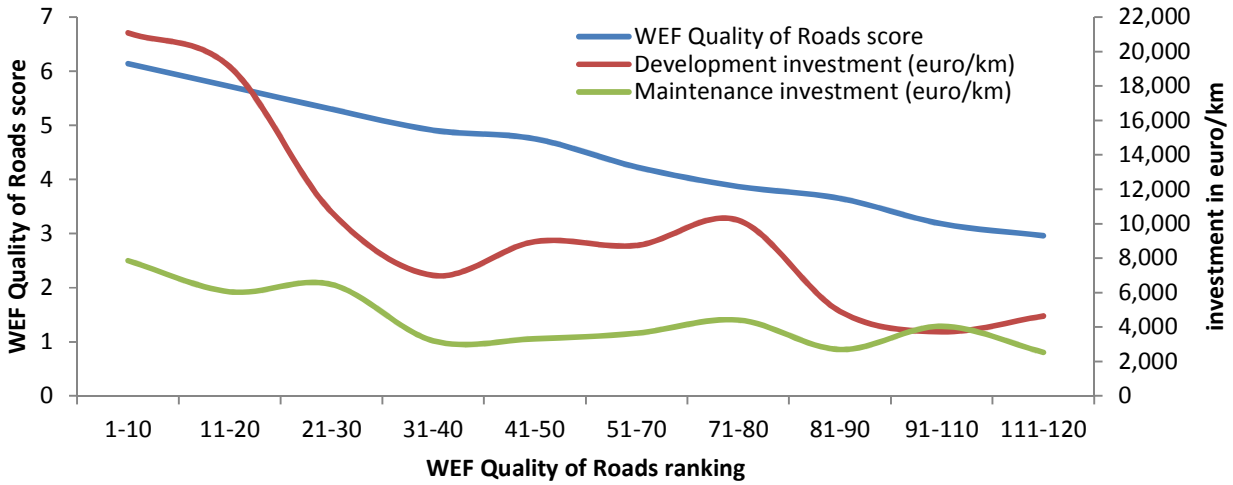
167. The WEF Quality of Roads indicator is already included in the Transport Strategy 2020 and the MID Strategic Plan 2014-2018. However, the indicator is based on the ranking of Kazakhstan regarding the Quality of Roads indicator compared to other countries in the world. This ranking may improve as a result of road improvements in Kazakhstan and higher scores for this indicator, but this could also happen as a result of lower scores for other countries. Similarly, if other countries improve their scores, the ranking of Kazakhstan may be lowered, even if the roads are improved and its score is increased. As shown in these examples, the ranking does not properly reflect the desired outcome (higher user satisfaction).

168. Instead of the ranking, it is therefore recommended to use the score for the Quality of Roads indicator. The score is only dependent on the satisfaction of users in Kazakhstan, and is not influenced by changes in other countries. The score of the WEF Quality of Roads indicator reflects the amount of investment in road development and maintenance, as can be seen in the graph below, with countries investing more per kilometre receiving higher scores.

Table 47 Proposed outcome indicator for road user satisfaction

Score for the World Economic Forum Quality of Roads indicator (#)
Score for the Quality of Roads indicator as reported by WEF

Figure 15 WEF Quality of Roads score versus road sector investments



Source: Consultant's processing of WEF data

169. The data is collected by WEF and made available in the annual publication of the *Global Competitiveness Report*. Where the timing of publication is not suitable, the data may be obtained at an earlier stage from the World Economic Forum or from the National Analytical Centre in Kazakhstan.

170. The proposed targets for this indicator are presented in the table below. The baseline values are based on data from the WEF *Global Competitiveness Reports* of 2012, 2013 and 2014. The proposed targets for future years are based on targets for the WEF ranking, and will need to be further discussed with COR.

Table 48 Proposed targets for the outcome indicator for road user satisfaction

Existing indicator	2012	2013	2014	2015	2016	2017	2018	2019	2020
WEF Quality of Roads ranking (#)	117	117	113		113		105		
Proposed indicator	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
WEF Quality of roads score (#)	2.7	2.8	3.0	3.1	3.3	3.4	3.5	3.7	3.8

Note: Data for 2012-2014 reflects actual achievements. Data for 2015-2020 reflects planned targets.
Source: Transport Strategy 2020, COR draft budget request 2016-2018, consultant's processing of collected data

5. Sustainable road network financing

171. Sustainable financing of the road sector is a challenge in all countries. Many countries have therefore introduced road user charges, where road users pay to use the road (user pay principle). These charges may consist of usage charges such as tolls or fuel tax (related to the degree of use of the road), or access charges such as vehicle registration fees (related only to road access, not to the degree of usage). Many countries aim to have the revenue from road user charges cover at least the operation, maintenance and repair costs, and possibly also a portion of the construction and reconstruction costs (in some cases countries even aim to cover the costs of externalities such as congestion, accidents, pollution, CO_2).

172. The road sector in Kazakhstan is currently financed to a significant degree from the National Fund and from external loans (over half the development budget under the Nurly Zhol programme). In order to ensure the sustainability of road sector financing, it is important to ensure that a greater portion can be funded from road user charges. In Kazakhstan there are several road user charges in place. Section IV.G explained that the following user charges can be considered to be user charges of republican road users and are either earmarked for use in republican roads or feed into the republican budget: tolls, transit fee, fees for roadside advertising along republican roads, and overloading fees on republican roads.

173. Currently only the toll revenue is directly allocated to road sector financing. However, it is not strictly necessary that road user charges go directly to COR and the road sector - they may flow to the republican budget, but provide additional revenue that allows the Ministry of Finance to allocate a greater budget to the road sector (without specific earmarking, separate budget subprograms or accounts).

174. For an indicator on sustainability of road user financing, it is recommended to focus on the degree in which the maintenance and repair budget of COR is covered by road user charges, given that this budget includes all repairs (including capital repairs - rehabilitation) and maintenance necessary to keep roads in proper condition. The construction of new roads and the upgrading of existing roads to a higher technical category (reconstruction) is not included in the proposed indicator.

Table 49 Proposed outcome indicator for sustainable road network financing

Percentage of republican road repair and maintenance expenditure covered by road user charges (%)

$$\frac{Total\ revenue\ from\ road\ user\ charges\ (KZT)}{Total\ republican\ road\ repair\ and\ maintenance\ expenditure\ (KZT)}$$

175. Although this indicator may be limited to include only include toll revenue that is collected by Kazavtozhol and is earmarked for use in the republican road network, the use of the toll revenue is currently restricted to only the toll roads where it has been collected (a small portion of the republican road network), and any future surplus will need to be transferred to the republican budget. As such it is not very different from the other road user charges identified above. To provide a complete overview on the degree in which republican road users are paying for the repair and maintenance of the

republican road network, it is recommended to also include the other road user charges that are collected. Data on the revenue from these other road user charges is readily available from the State Revenue Committee of the Ministry of Finance, while data on toll revenue is available from Kazavtozhol. On the expenditure side, general expenditure on repair and maintenance of republican tolled and non-tolled roads is available from Kazavtozhol.

176. The proposed targets for this indicator are presented in the table below. The baseline values have been set on the basis of data on collected road user charges, and expenditure on republican road repair and maintenance. The proposed targets for future years are based on targets for toll revenues from strategy documents, and extrapolation of growth rates for other user charges. These will need to be further discussed with COR.

Table 50 Proposed targets for the outcome indicator for road user satisfaction

Existing indicator	2012	2013	2014	2015	2016	2017	2018	2019	2020
Toll revenue (KZT million)	-	559	1,047	3,489	7,766	15,846	23,476	25,902	32,749
Toll road repair and maintenance expenditure (KZT million)	-	896	1,213	1,300	5,200	15,000	25,000	27,500	36,000
Transit fee (KZT million)	2,701	3,554	4,303	5,200	6,300	7,600	9,200	11,200	13,600
Republican roadside advertising (KZT million)	433	573	302	300	300	300	300	300	300
Repair and maintenance expenditure (KZT million)	27,000	29,258	34,966	41,000	41,000	41,000	41,000	45,000	45,000
Proposed indicator	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
% of republican road repair and maintenance expenditure covered by road user charges (%)	12%	16%	16%	21%	31%	42%	50%	52%	58%

Note: Data for 2012-2014 reflects actual achievements. Data for 2015-2020 reflects planned targets.
Source: Kazavtozhol toll road predictions, COR draft budget request 2016-2018, consultant's processing of collected data

6. Output indicators

177. Apart from the outcome indicators described above, the MfDR approach also makes use of output indicators. These are directly related to the activities and are used to verify achievement of the targets and assess compliance with the strategic plan. In the case of COR, the main activities may be considered to be the budget subprograms forming the COR budget. The strategic policy documents in Kazakhstan already include many of the commonly used output indicators. These indicators mainly relate to the length of republican or local road constructed, reconstructed, or repaired or the area of land acquired for road works. The difficulty lies with the output indicators related to activities that do not directly involve road (re)construction or repair.

a. Budget program 003, subprograms 004, 005, 016, 017 and 032 - Republican road (re)construction

178. For budget program 003 regarding republican road construction and reconstruction, the existing output indicators are considered appropriate. These look at the length of republican roads constructed or reconstructed. However, some of these works are spread over more than one year, with contractors generally completing works up to the bottom layer of the pavement in the first year, and placing the riding surface for completed sections in the following year. In order to reflect this and show the progress being made, two indicators are used, the first showing the length of road completed up to the lower layer of the pavement, and the second showing the road length fully completed up to the riding surface. For the purposes of MfDR, it is recommended to only look at the fully completed (re)construction works.

Table 51 Proposed output indicator for republican road (re)construction

Length of fully completed republican road (re)construction (km)
$Length\ of\ republican\ road\ (re)construction\ fully\ completed\ up\ to\ the\ riding\ surface\ of\ the\ pavement$

179. The proposed baseline and targets for this indicator are presented in the table below. These targets have been set on the basis of the targets presented by COR in their draft budget request for 2016-2018. These proposed targets will need to be further discussed with COR.

Table 52 Proposed targets for the output indicator on republican road (re)construction

Proposed indicator	2012	2013	2014	2015	2016	2017	2018	2019	2020
Length of completed republican road reconstruction (km)	260	1,043	597	340	531	816	700		

Note: Data for 2012-2014 reflects actual achievements. Data for 2015-2020 reflects planned targets.
Source: Draft COR budget request 2016-2018

b. Budget program 091, subprogram 100 - Republican road repair and maintenance

180. For subprogram 100 related to republican road repair and maintenance, the current indicators look at the length of republican roads where repairs have been completed. It is recommended to continue using this indicator, rather than using two separate indicators for capital repairs and mid-term repairs as proposed in the draft COR budget request for 2016-2018. An indicator related to the length of republican roads receiving routine maintenance is also not considered appropriate, as this only reflects the length of road under reconstruction or repair where routine maintenance is not applied, and does not reflect the degree in which routine maintenance needs are actually addressed. The outcome indicator on surface defects would be a better performance indicator for routine maintenance.

181. Because this subprogram also includes diagnostics and instrumental examination, it is recommended to include an indicator reflecting these activities. In light of the RAMS that is under development and its need for regular data collection through instrumental examinations, it is recommended to include an indicator that looks at the percentage of the paved republican road network that is covered by instrumental examination during the autumn survey (as this is the survey that is generally used to determine the road condition).

Table 53 Proposed output indicators for republican road (re)construction

Length of completed republican road repairs (km)
$Length\ of\ completed\ republican\ road\ repairs\ (km)$
Percentage of paved republican road network covered by instrumental examination during the autumn survey (%)
$\frac{Length\ of\ paved\ republican\ road\ covered\ by\ instrumental\ examination\ during\ autumn\ surve}{Total\ length\ of\ paved\ republican\ road\ network\ (km)}$

182. The proposed targets for these indicators are presented in the table below. The targets for repairs have been set on the basis of the targets presented by COR in their draft budget request for 2016-2018. Targets for instrumental surveys are based on discussions with the RAMS consultants. These proposed targets will need to be further discussed with COR.

Table 54 Proposed targets for the outcome indicator on republican road repair and maintenance

Proposed indicator	2012	2013	2014	2015	2016	2017	2018	2019	2020
Length of republican roads repaired (km)	1,164	1,165	1,140	1,136	1,248	1,352	1,136		
Percentage of paved network covered by instrumental examination (%)	-	-	-	-	5%	25%	50%	75%	80%

Note: Data for 2012-2014 reflects actual achievements. Data for 2015-2020 reflects planned targets.
Source: COR draft budget request 2016-2018

c. Budget program 091, subprogram 101 - Quality assurance

183. For subprogram 101 related to quality control, the MID Strategic Plan 2014-2018 introduces the length of (re)construction and repair works in republican roads that are covered by quality control. However, this is difficult to relate to the length of executed (re)construction and repair works in order to verify to which degree the works are checked. It is therefore recommended to instead use the percentage of the length of executed (re)construction and repair works covered by quality control and approved by the zhollaboratories. Ideally we would like to see all (re)construction and repair works quality controlled and approved by the zhollaboratories, but this is not always feasible. This indicator would show to which degree quality control is able to cover all works in republican roads. It is recommended to differentiate between coverage in republican roads and in local roads (as part of targeted transfers).

Table 55 Proposed output indicators for quality control

Percentage of <u>republican</u> road (re)construction and repair length that has been checked for quality and has been approved (%)

$$\frac{Length\ of\ republican\ road\ (re)construction\ and\ repairs\ checked\ and\ approved\ (km)}{Total\ length\ of\ republican\ road\ (re)construction\ and\ repairs\ (km)}$$

Percentage of <u>local</u> road (re)construction and repair length that has been checked for quality and has been approved (%)

$$\frac{Length\ of\ local\ road\ (re)construction\ and\ repairs\ checked\ and\ approved\ (km)}{Total\ length\ of\ local\ road\ (re)construction\ and\ repairs\ (km)}$$

184. The proposed targets for these indicators are presented in the table below. These targets have been set on the basis of the targets presented by COR in their draft budget request for 2016-2018. These proposed targets will need to be further discussed with COR.

Table 56 Proposed targets for the outcome indicator on quality control

Proposed indicator	2012	2013	2014	2015	2016	2017	2018	2019	2020
% of republican road works checked and approved (%)				95%	95%	95%	95%	95%	95%
% of local road works checked and approved (%)				95%	95%	95%	95%	95%	95%

Note: Data for 2012-2014 reflects actual achievements. Data for 2015-2020 reflects planned targets.
Source: COR draft budget request 2016-2018

d. Budget program 091, subprogram 102 - Management services

185. Subprogram 102 is related to the management of the (re)construction, repair and maintenance works by Kazavtozhol. The MID Strategic Plan includes several indicators, but these are related more to sub-activities (equipment purchase, software purchase, etc.) or the number of staff members under contract than to the overall management. Instead it is recommended to look at the actual output of Kazavtozhol, which is the number of contracts signed and successfully completed. This should look at the percentage of the planned length for republican road (re)construction and repairs, to avoid differences between the estimated costs, contracted costs and final costs. It is recommended that the indicator look at the percentage of the planned length of republican (re)construction and repair works successfully contracted and completed.

Table 57 Proposed output indicator for republican road services

Percentage of planned (re)construction, repair and maintenance works in republican roads completed (%)

$$\frac{Length\ of\ completed\ republican\ road\ (re)construction\ and\ repair\ works\ (km)}{Length\ of\ planned\ republican\ road\ (re)construction\ and\ repair\ works\ (km)}$$

186. The proposed targets for this indicator are presented in the table below. The baseline values have been set on the basis of the achievements reported by COR in their annual progress reports. The proposed targets have been set by the consultant team and will need to be further discussed with COR.

Table 58 Proposed targets for the output indicator on republican road services

Proposed indicator	2012	2013	2014	2015	2016	2017	2018	2019	2020
% of planned (re)construction, repair and maintenance works successfully completed (%)	85%	109%	88%	95%	95%	95%	95%	95%	97%

Note: Data for 2012-2014 reflects actual achievements. Data for 2015-2020 reflects planned targets.
Source: MID annual progress reports, consultant's processing of collected data

e. Budget program 091, subprogram 103 - Transfers for local road and street (re)construction

187. Subprogram 103 regarding transfers for local road and street (re)construction uses indicators related to the length of ongoing reconstruction works (up to the bottom layer of the pavement) and the length of fully completed (re)construction works (up to the riding surface). Here again it is recommended to have the MfDR indicators focus only on the length of (re)construction works fully completed.

Table 59 Proposed output indicators for local road and street (re)construction

Length of fully completed local road and street (re)construction (km)

$$Length\ of\ local\ road\ and\ street\ (re)construction\ fully\ completed\ up\ to\ the\ riding\ surface\ of\ the\ pavement$$

188. The proposed targets for these indicators are presented in the table below. These targets have been set on the basis of the targets presented by COR in their draft budget request for 2016-2018. These proposed targets will need to be further discussed with COR.

Table 60 Proposed targets for the output indicator on local road and street (re)construction

Proposed indicator	2012	2013	2014	2015	2016	2017	2018	2019	2020
Length of completed local road and street reconstruction (km)	63	156	155	112	125	121	125		

Note: Data for 2012-2014 reflects actual achievements. Data for 2015-2020 reflects planned targets.
Source: Draft COR budget request 2016-2018

f. Budget program 091, subprogram 104 - Transfers for priority projects in local roads and streets

189. Subprogram 104 related to priority projects in local roads generally involves repairs to local roads and streets. The indicator in use for this subprogram looks at the length of local roads and streets repaired. This indicator is considered appropriate and it is recommended to continue using it.

Table 61 Proposed output indicator for local road and street repairs

Length of completed local roads repairs (km)
$Length\ of\ local\ roads\ and\ streets\ repaired\ (km)$

190. The proposed targets for this indicator are presented in the table below. These targets have been set on the basis of the targets presented by COR in their draft budget request for 2016-2018. These proposed targets will need to be further discussed with COR.

Table 62 Proposed targets for the output indicator on local road repairs

Proposed indicator	2012	2013	2014	2015	2016	2017	2018	2019	2020
Length of completed local road and street repairs (km)	623	588	22	53	95	133			

Note: Data for 2012-2014 reflects actual achievements. Data for 2015-2020 reflects planned targets.
Source: Draft COR budget request 2016-2018

7. Results-based Framework

191. The set of outcome and output indicators used in a results-based plan are often put together in a results-based framework (also referred to as a logical framework or design and monitoring framework). This shows the relationship between the inputs, activities, outputs, outcomes and impact, defining the output and outcome indicators and the targets to be achieved. It also identifies any assumptions or risks that are important to the design for the expected outcomes to be achieved through the planned outputs, and the expected outputs to be achieved through the planned activities. A results-based framework based on the output and outcome indicators described above is presented below. This results-based framework forms the basis of the results-based planning, showing how inputs and activities lead to specific outputs, which in turn lead to specific outcomes and impact.

Table 63 Results-based framework

Design Summary	Performance Targets/Indicators	Data Sources/ Reporting Mechanisms	Assumptions and Risks
Impact			
Travel times and travel costs between major cities reduced	Average travel time between hubs reduced from 115 hours in 2014 to 103 hours in 2018 and XXX in 2020 (Nurly Zhol) Average vehicle operating costs per vehicle-km on republican roads reduced to XXX by 2020	MID progress report for Nurly Zhol RAMS	**Assumptions** • XXX **Risks** • XXX

Design Summary	Performance Targets/Indicators	Data Sources/ Reporting Mechanisms	Assumptions and Risks
Outcomes			
Road connectivity and sustainability improved	Percentage of the republican paved road network with an IRI $\leq$ 5.0 increased from XXX% in 2014 to XXX% in 2018 and XXX% in 2020	Autumn instrumental examination, RAMS	**Assumptions** • XXX
	Road pavement area with surface defects (potholes) reduced from 17 m^2/lane-km in 2014 to 12 m^2/lane-km in 2018 and 8 m^2/lane-km in 2020	Kazakhavtodor autumn survey/ Autumn instrumental examination	**Risks** • XXX
	Percentage of the core republican network in technical category I or II increased from 46% in 2014 to 69% in 2018 and 80% in 2020	Kazakhavtodor annual road statistics	
	Number of untreated blackspots in the republican road network reduced from 202 in 2014 to 140 in 2018 and 100 in 2020	Kazakhavtodor bottleneck statistics	
	Score for the World Economic Forum Quality of Roads indicator increased from 3.0 in 2014 to 3.5 in 2018 and 3.8 in 2020	WEF Global Competitiveness Report	
	Percentage of the republican road repair and maintenance expenditure covered by road user charges increased from 16% in 2014 to 50% in 2018 and 58% in 2020	MOF statistics, Kazavtozhol expenditure and toll revenue reports	
Outputs			
1. Republican road network expanded and upgraded	1.1 2,387 km of republican road (re)construction fully completed by 2018 and XXX km by 2020	Project documents	**Assumptions** • XXX
2. Republican road network condition improved	2.1 3,736 km of republican roads repaired by 2018 and XXX km by 2020	Project documents	**Risks** • XXX
3. Republican road network properly managed	3.1 Percentage of planned republican road (re)construction, repair and maintenance works successfully completed increased from 88% in 2014 to 95% in 2018 and 97% in 2020	Kazavtozhol annual reports	
	3.2 Percentage of republican road network covered by instrumental examination during the autumn survey increased from 0% in 2014 to 50% in 2018 and 80% in 2020	Instrumental examination data	
	3.3 95% of republican road (re)construction and repair works covered by quality control by 2018 and 95% by 2020	Quality control reports	
4. Local road network expanded, upgraded and condition improved	4.1 371 km of local roads (re)constructed using targeted transfers by 2018 and XXX km by 2020	Oblast reports	
	4.2 228 km of local roads repaired by 2018 and XXX km by 2020	Oblast reports	
	4.3 Percentage of local road and street (re)construction and repair works covered by quality control increased from XXX% in 2014 to XXX% in 2018 and XXX% in 2020	Quality control reports	

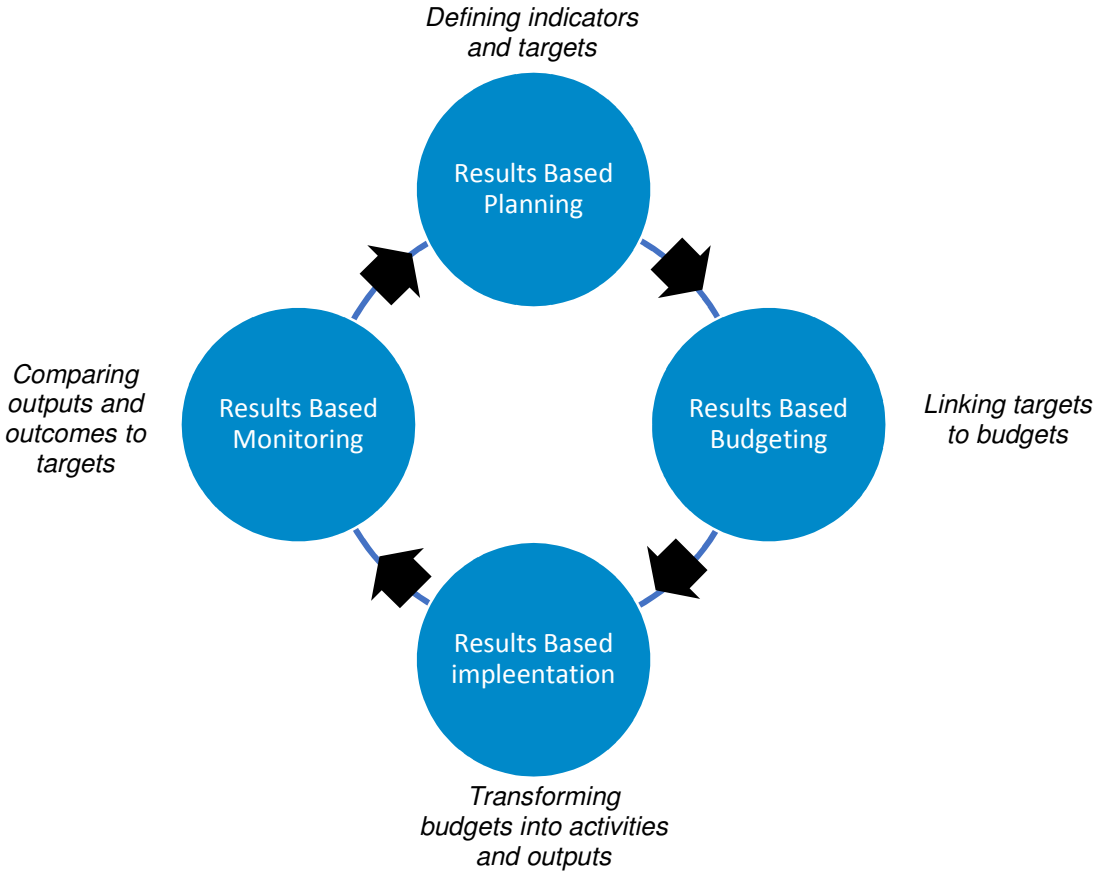
Design Summary	Performance Targets/Indicators	Data Sources/ Reporting Mechanisms	Assumptions and Risks
Activities		**Inputs**	
Budget program 003 - Republican road construction and reconstruction • Subprogram 004 - External loans • Subprogram 005 - Domestic resources • Subprogram 016 - State budget co-financing for external loans • Subprogram 017 - National Fund co-financing for external loans • Subprogram 032 - Target transfers from the National Fund Budget program 091 – Republican road repair, maintenance and management • Subprogram 100 - Republican road repair and maintenance • Subprogram 101 - Quality assurance of road construction and repair work • Subprogram 103 - Target transfers for local road and street (re)construction • Subprogram 102 - Construction, reconstruction, repair and maintenance services • Subprogram 104 - Target transfers for financing priority projects in local roads		**Republican Budget** KZT XXX billion **External Loans** KZT XXX million **National Fund** KZT XXX billion	

Source: Consultant's processing of collected data

VII. THE MFDR MANAGEMENT CYCLE

192. The MfDR management cycle consists of four main steps. **Results-based planning** refers to the need for a medium-term strategic plan that defines the outputs and outcomes to be achieved in terms of indicators and targets. **Results-based budgeting** involves the linkage of budgets and financing to the results that are to be achieved, as well as the allocation of the budget to the different activities. **Results-based implementation** involves the administrative management, technical design, procurement and contract management to ensure proper implementation. **Results-based monitoring** involves the regular review of results (outputs and outcomes) with the aim of assessing progress, as well as to adjust the other components where necessary. The monitoring results may also be used to provide transparency and accountability to civil society regarding the use of funds and the results achieved. This chapter will discuss each of these steps in greater detail, looking how the MfDR approach may be linked up with existing systems already in place in Kazakhstan.

Figure 16 MfDR management cycle



A. Results-based planning

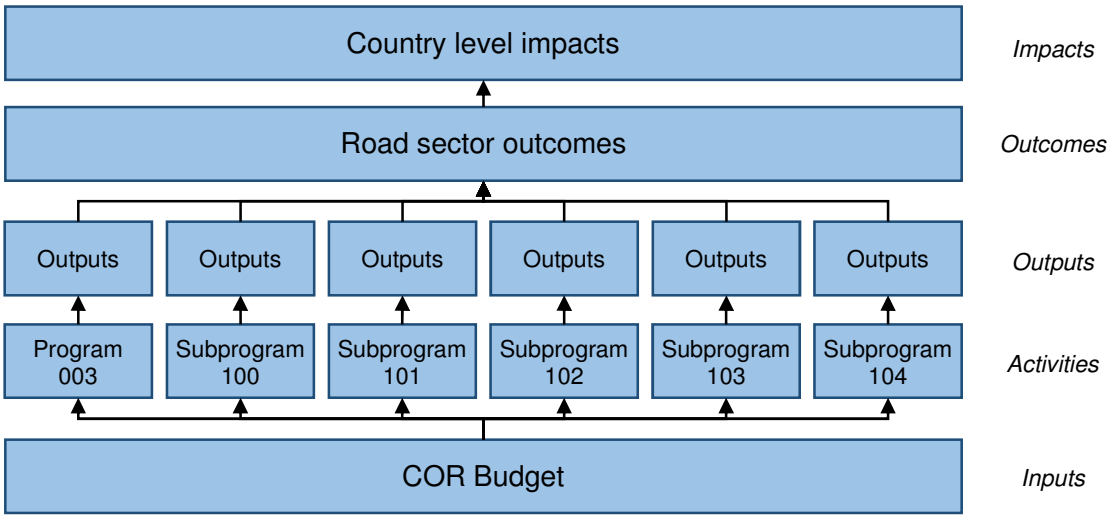
193. Results-based planning is the first step in MfDR. It determines the results to be achieved in the planning period (outputs, outcomes and impact) and how this will be done (through which activities and using which inputs). First the desired outcomes are determined (defining what the plan hopes to achieve in terms of change in the medium-term), and this is then translated into the required outputs, activities and inputs. Although the development results come first in results-based planning, they will need to take into account the budget that is likely to be available, to ensure a proper balance exists.

194. In Kazakhstan the ministerial strategic plan forms the basis of results-based planning. The Ministry of National Economy has recently issued a new format for ministerial strategic plans, which was prepared with support from the World Bank technical assistance on Results-Based Budgeting. A new MID Strategic Plan based on this new format was issued in December 2015.

195. The Strategic Plan is the core element of results-based planning, and forms the basis for subsequent results-based budgeting, results-based implementation and results-based monitoring. To ensure the success of the MfDR approach, it is important that the proposed output and outcome indicators and related targets are included in the new MID Strategic Plan. This will ensure that these indicators and targets are used in the annual budgeting process, the implementation of works and the annual monitoring and evaluation. Any indicators that are not included, will likely not be used in practice.

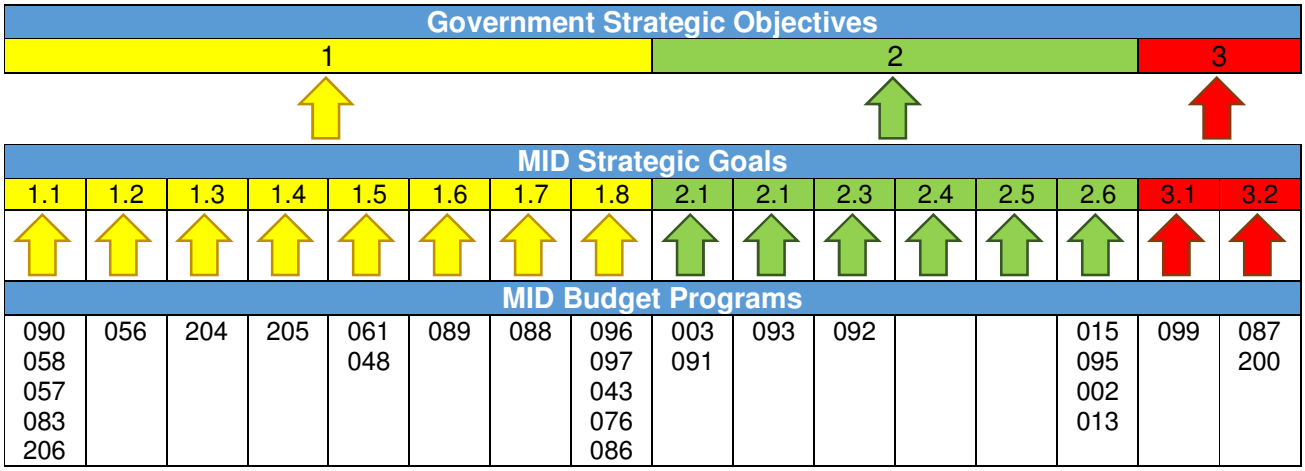
196. In amending the new MID Strategic Plan, the results-based framework presented in the previous section should form the basis. This shows how inputs and activities come together to result in specific outputs, which in turn lead to specific outcomes and impacts. It shows the link between the inputs and activities of COR, and the higher-level impacts as defined in national strategy documents such as Strategy 2050 and Nurly Zhol. The Strategic Plan will provide more detail to the results-framework, distinguishing the budgets (inputs) for the different subprograms (activities), and showing how each subprogram is expected to result in specific outputs, and the budget program as a whole (COR) is expected to result in certain outcomes.

Figure 17 Linkage between inputs, activities, outputs, outcomes and impacts



197. In the new MID Strategic Plan, roads fall under **Government Strategic Direction 2: Advanced development of transport infrastructure for the needs of the economy and the realization of transit potential**. Within that Strategic Direction, roads fall under **Strategic Goal 2.1: Attraction of investments, including foreign loans for the development and maintenance of road infrastructure**. Under that Strategic Goal, there are two budget programs related to COR. This is shown in the figure below.

Figure 18 Format of the new Strategic Plans



198. Within this format, the proposed MfDR output indicators should be included as indicators of direct result for each budget subprogram, and the proposed MfDR outcome indicators should be included as indicators of development result under each budget program of Strategic Goal 2.1. Unless the Strategic Plan includes a complete set of output indicators that properly cover the different outputs of COR, and a full set of outcome indicators that describe the different outcomes to be achieved by COR, the Strategic Plan will not form a proper basis for budgeting, implementation and monitoring.

199. Although the format of the MID Strategic Plan has been amended, the indicators have not changed much. The indicators currently included in the MID Strategic Plan are listed below. These are still very much based on output indicators, and do not properly address the comments regarding earlier indicators. As such, the annual reporting and monitoring against these indicators will not really reflect the performance of COR as the main entity responsible for the republican road network.

Table 64 COR performance indicators in the 2015 MID Strategic Plan

- WEF "Quality of Infrastructure" ranking (#)
- WEF "Quality of Roads" ranking (#)
- Volume of investments, including foreign loans, for development and maintenance of roads (KZT)
- Percentage of roads in good condition (%)
- Length of republican roads in technical category I or II (km)
- Length of republican roads under tolls (km)
- Number of roadside service stations along main corridors (#)
- Percentage of local roads in good or satisfactory condition (%)
- Percentage of local roads in good condition (%)

B. Results-based budgeting

200. Results-based budgeting links the planned outputs and outcomes to a (multi)annual budget or budget request. The funding required to achieve the planned outputs and outcomes is calculated and linked directly to the outputs and outcomes to be achieved each year (to a certain extent this has already been done upon preparing the plan, but is worked out in more detail based on the specific road works that are planned). Alternatively, where the funding levels required to achieve the planned outputs and outcomes are not available, the available funding is entered and the outputs and outcomes are adjusted accordingly. In this case the outputs and outcomes to be achieved will be lower than the targets, and this should be explained in the budget request (explaining the consequences of lower funding levels). In preparing the budget, achievements in previous years should be taken into account, assessing whether the planned outputs and outcomes were indeed

achieved with the amount of funding made available. The budget needs to be realistic, as it is the basis for accountability - if the requested budget is provided but planned outputs and outcomes are not achieved, proper justification will be required to explain why this is the case.

201. The World Bank has been supporting the government in introducing results-based budgeting in Kazakhstan. This support has been aimed at the Ministry of National Economy, but the COR has been one of the pilot units where results-based budgeting was being tested. A format for the results-based budget request has been prepared, and for the current budget request (2016-2018) MNE required the budget programs to submit a results-based budget request together with the traditional budget request. It is expected that from next year onwards, the results-based budget request will become the main format. The format is prepared for each budget program, which is a "*group of independent, but closely related activities or projects designed to achieve a common goal or objective*".

202. In the case of the road sector, the activities are all related to improving the road network and the budget program concerned is COR. However, with the change in budget programs and subprograms, COR now has two separate budget programs, one for development capital expenditures (003) and one for recurrent expenditures (091). Under each of these budget programs, subprograms are included related to specific types of activities. For each subprogram, indicators of direct results (output indicators) are defined with achieved and expected targets for the previous and current years, and planned targets for the next three years (Kazakhstan works with three-year rolling budget plans). For each subprogram the annual budget levels required to achieve the targets are also defined.

203. Given that the budget subprograms of COR are related to the activities it carries out, the indicators used should be output indicators. The outcome indicators discussed in the previous section are not suitable for the subprograms because they are actually the result of the combination of the different subprograms or activities. It is very difficult, if not impossible, to separate the outcome indicator targets for the different activities, and in the end this would not necessarily have a function. Instead, the outcome indicators and targets should be used for the budget program as a whole. This has been done as an example for budget subprogram 100, using the budget request format and data from the 2016-2018 COR budget request.

Table 65 Example budget request with output indicators and targets for budget subprogram 100

Budget Subprogram	**100: Repair, maintenance, diagnostics, examination**					
Kind of Budget Subprogram:						
Content	Implementation of capital expenditure					
Current / Development	Current					
Description of the Budget Subprogram	Rehabilitation, mid-term repair, routine repair, maintenance, landscaping, diagnostics and instrumental examination aimed at increasing the percentage of roads in good condition.					
Indicators of direct results for the Budget Subprogram	**Unit**	**Actual**	**Current**	**Planned period**		
		2014	**2015**	**2016**	**2017**	**2018**
Length of completed repairs in republican roads	km	1,140	1,136	1,248	1,352	1,136
Percentage of network covered by instrumental examination	%	-	-	5%	25%	50%
Costs of the Budget Subprogram	**Unit**	**Actual**	**Current**	**Planned period**		
		2014	**2015**	**2016**	**2017**	**2018**
Domestic sources	KZT '000			41,000,000	41,000,000	41,000,000
	KZT '000					
	KZT '000					
Total costs of Subprogram	KZT '000			**41,000,000**	**41,000,000**	**41,000,000**

204. In the case of budget program 003, the subprograms are differentiated on the basis of the source of funding, not the type of activity (all involve construction and reconstruction of republican roads). In this case, the use of separate budget request forms for each subprogram actually creates confusion, especially where there is co-financing and the expected outputs are financed from more than one source. Here the existing budget request format allows all outputs from the different subprograms to be combined in one form, indicating the amount of funding from each funding source. This has been done as an example below, based on the data from the COR 2016-2018 budget request.

Table 66 Example budget request with output indicators and targets for budget subprograms 004,005,016,017,032

Budget Subprogram	**004, 005, 016, 017, 032: Reconstruction of republican roads**					
Kind of Budget Subprogram:						
Content	Implementation of public investment					
Current / Development	Development					
Description of the Budget Subprogram	Reconstruction of core republican roads to the existing or a higher technical standard to facilitate transport between different parts of the country and transit through the country.					
Indicators of direct results for the Budget Subprogram	**Unit**	**Actual**	**Current**	**Planned period**		
		2014	**2015**	**2016**	**2017**	**2018**
Length of reconstructed republican roads	km			541	419	654
Costs of the Budget Subprogram	**Unit**	**Actual**	**Current**	**Planned period**		
		2014	**2015**	**2016**	**2017**	**2018**
Foreign loans	KZT '000			152,383,044	149,911,930	178,938,374
Co-financing from state budget	KZT '000			23,918,312	17,396,916	7,082,506
Domestic sources	KZT '000			5,063,511		
National Fund	KZT '000			123,300,000		
Total costs of Subprogram	KZT '000			**304,664,867**	**167,308,846**	**186,020,880**

205. There is a separate form for the budget programs, which includes development results (outcome targets) instead of direct results (output targets). The form is considered a good complement to the subprogram forms, but because COR currently consists of two separate budget programs, it is difficult to attribute the outcome targets to a specific budget program (for instance, road condition improvements are the result of both reconstruction and repair/maintenance works). In this sense it would be better if road reconstruction was considered a budget subprogram (with different funding sources), with one single budget program for COR. Then the development results could be attributed to the complete set of budget programs under COR. Also, the current form defines the development results in terms of text, instead of indicating them in a table as is done for the subprograms. Such a table would allow easier comparison of the target outcomes to be achieved each year and the budget allocations for those years. An example of a modified budget request form for COR as a single budget program is provided below.

Table 67 Example budget request with outcome indicators and targets for COR budget program

Budget Subprogram	**004, 005, 016, 017, 032: Reconstruction of republican roads**					
Kind of Budget Subprogram:						
Content	Implementation of public investment					
Current / Development	Development					
Goal of the Budget Program	Improvement of the condition and capacity of the road network in Kazakhstan in order to improve connectivity between different parts of the country and to reduce costs of transport and transit.					
Indicators of final results for the Budget Program	**Unit**	**Actual**	**Current**	**Planned period**		
		2014	**2015**	**2016**	**2017**	**2018**
WEF Quality of Roads score	#	3.0	3.1	3.3	3.4	3.5
Republican roads with IRI≤5.0	%	-	-	-	-	-
Area of surface defects per lane-km	m^2 / lane-km	17	16	15	13	12
Core network in technical category I or II	%	46%	54%	58%	64%	69%
Repair/maintenance expenditure from road user charges	%	16%	21%	31%	42%	50%
Number of blackspots	#	202	200	180	160	140
Costs of the Budget Program	**Unit**	**Actual**	**Current**	**Planned period**		
		2014	**2015**	**2016**	**2017**	**2018**
Foreign loans	KZT '000			152,383,044	149,911,930	178,938,374
Domestic sources (development)	KZT '000			5,063,511		
Domestic sources (current)	KZT '000			96,939,768	81,884,369	73,278,236
Co-financing of external loans from the republican budget	KZT '000			23,918,312	17,396,916	7,082,506
Target transfer from the National Fund	KZT '000			123,300,000		
Total costs of Program	KZT '000			**401,604,635**	**249,193,215**	**259,299,116**

206. The resulting structure of the different outcome and output indicators for respectively the budget program as a whole and for the different subprograms would then be as indicated below.

Table 68 Proposed structure of outcome and output indicators for results-based budgeting

- **Budget Program Targets**
  - Percentage of the republican (paved) road network with an IRI ≤ 5.0 *(targets by year)*
  - Road pavement area with surface defects (potholes) per lane-km *(targets by year)*
  - Percentage of the republican core network in technical category I or II (*targets by year*)
  - Number of untreated blackspots in the republican road network (*targets by year*)
  - Score for the WEF Quality of Roads Index (*targets by year)*
  - Percentage of republican repair and maintenance budget covered by user charges *(targets by year)*
- **Subprograms 004, 005, 016, 017 and 032: Republican road construction and reconstruction**
  - Length of fully completed republican road (re)construction *(targets by year)*
- **Subprogram 100: Republican road repair and maintenance**
  - Length of completed republican road repairs *(targets by year)*
  - Percentage of paved republican road network covered by instrumental examination during the autumn survey (*targets by year*)
- **Subprogram 101: Quality assurance of road construction and repair work**

- Percentage of republican road (re)construction and repair length that has been checked for quality and has been approved (*targets by year*)
- Percentage of local road (re)construction and repair length that has been checked for quality and has been approved (*targets by year*)

- **Subprogram 102: Management of road construction, reconstruction repair and maintenance**
  - Percentage of planned (re)construction, repair and maintenance works in republican roads completed (*targets by year*)
- **Subprogram 103: Target transfers for local road construction and reconstruction**
  - Length of fully completed local road and street (re)construction (*targets by year*)
- **Subprogram 104: Target transfers for local road repair and maintenance**
  - Length of completed local roads repairs (*targets by year*)

C. Results-based implementation

207. The next step in the MfDR cycle is the implementation and the management of projects and programs. This especially refers to the efficient and effective procurement and management of contracts to ensure that the planned activities are carried out and that the planned outputs are indeed achieved. This is primarily the responsibility of Kazavtozhol, which is responsible for the implementation management of works in republican roads. The management of works in local roads and streets, meanwhile, is the responsibility of the Akimats and the cities of Astana and Almaty. Quality control is carried out directly by the zhollaboratories, while the responsibility for diagnostics and instrumental examination is shared between the zhollaboratories and KazdorNII.

208. Assuming proper planning and budgeting has taken place, the achievement of the planned outputs can be controlled through regular monitoring by COR, ensuring that these different stakeholders are progressing as planned. In addition to regular monitoring, it is also possible to sign performance agreements with these stakeholders, thus delegating responsibility for achieving the outputs to them. Under such performance agreements, the different stakeholders agree to achieve certain outputs with the budget or contract amount allocated to them. The performance agreements should also include penalty measures in case of poor performance, and possibly reward mechanisms in case of good performance. This is already being done in Kazakhstan, with performance agreements in place between COR and Kazavtozhol and between COR and the Akimats (at least for local road and street reconstruction). It is proposed to expand this practice and to sign performance agreements with all stakeholders that are responsible for implementing activities and for achieving certain outputs. This will introduce better incentives to all stakeholders to achieve or even surpass the planned outputs. For this purpose, it is important that the performance agreements include the same indicators and targets as proposed in this report, and as included in the Strategic Plan and the approved budget request.

209. Similar performance agreements are also used with contractors, especially for maintenance. These performance-based maintenance contracts require the contractors to achieve a certain maintenance standard or road condition against a fixed lump sum payment, often covering multiple years. Such contracts facilitate budgeting for maintenance (as the payments are fixed). They also give greater security of achieving certain predefined maintenance standards or road conditions (at least for the roads included in the contract), thus making it easier to define the targets regarding road conditions in future years. For the contractors, performance-based maintenance contractors have also proven beneficial (where they are designed properly), giving contractors the flexibility of planning their inputs and activities and allowing them to purchase specialized equipment and materials in bulk to reduce their costs (especially where multiannual contracts are used).

210. Performance-based maintenance is an approach that introduces a single point of responsibility for a road or road network. A single contractor is made responsible for all maintenance and repairs needed in the road, with the aim of ensuring the most efficient combination of capital repairs, mid-term repairs, routine repairs and routine maintenance is used by the contractor as a means of reducing

costs, thus reducing his bid price and increasing his profit. The problem in Kazakhstan is that the introduction of a single point responsibility is not straightforward. Kazakhavtodor is the sole contractor allowed to carry out routine maintenance in republican roads. Other contractors are therefore not entitled to carry out routine maintenance, while Kazakhavtodor is not allowed to carry out mid-term repairs or capital repairs. At present, no single contractor is able to carry out all maintenance and repair works. However, with the planned privatization of Kazakhavtodor this is likely to change, making it easier to introduce performance-based maintenance contracts with either Kazakhavtodor or with private sector contractors.

211. In Kazakhstan, several development partners are planning to introduce performance-based maintenance contracts. The World Bank under its *South West Roads Project* is planning to introduce so-called quality charters to be signed with Kazakhavtodor for the performance-based maintenance of 600 km of the Western Europe - Western China road corridor. However, as mentioned above this approach will only work until mid-term repairs are needed that Kazakhavtodor is not allowed to carry out. The World Bank approach is a means of controlling the performance of Kazakhavtodor for routine maintenance, but is not a real performance-based maintenance contract.

212. EBRD is planning to introduce performance-based maintenance in the Astana-Schuchinsk toll road, probably involving open tendering. Under the EBRD approach a private sector contractor will become responsible for all maintenance and repair. The approach will introduce a single point of responsibility required under performance-based maintenance contracts. However, this requires an amendment to legislation, allowing private sector contractors to carry out routine maintenance, in order for the approach to become sustainable (for the project an exception can be made as part of the project agreement, but this will end together with the project). Given that the pilot is planned for the toll road, it may be easier to introduce single point responsibility since maintenance is already being carried out by Kazavtozhol instead of Kazakhavtodor.

213. ADB is preparing a *Performance-Based Road Maintenance Project* that will cover approximately 1,000 km of republican roads and will be implemented by Kazakhavtodor in combination with an international Management Contractor who will assist in the planning of works (bringing performance-based maintenance experience from other countries) and will be responsible for the larger maintenance works. It was initially planned to involve Kazakhavtodor as domestic partner, but this would not result in a sustainable model since Kazakhavtodor could only carry out routine maintenance and routine repair, and was not allowed to carry out mid-term or capital repairs. With the planned privatization of Kazakhavtodor, the teaming up of the international Management Contractor with a domestic contractor (Kazakhavtodor or a private sector contractor) will be easier, allowing the domestic contractor to acquire skills and get involved in future performance-based contracts. However, this will require that the privatization of Kazakhavtodor go hand in hand with a liberalization of the maintenance and repair market, allowing all parties to compete for all types of maintenance and repair.

D. Results-based monitoring

214. The last step in the MfDR cycle is the monitoring and evaluation. This is important to assess progress and achievement of the targets regarding the different output and outcome indicators. Apart from serving to verify achievement of the targets, it also allows to monitor progress and make adjustments to the design and the strategic plan if outputs and outcomes are not being achieved as planned (or if it is found that the indicators being used are not appropriate).

215. When properly designed, the achieved outputs should lead to the desired outcome. If the outputs are not achieved as planned, the outcomes are also unlikely to be achieved. Monitoring of output indicators allows managers to assess progress of outputs compared to targets, and adjust inputs and activities at an early stage to ensure that the output targets are achieved. The combination

of output and outcome indicators allows both the progress of outputs and outcomes to be compared to their targets. Where output targets are being achieved, but outcome targets are lagging, this implies a problem with the design of the plan, which will then need to be adjusted.

216. Monitoring of the output and outcome indicators should be carried out regularly. For the outputs it is recommended to calculate the indicators once a month or at least once every quarter in order that progress may be monitored. Monitoring throughout the year will allow any necessary adjustments to be made in a timely manner, which is not possible if the indicators are only calculated at the end of the year. For the outcome indicators the situation is different. As long as the output targets are achieved, the outcome targets should also be achieved if the design is in order. Monitoring on an annual basis is therefore considered sufficient, although the calculation of the outcome indicators halfway through the year will allow COR to check the consistency of the design, and whether the achieved outputs are indeed resulting in the expected outcomes. This will still allow for changes to be made to the design where necessary, also in response to possible external factors (e.g. very bad weather).

217. Each of the indicators should be calculated and compared to the targets. In doing so, it is important that the original targets not be changed. The targets included in the Strategic Plan and the budget request should not be adjusted. Targets for future years may be adjusted (based on budget availability and lessons learned from previous years), but for the current year and past year the targets should not be adjusted. Instead the difference between the targets and the actual achieved result should be analyzed and explained. This will give insight into why the targets were not achieved - whether it was a problem with the planning, the costing and budgeting, or the implementation.

218. The results should be entered into an annual monitoring report, describing the achieved results and identifying any issues regarding the achievement of the targets, both for the output indicators and for the outcome indicators. COR already prepares such annual reports for monitoring progress regarding the implementation of the MID Strategic Plan, and this may form the basis for the monitoring of MfDR indicators, especially where the MfDR indicators are included in the MID Strategic Plan.

219. In the 100 steps presented by the new government of President Nazarbayev, the achievement of results has become an important objective, with bonuses to staff being linked to the achievement of the targets set in Strategic Plans and state bodies required to publicly present annual achievement of key performance indicators. The proper monitoring and reporting of indicators is therefore becoming a more important issue, and proper systems need to be put in place for the collection and compilation of the required data and for the reporting on the different indicators.

220. Apart from assessing whether targets have indeed been achieved, the results should be analyzed to determine whether there is any need to adjust the design of the results-based framework: the combination of available inputs, planned activities and outputs, and expected outcomes. An analysis of the achieved results can give insights into how inputs and activities can be rearranged to ensure outputs are achieved more efficiently and become more effective in achieving the desired outcomes. This may require adjustments to the Strategic Plan and future budget requests. Such adjustments are important to continuously improve the performance of COR and the other stakeholders in the road sector.

221. A problem that has been identified in the collection and analysis of data on the road sector in Kazakhstan as part of this assignment, is that data is provided in a large number of reports and spreadsheets. More often than not, there are differences between the different reports and spreadsheets. Although these differences tend to be slight, they are nevertheless important, as they reflect a level of unreliability of the data. To a large part this is understood to be the result of the many different documents flowing between COR and Kazavtozhol (and its branch offices), Kazakhavtodor (and its branch offices), the different zhollaboratories, KazdorNII and the various Akimats. This

enormous number of reports, many of them paper-based, is resulting in errors entering into the data at various stages of the data compilation and reporting process.

222. To reduce such errors, it is recommended to introduce a (web-based) project management system. Such a project management system is a requirement for successful project and program management, in order to collect, analyze and report progress on all road projects funded from the COR budget. Such a system provides a centralized database with a single set of data that may be used for different reporting, analysis and planning purposes. It also forms a very good source of data for monitoring the progress regarding the planned activities and outputs, as well as the planned outcomes. It must be noted that such a system is different from the road asset management system (RAMS) currently being developed with World Bank support, although the two may be linked to a certain degree.

223. Initially such a multi-user project management system may be a simple off-the shelf database system configured for the specific data needs of the Kazakhstan road sector, allowing for data entry at various locations to capture data and to generate specific reports according to the needs of COR and other stakeholders. This may also include the generation of reports on the progress regarding the MfDR indicators and any other indicators included in the Strategic Plan. Depending on the level of sophistication of the proposed system, COR may require additional IT staff or may hire a third party provider to support the system.

VIII. INSTITUTIONAL ARRANGEMENTS FOR MFDR

224. Section 33 of this report (Institutional Setup) explains the roles of the institutional stakeholders in the Kazakhstan road sector regarding ownership, management and works implementation. This section of the report presents the role of each of the stakeholders in institutionalizing the MfDR approach to further improve the management of the republican road network. This is done by describing for each output and outcome indicator the responsible stakeholder for setting the targets, achieving the targets, collecting the data needed to calculate the indicator, compiling the data needed to calculate the indicator, calculating the indicator, and reporting on achievements.

A. Output indicators

225. For the output indicators, the targets will be set by COR, while the responsibility for achievement of the targets may be delegated to other stakeholders through performance agreements. These stakeholders will generally also be responsible for data collection. In the case of sub-national units, data compilation for the country as a whole may need to be carried out by a different stakeholder. Calculation of the indicators and annual reporting to MID is the responsibility of COR.

1. Subprogram 004, 005, 016, 017, 032: Republican road (re)construction

226. The output indicators for this subprogram look at the lengths of fully completed republican road (re)construction. The targets are set by COR (Construction and Reconstruction Department) in coordination with Kazavtozhol. Responsibility for achieving the targets lies with COR, but in the case of annual targets may be delegated to Kazavtozhol through a performance agreement defining the minimum length of completed construction and reconstruction works to be achieved by the end of the year. Kazavtozhol is responsible for procurement and contract management for (re)construction works, and therefore has ready access to data on the length of completed works. The Kazavtozhol branch offices will be responsible for data collection regarding completed (re)construction works in each oblast, while the Kazavtozhol main office will be responsible for data compilation for the whole country. The indicator may be calculated by either Kazavtozhol or COR. COR will be responsible for annual reporting on the achievement of the indicator to MID.

2. Subprogram 100: Republican road repair and maintenance

227. The output indicator for this subprogram looks at the lengths of republican road repaired and the percentage of the republican road network that has been covered by the instrumental examination during the autumn survey. The targets are set by COR (Maintenance Services Department and Science & Work Quality Department) in coordination with Kazavtozhol. Responsibility for achieving the target lies with COR, but in the case of annual targets for repair works may be delegated to Kazavtozhol through a performance agreement defining the minimum length of completed repair works to be achieved by the end of the year. Kazavtozhol is responsible for procurement and contract management for repair works, and therefore has ready access to data on the length of completed works. The Kazavtozhol branch offices will be responsible for data collection in each oblast, while the Kazavtozhol main office will be responsible for data compilation for the whole country. The instrumental examinations will likely be carried out by the zhollaboratories (based on the current proposal of the RAMS consultant and COR). A performance agreement may be signed with the zhollaboratories regarding the target percentage or length of the republican road network to be included in the instrumental examinations. The data is collected by the zhollaboratories and will need to be compiled by a different entity. At the moment it is not yet clear who will be responsible for data compilation at national level, whether this will be Kazavtozhol, KazdorNII or COR. This will be determined as part of the support to the development of the RAMS, and should ideally be the same unit that is responsible for the RAMS. The indicators may be calculated by either Kazavtozhol or COR. COR will be responsible for annual reporting on the achievement of the indicator to MID.

3. Subprogram 101: Quality assurance for road (re)construction and repairs

228. The output indicators for this subprogram look at the percentage of completed (re)construction and repair works in republican and local roads where quality control has been carried out by the zhollaboratories. The targets are set by COR (Science and Work Quality Department) in coordination with the zhollaboratories. Responsibility for achieving the target lies with COR, but in the case of annual targets may be delegated to the zhollaboratories through a performance agreement defining the minimum percentage of completed (re)construction and repair works in republican and local roads to receive quality control during the year. The zhollaboratories are responsible for quality control, and will collect the data on the length of completed road works where quality control has been carried out. The Kazavtozhol oblast branches have the data on the total length of road works and they also receive all the approvals from the zhollaboratories and will therefore also be involved in data collection. The data compilation for the country as a whole will be carried out by the Kazavtozhol head office. Alternatively, this may be done by COR (Science and Work Quality Department). The indicator may be calculated by either Kazavtozhol or COR. COR will be responsible for annual reporting on the achievement of the indicator to MID.

4. Subprogram 102: Management services

229. The output indicators for this subprogram look at the lengths of planned (re)construction and repair works in republican roads actually completed. The targets are set by COR (Construction & Reconstruction Department and Maintenance Services Department) in coordination with Kazavtozhol. Responsibility for achieving the target lies with COR, but in the case of annual targets may be delegated to Kazavtozhol through a performance agreement defining the minimum percentage of planned (re)construction and repair works to be completed by the end of the year. Kazavtozhol is responsible for procurement and contract management for the construction and repair works, and therefore has ready access to data on the length of completed works. The Kazavtozhol branch offices will be responsible for data collection in each oblast, while the Kazavtozhol main office will be responsible for data compilation for the whole country. The indicator may be calculated by either Kazavtozhol or COR. COR will be responsible for annual reporting on the achievement of the indicator to MID.

5. Subprogram 103: Transfers for local road (re)construction

230. The output indicators for this subprogram look at the lengths of fully completed (re)construction of local roads and streets financed from targeted transfers. The targets are set by COR (Local Road Network Development Department) in coordination with the Akimats. Responsibility for achieving the target lies with COR, but in the case of annual targets may be delegated to the Akimats through a performance agreement defining the minimum length of fully completed construction and reconstruction works to be achieved by the end of the year (this is currently already happening). The Akimats are responsible for procurement and contract management for the construction and reconstruction works in local roads, and will therefore be responsible for data collection in each oblast and the cities of Astana and Almaty. Coordination with the oblasts and the cities of Astana and Almaty is carried out by the COR Local Road Network Development Department, which will therefore be responsible for data compilation for the country as a whole. The indicator will be calculated by COR, which will also be responsible for annual reporting on the achievement of the indicator to MID.

6. Subprogram 104: Transfers for local road repair

231. The output indicator for this subprogram looks at the lengths of completed local road and street repairs. The targets are set by COR (Local Road Network Development Department) in coordination with the Akimats. Responsibility for achieving the target lies with COR, but in the case of annual targets may be delegated to the Akimats through a performance agreement defining the minimum

length of completed repair works to be achieved by the end of the year. The Akimats are responsible for procurement and contract management for the repair works in local roads, and will therefore be responsible for data collection in each oblast and the cities of Astana and Almaty. Coordination with the oblasts and the cities of Astana and Almaty is carried out by the COR Local Road Network Development Department, which will therefore be responsible for data compilation for the country as a whole. The indicator will be calculated by COR, which will also be responsible for annual reporting on the achievement of the indicator to MID.

B. Outcome indicators

232. For the outcome indicators the targets will be set by COR. Responsibility for achievement of the outcome targets cannot easily be delegated to other stakeholders through performance agreements as is the case for output targets. The autonomy and capacity of the other stakeholders is generally too limited to allow for such delegation of responsibility, although this may be introduced at a later stage. In countries such as Australia, New Zealand, South Africa and the United Kingdom, road agencies are made responsible for achieving certain outcome indicators such as minimum road conditions, but they generally have greater autonomy in the decision making regarding the use of funding for different interventions (capital repairs, mid-term repairs, routine repairs, routine maintenance), and they have higher skill levels in terms of being able to predict and model the effect of different budgets and strategies on road conditions. For Kazakhstan the responsibility for achieving the targets has therefore been placed with COR for the time being. Data collection will be carried out by the different stakeholders. Where sub-national units are involved, data compilation for the country as a whole will be carried out by other national level stakeholders. COR will be responsible for calculating the indicators and reporting achievements to MID.

1. Road condition: Percentage of republican roads with IRI≤5.0

233. This outcome indicator for COR as a whole looks at the percentage of the republican road network with a roughness of IRI 5.0 or less. The targets are set by COR (Science & Work Quality Department) in coordination with Kazavtozhol (this can be done on the basis of the planned (re)construction and repair works using the RAMS system). Responsibility for achieving the targets lies with COR. The zhollaboratories will be involved in the instrumental examination of the roads and will collect the data for each oblast. It is not yet certain which stakeholder will be responsible for processing the survey data and entering it into the RAMS[11], but it is likely that Kazavtozhol will be involved in some form or other and it is therefore well positioned to compile the roughness data for the country as a whole. The indicator may be calculated by either Kazavtozhol or COR. COR will be responsible for annual reporting on the achievement of the indicator to MID.

2. Road condition: Area of surface defects (potholes) per lane-km

234. This outcome indicator for COR as a whole looks at the area of surface defects (potholes) per lane-kilometre of paved republican road. The targets are set by COR (Science & Work Quality Department) in coordination with Kazavtozhol and Kazakhavtodor (this can be done on the basis of the planned (re)construction, repair and maintenance works using the RAMS system). Responsibility for achieving the targets lies with COR. Currently, data on surface defects (potholes) is being collected by Kazakhavtodor. Once the instrumental examinations are carried out on a regular basis, this data will likely be collected by the zhollaboratories as part of the instrumental examination of the roads. It is not yet certain which stakeholder will be responsible for processing the survey data and entering it into the RAMS[12], but it is likely that Kazavtozhol will be involved in some form or other and it is therefore well positioned to compile the surface defect data for the country as a whole. It currently also receives

[11] This will be determined by COR with support from the RAMS consultant.
[12] This will be determined by COR with support from the RAMS consultant.

the surface defect data from Kazakhavtodor. The indicator may be calculated by either Kazavtozhol or COR. COR will be responsible for annual reporting on the achievement of the indicator to MID.

3. Road standards: Percentage of core republican road network with category I or II

235. This outcome indicator for COR as a whole looks at the percentage of the core republican road network that has technical category I or II. The targets are set by COR (Construction and Reconstruction Department) in coordination with Kazavtozhol. Responsibility for achieving the targets lies with COR. The Kazavtozhol oblast branches will be responsible for data collection at oblast level, and Kazavtozhol head office will be responsible for data compilation for the country as a whole. The indicator may be calculated by either Kazavtozhol or COR. COR will be responsible for annual reporting on the achievement of the indicator to MID.

4. Road safety: Number of untreated blackspots in republican roads

236. This outcome indicator for COR as a whole looks at the number of untreated blackspots (bottlenecks related to road accidents) in the republican road network. The targets are set by COR (Maintenance Services Department) in coordination with Kazavtozhol and Kazakhavtodor. Responsibility for achieving the targets lies with COR. Kazakhavtodor is already collecting data on road accidents from the Traffic Police and will be responsible for data collection for this indicator. Kazakhavtodor will also be responsible for data compilation and its processing to determine the blackspots on the basis of the accident data. The indicator may be calculated by either Kazavtozhol or COR. COR will be responsible for annual reporting on the achievement of the indicator to MID.

5. Road user satisfaction: WEF Quality of Roads score

237. This outcome indicator for COR as a whole looks at the user satisfaction based on the score obtained in the WEF Quality of Roads index. The targets are set by COR (Construction and Reconstruction Department and Maintenance Services Department). Responsibility for achieving the targets lies with COR. The data collection is carried out by the World Economic Forum (through the national Analytical Centre in Kazakhstan), which also compiles the data and calculates the indicator (the WEF Quality of Roads score is published every year in the Global Competitiveness Report). COR will be responsible for annual reporting on the achievement of the indicator to MID.

6. Road financing: Percentage of repair and maintenance expenditure covered by road user charges

238. This outcome indicator for COR as a whole looks at the percentage of the expenditure on repair and maintenance of the republican road network that is covered by revenue from road user charges. The targets are set by COR (Maintenance Services Department) in coordination with Kazavtozhol (this can be done on the basis of the expected toll road length, toll rates and traffic volumes, as well as expected trends for other road user charges). Responsibility for achieving the targets lies with COR (at least for the revenue within its control). Kazavtozhol is directly involved in the collection of toll revenue and the approval of payments for repair and maintenance and is therefore best suited to collect data for this indicator. This will involve the Kazavtozhol oblast branches for the payment data in non-tolled roads and the Kazavtozhol toll road directorate for the toll revenue and payment data for toll roads. Some data will also need to be collected from MOF. The data will be compiled by the Kazavtozhol head office. The indicator may be calculated by either Kazavtozhol or COR. COR will be responsible for annual reporting on the achievement of the indicator to MID.

C. Overview of institutional arrangements

239. In summary, COR as a representative of MID is responsible for setting the targets and for annually reporting on achievements. COR is also ultimately responsible for achieving the targets,

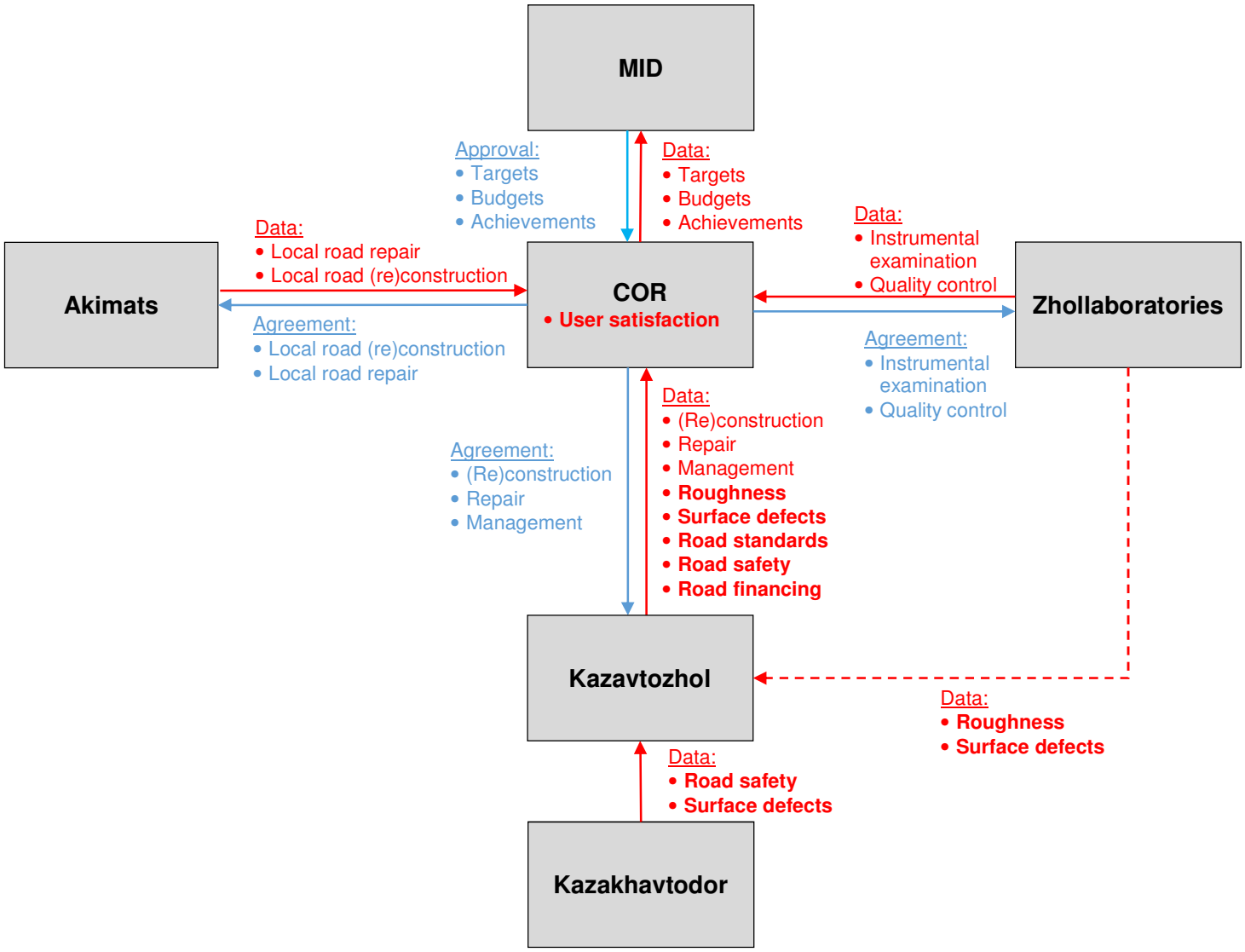
although in the case of output targets, it can delegate responsibility to other stakeholders by signing a performance agreement in which the other stakeholders assume responsibility for achieving certain outputs with the budget or contract amount allocated to them. Such a performance agreement is not appropriate for outcome targets at this stage in time, as the other stakeholders do not have enough capacity or autonomy to ensure that they can achieve such targets. The responsibility for data collection is spread over different stakeholders, and where data collection is carried out by sub-national units, other national level stakeholders are responsible for data compilation for the country as a whole. Although COR is considered to be responsible for the calculation of the different MfDR indicators, other stakeholders may be involved in doing the preparatory work (as is the case now). COR is responsible for reporting on achievements. An overview of the institutional responsibilities regarding the MfDR indicators is presented in **Error! Not a valid bookmark self-reference.**, while Figure 20 shows the delegation of responsibilities and the flow of data regarding the MfDR indicators.

Figure 19 Overview of institutional responsibilities for MfDR indicators

	Subprogram/Indicator	Setting targets	Achieving targets	Data collection	Data compilation	Indicator calculation	Annual reporting
OUTPUT INDICATORS	**Subprograms 004, 005, 016, 017, 032** Republican road (re)construction	COR (Kazavtozhol)	COR (Kazavtozhol)	Kazavtozhol branch offices	Kazavtozhol	COR (Kazavtozhol)	COR
	Subprogram 100 Republican road repair	COR (Kazavtozhol)	COR (Kazavtozhol)	Kazavtozhol branch offices	Kazavtozhol + COR	COR (Kazavtozhol)	COR
	Subprogram 100 Instrumental examination	COR (Zhollaboratories)	COR (Zhollaboratories)	Zhollaboratories	Kazavtozhol + COR	COR (Kazavtozhol)	COR
	Subprogram 101 Quality assurance republican roads	COR (Zhollaboratories)	COR (Zhollaboratories)	Zhollaboratories + Kazavtozhol branch offices	Kazavtozhol + COR	COR (Kazavtozhol)	COR
	Subprogram 101 Quality assurance local roads	COR (Zhollaboratories)	COR (Zhollaboratories)	Zhollaboratories	COR	COR	COR
	Subprogram 102 Management services	COR (Kazavtozhol)	COR (Kazavtozhol)	Kazavtozhol branch offices	Kazavtozhol	COR (Kazavtozhol)	COR
	Subprogram 103 Local road (re)construction	COR (Akimats)	COR (Akimats)	Akimats	COR	COR	COR
	Subprogram 104 Local road repair	COR (Akimats)	COR (Akimats)	Akimats	COR	COR	COR
OUTCOME INDICATORS	**Road condition - roughness** % with roughness ≤ IRI 5.0	COR (Kazavtozhol)	COR	Zhollaboratories	(Kazavtozhol)	COR (Kazavtozhol)	COR
	Road condition - surface defects Area of defects per lane-km	COR (Kazavtozhol + Kazakhavtodor)	COR	Zhollaboratories	(Kazavtozhol)	COR (Kazavtozhol)	COR
	Road standard % core network category I+II	COR (Kazavtozhol)	COR	Kazavtozhol	Kazavtozhol	COR (Kazavtozhol)	COR
	Road safety Number of accident bottlenecks	COR (Kazavtozhol)	COR	Kazakhavtodor (Traffic Police)	Kazakhavtodor (Kazavtozhol)	COR (Kazavtozhol)	COR
	User satisfaction WEF Quality of Roads score	COR	COR	WEF	WEF	WEF	COR

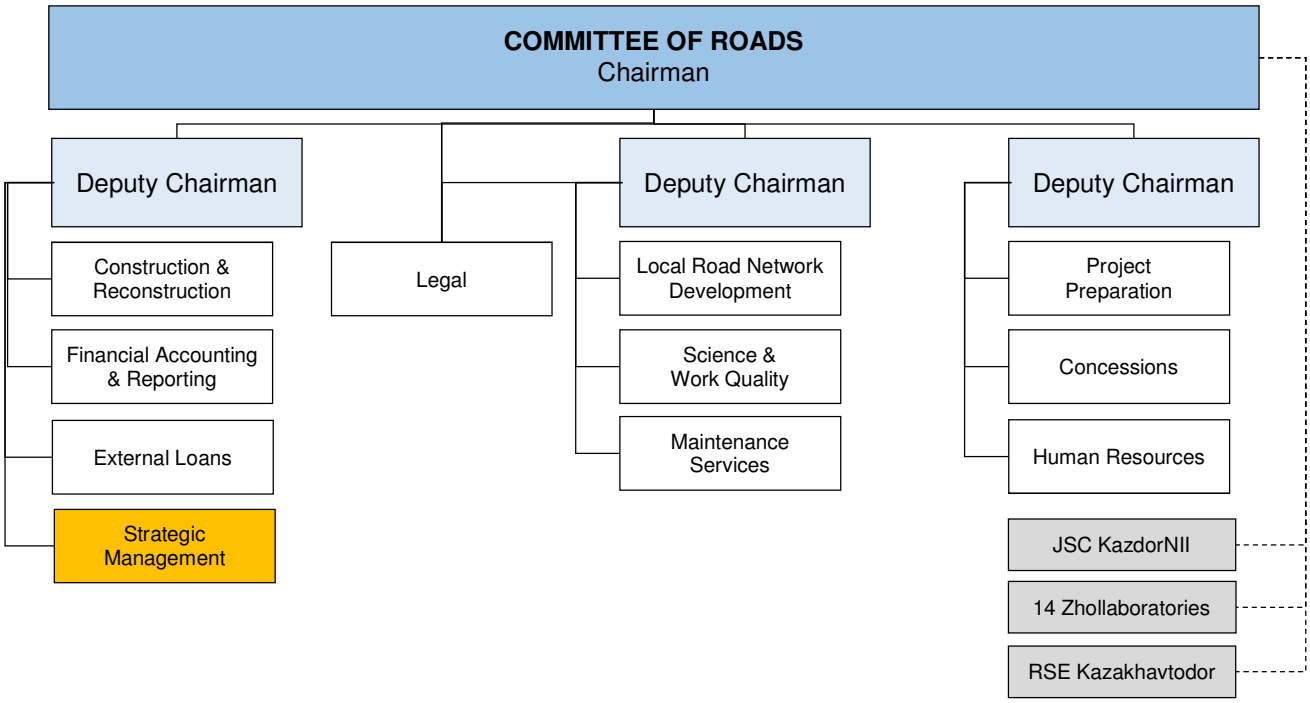
Road financing % maintenance/repair from user charges	COR (Kazavtozhol)	COR	Kazavtozhol + COR	COR	COR (Kazavtozhol)	COR

Figure 20 Delegation of responsibilities and flow of data for MfDR indicators



240. From the description above it may be clear that several departments in COR are responsible for setting targets, achieving targets, compiling data, calculating indicators and reporting to MID. This dispersed responsibility makes it difficult to make anybody accountable. This is also obvious currently with the preparation of the COR input for the MID Strategic Plan and the annual progress reports. Although this is currently being carried out by the Construction and Reconstruction Department of COR, this involves several other departments and is done in addition to their other responsibilities regarding road development. It is strongly recommended to establish a **Strategic Management Department** in COR that will become responsible for preparing strategic plans, budget requests and annual progress reports. It would also be responsible for setting targets for the different indicators, ensuring the targets are achieved (including regular monitoring of progress), compiling data and calculating the indicators, and reporting to MID on an annual basis. Such a strategic management department is common in other countries, especially where daily management is largely carried out by a road agency such as Kazavtozhol. The resulting structure of COR would then be as shown in the figure below.

Figure 21 Proposed inclusion of Strategic Management Department in COR



D. MfDR Training

241. In February 2016, a two-day training workshop was held regarding Managing for Development Results. Participants included representatives from the Committee of Roads, the MID Strategy Department, the Ministry of National Economy, Kazavtozhol, KazdorNII, Zhollaboratories, and the RAMS consultant. A full list of participants is provided in Appendix III.

242. The training consisted of 4 modules related to the four stages of the MfDR cycle (planning, budgeting, implementing and monitoring) and a fifth module looking specifically at institutional arrangements. Participants were explained about the MfDR cycle, the specific output and outcome indicators proposed for COR, and their use in the Strategic Planning and Budget Request documents and annual performance reports. Most of the attention was given to planning and budgeting, with participants working in groups to define indicators, data sources and targets, and using these to fill in budget requests for programs and subprograms. Performance agreements between COR and different entities involved in implementation were also discussed, comparing proposed options to current arrangements. A lot of attention was also given to institutional responsibilities, with particular focus on the RAMS and the collection, compilation and analysis of road condition data, discussing possible institutional arrangements for operating the RAMS.

Figure 22 MfDR training workshop

APPENDICES

Appendix I **TERMS OF REFERENCE**

1. Vasily Banschikov – Result-Based Planning and Monitoring (Team Leader)

- Analyze the existing policy and institutional constraints for MfDR integration and make recommendations for effective institutionalization of MfDR;
- Carry out a results-based management readiness assessment of MID (earlier MOTC) and make recommendations for capacity development;
- Review the transport sector development programs (MOTC's strategic plan to 2020 and annual operational plan) and their impact, outcomes and outputs. Identify their linkages with the national development strategies (Development Strategy-2050 and Accelerated Industrial-Innovation Development Strategy to 2020) and regional and territorial development programs and strategies;
- Define whether performance indicators and targets are measurable and time-bound;
- Assess the alignment between the strategic plan and budgeting process for capital and operational expenditures in the roads subsector—how the funds are allocated and the funding options are defined;
- Review if allocated resources are sufficient for implementation of activities; if not, what are the funding alternatives;
- Determine how the annual budget and a medium-term expenditure framework (MTEF) are aligned and what are the factors for prioritizing available resources;
- Develop a methodology and work plan to institutionalize and operationalize MfDR;
- Use a logic model to show logical connection between work (activities) outputs and intended key results (outcomes) at each level (project, program, sector plan, national development plan), indicators and the assumptions and risks that may influence success or failure of achieving development results;
- Develop a comprehensive results-based management framework for the roads subsector including identification of intermediate and final key performance indicators (KPIs) with the baselines and medium-term targets for budget and MTEF formulation and monitoring progress in development results;
- Develop the MfDR implementation manual with guidelines and procedures;
- Assess the current process for policy/plan/project monitoring and evaluation and existing reporting and if it produces adequate performance information based on which any corrective actions can be developed;
- Develop a results-based monitoring and evaluation (M&E) system for the transport sector/e-project monitoring system (PMS)/database for evaluation information and ensure clear link of M&E system tools to budget processes;
- Ensure multiple stakeholder involvement in M&E to avoid self-evaluation by MOTC;
- Develop operational manuals for a results-based management M&E system;
- Identify training of the MOTC and the Roads Committee and prepare a training program;
- Work closely with other development partners in designing long-term support to sustain efforts to practice MfDR;
- Supervise the work of the national consultants; and
- Help prepare learning and dissemination materials for MfDR in the roads subsector

2. Serge Cartier van Dissel - Transport (Roads) Sector Specialist

- Review the transport (roads) sector development planning framework including development priority setting, financing options, procurement, operation and maintenance;
- Review the organizational chart of the MOTC and assess the institutional arrangements and responsibilities of the Roads Committee, national operator Kazavtozhol, departments and divisions at MOTC's and regional levels;
- Review the sector performance summarizing available data on road length and condition, estimates of routine and periodic maintenance expenditures required, actual allocations, and new investment projects in the pipeline with resource requirements;
- Identify the main constraints to delivering high quality road services at all levels (republican, urban, and rural road networks);
- Assess the major challenges on private sector participation and recommend alternative mechanisms for financing road infrastructure rehabilitation and maintenance;
- Formulate outcome-based KPIs for the roads subsector that will guide budget formulation and investments;
- Assess project management and technical capacity of MOTC's staff to effectively implement a results-based management system;

- Assist to design a results-based framework;
- Assess the possibility of introduction of performance-based maintenance contracting modality by the MOTC;
- Pilot-test MfDR in the MOTC, monitor its implementation and lessons learned;
- Provide inputs to MfDR manuals, methodology papers, and guidelines;
- Make recommendations to design an electronic project management system (e-PMS) to collect, analyze, and report progress of all development roads projects;
- Contribute to development of a monitoring and evaluation system (M&E);
- Help design training programs and conduct training workshops; and
- Supervise the work of the national transport (roads) sector expert.

3. Assylbek Orazymbetov – Transport (Roads) Sector Expert

- Analyze strategic and investment planning framework and budget management process in the transport sector;
- Assist the international consultants in developing guidelines and procedures;
- Support the MOTC on pilot testing and application of MfDR and adopt a results-based monitoring framework;
- Help in data collection for preparing KPI's with baseline and medium-term targets;
- Contribute to stakeholders' on the development of the roads sub-sector KPI's;
- Support review relevant documents, research and analyze data and information, prepare notes and briefs;
- Coordinate and facilitate consultations with government agencies, development partners and other stakeholders;
- Help organize workshops, training seminars and conferences;
- Arrange for translation into local language of MfDR manuals, guidelines and other assessment and analytical work in consultation with ADB, MOTC and international consultants; and
- Report to ADB on progress and implementation of TA activities

4. Daulet Aspanbetov - Monitoring and Evaluation Expert

- Identify the links between plans, budgets, MOTC/Roads Committee actions and feedback mechanisms;
- Guided by the result-based planning and monitoring specialist, help the Roads Committee prepare a comprehensive results-based roads subsector framework including identification of intermediate and final indicators for monitoring progress in development results;
- Assist in developing MfDR manual and guidelines for the Roads Committee;
- Coordinate with MOTC data collection for preparing KPIs with baseline and medium-term targets;
- Contribute to stakeholders discussions on the development of the roads subsector KPIs;
- Help develop a results-based monitoring and evaluation (M&E) system for the roads subsector;
- Assist in developing operational manuals for a results-based management M&E system;
- Identify training needs of the MOTC and the Roads Committee and develop a training program;
- Identify development partners that are engaged in supporting MfDR capacity;
- Prepare learning and dissemination materials for MfDR in the roads subsector;
- Perform any tasks assigned by the result-based planning and monitoring specialist and by MOTC and which are supported by ADB;
- Prepare relevant sections of the inception and final consultants' reports; and
- Act as a resource person for ADB and liaise with ADB and MOTC on issues related to S-CDTA implementation.

Appendix II **PEOPLE MET**

ADB Kazakhstan Resident Mission (KARM)
- Mr. Jinlin Yang — Director, Kazakhstan Resident Mission (Astana)
- Ms. Asem Chakenova — Associate Project Officer, Kazakhstan Resident Mission (Astana)
- Mr. Almazbek Galiev — Senior Procurement Specialist, Central Operations Services Division 1 (Manila)

Ministry of Investment and Development - Finance Department (MID)
- Mr. Yuri Kappel — Deputy Chairman

Ministry of Investment and Development - Strategy Department (MID)
- Ms. Alia Amirzhanova — Deputy Chairman

Ministry of Investment and Development - Committee of Roads (COR)
- Mr. Satzhan Ablaliev — Deputy Chairman, Project Preparation + Science & Work Quality
- Mr. Amangeldy Bekov — Deputy Chairman, Construction & Reconstruction + Financial Accounting & Reporting
- Mr. Sayranbek Barmakov — Deputy Chairman, External Loans + Maintenance Services
- Mr. Bakhyt Kanatbekov — Director, Maintenance Services Department
- Mr. Yerlan Zhumagulov — Senior Expert, Construction & Reconstruction Department
- Mr. Erkebulan Supaldiarov — Expert, Construction & Reconstruction Department
- Mr. Gabit Shymyrbaev — Head, Local Road Network Development Department
- Ms. Raihan Sagindykova — Head, Financial Accounting & Reporting Department
- Mr. Bolatbek Aitbaev — Head, Science and Work Quality Department
- Ms. Anar Iskakova — Head, External Loans Department
- Mr. Dauren Toktarov — Head, Project Preparation Department
- Ms. Botagoz Vaissova — Director, Concession Department

KazAutoZhol
- Mr. Ulan Alipov — First Deputy Chairman
- Mr. Temirkhan Mendygaliev — Deputy Chairman, Construction & Reconstruction Department
- Mr. Tolegen Abdullin — Deputy Chairman, Road Maintenance Department
- Mr. Zhanarbek Suleymenov — Deputy Chairman, Management and Administration
- Mr. Askhat Okasov — Director, Road Maintenance Division
- Mr. Aydin Abdrahmanov — Head, Road Safety Office
- Mr. Nurbol Abdibekov — Head, Road Maintenance Office
- Mr. Arman Kairbekov — Director, Road Network Development and Investment Projects Division
- Mr. Erjan Terekulov — Director, Corporate Development
- Ms. Liza Kurmasheva — Manager, Strategic Planning Department
- Mr. Pirmat Olzhauly — Manager, Finance Department
- Mr. Yerlan Kalymov — Manager, Capital Construction

Kazakhavtodor
- Mr. Baurjan Serikbaev — Deputy General Director
- Mr. Timur Alimov — Chief of industrial engineering department
- Mr. Sayat Altynbekov — Chief of service of traffic management
- Mr. Aidos Serik Adihanұly — Deputy of Akmola branch
- Mr. Shamishev Ernur — Chief engineer of Akmola branch

Ministry of Finance (MOF)
- Ms. Zayfun Yernazarawa — Director, Budget Legislation Department
- Mr. Arsen Kazbekov — Head, Transport Unit
- Ms. Olga Atlanova — Chief, Budget Planning Unit
- Mr. Aslan Shorov — Budget Planning Unit

Ministry of National Economy (MNE)

- Ms. Zhazia Askarov — Budget Planning

Statistics committee of Ministry of National Economy (MNE)

- Ms. Lifa Yakipova — Head Statistics of Services and Energy
- Ms. Aynur Adilova — Senior Expert, Transport statistics
- Ms. Svetlana Grigoreeva — Senior Expert, Transport statistics
- Ms. Bagpan Debirova — Senior Expert, Construction and Investment
- Ms. Marina Misora — Senior Expert, Structural statistics
- Ms. Asel Shauenova — Senior Expert, Price statistics
- Mr. Ernar Shukalov — Senior Expert, International Statistical Cooperation

World Bank

- Ms. Aliya Karakulova — Operations Officer, Infrastructure, Sustainable Development Department
- Ms. Alma Nurshaikhova — Public Sector Reform Specialist, RBB
- Mr. Hayk Davtyan — Strategic Planning Consultant, RBB
- Mr. Ivor Beazley — Senior Public Sector Specialist
- Ms. Shynar Zakir — Public Sector Reform Consultant

European Bank for Reconstruction and Development (EBRD)

- Mr. Timur Yermekov — Associate Banker, Infrastructure, Russia and Central Asia

Appendix III **WORKSHOP PARTICIPANTS**

Ministry of Investment and Development - Committee of Roads (COR)

- Mr. Satzhan Ablaliev — Deputy Chairman, Project Preparation + Science & Work Quality
- Mr. Dauren Toktarov — Head, Construction and Reconstruction Department
- Ms. Anar Gabdullina — Head, Science and Work Quality Department
- Mr. Amir Karimbaev — Head, Project Preparation Department
- Mr. Djantore Kubeysinov — Acting Head, Maintenance Services
- Mr. Nurlan Samanbetov — Senior Expert, Science and Work Quality Department
- Mr. Kanat Utepbergenov — Senior Expert, Project Preparation Department
- Mr. Azat Umarov — Senior Expert, Financial Accounting and Reporting
- Mr. Abdullah Abishev — Expert, Legal Department
- Ms. Agul Sherebaeva — Expert
- Mr. Adlethom Boetaev — Expert

Ministry of Investment and Development - Strategy Department (MID)

- Ms. Gauhar Abdrashitova — Expert, Strategic Planning Department

Ministry of National Economy (MNE)

- Mr. Erlan Ausharipov — Senior Expert, Management and Development of Infrastructure and Ecology
- Ms. Asemgul Djakenova — Expert, Management and Development of Infrastructure and Ecology

KazAutoZhol

- Mr. Erjan Terekulov — Director, Corporate Development
- Mr. Kurbanali Primetov — Director, Procurement
- Mr. Tolegen Abdullin — Director, Road Maintenance Department
- Ms. Liza Kurmasheva — Head, Operations Unit
- Mr. Nurbol Abdibekov — Head, Road Maintenance Office
- Mr. Aset Turgaev — Chief Expert, International cooperation and investments
- Mr. Ernur Djaniyazov — Chief Expert, Finance
- Ms. Saet Shotleen — Expert

KazdorNII

- Mr. Darhan Sakanov — Vice President
- Mr. Duman Kalabiev — Chief Engineer, Astana Oblast Branch

Zhollaboratories

- Mr. Adilhan Kajkenov — Engineer, Materials

Kazakhavtodor

- Mr. Ilyas Shulembekov — Head, Planning Department
- Mr. Sayt Altinbekov — Chief Specialist

SPT Asia Great (RAMS Project)

- Mr. Guido Bonin — Team Leader, RAMS Project
- Ms. Zhanna Kuljanova — Interpreter, RAMS Project

Appendix IV **EXISTING INDICATORS IN STRATEGY DOCUMENTS**

	Strategy 2020 (Feb 2010)	**Strategy 2050 (Dec 2012)**	**Transport Strategy 2020 (Jan 2014)**	**MID Strategic Plan 2014-2018 (Dec 2014)**
Impact		• Enter club of top 30 most developed countries in the world by 2050		
Outcomes	• **85% of national roads in good or satisfactory condition by 2015** • **70% of local roads in good or satisfactory condition by 2015** • **Transit volume doubled by 2020** • Transit potential increased through transport investments • Institutional reforms and liberalization of road sector • Modern road network linking major cities and towns by 2020	• Selection of investments in terms of economic feasibility and impact (rate of return) • Integrate national economy into global environment (trade + transit) • **Double transit potential by 2020, 10-fold by 2050** • Connect 14 oblasts of the country • Infrastructure centres in remote areas with low population density • Second wave of large-scale privatization • Decentralization of rights and resources, and delineation of responsibilities	• **Quality of Roads index World Economic Forum improved from 117 in 2012 to ? in 2020** • **Road transit goods transport 2.3 million tons by 2016 and 3.5 million tons by 2020** • All freight transit 25 million tons by 2016 and 35.5 million tons by 2020 • All freight transport 4.25 billion tons by 2016 and 5.86 billion tons by 2020 • All freight transport 598 billion ton-km by 2016 and 788 billion ton-km by 2020 • All passenger transport 25.54 billion passengers by 2016 and 34.23 billion passengers by 2020 • All passenger transport 346 billion passenger-km by 2016 and 535 billion passenger-km by 2020 • **Republican roads in good condition 38% by 2016 and 48% by 2020** • **Republican roads in good/satisfactory condition 86% by 2016 and 89% by 2020** • **Complex index for national roads 80% by 2016 and 90% by 2020** • Maintenance backlog national roads (11,300km in 2013) • **Percentage of national roads class I+II 36% by 2016 and 48% by 2020** • **Share of class I+II roads under tolls 10% by 2016 and 55% by 2020** • **Annual toll collection KZT 88.9 billion by 2020** - cover all maintenance costs of toll roads • **Public satisfaction with paved national roads 58% by 2016 and 70% by 2020** • Asset value ($109.7 billion in 2013) • Total investment in national roads in period 2014-2020	• **Quality of Roads index World Economic Forum improved from 117 in 2012 to 105 in 2018** • All freight transport 4.3 billion tons by 2016 and 5.2 billion tons by 2018 • All freight transport 479 billion ton-km by 2016 and 591 billion ton-km by 2018 • All passenger transport 25.5 billion passengers by 2016 and 31.9 billion passengers by 2018 • All passenger transport 346 billion passenger-km by 2016 and 452 billion passenger-km by 2018 • **National roads in good/ satisfactory condition 86% by 2016 and 87% by 2018** • **National roads in good/ satisfactory condition 20,196 km by 2016 and 20,437 km by 2018** • **Transit freight 22.0 million tons by 2016 and 26.5 million tons by 2018** • **Income from transit freight KZT 205 billion by 2016 and KZT 240 billion by 2018** • Introduction of market-based approaches
Outputs	• **(Re)construction of national roads 16,400 km in period 2010-2020, 50% with private funding** • **(Re)construction of Western Europe-**		• **(Re)construction of 6 international corridors completed by 2020** ○ Tashkent-Shymkent-Almaty-Khorgos (WEWC) ○ Shymkent-Kyzylorda-Aktobe-Uralsk-Samara (WEWC) ○ Almanty-Karaganda-Astana-Petropavlovsk (CS) ○ Astrakhan-Atyrau-Aktau-Turkmenistan ○ Omsk-Pavlodar-Maikapshagai	• **(Re)construction of 6 international corridors completed by 2019** ○ Tashkent-Shymkent-Almaty-Khorgos (WE-WC) ○ Shymkent-Kyzylorda-Aktobe-Uralsk-Samara (WE-WC) ○ Almaty-Karaganda-Astana-Petropavlovsk (CS)

	Strategy 2020 (Feb 2010)	Strategy 2050 (Dec 2012)	Transport Strategy 2020 (Jan 2014)	MID Strategic Plan 2014-2018 (Dec 2014)
	Western China road completed by 2014 • Pay system introduced in some national roads by 2012		○ Astana-Kostanay-Chelyabinsk • **(Re)construction of Western Europe-Western China (WE-WC) road completed by 2020** • **(Re)construction of interregional national roads completed by 2020** ○ Taskesken-Bakhty ○ Almaty-Usharal-Dostyk ○ Atyrau-Aktobe • **(Re)construction centre-south (CS), centre-west (CW), centre-east (CE) completed by 2020** • Concession for Almaty ring road started • **(Re)construction national roads 2,932 km in period 2014-2016 and 5,703 km in period 2014-2020** • **Capital and mid-term repair of national roads 4,170 km in period 2014-2016 and 10,195 km in period 2014-2020** • **Length of self-financing toll roads 841km by 2016 and 6,186 km by 2020** • **Updated regulatory documents 66% by 2016 and 78% by 2020** • **National road coverage of automated road asset management 8,000 km by 2016 and 23,485 km by 2020** • **Percentage of national roads with roadside services 25% by 2016 and 76% by 2020** • **Built/upgraded 55 service centres in period 2014-2016 and 260 service centres in period 2014-2020** • **Qualified personnel with technical specialties 17% by 2016 and 40% by 2020** • **Number of bus terminals 49 by 2016 and 172 by 2020** • **Number of weigh scales 80 by 2016** • Long-term performance-based maintenance contracts introduced • Legal framework PPP/concessions introduced • Pavement management system introduced by 2016 • Intelligent traffic monitoring system on toll roads by 2017 • Annual maintenance coverage national roads (16% in 2013) • User satisfaction portal by 2014 • Create infrastructure centres	○ Astrakhan-Atyrau-Aktau-Turkmenistan ○ Omsk-Pavlodar-Maikapshagai ○ Astana-Kostanay-Chelyabinsk • **(Re)construction of Western Europe-Western China (WE-WC) road completed by 2017** • **(Re)construction of road connecting to oblast centres completed by 2019** ○ Taskesken-Bakhty ○ Aktobe-Martuk ○ Almaty-Ust-Kamenogorsk ○ Astana-Shiderty-Pavlodar ○ Kurty-Burylbaytal • **(Re)construction of national roads for EXPO completed by 2017** ○ Astana-Temirtau (Karaganda) ○ Astana-Pavlodar ○ South-West bypass Astana ○ Schuchinsk-Zerenda • **Reconstruction national roads 3,990 km in period 2014-2018** • **Repair national roads 7,600 km in period 2014-2018** • **Annual budget 002 for road development KZT 245 billion in 2016** • **Annual budget 003 for road repair and maintenance KZT 41 billion by 2016** • Expenditure on public roads KZT 323.2 billion in 2013 • Expenditure on national roads KZT ? in period 2014-2018 • Cost of construction for class II roads KZT 393 million/km by 2016 • Cost of reconstruction for class II roads KZT 172 million/km by 2016 • Cost of repair KZT million/km in 2016 • Length of construction and repair works quality controlled • Tolls introduced in some national roads