ECONOMIC AND FINANCIAL ANALYSIS

A. General

1. The government intends to improve or realign three important road sections of the North–South Corridor between Jinvali, 54 kilometers (km) north of the capital Tbilisi, and the border with the Russian Federation at Larsi, a distance of 111 km on the current alignment. The project focuses on section 2 from Kvesheti (km 74.1) to Kobi (km 107.7); the current alignment (the existing highway) is 33.6 km long, which will be shortened to 23 km by the project road.

2. The highest point on the project road is Jvari pass, with an altitude of 2,379 meters (m). Road closures are common during winter and the Kvesheti–Kobi section was closed to all vehicles for an average of approximately 44 days per year during 2012–2016. Reducing these closures, and their impact on journey time and reliability, are an important part of the rationale for the proposed project. Upgrading section 2 alone would significantly effect but not entirely eliminate closures.

3. The existing highway serves the north–south transit corridor between the Russian Federation, Georgia and Armenia, and is the only land route currently available to Georgian and Armenian workers moving to or from the Russian Federation. The project will expand Georgia's transit capacity, reduce transport costs, and facilitate the government's strategy to capture transport cost savings and use these to generate wider economic benefits.

4. The area from Gudauri north to the border at Larsi is in Kazbegi municipality, whose administrative center is Stepantsminda. According to a 2015 baseline study, around 25% of households are pensioners, compared with 15% nationally; 30% receive targeted social assistance, compared with 12% nationally. The ski resort of Gudauri lies 12 km north of Kvesheti, but uncertainty over road closures makes it difficult to link the local economies of Stepantsminda and Gudauri during the winter season. The proposed project will overcome this limitation.

5. Travel on the existing highway is hazardous. From 2012 to 2017, 28 deaths and 377 injuries were recorded on the three sections between Jinvali and Larsi, with 6 deaths and 89 injuries on section 2 alone.

6. The existing highway has a poor horizontal and vertical alignment and its pavement is badly cracked. In the without-project scenario, the existing highway will continue to deteriorate and vehicle operating speeds are expected to fall to 32 km per hour (km/h). The with-project scenario envisages a high standard, two-lane road with an asphalt concrete pavement on a new alignment. Its total length will be 23 km. There will be 8.9 km of two-lane tunnels and 1.9 km of three lane tunnels. Lane width will remain at 3.5 meters, but shoulder width will be increased to 2.5 meters. Safety features will be improved and the tunnels and bridges will be constructed to modern standards. Average travel speed on the road is expected to increase to 59 km per hour.

B. Demand Estimate

7. The Roads Department has undertaken traffic counts three times per year since 2007 at Kobi (km 107) and Jinvali south (km 20). In addition, consultants hired by the World Bank assessed traffic in 2017 at Larsi (km 136), Jinvali (km 25) and Kobi. Economic activities and traffic volumes fall with increasing distance from Jinvali. The without-project alignment is therefore divided into two sections for analysis: Kvesheti–Gudauri and Gudauri–Kobi. Table 1 shows the adopted base-year traffic.

Table 1: Base Year (2017) Traffic

Location	Cars, SUVs etc.	Mini-buses	Vans & pickups	Medium buses	2-axle trucks	3-axle trucks	≥4-axle truck-trailers	AADT vehicles/day
Km 74.1–86[a]	2,732	221	221	144	187	100	408	4,014
Km 86–107.7[b]	2,212	175	175	95	121	70	265	3,113
Weighted average	2,396	191	191	112	144	81	316	3,432

AADT = annual average daily traffic, km = kilometer, SUV = sport utility vehicle.
[a] Kvesheti to Gudauri section (average of Asian Development Bank consultants' count at km 25 and the adopted traffic for Gudauri–Kobi).
[b] Gudauri to Kobi section: average of Asian Development Bank consultants' counts and Roads Department counts at km 107).
Source: Asian Development Bank estimates.

8. Regional crises and weather-induced road closures have led to highly variable traffic on the existing highway, rendering it impossible to infer normal traffic growth from historic data. Instead, traffic growth rates were inferred from gross domestic product (GDP) growth and elasticities used on other studies in Georgia. GDP growth was assumed to be (i) 4.8% for 2018–2020;[1] (ii) 4.0% for 2021–2030; and (iii) 3.6% for the remainder of the evaluation period. In the short to medium term, strong growth of heavy goods traffic is expected to continue. In the longer term, merchandise trade and road transport may be displaced by trade in services, while the regional economic environment is likely to remain volatile.

9. Acknowledging the various influences on traffic growth, the weighted average traffic growth rate from 2018 to 2025 is assumed to be 5.7%, implying an income elasticity of 1.3 with respect to forecast GDP growth over the same period. In subsequent periods, elasticity is reduced to 1.0 and traffic growth to 4.1% during 2026–2029, and elasticity to 0.9 and traffic growth to 3.3% from 2030 onwards, approximately double the GDP growth over the same period. Average annual traffic growth over the entire evaluation period is 4.2%. Table 2 shows adopted GDP growth rates and elasticities.

Table 2: Gross Domestic Product Growth Rates and Elasticities Used in Traffic Forecasts

Period	GDP	Car	Minibus	Van or pickup	Bus	MGV	HGV	Tractor Trailer
2018–2020	4.8%	1.2	1.2	1.2	0.7	1.2	1.65	1.65
2021–2025	4.0%	1.0	1.0	1.0	0.7	1.2	1.65	1.65
2026–2029	4.0%	1.0	1.0	1.0	0.7	1.2	1.2	1.2
2030–2047	3.6%	0.8	1.0	1.0	0.7	1.2	1.2	1.2

GDP = gross domestic product, HGV = heavy goods vehicle, MGV = medium goods vehicle.
Source: Asian Development Bank estimates.

10. Generated traffic is likely to be a significant benefit and is expected to arise (i) from the reduction in the number and duration of weather-related road closures, which is estimated at 10% of normal traffic; and (ii) because the new alignment will reduce road user costs even during fair weather, which is estimated at 28% for passenger traffic, and 18% for goods traffic, with a 4-year ramp-up period.

11. A consultants' origin and destination survey, carried out in 2017, indicated that there was modest potential for additional traffic with trip ends in Azerbaijan and the Russian Federation to divert to the project road, starting at 35 vehicles per day in 2024 and subject to a 4-year ramp-up. Adopted traffic forecasts are summarized in Table 3.

[1] ADB. 2018. *Asian Development Outlook 2018: How Technology Affects Jobs.* Manila; ADB. 2019. *Asian Development Outlook 2019: Strengthening Disaster Resilience.* Manila; World Bank. 2019. *Global Economic Prospects.* Washington DC.

Table 3: Traffic Forecasts (vehicles per day)

Year	Normal traffic	Generated and diverted traffic	Total
2017	3,432	0	3,432
2023	4,811	0	4,811
2024[a]	5,061	0	5,061
2028[b]	6,015	2,188	8,204
2035	7,775	2,817	10,592
2040	9,278	3,356	12,634
2048[c]	12,313	1,759	14,071

[a] First benefits and start of ramp-up period for generated and diverted traffic.
[b] End of ramp-up period.
[c] Traffic capped at approximately 14,000 vehicles per day, estimated road capacity.
Source: Asian Development Bank estimates.

C. Economic Costs

12. The economic costs of the project comprise (i) capital investment, which includes civil works, physical contingencies, land acquisition and resettlement, as well as consulting services for project management and construction supervision; and (ii) road maintenance.

13. A residual value of 50% of the investment cost is estimated by applying the straight-line depreciation method to individual project items based on assumed lifespans. This is a higher residual value than usual, which is justified in this case by the high proportion of tunnel works (62% of total estimated capital investment).[2]

14. Project base financial cost in 2019 prices is estimated at $409 million, including works and consulting services, physical contingencies of 5% applied to works and consulting costs, but excluding duties, value added tax (VAT), and financing charges during implementation. This is converted to an economic price of $399 million by applying a standard conversion factor estimated at 0.99,[3] and a shadow wage rate factor of 0.7 to unskilled labor. The economic cost per km is $17.3 million. The assumed expenditure profile is 10% in 2020, 40% in 2021, 35% in 2022, and 15% in 2023.

15. The without-project scenario involves routine maintenance, including crack sealing and pothole patching. Under the without-project scenario, the International Roughness Index (IRI) is expected to deteriorate to an average IRI of 8.5 within 5 years. Under the with-project scenario the maintenance regime is shown in Table 4. Incremental annual operating and maintenance expenses of lighting and fan ventilation for the project road (especially at tunnels) are estimated at a financial cost of $2.3 million per year.

Table 4: With-Project Maintenance Interventions

Intervention	Economic unit cost	Intervention criteria
40 mm overlay	$29/m^2 plus preparatory works:	10 year intervals & IRI ≥ 7, post-works IRI = 3
Pothole patching	$12/m^2	Potholes > 5/km, 85% patched
Crack sealing	$5/m^2	Every 2 years, 85% sealed
Drain clearing etc	$1,000/km	Annually
Winter maintenance	$1,000/km	Annually

IRI = international roughness index, km = kilometer, m^2 = square meter, mm = millimeter.
Source: Asian Development Bank estimates.

[2] This assumes a tunnel life of 50 years, although many highway tunnels last much longer: a 2015 survey of highway tunnels in the United States found that 62% were over 50 years old and 35% were over 100 years old. National Highway Co-operative Research Program. Transportation Research Board of the National Academies 2015. *Project NCHRP 14-17: Guide for the Preservation of Highway Tunnel Systems*. Delaware.

[3] Using the ADB simplified method based on merchandise imports of $7.48 billion, exports of $2.38 billion, and taxes on trade of $43 million (averages in current dollars for 2010–2017 from World Bank Development Indicators).

D. Economic Benefits

16. The main quantifiable economic benefits are vehicle operating cost (VOC) savings, savings in travel time, crash cost reductions, the benefits of generated and diverted traffic, and emission reductions. Such benefits were quantified primarily using standard Highway Design and Maintenance Version 4 (HDM-4) software.

17. VOC savings arise from changes in fuel consumption and vehicle wear and tear. In order to estimate VOC savings, HDM-4 requires shadow prices of fuel, vehicles, tires and labor, as well as operating characteristics of vehicles. Retail gasoline and diesel prices in Tbilisi in April 2018 were GEL2.3–GEL2.4 ($0.92–$0.96) per liter. Fuel is subject to VAT (at a standard rate of 18%) and excise duty (GEL250/ton for gasoline and GEL200/ton for diesel). Deducting VAT and excise duty, and adjusting for expected long-term crude oil prices gives a shadow price of $0.7 per liter.[4]

18. Travel time savings are based on vehicle-speed relationships in HDM-4. They are monetised by applying values of time estimated for different categories of road users. Based on recent Georgian wages, working time is given a shadow price of between $2.7 per hour for bus passengers and $4 per hour for car passengers. As a reference, GDP per capita in 2018 was estimated at $2.2 per hour. Non-working time is valued at 30% of working time. The value of time savings was increased in line with GDP per capita, conservatively assumed to be 3% per year.[5]

19. The forecast with-project operating speed is 59 km/h, while in the without-project case, operating speed falls to 32 km/h. The average with-project journey time savings over the entire evaluation period is 40 minutes, of which approximately 70% is attributable to speed and the remainder to distance reduction.

20. The value of changes to the time goods spend in transit is assumed to be $0.1 per hour for all goods vehicles, a value that corresponds to a time saving of one hour for a load of one ton valued at $10,000.

21. Without the project, road users face significant of unpredictability in their journey times. Journey time unpredictability has a cost to road users and operators; typically they will re-schedule their departure times in order to mitigate any penalty arising from a late arrival. Although there is extensive literature on this topic, there are no readily available methodologies applicable in the context of the project. Therefore, the benefit of reducing the unpredictability of journey times has not been assessed.

22. During 2012–2016 an annual average of 1 death and 15 injuries were recorded along the project road. Using the International Road Assessment Programme methodology,[6] the present value of crash costs over the entire evaluation period is $34 million in the without-project scenario.[7] The project will deliver a much safer alignment and reduce the road safety hazards arising from ice and snow.[8] No formal assessment of the expected change in deaths and injuries has been made, and thus a nominal 25% crash cost saving is included in the evaluation.

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[4] World Bank. 2018. *Commodity Markets Outlook.* Washington DC.
[5] GDP per head grew at an annual average of 5.6% from 2007 to 2016.
[6] International Road Assessment Programme. 2008. *The True Cost of Road Crashes*. London
[7] Assumes that value increases in proportion to real GDP growth and to traffic growth.
[8] Improved alignments increase sight distances and reduce grades (International Road Assessment Programme. Road Safety Toolkit).

23. The benefits of generated traffic are assessed using the "rule of half", applied to the change in generalized cost between the with- and without-project cases.[9] Diverted traffic benefits are estimated as the product of the diverted traffic, the distance saving (800 km) and the weighted average project road user costs (approximately $0.6 per vehicle-km).

24. HDM4 calculates carbon dioxide emissions from fuel consumption. The evaluation uses the recommended Asian Development Bank (ADB) value of $36.30/ton of carbon dioxide equivalent in 2016, increased thereafter at a real rate of 2% per annum.

25. Fleet average VOC components against IRI are in Table 5. The most significant item is fuel, reflecting a moderately high proportion of heavy goods vehicles in the fleet and the poor alignment of the existing road. VOC and journey time savings across the entire fleet and over the evaluation period are summarized in Table 6.

Table 5: Vehicle Operating Cost Components
($ per vehicle-kilometer)

IRI (m/km)	Fuel	Spares	Capital[a]	Others[b]	Total
2.0[c]	0.106	0.072	0.075	0.039	0.29
6.0[c]	0.108	0.087	0.077	0.040	0.31
8.0[d]	0.153	0.107	0.098	0.064	0.42

IRI = international roughness index, km = kilometer, m = meter.
[a] Equivalent annual cost of vehicle, computed using the optimal life approach.
[b] Includes maintenance, crew costs, tires and overheads.
[c] On new road.
[d] On existing road.
Source: Asian Development Bank estimates.

Table 6: Vehicle Operating Cost and Journey Time Savings

	Without-project		With-project		Saving
Item	IRI	$/vehicle-km	IRI	$/vehicle-km	$/vehicle-km
VOC	15	0.55	3.9	0.34	0.21
Journey time values		0.66		0.33	0.33

IRI = international roughness index, km = kilometer, VOC = vehicle operating cost.
Note: All values are averages over evaluation period.
Source: Asian Development Bank estimates.

26. Approximately 24% of project benefits will accrue to the poor. This estimate is based on assumed percentages of VOC and time savings for each vehicle class that accrue to the poor (summarized in Table 7). In general it is assumed that vehicle owners and/or operators are not poor, while a high proportion of bus passengers are poor. Owners and passengers of vans occupy an intermediate position.

Table 7: Benefits by Vehicle Class and Surplus to the Poor

Item	Truck-trailer	HGV	Car	Bus[a]	MGV	Minibus	Van	Total
Total benefits ($ million)	408.4	69.7	1287.1	365.2	79.5	197.5	88.6	2,496
Estimated surplus accruing to the poor:								
Poor % of VOC	0%	0%	10%	0%	20%	0%	50%	
Poor % of time savings	0%	0%	10%	80%	20%	100%	50%	
Benefit to poor ($ million)	0.0	0.0	128.7	253.4	15.9	149.2	44.3	591
Benefit to poor as %	0%	0%	10%	69%	20%	76%	50%	**24%**

[9] A standard method used in transport economics which approximates the incremental benefits arising from generated traffic. It is calculated as half of the product of the difference in generalized cost and difference in demand arising from the project.

HGV = heavy goods vehicle , MGV = medium goods vehicle, VOC = vehicle operating cost.
Note: quantities shown are undiscounted totals over the evaluation period.
[a] Bus travelers include those who use this route to gain employment outside of Georgia and therefore their value of time is slightly higher than the average.
Source: Asian Development Bank estimates.

E. Results of Economic Analysis

27. Economic analysis was carried out using standard appraisal methodology. The results (Table 8) are expressed in terms of the key economic indicators, namely benefit–cost ratio, economic internal rate of return (EIRR) and net present value at a 9% discount rate. Present values of costs and benefits are also shown. The main project benefits start in 2024. The results are presented using the world price numeraire. The results indicate that the project is economically viable, with a benefit–cost ratio of 1.6, an EIRR of 13.2% and a net present value of $190 million. In addition to conventional transport economics benefits there are compelling indirect benefits that have not been quantified and are described in paras. 1–11.

Table 8: Streams of Costs and Benefits
(2019 world prices, $ million)

	Incremental costs		Incremental benefits						Benefits	
Year	Invest-ment	Main-tenance	VOC savings - normal traffic	Time savings - normal traffic	Gen-erated traffic	Diverted traffic	Safety	Emission reductions	Total	Net
2018	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2020	39.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	(39.9)
2021	159.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	(159.5)
2022	139.6	0.0	(0.3)	(0.1)	0.0	0.0	0.0	0.0	(0.4)	(139.9)
2023	59.8	0.0	(1.4)	(0.7)	0.0	0.0	0.0	0.0	(2.1)	(61.9)
2024	0.0	2.2	15.7	9.7	0.0	0.0	0.5	0.4	26.2	24.0
2025	0.0	2.2	18.7	12.5	0.6	0.7	0.6	0.4	33.5	31.3
2026	0.0	2.2	22.1	16.5	1.7	1.4	0.6	0.4	42.7	40.4
2027	0.0	2.2	25.1	20.5	3.3	2.1	0.7	0.5	52.0	49.8
2028	0.0	2.2	27.0	23.3	5.0	2.8	0.7	0.5	59.4	57.1
2029	0.0	2.2	28.3	25.3	5.5	2.9	0.8	0.5	63.3	61.1
2030	0.0	2.2	29.5	27.5	6.0	2.9	0.9	0.6	67.4	65.2
2031	0.0	2.2	30.6	29.8	6.6	2.9	0.9	0.6	71.4	69.2
2032	0.0	2.2	31.7	32.2	7.2	3.0	1.0	0.7	75.7	73.5
2033	0.0	2.2	32.8	34.9	7.8	3.0	1.1	0.7	80.3	78.1
2034	0.0	2.2	33.9	37.6	8.5	3.1	1.1	0.7	85.0	82.8
2035	0.0	2.3	35.0	40.5	9.3	3.2	1.2	0.8	89.9	87.7
2036	0.0	2.2	36.1	43.6	10.1	3.2	1.3	0.8	95.1	92.9
2037	0.0	2.3	37.2	46.9	11.0	3.3	1.4	0.9	100.7	98.4
2038	0.0	2.2	38.4	50.5	12.0	3.4	1.5	0.9	106.7	104.5
2039	1.6	2.4	39.6	54.4	13.1	3.5	1.6	1.0	113.1	109.1
2040	0.0	2.2	42.1	58.8	14.6	3.5	1.7	1.1	121.7	119.5
2041	0.0	2.3	43.6	63.4	16.0	3.5	1.9	1.2	129.5	127.1
2042	0.0	2.2	45.1	68.4	16.7	3.6	2.0	1.3	137.0	134.8
2043	0.0	2.2	46.6	73.8	17.4	3.7	2.1	1.4	145.0	142.7
2044	0.0	2.2	48.2	79.7	17.0	3.8	2.3	1.5	152.4	150.2
2045	0.0	2.2	49.7	86.0	16.3	3.9	2.5	1.7	160.0	157.8
2046	3.0	2.3	51.1	92.8	15.3	4.0	2.6	1.9	167.8	162.5

Year	Incremental costs		Incremental benefits						Benefits	
	Invest-ment	Main-tenance	VOC savings - normal traffic	Time savings - normal traffic	Gen-erated traffic	Diverted traffic	Safety	Emission reductions	Total	Net
2047	0.0	2.2	55.0	100.8	14.1	3.9	2.8	2.2	178.8	176.6
2048	(199.4)	2.2	57.0	109.0	12.2	4.0	2.8	2.4	187.5	384.6
PV at 9%	280	14.4	194	220	43.8	15.7	6.9	4.6	485	190
% of total benefits			40%	45%	9.0%	3.2%	1.4%	1.0%	NPV	190
									EIRR	13.2%
									BCR	1.65

( ) = negative, BCR = benefit-cost ratio, EIRR = economic internal rate of return, NPV = net present value, PV = present value, VOC = vehicle operating costs.
Source: Asian Development Bank estimates.

28. Sensitivity tests were carried out to determine the effect of variations in key input parameters. Switching values are 164% with respect to construction costs and –39% with respect to benefits, meaning that the project would still be economically viable if construction costs were to rise by less than 64% or the benefits to fall to 39% or less of base case values. The project EIRR remains at 11.9% even if generated and diverted traffic, and road safety benefits are excluded.

Table 9: Sensitivity Analysis

Case	EIRR	NPV, $ million	Switching value
Base case	13.2%	+190	
Costs +20%	11.5%	+132	164%
Benefits –20%	11.2%	+93	–39%
Costs +20% and benefits –20%	9.7%	+35	
No generated or diverted traffic or safety benefits	11.9%	+124	

EIRR = economic internal rate of return, NPV = net present value.
Source: Asian Development Bank estimates.

F. Financial Analysis

29. The project is non-revenue generating. The project road will be maintained under the government's maintenance program. Therefore, aspects of financial sustainability have been assessed from the viewpoint of the ability to ensure the upkeep of the assets created and improved under the project.

30. An assessment of the Ministry of Regional Development and Infrastructure's road asset management practices and capabilities was undertaken in February 2019. The Roads Department carries out annual road condition surveys for international roads (1,520 km) and secondary roads (5,370 km) under its jurisdiction. Baseline conditions for 2004 reflect the decades of underfinancing of the sector. About 55% of international roads and 70% of secondary roads were in bad condition. The 2018 surveys revealed that over 85% of international roads and 60% of secondary roads are in good or fair condition.

31. Steady increases in road sector funding since 2004 have eliminated much of the maintenance backlog and the Roads Department's current 5-year plan aims to complete the road network rehabilitation. Financing for maintenance will be increased by shifting rehabilitation funds to routine and preventive maintenance to achieve higher service levels and increased road asset lifecycles.

32. The Roads Department's road maintenance expenditures are in Table 10.

Table 10: Roads Department Road Maintenance Expenditures, 2013–2018

GEL million [$ million]

	2013	2014	2015	2016	2017[a]	2018
Routine maintenance	31 [18]	37 [21]	39 [17]	46 [17]		
Periodic & routine maintenance					86 [34]	90 [33]
Periodic maintenance	202 [121]	165 [93]	153 [67]	161 [68]		
Rehabilitation					212 [84]	275 [101]
Emergency	7 [4]	10 [6]	7 [3]	12 [5]	8 [3]	18 [7]
Embankment protection	5 [3]	5 [3]	7 [3]	2 [1]	15 [6]	23 [8]
Exchange rates (GEL per $)	1.66	1.77	2.27	2.37	2.51	2.50

[a] Periodic and routine maintenance was moved from the capital budget (periodic maintenance and rehabilitation) to the recurrent budget and combined contractually beginning in 2017.

Source: Roads Department.

33. In 2018, the maintenance budget was about $149 million, equivalent to about $24,500 per km for the road network under the Roads Department's responsibility. During 2014–2018, the annual expenditure for road maintenance nearly doubled, from GEL218 million to GEL407 million; the compounded annual road maintenance expenditure growth rate was 13.3%, while the average annual inflation rate was 3.6%. The annual average incremental maintenance costs associated with the project are estimated to be in line with the current expenditure ($25,000 per km) and equivalent to about 0.4% of the overall road maintenance expenditure in 2018.

34. During 2014–2018, the compounded annual growth of road-related revenues was 15.1%, (1.2%–2.1% of GDP). Substantial increases in road-related revenues since 2016 is mostly due to increased excise fuel taxes and overall traffic volumes. Furthermore, several new revenue sources will be introduced during 2019–2020, including driver license fees, vehicle ownership taxes, and annual vehicle inspection fees.

35. The government has made continued efforts to improve road maintenance planning, budgeting, and efficiency through the development of a road asset management system (RAMS), the piloting of performance-based maintenance (PBM) contracts, and the assessment of tolling options.

36. ADB and the World Bank have supported development of the RAMS that is being fed into a 5-year rolling planning and programming process, and a road assessment system that will adopt the International Road Assessment Programme's approaches and methodologies, which aim to develop safer roads investment planning and performance tracking systems.

37. The Roads Department has no direct labor force, or maintenance or construction equipment, and contracts out all its maintenance and construction activities. Georgia is divided into 26 maintenance zones, with 22 active maintenance contractors. All contractors are recruited under open competitive bidding for 2-year contracts. Since 2016 the government has been moving toward adopting a PBM approach. One PBM contract is under implementation in the Kakheti region, and two other PBM contracts are being prepared under ADB and World Bank financing. The Roads Department is considering options for gradual introduction of service level-based payments for maintenance contracts funded by the state budget.

38. Recognizing the need to further expand its revenue base, the government has sought assistance from development partners to assess the potential and suitability of road tolling. Two studies (supported by the World Bank and the European Bank for Reconstruction and

Development) recommended tolling as a viable revenue source.[10] The government is recruiting consultants to (i) conduct a feasibility of seven pre-identified priority highway sections, including the project road; and (ii) prepare technical, financial, and bidding documentation for the three most viable tolling projects.

39. The government is committed to maintaining the project roads and facilities at the required standard, as reflected in a specific covenant in the draft loan agreement. The government's continuous efforts to advance the RAMS, PBM, and tolling agendas will further improve the overall road maintenance situation. It is therefore concluded that the Roads Department has sufficient financial capacity, within the government's budgetary procedures, to meet recurrent expenditures to adequately operate and maintain the project road.

[10] Global Infrastructure Facility. 2017. *Georgia: East–West Highway Tolling and O&M Concession*. Unpublished.; WS Atkins International Ltd. 2018. *Georgia: Development of a National Electronic Toll Collection Strategy.* Unpublished.