

TECHNICAL COMMITTEE 1.3 – FINANCE AND PROCUREMENT

1.3.1. Best practices in funding and financing of road infrastructure

Strategies / Objectives

- World-wide scanning of road infrastructure construction and operation funding and financing (including public budgets, direct and shadow toll roads) as well as the relevant road infrastructures operation costs.
- Identify best practices in special Innovative funding models and Hybrid funding solutions for LMICs.
- Investigate methods of financing of road maintenance, small scale rehabilitation, road safety improvement works, ITS, traffic management and other similar investment related to road infrastructure.
- Encourage coordination with other TCs and TFs, such as *T.C. 1.1. – Performance of Transport Administration, T.C.1.2 – Planning Road Infrastructure and Transport to Economic and Social Development, T.F. 1.1 Well-Prepared Projects, T.C. 3.3 – Asset management.*

Obtaining sufficient funding for road infrastructure maintenance and expansion remain a key challenge for roads authorities globally. Roads authorities in many instances cannot simply rely on direct budget allocations from the fiscus and need to access alternative sources of funding to meet their funding requirements.

Traditional funding options will remain the basis for developing innovative and hybrid funding solutions. These solutions do have challenges and include:

- Budgets appropriated by Governments towards roads authorities. The origin of these funds is tax based and may be raised in different ways, from personal taxation, Value Added Tax (VAT), Goods and Services Taxes (GST), property taxes, etc. Roads authorities are exposed to variations in budget appropriations due to fluctuations in economic conditions and changes in governments' policy objectives. For LMIC's, social expenditure demands on their fiscus may have a more severe impact to obtain sufficient funds for road construction and maintenance.
- Fuel Taxes is an "easy to collect" indirect road user charge that has been used very effectively to fund roads development and maintenance, either by means of dedicated fuel funds or as a general tax. Taxation of fuel will remain a primary source of road funding in many countries, although its efficiency is threatened by various factors including political will to increase fuel taxes, improvement in vehicle fuel consumption efficiencies, the introduction of battery powered vehicles and the negative environmental impact associated with fossil fuels. As a result, fuel taxation as a "user charge" is becoming inequitable and unsustainable.
- Vehicle registration/licensing fees - Income generated from vehicle registration and license fees is a direct user charge that can be utilized to fund road infrastructure. It does not take into consideration the actual distance travelled on road infrastructure. These fees, if linked to actual road usage overcomes the issue related to fuel taxes and improved efficiencies. In many instances, these fees are not available to transport authorities for infrastructure provision since it is part of general revenue to national, provincial or municipal authorities and utilized elsewhere. These fees do provide a mechanism that can be further developed to fund specific projects in an equitable manner.
- Traffic fines are regarded by some authorities to be a revenue source for road funding. However, it should not and cannot be a sustainable funding mechanism since all roads authorities' objective should aim for zero revenue from traffic fines and full compliance to traffic laws.

- Development impact fees are utilized as a funding mechanism by roads authorities to mitigate the impact of developmental traffic on existing infrastructure. Developer contributions towards infrastructure provision can be tailored in such a way to systematically provide new and/or upgraded road infrastructure based on a pre-determined route network improvement plan and allocate specific upgrades or new infrastructure to a specific development. Developer contributions can play an integral role to finance the local supporting road network. However, it is unlikely that developer contributions will be sufficient to fund upgrading and expansions of freeway networks.
- Tolling is an equitable way of implementing the user-pay principle and does not compromise fiscal integrity. It generates funding through borrowing to allow for the implementation of large road infrastructure projects, resulting in earlier project delivery and realization of road user and economic benefits. Tolling is becoming a more attractive option for LMIC's, especially through the implementation of PPP's where the private sector provides technical expertise and access to equity and debt to finance for large road infrastructure projects. The private sector is risk averse and may require additional guarantees from their government partners related to base traffic and traffic growth for especially green fields projects.

Several innovative approaches to funding highways are already in practice, while others are under consideration. Hybrid funding solutions are also becoming more popular. World-wide scanning of road infrastructure construction and operation funding and financing, as well as the relevant road infrastructures operation costs, investigation is extremely helpful to understand funding sources and needs of a road infrastructure.

The aim of *T.C.1.3* will be to evaluate these funding options in special for LMIC's where funding is limited, if not available and further scrutinize the existing options. It will need to determine whether these options are possible or even sustainable for LMIC's and should also address external factors i.e environmental impact, social benefit etc. Furthermore, new innovative options should be explored, and it should be determined if a combination of available funding options in a hybrid fashion may provide alternative funding options that can also address the needs and circumstances of LMIC's.

In addition, funding and procurement of road infrastructures are strictly interconnected and the choice of the best solution to realize a road infrastructure projects depends on: (i) a well-prepared project; (ii) adequate project funding; (iii) appropriate contractual terms.

The three conditions above are deeply influenced by national legislations which often prevent or limit the possibility to achieve the most efficient solution.

An objective of *T.C. 1.3* shall be to detect the main legal and economic factors affecting the way of funding and procuring road infrastructures in order to identify, first of all, which are the most efficient scenarios for the successful realization of a project.

In this Cycle, this technical committee will identify and illustrate case studies (regarding both large and small scale projects) highlighting pros and cons of the relevant funding systems in relation to construction and operation phases. The final report will include the outcomes of interviews with authorities and sectors' expert and an in-depth analysis of the most relevant literature and legal provisions.

Outputs	Expected Deadlines
<ul style="list-style-type: none"> <li>• Collection of case studies</li> </ul>	<ul style="list-style-type: none"> <li>• December 2020</li> </ul>
<ul style="list-style-type: none"> <li>• Full report</li> </ul>	<ul style="list-style-type: none"> <li>• December 2021</li> </ul>

### 1.3.2. Impact of new propulsion techniques on funding

#### Strategies / Objectives

- Analyze the direct and indirect impact of new propulsion techniques focused on decarbonization on funding road infrastructure.
- Encourage coordination with other TCs and TFs, such as *T.C. 1.1 – Performance of Transport Administration*, *T.F.B.2 – Automated vehicles – challenges and opportunities for road operators and authorities* and *T.F. 2.1 – New mobility and its impact on Road Infrastructure and Transport*.

Advancement in vehicle design and technology has redefined the way in which vehicles burn fossil fuels by using electric, hybrid and solar energy systems to replace the traditional combustion and fuel engines in vehicles. As vehicles become more fuel efficient, the fuel levy / tax contribution will reduce over time or will completely fall away if a user converts to alternative fuels. This in turn has a direct impact on the ability for obtaining secondary funding for road infrastructure through the utilization of these funds.

Current vehicle propulsion systems alternatives to the fuel-fed engine system include:

- Gas-electric hybrids: Power split hybrid vehicles which contain both an internal combustion engine and an electric engine which powers the engine of the vehicle. This type of vehicle uses a battery to provide power at lower speeds, or to handle the stop/start action of an engine. Regenerative braking and the internal combustion engine of the vehicle is used to charge the battery.
- Plug-in hybrids are similar to gas-electric hybrids except that they have bigger batteries which can propel the car limit distances using only electricity thereby generating zero emissions.
- Electric vehicles operate purely on electric energy which powers the engine of the vehicle.
- Ethanol and flex fuel: Flex fuel is fuel that contains up to 85% of ethanol.
- Biodiesel is fuel which has been manufactured from vegetable oil, animal fats or recycled restaurant grease.
- Propane is produced as a by-product of natural gas and crude oil refining. Propane costs approximately a third less than gasoline. Using propane in vehicles eases maintenance of vehicles and reduces emissions produced.
- Liquefied and compressed natural gas produces vehicle mileage similar to that of gasoline but does so by burning more cleanly.

Fuel cells: Hydrogen is attractive because it can be produced domestically, and it burns cleanly. Vehicles which are powered by fuel cells are two to three times more efficient than those powered by gasoline.

Solar powered vehicles use photovoltaic cells to convert sunlight into electricity. This electricity powers the vehicle's motor. Solar powered vehicles generate zero emissions.

It can be concluded that even though the fuel tax is not the primary revenue source to cover road infrastructure costs, it has an equitable link to road usage and therefore there exists a linear relationship between the consumption of fuel and road usage. Together, alternative fuels limit this as a funding option available to governments to generate a user fee revenue.

Some Administrations have started developing ways of generating revenue from owners of electric and autonomous vehicles through the following methods:

- Vehicle Miles Travelled Tax applies to drivers according to the distance travelled. Modern technology has improved the accuracy of determining the distance travelled by vehicles thereby enabling accurate calculations for vehicle miles travelled (VMT) taxes. The main challenge encountered by these tax programs is related to implementation. These programs rely on

tracking each vehicle's mileage via a device within the vehicle or by drivers reporting their mileage.

- **Transportation Taxes on Electricity:** tax applied to drivers of electric vehicles. An option of restoring equity, due to electric vehicle owners not being subjected to the fuel/gas tax, is to levy road taxes through the electricity that these drivers consume as they use the road infrastructure. As a fuel, the electricity consumed by a single electric vehicle is almost perfectly equivalent to the fuel consumed by a fuel powered vehicle.
- **Rethinking Free-riding with Transport Network Companies (TNC):** Passengers of autonomous taxis, or Uber, should contribute to a tax program per their usage of the service. Currently TNC's have drivers who operate fuel operated vehicles. It is envisaged that due to the transition from fuel operated vehicles to electric vehicles, TNC's will change their vehicles accordingly. Therefore, the vehicles owned by TNC's will no longer be subjected to a fuel tax/levy. The most effective method of ensuring that TNC's use the road infrastructure while contributing to the funding of the road is for them to charge riders based on the distance they travel per trip.

It is evident that the current user fee-based system will become redundant and a new method of recovering this portion of the revenue, previously recovered through the fuel tax/levy, needs to be developed.

The aim of this technical paper will be to evaluate the effect of these alternative fuels on the fuel tax considering the advantages and disadvantages for each type. The timeframes over when this fund will deplete and how it will affect current government infrastructure projects. It should also assess the risks and broadly address possible mitigation measures. In this Cycle, a briefing note is expected to be completed.

Outputs	Expected Deadlines
• Briefing note.	• March 2022

### 1.3.3. Harmonization of procurement

#### Strategies / Objectives

- Identify good practices and success stories in road infrastructures procurement and elaborate conclusions on the most efficient procurement solutions.
- Define criteria for homogenization and good practices on procurement.
- Analyze best practices to encourage ethical and social responsibility through procurement procedures.
- Encourage coordination with other TCs and TFs, such as *T.C. 1.1 – Performance of Transport Administration, TF 1.1 Well Prepared Projects* and *T.C. 3.3 – Asset Management*.

A major challenge faced by government departments and agencies is the effective procurement of service providers. All infrastructure development projects as a minimum, require a professional team of engineers to determine the scope for design, standards for construction and effective project delivery. The reality is that many authorities do not have the necessary skills and resources to successfully comply with all procurement requirements to appoint professional teams.

Without the appointment of professional teams, a project cannot get out of the starting blocks and the design and tender process for the appointment of a contractor is delayed or may never happen. The knock-on effect of this tendency is poor service delivery and a delay in the implementation of large infrastructure projects that are essential for economic growth and job creation. To ensure effective project delivery, serious consideration must be given to simplify the process to appoint professional teams.

The tender mechanism for the delivery of professional engineering services may have resulted in lower design and supervision cost, but there is a price to pay. And without generalizing, there may be unintended consequences such as reduced quality of design, specifications and supervision. Poor design and specifications result in cost inefficiencies, contractual claims and time overruns/delays during the construction phase.

Furthermore, there should also be more scope to accommodate partnerships between Government and the private sector and a reasonable level of flexibility in procurements processes to encourage innovation and speedier implementation.

A PIARC Technical Report in 2003 – Procurement of Works, Goods and Services by Road Administrations set out a framework for international collaboration on improving procurement of works, goods and services by Road Administrations. It develops the background for a dossier of best practice summaries linked to road network and organizational characteristics so that the information can be related to particular country situations and can be used as a background.

Some current industry criteria include:

- Free and fair processes ensuring competition in procurement is not only good practice but ensures transparency and visibility, but it also yields other project benefits. Competition facilitates market prices and spurs innovation, higher service levels and better value.
- Value for Money is a process of ensuring that the best value for money is obtained but still adheres to procurement rules and processes. For government agencies, best value must be obtained in utilizing public funds whilst still enabling government priorities and objectives. Optimal use of these funds needs to be assessed considering the combination of economy and efficiency.
- Ethics and Accountability ensuring that all parties act in each other's best interest and is fully accountable. They deal on a basis of mutual respect and trust conduct their business with integrity.
- The concept of Equity from a global perspective seeks to offer opportunities to new participants who were previously disadvantaged by a means of unfair discrimination. This ensures that entities are fully inclusive and aligned to support their respective industries.

Other Criteria include integrity, control and efficiencies.

There is current limited research on this topic and a concerted effort should be undertaken by this technical committee to compile case studies of relevance.

The aim of the *T.C. 1.3* will be to develop fundamental criteria that will govern procurement practices internationally through the evaluation of current processes and techniques. These overarching principles should form the basis of procurement guidelines for agencies. It should also address current challenges faced in the industry especially with emphasis on maladministration and corruption. The outcomes of the report should assist entities to align their procurement goals and deliverables and support good governance. It should aim to simplify the processes whilst enabling faster and more efficient delivery of the service. For LMIC's, it should address the limited capacity available at authorities to follow process due to limited skills available and to consider the appointment of consultants to assist in the procurement.

Outputs	Expected Deadlines
<ul style="list-style-type: none"><li>• Collection of case studies</li></ul>	<ul style="list-style-type: none"><li>• June 2022</li></ul>
<ul style="list-style-type: none"><li>• Full report</li></ul>	<ul style="list-style-type: none"><li>• December 2022</li></ul>