



# Highways Workshop

22–23 May 2023 • Tbilisi, Georgia

## Семинар по автомобильным дорогам

22–23 мая 2023 года • Тбилиси, Грузия



# Sustainable Road Infrastructure Finance in Mongolia

**Martin Horseling**

EBRD Consultant

FINNOC/MCPC



# The assignment

- **General Information:**

- A component of the 'Ulaanbaatar Darkhan Road Expansion Project – Institutional Support to Improve Funding for Road Asset Maintenance'
- Financed by EBRD
- Implemented by Finnish Overseas Consultants and Mongolian Construction Project Consultants Group
- Duration of 18 Months

- **Objective:**

- To provide Legal and Institutional Support to improve Road Maintenance Operations in the country





# Project Components

- A. Technical support for designing the distribution methodology
- B. Institutional support for developing an audit function for the Road Fund Board
- C. Legal support for drafting and amending the secondary legislations
- D. Human capital development (Training)



# The rationale of road maintenance financing

- Road transport provides 90-95% of all mobility needs,
- Substandard road infrastructure has a significant impact on economic development potential,
- Its existence creates a requirement to provide maintenance to ensure that it retains its functionality for the envisaged lifespan,
- Dimensions, time and use determine the quantity of maintenance required,
- Generally, network wide maintenance requirements will remain constant over time if planned properly,
- **This makes infrastructure maintenance a fixed cost that must be covered regardless of the state of the economic cycle.**



# Implications for financing

- Considering that transport infrastructure maintenance is a continuous and long term process infrastructure financing must be:
  - Predictable,
  - Stable,
  - Constant over time,
  - Sufficient to avoid rapid and untimely deterioration of the asset.
- This requires a clear understanding of what maintenance is and what it is not.





# Maintenance vs Investment

- The distinction between maintenance and investment is not always considered clear but at the same time is clearly defined in the IMF Government Financial Statistics Manual (GFS 2014) as:
- **Investments:**
  - "Major improvements (such as renovations, reconstructions, and enlargements) to existing assets that increase their productive capacity, extend their service lives, or both, are classified as acquisitions of fixed assets." (investments)

Source: adapted from GFS 2014



# Maintenance

- "Activities that owners or users of assets are obliged to undertake periodically in order to be able to utilize such assets over their expected service lives. They are current costs that cannot be avoided if the fixed assets are to continue to be used. The owner or user cannot afford to neglect maintenance and repairs as the expected service life may be drastically shortened otherwise."
- "Maintenance activities do not change the fixed asset or its performance, but simply maintain it in good working order or restore it to its previous condition in the event of a breakdown. Defective parts are replaced by new parts of the same kind without changing the basic nature of the fixed asset."

Source: adapted from GFS 2014





# Budget vs borrowing as a source of finance

- As a matter of principle, recurrent costs such as maintenance must be financed from the recurrent budget. These costs are generally constant over time.
- Investments can/may be financed from loans and grants though one must beware that the maturity does not exceed the lifespan of the asset to be created. Investments are generally ‘lumpy’, meaning they imply a large outlay in a short period of time.



# Therefore financing must be as follows

Type of action	Type of financing
Regular maintenance (annual programme)	Budget
Periodic Maintenance such as pavement overlays etc. (each 8 – 10 years as needed)	Budget
Rehabilitation (20-30 year periods)	Loans or budget
New Construction	Loans or budget



# The approach in Mongolia

- To secure funds to maintain its road assets, Mongolia has created several road funds,
- This presentation discusses only the **State Road Fund (Autoroad fund)** and provides information on the successful and not so successful elements of the process of creating the State Road Fund,
- It can provide some valuable lessons for the future.





# Establishment of the Road Fund

- **The Law on Autoroads:**
  - Establishes the autoroad fund
  - Establishes the roadcouncil
  - Identifies sources of financing for the fund
- **The Law About Special Fund**
  - Prevents the autoroad fund from becoming an organisation with its own staff by requiring it to be added to a list of exceptions if an organisation were to be established.



# Financing sources according to the law

- **Law on Autoroads:**

- not less 20 percent of excise taxes imposed on imported vehicles;
- funds from foreign loan, assistance and donation;
- funds allocated from the state budget;
- Tolls
- Traffic Penalties
- Transit fees paid by foreign vehicles
- Charges for the use of the right of way
- Others.

**Fuel taxes are set in a separate law discussed later.**

- **Govt. Resolution 312:**

- not less 20 percent of excise taxes imposed on imported vehicles;
- funds from foreign loan, assistance and donation;
- funds allocated from the state budget;
- Tolls
- Traffic Penalties
- Transit fees paid by foreign vehicles
- Charges for the use of the right of way
- **Fuel taxes**
- **Interest on account balances**



# Fuel taxes

- Established in the ‘Law About the Official Tax on Petrol and Diesel Fuel’,
- The Law not earmark a specific percentage to the road fund but instead states:
  - The government will determine the percentage and amount of this tax revenue to be collected in the road fund.
- Govt. Resolution 312 (2019) sets the fuel tax as a specific amount in local currency per ton:

- 1 USD = 3,484.37 MNT.

Year	Amount of tax revenue per 1 ton to be collected in the road fund (MNT)	
	Gasoline	Diesel fuel
2020	16 200	1,800
2021	18,000	2,000
2022	20,000	2,000
In the following years	22,000	2,000



# Financing in practice

- The legislation, despite its appearance to the contrary, does not provide a guaranteed source of finance (earmarked) for the State Road Fund as:
  - *The State Central Administrative Body Responsible for Road Matters shall develop a proposal for funds to be deposited in the State Road Fund in accordance with relevant procedures and submit it to the State Central Administrative Body Responsible for Finance and Budget Matters.*
- **In short, allocations to the road fund are subject to the considerations of priority as part of the regular budget process and there is no predictable level of financing.**
- Financing for the road fund is a budget line in the state budget and not an earmark.



# An example of financing in practice (1)

- Detailed Budgets for 2019 and 2020

Item		2019	2020
REVENUE		<u>38,834,561,357</u>	<u>54,448,005,712</u>
Operational Revenue (=tolls)		8,866,366,785	8,648,005,712
State Budget		29,968,194,572	45,800,000,000
EXPENDITURE		<u>34,984,218,771</u>	<u>54,312,377,076</u>
Toll collection		5,016,024,199	2,892,709,516
Road Maintenance		29,968,194,572	51,419,667,560

- The state budget is generally not considered a good source of financing as it is subject to political pressures and priorities.



# An example of financing in practice(2)

- Evolution of the budget:

Year	Amount (bn MNT)
2019	2.2
2020	60.8
2021	80.0
2022	75.0 (62)

- The budget allocations are not aligned with the expenditure, and
- The 2022 allocation was reduced to finance social spending
- Inflation has increased to 13.4% in 2021





# Adequacy of funding sources (1)

- The previous slide warrants the question what would have occurred if the funds were earmarked and put into the fund.










Source	Potential revenue (bn)
20% of vehicle import tax	39.7
State budget	?
Toll revenue	10.0
Traffic Fines	?
Transit Fees	Not much
Fees for using right of way	0
Fuel excise taxes	?
Interest	0

## Adequacy of funding sources (2)

- As can be seen in the preceding table , current sources may not be able to provide the type of stable financing that road maintenance requires
- This prevents proper multi-annual planning of maintenance
- It leads to chronic underfunding with a cycle of **build – neglect – reconstruct – neglect** and so on. This is a very expensive method of operating an expensive asset of very high economic importance



# How adequate would funds have been if earmarked

Source	Adequacy	Reasoning
Not less 20 percent of excise taxes imposed on imported vehicles		Vehicle imports closely follow the economic cycle and may not be stable over time.
Funds from foreign loan, assistance, and donations		Unpredictable and not easy, if at all, to plan over the long term.
Funds allocated from the state budget		Subject to ever shifting political priorities, unless set in law as mandatory spending at a minimum level.
Tolls		Tolls are a function of economic activity and can, if set at a high enough level, provide a significant proportion of the funding.
Traffic Penalties		Not predictable and carries significant reputation risk for the police.
Transit fees paid by foreign vehicles		If all foreign traffic is covered, a viable source of finance.
Charges for the use of the right of way		Stable source, as this mostly concerns buildings such service stations etc.
Fuel taxes		Generally seen as a good source, but.....
Interest on account balances 20		Not a good source if there is no money in the bank.



# International context of road financing

- Many advanced economies have moved towards a funding model that directly links either ownership or use of a motor vehicle to financing of road maintenance:
- This is mainly done through:
  - Fuel taxes (often a large proportion of funding)
  - Annual road user charges
  - Fees for first registration
  - Road user charges for foreign vehicles.
- In addition, the top level (motorway) road network of a country may consist of toll roads.
- This funding model has worked well until recently.



# And then:





# Result !

- In many countries and territories, funding models must be/are being revised to account for recent developments,
- For example, Europe has set a target of phasing out the sale of new Internal Combustion Engine vehicles by 2035,
- In some countries this development is already visible, with EV's making up a large proportion of sales of new vehicles,
- Charging infrastructure requires large investments to accommodate this transition to EV's.
- **We still may be sceptical about EV's, but unless some revolutionary technology appears, it is the only viable means of transport for the near future.**





# Financing for the future – our thoughts and recommendations

- The changing environment requires new road infrastructure funding models that still need to meet the requirements discussed earlier,
- In Mongolia, this does not make a difficult situation easier as multiple factors must be considered as well such as:
  - Potential Revenue Level
  - Social Equity
  - Economic development effects/distortions
  - Environment/externalities
  - Ease / cost of collection
  - Stability over time



# Sources considered

- Tax on hydrocarbon (fossil) fuels,
- Tax on electricity used for EV charging
- Annual Circulation Tax / Road user charges
- Tolls
- State budget
- Use of right of way



# Recommendations and Rationale

- As part of the institutionalisation, it has been recommended to make the road fund an organisation at arms length of the Government, with its own governance structure and sources of funding,
- The sources of finance would be as follows:
  - Tolls (to be set by the road fund board according to needs),
  - Annual Road User Charge (to be set by the road fund board according to needs and a methodology),
  - Charges for the use of the right of way (to be set based on a method to be developed).
- **As can be noted, there are only few sources recommended. The reason for this is discussed next.**





# Fuel Taxes (including electricity)

- Elasticity of demand provides an upper limit to the amount of taxes that can be raised from discretionary items such as fuel.
- A too large increase in fuel taxes to fund infrastructure may reduce consumption and result in less revenue instead of more revenue,
- Though good for climate change, from revenue perspective it is not desirable,
- Nevertheless, generally demand is relatively price inelastic (until EV's or other fuels become widely available)



# Expected future developments

- Though imperfect, EV's and hydrogen fuelled vehicles may become substitutes for fossil fuel vehicles,
- This will undermine the classic model of relative absence of price sensitivity of fuel demand,
- Especially EV's will create challenges, as it will be difficult to tax electricity to cover shortfalls when people can buy solar panels to charge their cars as some smaller EV's already envisage.





# Road user charges / taxes on vehicle ownership

- These are a good and stable source of financing, as for many people owning a car fulfils an important part of their needs according to Manslow,



Maslow's hierarchy of needs

- Cars become important to many once their basic needs (food, shelter) have been met,
- Cars fulfil most of the other needs, and therefore vehicle ownership is not very sensitive to the economic cycle.
- Nevertheless, road user charges must be equitable and address also the externalities of transport.





# Externalities in transport

- Externalities are costs imposed on society that are not accounted for in any other way,
- These include:
  - Congestion
  - Pollution
  - Noise
  - Use of natural resources
  - Climate change
- Externalities are mostly undesirable side effects that also provide an opportunity to generate revenue



# How to address externalities

- Externalities are addressed in different manners, some can be used to achieve other policy objective through behavioural change for example:
  - **Congestion** can be addressed by a congestion charge,
  - **Pollution** can be addressed by enhanced emission standards for new vehicles, pollution based annual circulation taxes, road user charges and clean air zones,
  - **Noise** can be addressed by adding noise barriers to roads, to be paid by all road users,
  - **Use of natural resources** can be made more efficient by an extraction tax (for example an amount to be paid per m<sup>3</sup> of sand)
  - **Climate change** is addressed by encouraging people to purchase more fuel efficient vehicles, or EV's



# What that means for revenue

- Some, but not all externalities can be priced for the purpose of behavioural change and revenue generation, by for example:
  - Classifying vehicles in a “**pollution**” **category** and putting a higher annual road user charge on polluting vehicles,
  - CO<sup>2</sup> emissions are directly related to fuel consumption, hence a tax on CO<sup>2</sup> can be good for the climate and the road maintenance budget,





# Toll as a means of road financing

- From policy perspective, toll is a good method to collect funds for investment in and maintenance of road infrastructure
- In the context of Mongolia however, it may not be practical as a solution due to the size of the network in relation to its population and traffic density
- The current system with a limited number of toll collection points cannot be considered an adequate system from the perspective of revenue generation



# Costly infrastructure

- Classic toll collection infrastructure is expensive
- This can only be justified when toll levels are such as to bring in significant revenue
- Example: Paris to Laval costs ~ 0,12 USD/ km for a passenger vehicle,
- These are not levels that currently would be acceptable.





# Toll as a means of road financing

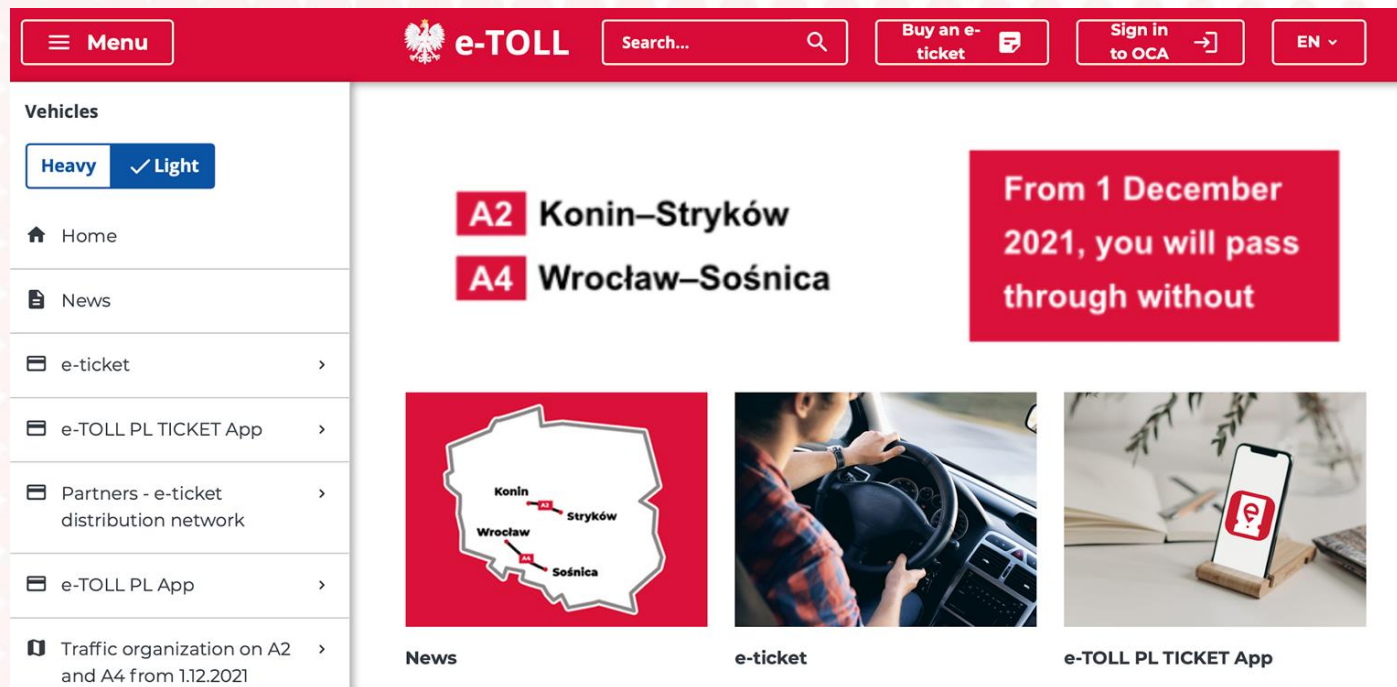
- Key challenge is the need for access control to ensure that everyone driving on the road actually pays toll as required
- This may be feasible in some, limited areas on some limited number of roads, but will not be feasible over a large proportion of the network, this also has a large environmental impact for example by limiting animal movement through fences.
- Also, in the context of Mongolia, with unpaved national roads, it would be difficult to implement.
- Alternative options would involve electronic toll collection, which require enforcement infrastructure that may be costly





# Electronic toll collection

- Poland has an e-toll system that provides different payment options and technologies
  - Self declaration and payment before travel,
  - On board unit with GPS and post travel declaration



# Electronic toll collection

- The Polish system relies on traffic monitoring cameras to enforce and ensure compliance
- Fines for non payment are very high, some 50 times the toll that should have been paid
- A 3 day grace period is given to allow drivers to declare their trip voluntarily afterwards and avoid any fines that may be coming their way
- It may be an option for the longer term to, at least partially finance the upkeep of the main (paved) road network.



# State budget as a source of finance

- Unless road maintenance financing is included into the mandatory spending budget (among pensions, social spending, etc) it will always be just one item among many priorities for the Government to be financed in the discretionary budget,
- This is evidenced by the regular early/mid year reduction of the road maintenance budget in past years as shown earlier.
- Therefore, the state budget has not been recommended as a source of road maintenance funding.





# Charges for the use of the right of way

- Charges for the right of way are applicable when someone uses land that is within 50m of the centerline of the road,
- This will be mostly road related structures and services (such as fuel stations, roadside restaurants etc.)
- A charge on this can be a stable source of finance, though at this moment it is not possible to determine the revenue potential.



# Covering financing needs

- The financing needs to fully fund Road Maintenance in 2022 were estimated at the time at 130 Billion Tugruk,
- Calculations have shown that two out of the three sources of finance would be able to cover this amount comfortably,
- It would leave some funds to expand the toll collection system further or clear the backlog road maintenance.



# Revenue potential of a simple annual road user charge

Vehicle types charged	Number	Ratio	Tariff	Revenue
			(₹/year)	(₹ tr/yr)
Passenger car	622,796	2	94,000	58,542,824,000
Truck	189,719	5.5	258,500	49,042,361,500
Bus	6,672	3	141,000	940,752,000
Special (ambulance, fire engine)	15,046	3	141,000	2,121,486,000
Tanker-truck	7,083	5.5	258,500	1,830,955,500
Hauler	20,598	7.7	361,900	7,454,416,200
Mobile equipment	12,387	3	141,000	1,746,567,000
	874,301			<b>121,679,362,200</b>
Data from February 2022				

1 USD (\$) = 3,060.83₹



# Estimated toll revenue potential

Toll / revenue potential		Day	Working days	All days
Passenger Cars		54,958,500	13,739,625,000	20,059,852,500
Light truck		927,000	231,750,000	338,355,000
Medium truck	non trailer	741,000	185,250,000	270,465,000
	with trailer	109,000	27,250,000	39,785,000
Heavy truck	non trailer	2,965,000	741,250,000	1,082,225,000
	with trailer	1,352,500	338,125,000	493,662,500
Micro bus		68,000	17,000,000	24,820,000
Medium bus		133,000	33,250,000	48,545,000
Large bus		340,500	85,125,000	124,282,500
Special purpose		28,500	7,125,000	10,402,500
Motorbike		3,250	812,500	1,186,250
		61,626,250	<b>15,406,562,500</b>	<b>22,493,581,250</b>

1 USD (\$) = 3,060.83₹

# Expected outcome

- It is believed that the proposed approach will be able to collect sufficient revenue to ensure that, if wisely spent, road maintenance is fully financed and able to ensure that the road network remains in serviceable condition.



# Changes proposed to achieve the outcome(1)

- **Legal and institutional changes**
  - Ringfencing through an agreement with the Parliament and the Ministry of Finance the financing sources identified for the road fund
  - Increase the powers of the AutoRoad Fund Council/Board to prioritise where and how resources are spent
  - Determine in law which documents the AutoRoad Fund Council is to receive, from who and in which frequency





# Changes proposed to achieve the outcome(2)

- **Legal and institutional changes**
  - The multiple overlapping roles of the Road Transport Development Center shall be removed in particular:
    - Supervision Consultant must be independent from private sector
    - RTDC should have no participation in the RF Council
    - No participation by the center in the working group under 154/159 that determines the performance of the maintenance contractor



# Changes proposed to achieve the outcome(3)

- **Legal and institutional changes**
  - Revised payment structure to reflect the high fixed cost base of the road maintenance contractors (availability fee)
  - Revised performance framework that ensures that only work performed is paid for



# Thank you for your attention

Any remaining questions ?

