



# **Italian G20 Presidency**

## **Annex of Infrastructure Maintenance Case Studies**

[Extended Version]

**July 2021**



## Annex – G20 Maintenance Case Studies




### I. Background

This Annex presents a collection of G20 maintenance case studies to enrich the ***G20 Policy Agenda on Infrastructure Maintenance*** by promoting knowledge sharing, as well as illustrating concrete applications of a range of policy tools and levers that can be adopted to enable better planning and prioritization, to secure adequate resources and to implement more efficient and effective maintenance of infrastructure.

G20 members have submitted on a **voluntary basis** the case studies, providing a brief description of a domestic project, program or institutional reform (completed or ongoing) that could illustrate a best practice solution to promote infrastructure maintenance. To secure a balanced representation, **two cases per member** have been selected, so as to ensure a more accurate focus on infrastructure maintenance and diversity in terms of sectors covered. This collection of case studies should not be interpreted as a representative sample of members' efforts in infrastructure maintenance, but rather as a **demonstration of the G20 active engagement** in this field.

The present **Annex** (complete with details on all cases) is retrievable at this [link](#). To assist the case studies collection, the IWG members received an ***Infrastructure Maintenance Case Study Template***, along with an ***Annotated Glossary on Infrastructure Maintenance*** for guidance: both instruments are available at this [link](#).

### II. Selected case studies

Country		Name	Policy	Sector
AUS		Roads to Recovery Program	funding	transportation
AUS		Bridges Renewal Program	funding	transportation
BRA		New Basic Sanitation Regulatory Framework	planning; funding; delivery	Water-Waste
BRA		PROSEFER – National Railway Safety Program in Urban Areas	planning	transportation; social
CAN		Canada Core Public Infrastructure Survey	planning	Water-Waste; transportation; social
CAN		Municipal Asset Management Program	delivery	other
CHE		National Roads and Agglomeration Transport Fund	planning; funding; delivery	transportation
CHE		Electricity Grid Usage Tariff	planning; funding; delivery	energy
CHN		Retrofitting Ageing Highway Bridges	planning	transportation; social
CHN		Circular of the Ministry of Finance on Issuing the Operation Guideline for Performance Management of PPP Projects	planning; funding; delivery	energy; Water-Waste; transportation; ICT; social; other



Country		Name	Policy	Sector
EGY (from EIB)		<b>Cairo Metro Rehabilitation</b>	planning; delivery	transportation
ESP		<b>Adaptation Plans of the Spanish Port System to Climate Change</b>	planning; funding; delivery	transportation; social; other (sustainability)
ESP		<b>Real-time Monitoring and Drones for a Better Road Bridges Maintenance.</b>	planning; funding; delivery	transportation; ICT
ESP (from EIB)		<b>Metro de Madrid Infrastructure Upgrade</b>	planning; delivery	transportation
ETH (from EU)		<b>Road Sector Policy Support Programs – Ethiopia (Sector Budget Support Modality)</b>	planning; funding; delivery	transportation
FFF (from EU)		<b>Africa Transport Policy Program - SSATP</b>	planning; funding; delivery	transportation
FRA		<b>Sud Europe Atlantique High Speed Rail Link</b>	planning; funding; delivery	transportation
GBR		<b>Ofwat Price Review 19</b>	funding; delivery	Water-Waste
GBR		<b>Asset Information Services Strategic Plan - as part of the Control Period 6 (2019 – 2024) for Network Rail</b>	planning; delivery	transportation; ICT
GER		<b>Bridge Modernization Program, Retrofitting of Older Road Bridges (part A); Research Cluster “Intelligent Bridge” (part B)</b>	planning; delivery	transportation
GER		<b>Quality regulation, CAPEX in period mark-up and investment measures at TSO level by Bundesnetzagentur</b>	delivery	energy
IDN		<b>Eastern Sumatera Highway Preservation in Riau Province</b>	planning; funding; delivery	transportation
IDN		<b>Eastern Sumatera Highway Preservation in South Sumatera Province</b>	planning; funding; delivery	transportation
IND		<b>Long term O&amp;M of Infrastructure Assets through Public Private Partnerships</b>	planning; funding; delivery	transportation
ITA		<b>Bridge Safety National Guidelines</b>	planning	transportation
ITA		<b>ANAS multi-year planning cycle of road maintenance</b>	planning; funding; delivery	transportation; ICT
JPN		<b>National Strategy for Life Extension of Infrastructure</b>	planning; delivery	Water-Waste; transportation; social



Country		Name	Policy	Sector
JPN		<b>Fundamental Policy and Guideline for Pre-Flood Emergency Reservoir Drawdown Operational Procedure for Enhanced Flood Management</b>	planning; funding; delivery	energy; Water-Waste
KOR		<b>Master Plans for Managing Infrastructure (2020-2025)</b>	planning; delivery	energy; Water-Waste; transportation; information and communications; other
KOR		<b>Seoul Metropolitan City's Sustainable Infrastructure Management Plan</b>	planning; funding; delivery	Water-Waste; transportation; other
MEX		<b>Mexico Tollroads MRO (Maintainer – Rehabilitator – Operator) Model</b>	planning; funding; delivery	transportation
NLD		<b>Procurement of Innovative Circular and Modular Bridges</b>	planning; funding; delivery	transportation; social; other (sustainability)
NLD		<b>Vital Assets Program</b>	planning; funding; delivery	transportation
RUS		<b>Investment-Construction Model of Public-Private Partnership in the Development and Maintenance of Port and Coastal Infrastructure</b>	planning; funding; delivery	energy; transportation
RUS		<b>Energy Efficient School Maintenance Systems</b>	delivery	energy; ICT; social
SAU		<b>Treated Wastewater Use Scheme in Al Hasa Oasis</b>	delivery	Water-Waste
SAU		<b>Improve the Efficiency of Sea Water Desalination Plants in the Kingdom of Saudi Arabia - Shuaiba 1 Plant</b>	planning; delivery	energy; Water-Waste
SGP		<b>Singapore Air Traffic Management System Enhancement Project</b>	planning; delivery	transportation; ICT
SGP		<b>Punggol Digital District</b>	delivery	energy
TUR		<b>Istanbul Seismic Risk Mitigation and Emergency Preparedness Project (ISMEP)</b>	planning; funding; delivery	ICT; social
TUR		<b>Eurasia Tunnel: Ventilation Optimization Study</b>	planning; funding; delivery	energy; transportation; other
USA		<b>Pennsylvania Rapid Bridge Replacement</b>	planning; funding; delivery	transportation
USA		<b>The Transform 66 Outside the Beltway</b>	funding; delivery	transportation
ZAF		<b>Expanded Public Works Programme Integrated Grant for Municipalities</b>	planning; funding; delivery	transportation; social
ZAF		<b>Provincial Roads Maintenance Grant</b>	planning; funding; delivery	transportation



## II. Case studies at a glance

The 45 case studies presented in this Annex reflect the great variability of efforts undertaken by the G20, in terms of:

- **Key stakeholders in charge of the intervention** (Figure 1). Half of the cases involve more than one entity to implement the initiative. At the national level, the Ministries of Infrastructure/Transportation have a leading role in many cases (in only two cases Ministries of Finance are directly in charge). Local, regional and city government agencies, as well as sector authorities, are widely involved in infrastructure maintenance cases, while private corporations, government-owned corporations and regulators' participation is less frequent.
- **Administrative level of intervention** (Figure 2). Many examples involve multiple administrative levels (e.g. national, state and city level jointly engaged). Most cases submitted are at the federal or national level, while only two involved supranational entities.
- **Sector** (Figure 3). When counting each sector independently mentioned, transportation is, by far, the most frequently covered, followed by water and waste, and energy.
- **Macro-policy area** (Figure 4). Most of the selected cases touch all three policy areas related to infrastructure maintenance (planning, funding and delivery), followed by 8 cases combining two policy areas (planning and delivery).

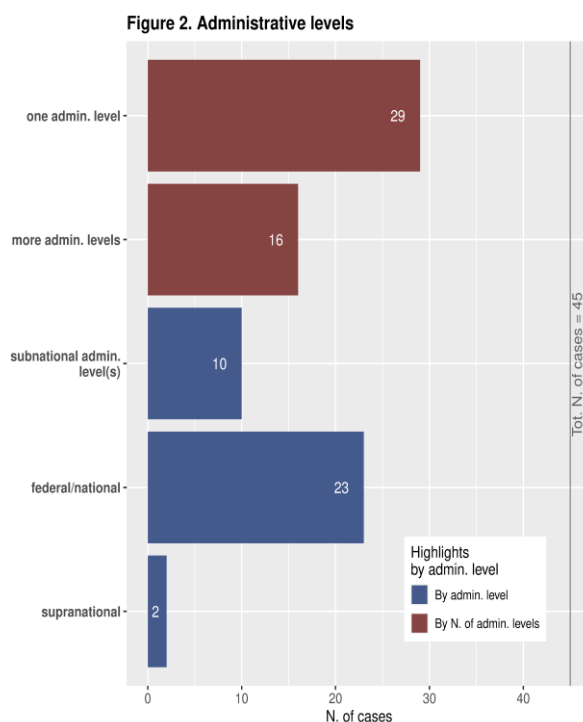
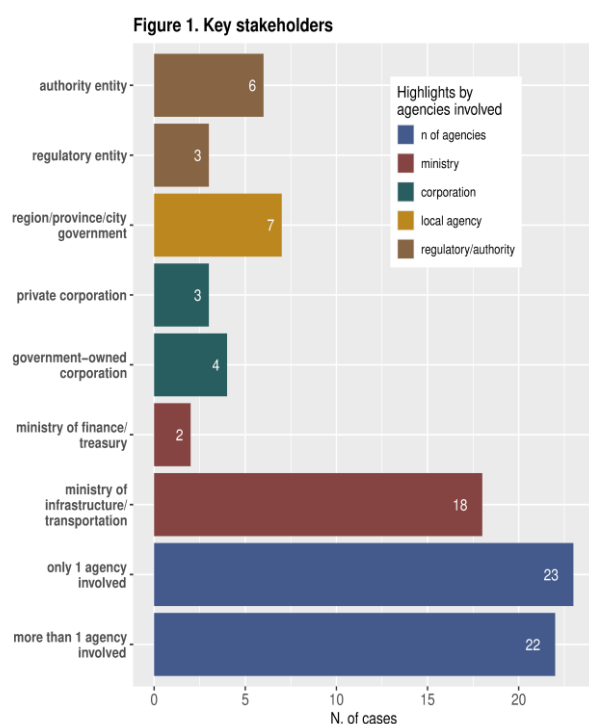




Figure 3. Prevalent sector(s)

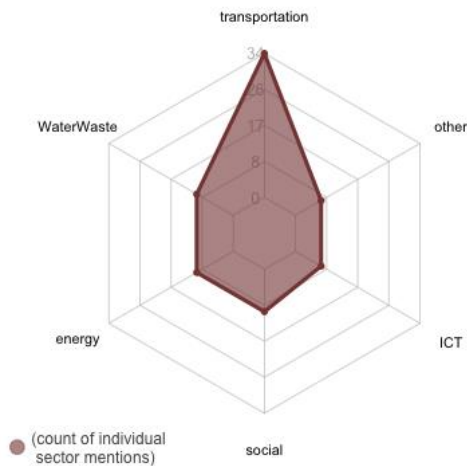
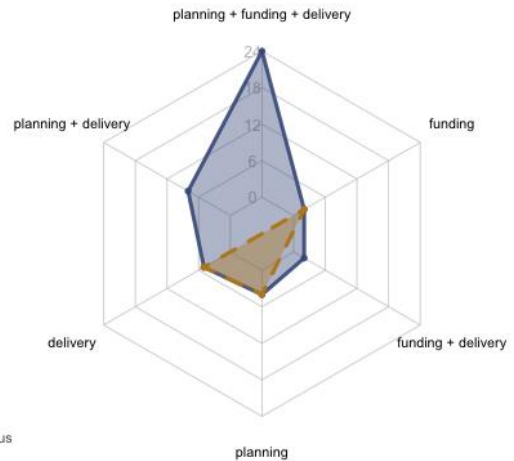


Figure 4. Prevalent Macro-policy area(s)



## IV. Key Insights

Many of the core messages included in the *G20 Policy Agenda on Infrastructure Maintenance* are reflected in the G20 case studies.

### Rationale

- **Maintenance is key to resilience.** Several cases report among their components improvements in term of sustainability and resilience (e.g. energy savings, CO2 emissions reduction, mitigation of natural hazard risk, early warning systems) or even the implementation of circular solutions for procurement and construction of bridges and viaducts.
- **Maintenance is required because of assets' age.** In nine of the selected cases the urgent need for maintenance interventions is explicitly driven by the age of the infrastructure assets.

### Challenges

- **Sectors are increasingly interdependent.** Close to half of the cases concern multiple sectors, where almost every possible combination of the covered sectors is represented. A fair number of cases has a focus on social infrastructure or on extending equitable access to networks, putting people (including vulnerable groups and future generations) at the center of their strategies.
- **Data as an inescapable prerequisite.** Several cases include some sort of data collection, survey or monitoring effort, often at the onset of the initiative to inform subsequent policy decisions.

### Solutions

- **Macro policy 1: Planning and regulation.** Many cases include some form of planning or guidelines revision effort, while a few others propose regulatory innovations. Among other planning-oriented policies reported are: the definition/adoption of standards, cross-agency collaboration and strengthening institutional capacity.



- **Macro policy 2: A role for the private sector in funding.** Several cases illustrate initiatives involving the private sector in the form of Public-Private Partnerships (PPPs), concessions or other contribution from private operators (mostly applied in the transport sector). Additional policies described by the case studies include various instances documenting earmarking of public funding sources for maintenance, including via dedicated funds. The reported initiatives included also a few examples of funding schemes incorporating preparedness to risk and other innovative funding sources.
- **Macro policy 3: Technology and knowledge sharing in improving delivery.** A large share of the examples illustrates initiatives that adopt *InfraTech* solutions (from innovative monitoring approaches, to data-driven, “smart” maintenance solutions, to new material technologies). Notably, there were also 4 cases with an explicit component dedicated to knowledge sharing efforts.

### Benefits

The *G20 Policy Agenda on Infrastructure Maintenance* highlighted the potential of maintenance to generate benefits at the **micro level** (i.e. project-level positive impacts), as well as at the **macro level** (i.e. impact positively affecting society, the economic system and the environment).

- **Project-level benefits.** A fair share of cases explicitly reports some reduction of Operations and Maintenance (O&M) costs associated with the implemented policy tool, often progressively achieved in phases. Some cases illustrate how rethinking approaches to O&M or introducing proper incentives can promote efficiency and construction quality, as well as extending assets’ life span.
- **Socio-economic impact and quality of service delivered to users.** The benefits achieved by reported cases encompass increasing safety and/or access to services. Interestingly, several examples illustrate a shifting to a long-term management perspective aligned with long-term goals set at the national or local level. A few of the reported cases also give explicit consideration to the creation of jobs connected to maintenance projects.
- **Environmental impact.** Energy efficiency gains are the most frequently observed among sustainability-related benefits. Other benefits mentioned are: optimization of water resource management and reduction of construction material use and of CO2 emissions.



## V. Case Studies in detail

Below are the details of the 45 case studies selected among those submitted by IWG members.

### AUS - Roads to Recovery Program

Info	Details
Country	AUS
Sector(s)	transportation
Sub-sector(s)	roads
Administrative level	federal
Key agencies in charge	Department of Infrastructure, Transport, Regional Development and Communications
Policy macro area(s)	funding
Policy specific tool(s)	other
Highlights	The Australian Government's Roads to Recovery Program provides funds to local governments for maintenance of the nation's local road infrastructure asset. Funds can be spent according to local council priorities, empowering local government to undertake road maintenance relevant to their communities.
Intended/achieved outcome(s)	<ul style="list-style-type: none"> <li>- The Roads to Recovery program improves local roads by funding construction and maintenance projects identified at the local level. These projects facilitate greater access for Australians and improve safety and economic and social outcomes.</li> <li>- The program operates uniformly across Australia. Under current arrangements, each council is guaranteed a share of the total available funding.</li> <li>- Councils choose the road projects on which to spend their Roads to Recovery funding based on their own priorities.</li> </ul>
Status & timeline	Roads to Recovery began on 1 January 2001, with funding to 2004-05, and has subsequently been extended several times.
References	<a href="https://investment.infrastructure.gov.au/infrastructure_investment/roads_to_recovery/">https://investment.infrastructure.gov.au/infrastructure_investment/roads_to_recovery/</a>

### AUS - Bridges Renewal Program

Info	Details
Country	AUS
Sector(s)	transportation
Sub-sector(s)	roads; bridges and tunnels





Info	Details
<b>Administrative level</b>	federal
<b>Key agencies in charge</b>	Department of Infrastructure, Transport, Regional Development and Communications
<b>Policy macro area(s)</b>	funding
<b>Policy specific tool(s)</b>	other
<b>Highlights</b>	Under the program, state, territory and local governments can submit projects proposals to a funding round, to access up to \$2.5 million per proposal (up to \$2 million for local governments). Funded projects are selected by the Australian Government and must source at least half of total project costs from outside the Bridges Renewal Program.
<b>Intended/ achieved outcome(s)</b>	Recognising the productivity benefits of bridge works, the Australian Government's Bridges Renewal Program funds the upgrade and replacement of bridges to enhance access for local communities and facilitate higher productivity vehicle access.
<b>Status &amp; timeline</b>	The program is funded to deliver \$760 million across Australia between 2015–16 and 2024–25. To date, the Australian Government has announced funding for five rounds, and plans to open applications for a sixth round in the future.
<b>References</b>	<a href="https://investment.infrastructure.gov.au/infrastructure_investment/bridges_renewal.aspx">https://investment.infrastructure.gov.au/infrastructure_investment/bridges_renewal.aspx</a> .

## BRA - New Basic Sanitation Regulatory Framework

Info	Details
<b>Country</b>	<b>BRA</b>
<b>Sector(s)</b>	Water-Waste
<b>Sub-sector(s)</b>	water supply; drinking water distribution; waste water collection; waste water treatment; solid waste management; other water & waste (drainage and stormwater management); urban infrastructure
<b>Administrative level</b>	national; state; region; city
<b>Key agencies in charge</b>	Ministry of Regional Development (federal government); National Agency of Water and Basic Sanitation (federal government); Subnational governments (states and municipalities); Subnational regulatory agencies (state, regional and municipal)
<b>Policy macro area(s)</b>	planning; funding; delivery



Info	Details
<b>Policy specific tool(s)</b>	<p>Strategic plan addressing infrastructure assets management / maintenance / repairing;  Data collection/analysis effort;  Definition/adoption of standards;  Institutional capacity/ governance;  Strengthened institutional framework;  Regulatory innovations;  Earmarking of funding sources for maintenance;  Regulation and practices to account for deferred maintenance costs in agencies' balance sheets;  Tax expenditures allocated to maintenance or rehabilitation purposes;  Innovative funding sources for delivering maintenance of public infrastructure;  Private sector investments, PPP, etc.;  Funding schemes incorporating preparedness to risk;  Mitigation of disincentives to asset maintenance spending;  Coordinated allocation of various available sources of funds, including supranational</p>
<b>Highlights</b>	<p>The new basic sanitation regulatory framework:</p> <ul style="list-style-type: none"> <li>• Determines that the National Water Agency (ANA) is vested with defining reference guidelines for basic sanitation regulation (including quality and efficiency standards in the provision, maintenance and operation of basic sanitation systems).</li> <li>• Makes it possible to inject more private investments in sanitation services.</li> <li>• Regionalizes the sanitation service provision, so that small municipalities will also be served.</li> <li>• Increases competition, facilitating private investments by opening room for concession contracts and biddings and prohibiting new program contracts. The current program contracts may be maintained until their final term, as long as the companies prove their economic and financial capacity and adapt to the goals of universalizing the framework.</li> <li>• Facilitates the privatization process of a state sanitation company. It eliminates the need of consent from the municipalities if there are no changes in the object and duration of their program contracts.</li> <li>• Brings more regulatory stability, by strengthening ANA, and provides legal certainty for investors, in addition to contributing to the revitalization of hydrographic basins, the conservation of the hydrographic environment and the reduction of water losses.</li> </ul>
<b>Intended/ achieved outcome(s)</b>	<p>The regulatory changes in specific sectors, such as sanitation (federal law n. 14026/2020) are aimed at boosting productivity growth by providing incentives for incumbent firms to adopt innovative technologies, and encouraging the entry of new and innovative firms in the market place, with evident impacts both in the provision of new infrastructures and in the maintenance of existing ones.</p>
<b>Status &amp; timeline</b>	<p>The Federal Law No. 14.026/2020 (Brazil's New Sanitation Legal Framework) was sanctioned on July 15, 2020.</p>



Info	Details
References	<a href="https://www.gov.br/pt-br/noticias/transito-e-transportes/2020/07/novo-marco-de-saneamento-e-sancionado-e-garante-avancos-para-o-pais">https://www.gov.br/pt-br/noticias/transito-e-transportes/2020/07/novo-marco-de-saneamento-e-sancionado-e-garante-avancos-para-o-pais</a> <a href="https://www.gov.br/ana/pt-br/assuntos/saneamento-basico/novo-marco-legal-do-saneamento">https://www.gov.br/ana/pt-br/assuntos/saneamento-basico/novo-marco-legal-do-saneamento</a> <a href="https://agenciabrasil.ebc.com.br/saude/noticia/2020-07/veja-principais-mudancas-no-novo-marco-legal-do-saneamento">https://agenciabrasil.ebc.com.br/saude/noticia/2020-07/veja-principais-mudancas-no-novo-marco-legal-do-saneamento</a> <a href="http://www.planalto.gov.br/ccivil_03/_ato2019-2022/2020/lei/l14026.htm">http://www.planalto.gov.br/ccivil_03/_ato2019-2022/2020/lei/l14026.htm</a> <a href="http://www.planalto.gov.br/ccivil_03/_Ato2007-2010/2007/Lei/L11445.htm">http://www.planalto.gov.br/ccivil_03/_Ato2007-2010/2007/Lei/L11445.htm</a> <a href="https://www.gov.br/ana/pt-br/assuntos/noticias-e-eventos/noticias/ana-define-normas-de-referencia-que-devera-elaborar-para-setor-de-saneamento-ate-2022">https://www.gov.br/ana/pt-br/assuntos/noticias-e-eventos/noticias/ana-define-normas-de-referencia-que-devera-elaborar-para-setor-de-saneamento-ate-2022</a>

## BRA - PROSEFER – National Railway Safety Program in Urban Areas

Info	Details
Country	BRA
Sector(s)	transportation; social
Sub-sector(s)	rail; urban mobility; civic buildings and structures; other social infrastructure (Public social and affordable housing assets)
Administrative level	federal; national
Key agencies in charge	Brazilian National Treasury
Policy macro area(s)	planning
Policy specific tool(s)	Strategic plan addressing infrastructure assets management / maintenance / repairing; Data collection/analysis effort; Definition/adoption of standards; Institutional capacity/ governance
Highlights	The purpose of the PROSEFER is to collect information about the level crossings on Brazilian railways and to rank them according to the priority level, in order to eliminate or reduce the negative effects of these level crossings in the urban areas of municipalities, promoting the safety of the population who lives with railway operations, improving urban mobility and people's quality of life. Its update frequency is yearly. The respondents are: Municipalities, infrastructure ministry, railway operators, railway concessionaires, National Land Transportation Agency, National Department of Transport Infrastructure.
Intended/ achieved outcome(s)	A management tool for planning improvements to existing Brazilian railways; categorize and rank priority investments; increase the transport capacity of the Brazilian railways; improve urban mobility and quality of life in urban areas of municipalities that live daily with the railway activity.



Info	Details
<b>Status &amp; timeline</b>	Launched in 2011, the Program was updated in 2020 for the first time, in order to improve the methodology that led to the prioritization of priority investments. As new level crossings emerge every year and as the data that guide the prioritization of investments are variable, such as vehicle counting at level crossings, it was suggested to promote annual updates for PROSEFER.
<b>References</b>	<a href="https://www.gov.br/dnit/pt-br/assuntos/ferrovias/prosefer">https://www.gov.br/dnit/pt-br/assuntos/ferrovias/prosefer</a>

## CAN - Canada Core Public Infrastructure Survey

Info	Details
<b>Country</b>	CAN
<b>Sector(s)</b>	Water-Waste; transportation; social
<b>Sub-sector(s)</b>	waste water collection; waste water treatment; solid waste management; other water & waste (storm water assets); roads; bridges and tunnels; urban mobility (Public Transportation); tourism and arts (culture assets like art galleries and museums); other social infrastructure (Public social and affordable housing assets)
<b>Administrative level</b>	federal
<b>Key agencies in charge</b>	Statistics Canada; Infrastructure Canada
<b>Policy macro area(s)</b>	planning
<b>Policy specific tool(s)</b>	Strategic plan addressing infrastructure assets management / maintenance / repairing; Data collection/analysis effort; Definition/adoption of standards; Institutional capacity/ governance;
<b>Highlights</b>	The purpose of this survey is to collect statistical information on the inventory, condition, performance and asset management strategies of core public infrastructure assets owned or leased by various levels of Canadian government. Its frequency is every 2 years. Its respondents are: municipalities, regional, provincial and territorial governments, northern communities, public transit authorities and crown corporations.
<b>Intended/ achieved outcome(s)</b>	Assess the condition of infrastructure assets; inform solutions and prioritize investment; monitor and report on progress of infrastructure investments; benchmark communities against similar municipalities nationwide.
<b>Status &amp; timeline</b>	Launched in 2017. Conducted for reference years 2016 and 2018. Reference year 2020 is in development.
<b>References</b>	<a href="https://www23.statcan.gc.ca/imdb/p2SV.pl?Function=getSurvey&amp;SDDS=5173">https://www23.statcan.gc.ca/imdb/p2SV.pl?Function=getSurvey&amp;SDDS=5173</a>



## CAN - Municipal Asset Management Program

Info	Details
Country	CAN
Sector(s)	other
Sub-sector(s)	other (not sector specific)
Administrative level	city
Key agencies in charge	Infrastructure Canada; Federation of Canadian Municipalities
Policy macro area(s)	delivery
Policy specific tool(s)	Solutions improving maintenance planning / lifecycle asset management strategy / risk management; Solution adopting integrated approach
Highlights	Supports municipalities with improving asset management practices through providing funding that enables: asset management assessments; development of asset management plans, policies and strategies; asset-related data collection and reporting; asset management training and organizational development; and knowledge transfer around asset management.
Intended/ achieved outcome(s)	Municipal infrastructure investment decisions are being made through stronger asset management practices using reliable data.
Status & timeline	Launched in 2016. An 8-year, \$110M program funded by Infrastructure Canada.
References	<a href="https://www.fcm.ca/en/programs/municipal-asset-management-program">https://www.fcm.ca/en/programs/municipal-asset-management-program</a>

## CHE - National Roads and Agglomeration Transport Fund

Info	Details
Country	CHE
Sector(s)	transportation
Sub-sector(s)	roads; bridges and tunnels; urban mobility
Administrative level	national
Key agencies in charge	Federal Roads Office (FEDRO)



Info	Details
<b>Policy macro area(s)</b>	planning; funding; delivery
<b>Policy specific tool(s)</b>	Strategic plan addressing infrastructure assets management / maintenance / repairing; Data collection/analysis effort; M&E framework focused on maintenance backlog and budgeting; Definition/adoption of standards; Institutional capacity/ governance; Regulatory innovations; Earmarking of funding sources for maintenance; Tax expenditures allocated to maintenance or rehabilitation purposes; Solutions improving maintenance planning / lifecycle asset management strategy / risk management; Contractual provisions improving maintenance delivery; Solutions improving maintenance delivery; Adoption/sharing of innovation and new technology for maintenance
<b>Highlights</b>	The National Roads and Agglomeration Transport Fund (NAF), introduced in 2017, creates the basis for the federal government to invest enough funds in the operation, maintenance and expansion of the national roads. The NAF is financed mainly through mineral oil and automobile taxes as well as user charges.
<b>Intended/ achieved outcome(s)</b>	The (underlying) law - Legge federale concernente il Fondo per le strade nazionali e il traffico d'agglomerato (LFOSTRA) - defines earmarked funds for the benefit of transportation infrastructure, with a clear prioritization of maintenance and preservation of infrastructure assets
<b>Status &amp; timeline</b>	NAF was launched in 2017.
<b>References</b>	<a href="https://www.astra.admin.ch/astra/it/home/temi/strassenfinanzierung/naf.html">https://www.astra.admin.ch/astra/it/home/temi/strassenfinanzierung/naf.html</a>

## CHE - Electricity Grid Usage Tariff

Info	Details
<b>Country</b>	CHE
<b>Sector(s)</b>	energy
<b>Sub-sector(s)</b>	energy transmission; energy distribution
<b>Administrative level</b>	national
<b>Key agencies in charge</b>	Swissgrid (the national grid company)
<b>Policy macro area(s)</b>	planning; funding; delivery



Info	Details
<b>Policy specific tool(s)</b>	Strategic plan addressing infrastructure assets management / maintenance / repairing; Data collection/analysis effort; M&E framework focused on maintenance backlog and budgeting; Definition/adoption of standards; Institutional capacity/ governance; Strengthened institutional framework; Regulatory innovations; Earmarking of funding sources for maintenance; Regulation and practices to account for deferred maintenance costs in agencies' balance sheets; Solutions improving maintenance planning / lifecycle asset management strategy / risk management
<b>Highlights</b>	According to the Electricity Supply Act (in German: "Stromversorgungsgesetz"), income from the electricity grid usage tariff (in German: "Netznutzungstarif") is used to cover grid maintenance costs.
<b>Intended/ achieved outcome(s)</b>	This ensures the long-term financing of maintenance.
<b>Status &amp; timeline</b>	The law was approved on 15 July 2007 and it is still in effect.
<b>References</b>	Underlying law: <a href="https://www.fedlex.admin.ch/eli/cc/2007/418/it#art_14">https://www.fedlex.admin.ch/eli/cc/2007/418/it#art_14</a> and <a href="https://www.fedlex.admin.ch/eli/cc/2007/418/it#art_15">https://www.fedlex.admin.ch/eli/cc/2007/418/it#art_15</a> Responsible agency: <a href="https://www.swissgrid.ch/en/home.html">https://www.swissgrid.ch/en/home.html</a> (Links are to websites in Italian, as the information is not available in English.)

## CHN - Retrofitting Ageing Highway Bridges

Info	Details
<b>Country</b>	CHN
<b>Sector(s)</b>	transportation; social
<b>Sub-sector(s)</b>	bridges and tunnels; tourism and arts; urban infrastructure
<b>Administrative level</b>	national
<b>Key agencies in charge</b>	Min Transp; Provincial Transp Depts
<b>Policy macro area(s)</b>	planning
<b>Policy specific tool(s)</b>	Strategic plan addressing infrastructure assets management / maintenance / repairing; Data collection/analysis effort



Info	Details
<b>Highlights</b>	As part of its efforts to modernise the infrastructure networks in, China launches a nationwide drive to retrofit ageing highway bridges to improve safety and durability, through improving and expanding traffic capacity and flood resistance capacity, improving technical conditions, and addressing insufficient load-capacity.
<b>Intended/ achieved outcome(s)</b>	Work objectives: 1) By the end of 2023, the retrofit of national and provincial trunk highway bridges classified into 4 or 5 categories in 2019 will be basically completed. 2) By the end of 2025, the retrofit of rural highway bridges classified into 4 or 5 categories in 2019 will be basically completed. The retrofit rate of national and provincial trunk highway bridges newly-classified into 4 or 5 categories should be 100%. A part of ageing existing highway bridges will be retrofit to make the ratio of category 1 and 2 in national express highway reach more than 95%, and the ratio of category 1 and 2 in ordinary national and provincial trunk highway reach more than 90%.
<b>Status &amp; timeline</b>	Work Schedule: 1) By the end of December 2020, the nationwide comprehensive survey has been completed. 2) By the end of February 2021, the total retrofit workload, implementation plan and management system have been determined by the provincial transport departments. 3) Between March 2021 and the end of December 2025, the provincial transport departments will make and implement the retrofit plan of each year, and report the progress to the Ministry of Transport (MOT) on monthly basis.
<b>References</b>	<a href="http://xxgk.mot.gov.cn/2020/jigou/glj/202012/t20201228_3509089.html">http://xxgk.mot.gov.cn/2020/jigou/glj/202012/t20201228_3509089.html</a> <a href="http://xxgk.mot.gov.cn/2020/jigou/glj/202012/P020201229367107959905.doc">http://xxgk.mot.gov.cn/2020/jigou/glj/202012/P020201229367107959905.doc</a> <a href="http://www.mot.gov.cn/2020zhengcejd/weiqiaogz/index.html">http://www.mot.gov.cn/2020zhengcejd/weiqiaogz/index.html</a>

## CHN - Circular of the Ministry of Finance on Issuing the Operation Guideline for Performance Management of PPP Projects

Info	Details
<b>Country</b>	CHN
<b>Sector(s)</b>	energy; Water-Waste; transportation; ICT; social; other
<b>Sub-sector(s)</b>	energy generation; energy storage; energy transmission; energy distribution; energy efficiency; renewable energy; water supply; dams and hydropower ; desalination; drinking water distribution; waste water collection; waste water treatment; solid waste management; irrigation and agri-business ; airports; ports; rail; roads; bridges and tunnels; urban mobility ; telecommunications; information technology; digital connectivity; civic buildings and structures; defense; education; healthcare; justice buildings; sports and recreation; tourism and arts; urban infrastructure; other social (elderly care, social security); other sector (ecological construction and environmental protection, integrated urban development, government infrastructure, affordable housing, forestry, agriculture)
<b>Administrative level</b>	national





Info	Details
<b>Key agencies in charge</b>	Financial departments at all provincial, municipal and county levels
<b>Policy macro area(s)</b>	planning; funding; delivery
<b>Policy specific tool(s)</b>	Definition/adoption of standards; Private sector investments, PPP, etc.; Other funding; Solutions improving maintenance planning / lifecycle asset management strategy / risk management; Contractual provisions improving maintenance delivery; Solutions improving maintenance delivery; Private sector participation in successful delivery of O&M
<b>Highlights</b>	<p>Performance management of PPP projects refers to project management activities including the management of performance targets and indicators, performance monitoring, evaluation and result application carried out throughout the full life cycle of PPP projects. The operation guidelines issued this time are applicable to all PPP projects, including government-pay projects, viability gap funding projects and user-pay projects. The performance evaluation results of PPP projects are an important basis for pay-for-performance.</p> <ul style="list-style-type: none"> <li>- For government-pay projects and viability gap funding projects, the annual operating expenditure borne by the government should be fully correlated with the performance evaluation results of the project company in the year. The financial department shall arrange corresponding expenditures in accordance with the results of the performance evaluation, and the project implementing agency shall make timely payment in accordance with the project contract.</li> <li>- For user-pay projects, the project revenue of the project company should be correlated with the performance evaluation results in the year. If the performance evaluation results are superior to the agreed standards, the project implementing agency shall enforce the incentive clauses agreed in the project contract. If the performance evaluation results fail to meet the agreed standards, the implementing agency shall enforce the default clauses agreed in the project contract, which may be achieved by setting liquidated damages affecting the project revenue, project extension restrictions or affecting price adjustment mechanism.</li> </ul>
<b>Intended/ achieved outcome(s)</b>	The Guideline was issued in order to regulate the full life cycle performance management of PPP projects, and improve the quality and efficiency of public service delivery.
<b>Status &amp; timeline</b>	The Guideline was issued in 2020
<b>References</b>	<a href="https://www.cpppc.org/en/czb/999281.jhtml">https://www.cpppc.org/en/czb/999281.jhtml</a>

## EGY (from EIB) - Cairo Metro Rehabilitation

Info	Details
<b>Country</b>	<b>EGY (from EIB)</b>
<b>Sector(s)</b>	transportation
<b>Sub-sector(s)</b>	urban mobility



Info	Details
<b>Administrative level</b>	national
<b>Key agencies in charge</b>	The metro operator ECM (Egyptian Co. for Metro Management & Operation); owner of the infrastructure NAT (National Authority for Tunnels), resorting under the Ministry of Transport
<b>Policy macro area(s)</b>	planning; delivery
<b>Policy specific tool(s)</b>	Strategic plan addressing infrastructure assets management / maintenance / repairing; Data collection/analysis effort; Other STRATEGIC PLANNING; Adoption/sharing of innovation and new technology for maintenance; Solutions improving maintenance cost management
<b>Highlights</b>	Cairo Metro Line 1 and 2 (the core of Greater Cairo Metro Network) have been in operation for more than 20 years attracting users with low fares and fast journey times. The line has not received a major renovation since its commissioning and most components are in need of an urgent upgrade. Much of the infrastructure and equipment (track, signalling and control, power, electromechanical, telecommunications) is at or near the end of its design life. Reliability, capacity and safety issues are a significant concern. Speed restrictions exist on some parts of the line due to the deteriorated tracks, sleepers and ballast. The signalling and control, which is a combination of classic fixed block signalling with a limited computer overlay, does not meet modern safety standards, does not have modern control capability and is increasingly difficult to maintain as components become unavailable. The power supplies are stretched today and will, with the increase in train services and air-conditioning, require upgrade including doubling the capacity of the overhead line equipment. Due to poor condition of the line, the line is operating at a degraded 3.5 minutes between trains rather than the original design of 2.5-minute headways. This is deemed to be a problem, as the line is overcrowded in the peak hours and passenger demand is forecast to continue to grow.
<b>Intended/ achieved outcome(s)</b>	Given the importance of both lines for the transport system of Cairo and the regional economy, it was decided by the metro operator ECM (Egyptian Co. for Metro Management & Operation) and the owner of the infrastructure NAT (National Authority for Tunnels) to rehabilitate all the systems and tracks to: <ul style="list-style-type: none"> <li>• Improve the reliability and long term sustainability of the metro services; and</li> <li>• Increase the transport capacity of the line by enabling higher speeds and a higher number of trains per hour.</li> </ul> The scope of the rehabilitation includes renewal and upgrading the signalling system, telecommunications systems, electromechanical systems, the centralised control system, the power supply system and renewal of parts of the tracks.



Info	Details
<b>Status &amp; timeline</b>	<p>(Status and funding)</p> <ul style="list-style-type: none"> <li>- Line 1: Design for the rehabilitation of line 1 is completed and procurement started. This is financed with a loan signed in January 2019 for EUR 350 million.</li> <li>- Line 2: Design for the rehabilitation of line 2 is ongoing. This is financed with an EIB loan of a total value of EUR 1.1 bn loan, of which a first tranche of EUR 600 million was signed in December 2020 and a second tranche of EUR 528 million would be signed in 2021. The project related to rehabilitation of the Line 2 is of a value of EUR 240 million that is a part of the EUR 1.1 bn loan.</li> </ul> <p>Rehabilitation of the two metro lines is very complex, considering that works need to take place while metro operations continue. At the same time the cost of such rehabilitation, and timely maintenance in the future is much lower than construction of new lines and is therefore to be prioritised. Both projects are being co-financed by the EBRD and the AFD.</p>
<b>References</b>	<p><a href="http://www.nat.org.eg/english/index.html">http://www.nat.org.eg/english/index.html</a></p> <p><a href="https://www.eib.org/en/projects/loans/all/20160947">https://www.eib.org/en/projects/loans/all/20160947</a></p> <p><a href="https://www.eib.org/en/press/all/2020-407-the-eu-bank-supports-urban-transport-in-egypt">https://www.eib.org/en/press/all/2020-407-the-eu-bank-supports-urban-transport-in-egypt</a></p>

## ESP - Adaptation Plans of the Spanish Port System to Climate Change

Info	Details
<b>Country</b>	ESP
<b>Sector(s)</b>	transportation; social; other (sustainability)
<b>Sub-sector(s)</b>	ports; civic buildings and structures; other (climate change)
<b>Administrative level</b>	national
<b>Key agencies in charge</b>	Puertos del Estado (Spanish Port System)
<b>Policy macro area(s)</b>	planning; funding; delivery
<b>Policy specific tool(s)</b>	<p>Strategic plan addressing infrastructure assets management / maintenance / repairing;</p> <p>Data collection/analysis effort;</p> <p>Institutional capacity/ governance;</p> <p>Coordinated allocation of various available sources of funds, including supranational;</p> <p>Solutions improving maintenance planning / lifecycle asset management strategy / risk management;</p> <p>Solution adopting integrated approach;</p> <p>Solutions integrating resilience into infrastructure intervention</p>



Info	Details
<b>Highlights</b>	<p>Loss of operation in transport infrastructures is one of the risks of climate change. The vulnerability of infrastructures in the face of adversities associated with the current and future climate is diverse, but it will affect ports in a very important way. Changes in the wind and waves are the variables related to the climate that most affect the operation of the ports, being able to paralyze the activity in most of them. For this reason, the Spanish Port System has developed a plan for the adaptation of the Spanish Port System to climate change, which is being implemented to meet the needs of the Port Authorities, consisting of the following steps/actions:</p> <ol style="list-style-type: none"> <li>1) Creation of focal points in each Port Authority to be able to execute the works that respond to this need.</li> <li>2) Development of a methodology in a pilot port, based on the definition of port risks in the present climate. The first step is to carry out an inventory of all possible vulnerabilities. The second step is the creation of a computer tool that will allow each port to define which of these vulnerabilities affect it. Based on the knowledge obtained in the previous step, a specific application will be created to report incidents due to ocean-meteorological phenomena. The objective is to build a database with observations on the effect of climate on infrastructures and port operations. Once it is understood what effects are possible, and a method for tracking them over time has been created, it remains to develop tools to estimate how they will evolve over time, throughout the 21st century</li> <li>3) Extension of the pilot methodology, developed for the pilot port, to the rest of the state-owned port system. The focal points in the ports would be each of the persons associated with the group described in point 1.</li> </ol>
<b>Intended/achieved outcome(s)</b>	<p>This is the basic planning instrument to promote coordinated action against the effects of climate change in Spain. Its main objective is to avoid or reduce present and future damages derived from climate change and to build a more resilient economy and society. It incorporates the new international commitments and contemplates the most recent knowledge on the risks derived from climate change. It includes the development of adaptation plans for ports as a priority line of action.</p>
<b>Status &amp; timeline</b>	<p>With a broader vision, the Government of Spain is working on the National Plan for Adaptation to Climate Change 2021 - 2030. This is the basic planning instrument to promote coordinated action against the effects of climate change in Spain.</p>
<b>References</b>	<p><a href="https://www.miteco.gob.es/es/cambio-climatico/temas/impactos-vulnerabilidad-y-adaptacion/pnacc-2021-2030_tcm30-512163.pdf">https://www.miteco.gob.es/es/cambio-climatico/temas/impactos-vulnerabilidad-y-adaptacion/pnacc-2021-2030_tcm30-512163.pdf</a>  <a href="https://www.naucher.com/wp-content/uploads/2021/01/Marco-estrategico-Propuesta-de-contenidos-Diciembre-1-2020.pdf">https://www.naucher.com/wp-content/uploads/2021/01/Marco-estrategico-Propuesta-de-contenidos-Diciembre-1-2020.pdf</a></p>

## ESP - Real-time Monitoring and Drones for a Better Road Bridges Maintenance.

Info	Details
<b>Country</b>	ESP
<b>Sector(s)</b>	transportation; ICT
<b>Sub-sector(s)</b>	roads; bridges and tunnels; telecommunications; digital connectivity



Info	Details
<b>Administrative level</b>	national
<b>Key agencies in charge</b>	Directorate-General for Roads (Ministry of transport, Mobility and the Urban Agenda)
<b>Policy macro area(s)</b>	planning; funding; delivery
<b>Policy specific tool(s)</b>	Strategic plan addressing infrastructure assets management / maintenance / repairing; Data collection/analysis effort; Private sector investments, PPP, etc; Solutions improving maintenance planning / lifecycle asset management strategy / risk management; Solutions improving maintenance delivery; Adoption/sharing of innovation and new technology for maintenance; Solutions improving maintenance cost management
<b>Highlights</b>	Many areas of road infrastructure are being transformed by digitalization. Some changes are already a reality - such as the installation of fiber optics on the road to obtain data and exchange information with drivers - while others will be developed in the future - such as the use of robots in road construction and maintenance. This case study focuses on two specific uses of technology to improve road maintenance: 1) Real-time bridge monitoring for maintenance planning, and 2) Use of drones for bridge inspection. A real-time monitoring and analysis platform is being created for the bridges that are monitored 24/7. This platform will function as a system for analyzing structures in real time, allowing the different technical teams involved in their maintenance and operation to make almost immediate decisions, depending on the specific needs of each case, and without the need for on-site staff.
<b>Intended/ achieved outcome(s)</b>	The main goal is to maximize safety and service conditions on Spanish roads. Newly built bridges, such as the 1812 Constitution Bridge in Cadiz (inaugurated in 2015) already have this monitoring. Most significantly, it has also been installed in bridges that have been in operation for decades, such as the Rande Bridge in Vigo (inaugurated in 1978) and the Centennial Bridge in Seville (inaugurated in 1992). In addition, the inspection of the bridges will use drones to analyze the condition of bridges over 300 meters long. This will reduce costs and time spent inspecting bridges, allowing more efficient management of the road network.
<b>Status &amp; timeline</b>	These initiatives are in line with the 2030 Safe, Sustainable and Connected Mobility Strategy that guides the Ministry's actions in terms of mobility, infrastructures and transport in the next 10 years, since it implies a commitment to the digitization of infrastructures that does not result in only in the best conservation management but in the safety of the users.
<b>References</b>	<a href="https://www.mitma.gob.es/el-ministerio/sala-de-prensa/noticias/vie-26022021-1138">https://www.mitma.gob.es/el-ministerio/sala-de-prensa/noticias/vie-26022021-1138</a> <a href="https://www.mitma.gob.es/el-ministerio/sala-de-prensa/noticias/jue-04072019-1253">https://www.mitma.gob.es/el-ministerio/sala-de-prensa/noticias/jue-04072019-1253</a>



## ESP (from EIB) - Metro de Madrid Infrastructure Upgrade

Info	Details
Country	ESP (from EIB)
Sector(s)	transportation
Sub-sector(s)	urban mobility
Administrative level	region
Key agencies in charge	Metro de Madrid, owned solely by Madrid Regional Government (Comunidad Autónoma de Madrid).
Policy macro area(s)	planning; delivery
Policy specific tool(s)	Strategic plan addressing infrastructure assets management / maintenance / repairing; Solutions improving maintenance planning / lifecycle asset management strategy / risk management; Solutions improving maintenance delivery
Highlights	<p>Metro de Madrid S.A. ("METRO"), owned solely by Comunidad Autónoma de Madrid (CAM), operates a metro network comprised of 293 km and 301 stations, which makes it one of the biggest in the world.</p> <p>METRO's board of directors approves an annual investment plan, which includes investments to be executed the following year. In order to enable the rehabilitation and renewal works deemed necessary to maintain and improve current service levels, the company considers that a minimum of EUR 135 m per year should be invested on average during the period 2017-2022.</p> <p>This Framework Loan, financed by the EIB, supports the latest investment programme for rehabilitation, renewal and upgrade of part of Metro de Madrid's infrastructure network. This investment programme is aligned with METRO's strategic pillars, namely: 1) public service; 2) efficiency; and 3) client experience. These strategic pillars are at the same time in line with EU and EIB objectives with regards to the enhancement of sustainable public transport use. The project encompasses 6 groups of action plans:</p> <ul style="list-style-type: none"> <li>(a) Rehabilitation and upgrade of stations (buildings and equipment) including measures to improve accessibility for people with reduced mobility;</li> <li>(b) purchase of rolling stock spare parts and rolling stock upgrading;</li> <li>(c) upgrade and rehabilitation of track and structures;</li> <li>(d) specialised equipment/tools;</li> <li>(e) signalling technology to improve supply/demand; and</li> <li>(f) equipment renewal to improve energy efficiency.</li> </ul>



Info	Details
<b>Intended/ achieved outcome(s)</b>	<p>The general objectives of this investment plan are:</p> <ul style="list-style-type: none"> <li>• Improvement of the service offered, to recover previous years' demand levels,</li> <li>• Financial balance and efficiency in some of the key processes,</li> <li>• Improvement of quality and passenger perception.</li> </ul> <p>The following positive socio-economic impacts of the project can be highlighted:</p> <ul style="list-style-type: none"> <li>• Improvement of energy efficiency: The improvement of ventilation in metro lines will improve environmental conditions and reduce energy consumption. Improvement of energy efficiency will also result from upgrading works in different electrical systems.</li> <li>• Improvement of the transport quality and comfort for current and future users of the metro network: The metro services will be more reliable and will offer improved comfort levels after the planned renewal of signaling and communications systems, capacity increase of electric substations, improvements of the electrical and transformation systems and upgrading of rolling stock.</li> <li>• Enhancement of the attractiveness of public transport: The additional service features such as increased accessibility for people with reduced mobility, improved communication infrastructure, increased reliability and safety of escalators, introduction of air conditioning, etc. will help enhance the attractiveness of public transport. In addition, modernisation of metro lines should reduce travel time.</li> <li>• Reduction of operating costs: Maintenance costs are expected to decrease as a result of the track renewal operation. The improvement of energy efficiency and the optimisation of key processes will also introduce a reduction of operating costs.</li> </ul>
<b>Status &amp; timeline</b>	<p>Project implementation phase was originally planned from 2017 until the end of 2019, while execution of some of the planned investments will eventually be extended until the end of 2021. The sub-projects under this Framework loan in support of METRO's investment programme will be executed in the province of Madrid, mainly in Madrid city.</p>
<b>References</b>	<p>Metro de Madrid Accessibility and Inclusion Plan 2016-2020  Renewal plan for stations 2017-2021. Metro de Madrid  Madrid Metro Network Modernisation Plan 2016-2030  (The Modernisation Plan covers metro lines 1,2, 4, 5, 6, 7, 8 and 9, with a total budget of EUR 490 m)</p>

## ETH (from EU) - Road Sector Policy Support Programs – Ethiopia (Sector Budget Support Modality)

Info	Details
<b>Country</b>	<b>ETH (from EU)</b>
<b>Sector(s)</b>	transportation
<b>Sub-sector(s)</b>	roads; other transportation (Logistics, Road safety, Connectivity – transport corridor performance and services)
<b>Administrative level</b>	national; region; city
<b>Key agencies in charge</b>	Ethiopian Roads Authority (ERA), Ethiopian Road Fund Office





Info	Details
<b>Policy macro area(s)</b>	planning; funding; delivery
<b>Policy specific tool(s)</b>	<p>Strategic plan addressing infrastructure assets management / maintenance / repairing;  M&amp;E framework focused on maintenance backlog and budgeting;  Definition/adoption of standards;  Institutional capacity/ governance;  Strengthened institutional framework;  Regulatory innovations;  Earmarking of funding sources for maintenance;  Tax expenditures allocated to maintenance or rehabilitation purposes;  Innovative funding sources for delivering maintenance of public infrastructure;  Mitigation of disincentives to asset maintenance spending;  Solutions improving maintenance planning / lifecycle asset management strategy / risk management;  Solution adopting integrated approach;  Contractual provisions improving maintenance delivery;  Solutions improving maintenance delivery;  Solutions integrating resilience into infrastructure intervention</p>
<b>Highlights</b>	<p>The EU's strategic approach to support Ethiopia's road transport sector reforms &amp; sustainable sector performance is primarily based on the modality of sector budget support. It is aligned to the provision of the Government's "Road Sector Development Programme (RSDP)". Since 2006, the Government has been receiving road sector budget support in the magnitude of € 550 m to accompany their RSDP phases III to V, spearheaded by the Ethiopian Roads Authority (ERA). The Ethiopian road sector budget support programme is framed along key sectoral pillars of policy and strategy, network asset management and financing, institutional set-up etc. Notably, it looked at the sector as a whole and related transformative changes needed from a medium to long-term sustainability perspective. Annual sector budget support releases are based on joint sector performance assessments linked to a set of respective indicators linked to both quantitative and qualitative aspects. Amongst others, performance indicators on road asset management, maintenance management &amp; funding, absorption capacity, maintenance allocations etc. have been featuring prominently throughout EU road sector budget support programmes since 2006, complemented by indicators on access to all weather roads (the rural dimension), roads condition, fatalities, overloading, contractual performance etc.</p>





Info	Details
<b>Intended/ achieved outcome(s)</b>	<p>Key achievements:</p> <ul style="list-style-type: none"> <li>Between 2009 and 2017, the trend of federal roads and regional roads annually maintained has to a great extent steadily increased from some 13.000 km to 18.000 km (federal) and from some 7.300 km to almost 10.000 km (regional);</li> <li>The evolution of the rural roads accessibility has been growing from 52% of rural communities with access to all-weather roads in 2011 to 72% in 2016; the area further than 2 km from all-weather roads dropped from 69% in 2013 to 63% in 2018;</li> <li>The paved and gravel core road network condition (good and fair) has been constantly improving and remains at a satisfactory level. It has gradually increased from 69% in 2006 to 93% in 2017.</li> <li>Reforms to the Road Fund, including lifting a cap previously imposed on direct transfer of fuel levy, a new revenue source (Axle Load Based annual vehicle's licence renewal fee), and regarding ERA's asset management tools and maintenance mandate;</li> <li>The overall allocation to road maintenance has increased through the years by some 75% (from 2013 to 2018), but further efforts are needed to cover needs and maintenance backlog;</li> </ul> <p>The results achieved in some 15 years of RSDP support can be summarised as being quite essential. At the same time, critical areas have been flagged which demand stronger efforts and future support, particularly in relation to overload control, rural roads financing &amp; management, trade and transport facilitation and corridor connectivity-efficiency matters. Within the overall approach outlined above, accompanying capacity building services under project modalities were delivered. Those contributed to significant institutional reforms, to cope with the increasing road network and its asset management systems, specifically with regard to the set-up, functioning and operations of the Road Fund, highway management systems etc..</p>
<b>Status &amp; timeline</b>	<p>Since 2006, performance indicators on road asset management, maintenance management &amp; funding, absorption capacity, maintenance allocations etc. have been featuring prominently throughout EU road sector budget support programmes, complemented by indicators on access to all weather roads (the rural dimension), roads condition, fatalities, overloading, contractual performance etc.</p> <p>As from 2021, in view of the evolution of the transport sector, government priorities and changing needs, the new EU budget support operation shifts focus to smart and sustainable connectivity &amp; efficiency, trade facilitation, logistics and safety. At the same time, it aims at consolidating the achievements under the past budget support programme regarding road asset management and maintenance.</p>
<b>References</b>	<p>Videos:  Health via Healthy Roads   Capacity4dev (europa.eu)  <a href="https://vimeo.com/271133772">https://vimeo.com/271133772</a></p>

## FFF (from EU) - Africa Transport Policy Program - SSATP

Info	Details
<b>Country</b>	<b>FFF (from EU)</b>
<b>Sector(s)</b>	transportation
<b>Sub-sector(s)</b>	roads; urban mobility; other transportation (multi-modal transport approaches under aspects of connectivity & regional integration)



Info	Details
<b>Administrative level</b>	supranational; national; region; city
<b>Key agencies in charge</b>	<p>Operational Set-up: The SSATP is financed by the contributions of development partners to a trust fund administered by the World Bank. Current donors are the European Commission (EC), Swiss State Secretariat for Economic Affairs (SECO), Agence Française de Développement (AFD), and African Development Bank (AfDB).</p> <p>[governance structure omitted...]Partnerships: The SSATP is fostering partnership with institutions and initiatives with similar objectives such as institutions e.g. Africa Corridor Management Alliance (ACMA), MCLI (Maputo Corridor Logistics Initiative), Central Corridor, and ALCO (Asset-Liability Committee); with WCO (World Customs Organization) and IRU (International Road Union) on the transit regimes; with Mobilize Your City (MYC), IUTP/UATP (International Association of Public Transport/, and Leaders in Urban Transport Planning (LUTP) to promote the urban mobility agenda; and with the International Traffic Safety Data and Analysis Group (IRTAD), FIA (Federation Internationale de l'Automobile), and GRSF (Global Road Safety Fund) in the form of a strategic alliance to tackle issues related to data collection and analysis.</p>
<b>Policy macro area(s)</b>	planning; funding; delivery
<b>Policy specific tool(s)</b>	<p>Strategic plan addressing infrastructure assets management / maintenance / repairing;  M&amp;E framework focused on maintenance backlog and budgeting;  Definition/adoption of standards;  Institutional capacity/ governance;  Strengthened institutional framework;  Regulatory innovations;  Earmarking of funding sources for maintenance;  Innovative funding sources for delivering maintenance of public infrastructure;  Road Fund Maintenance Funding &amp; Management;  Solutions improving maintenance planning / lifecycle road asset management strategy / risk management;  Solutions improving maintenance delivery;  Solutions improving maintenance cost management</p>



Info	Details
<b>Highlights</b>	<p>Over more than three decades, the “Africa Transport Policy Program” - SSATP, formerly “Sub-Saharan Africa Transport Policy Program” - has been shaping African sound transport policies. It has gained the confidence of high-level policy makers such as the African Union Commission (AUC), Regional Economic Communities (RECs) and national governments, the community of transport practitioners across Africa, and the development partner community. The mission of the SSATP is to facilitate policy development and capacity building in the transport sector in Africa. SSATP activities follow the policy development cycle: knowledge creation and dissemination, advocacy, knowledge application etc. In the meantime, the program is proud on the membership of 42 African partner countries.</p> <p>The European Commission has supported the SSATP as key financier with more than EUR 22 million in support of the program’s previous development plans DP1 &amp; DP2 up to the present DP3 finishing mid 2021. Other key financiers are the Swiss State Secretariat for Economic Affairs (SECO), the Agence Française de Développement (AFD), the African Development Bank (AfDB) and the World Bank. Funds are channelled through a multi-donor Trust Fund administered by the World Bank.</p> <p>The European Commission is a member of the SSATP Executive Committee that is spearheaded by the AUC with the support of UNECA (United Nations Economic Commission for Africa).</p>
<b>Intended/ achieved outcome(s)</b>	<p>SSATP has made the commercialization of the road sector a thematic priority through its Road Management and Financing (RMF) thematic component within the program’s 1st and 2nd Development Plans (2004 to 2015); the program significantly contributed and made essential achievements by supporting the establishment of a sustainable financing mechanism &amp; legislation for road maintenance (Road Funds) and by improving road management practices (Road Agencies) in African countries; supported the creation of the Africa Road Maintenance Funds Association (ARMFA) with a view (i) to promote a network for exchange of experiences and information on good practices in the financing of road maintenance in Africa and (ii) vis-à-vis the promotion and strengthening of ties between Road Maintenance Funds in Africa.</p> <p>In 2021, the program’s key focus has shifted in response to evolving transport challenges in Africa towards the key pillars of (i) Regional Integration/Connectivity, (ii) Urban Transport and Mobility, (iii) and Road Safety</p>
<b>Status &amp; timeline</b>	<p>In its present phase of the 3rd Development Plan nearing completion by mid 2021, the program’s key focus has shifted in response to evolving transport challenges in Africa towards the key pillars of (i) Regional Integration/Connectivity, (ii) Urban Transport and Mobility, (iii) and Road Safety.</p> <p>The program continues supporting and consolidating RMF activities on road asset management, sustainable maintenance and financing through dissemination of good practices on road maintenance governance &amp; legislation as guidance for the creation of second-generation road funds or for reforming the existing first-generation road funds. It further continues contributing to ARMFA’s Annual General Assemblies to share the latest knowledge products in RMF.</p>
<b>References</b>	<p><a href="https://www.ssatp.org/">https://www.ssatp.org/</a>  <a href="https://www.ssatp.org/publications">https://www.ssatp.org/publications</a></p>



## FRA - Sud Europe Atlantique High Speed Rail Link

Info	Details
Country	FRA
Sector(s)	transportation
Sub-sector(s)	rail
Administrative level	national; region
Key agencies in charge	Sud Europe Atlantique High Speed Rail Link (France); LISEA S.A.S
Policy macro area(s)	planning; funding; delivery
Policy specific tool(s)	<p>Strategic plan addressing infrastructure assets management / maintenance / repairing;            Data collection/analysis effort;            Definition/adoption of standards;            Regulatory innovations;            Socio-economic observatory during the first 10 years of the Project;            Private sector investments, PPP, etc.;            Other funding;            Solutions improving maintenance planning / lifecycle asset management strategy / risk management;            Contractual provisions improving maintenance delivery;            Solutions improving maintenance delivery;            Adoption/sharing of innovation and new technology for maintenance;            Resilience or maintenance solution relying on nature-based approaches / green infrastructure;            Private sector participation in successful delivery of O&amp;M</p>



Info	Details
<b>Highlights</b>	<p>The Sud Europe Atlantique High-Speed Line is a 302-km long dual-track railway between Tours and Bordeaux, with 38km of additional links to the main cities in the South-West of France. (€7.7bn of investment).</p> <p>The project includes 445 structures in total, including 391 standard structures ("ouvrages d'art courants"), and 35 non-standard structures ("ouvrages d'art particuliers"), which had to be tailored to suit the particular site constraints, as well as 19 viaducts ("ouvrages d'art non-courants"). There are no tunnels on the route. Obligations and risks associated with the construction and operation and maintenance of the line have been transferred to contractors on a "back-to-back" and "if-and-when" basis under an operation and maintenance Contract entered into with MESEA (70% VINCI Concessions, 30% Systra).</p> <p>MESEA is in charge of the monitoring and routine maintenance of all the components of the line: tracks, catenaries, signalling/IT systems and civil works. MESEA operates with four maintenance bases along the line and almost 200 employees. The maintenance task orders are issued by a computerised maintenance management system. MESEA performs three types of Preventive Maintenance:</p> <ul style="list-style-type: none"> <li>• Systematic Preventive Maintenance: undertaken at fixed intervals in accordance with standards or at the completion of a defined number of usage cycles, but without prior checking of the state of the asset concerned;</li> <li>• Conditional Preventive Maintenance: based on monitoring of an asset's performance and/or significant performance parameters and includes additional actions required during hot weather or ice etc.; and</li> <li>• Predictive Maintenance: performed at intervals determined by extrapolation of significant parameters relating to an asset's degradation characteristics over time.</li> </ul> <p>LISEA remain responsible for major maintenance and renewals activities.</p>
<b>Intended/ achieved outcome(s)</b>	<p>The Sud Europe Atlantique HSL carries 20.5 million passengers per year between the South-West regions of France and Paris, and North and East regions of France. HSL SEA offers journey times between Paris and Bordeaux of 2h compared to 3h before construction.</p> <p>The route has been designed for speeds of up to 350 kph. The commercial speed is 320 kph.</p> <p>The Concession Agreement defines performance indicators and penalties are imposed in the case of failure to meet annual performance thresholds for regularity, reliability, availability and passenger comfort.</p>
<b>Status &amp; timeline</b>	The Sud Europe Atlantique HSL has been in service since 2nd July 2017.
<b>References</b>	<a href="https://www.lisea.fr/">https://www.lisea.fr/</a> <a href="https://www.mesea.fr/">https://www.mesea.fr/</a>

## GBR - Ofwat Price Review 19

Info	Details
<b>Country</b>	GBR
<b>Sector(s)</b>	Water-Waste
<b>Sub-sector(s)</b>	water supply; waste water collection; waste water treatment; solid waste management



Info	Details
<b>Administrative level</b>	national; region
<b>Key agencies in charge</b>	Ofwat
<b>Policy macro area(s)</b>	funding; delivery
<b>Policy specific tool(s)</b>	Private sector investments, PPP, etc.; Solutions improving maintenance planning / lifecycle asset management strategy / risk management; Solutions improving maintenance delivery; Resilience or maintenance solution relying on nature-based approaches / green infrastructure
<b>Highlights</b>	The Ofwat (regulator) Price Review 2019 (PR19) looks to deliver on resilience as a key theme of the review. The document sets out draft determinations which look to assess business plans and integrate into a wider review of companies' resilience action plans. As such, businesses submit business plans to Ofwat, and these are mapped onto government priorities (including resilience and maintenance). Ofwat then outlines expectations and findings in relation to companies' plans on long term resilience. This can include the quality of their resilience frameworks or maintaining stable asset health.
<b>Intended/ achieved outcome(s)</b>	It looks to deliver on resilience as a key theme of the review.
<b>Status &amp; timeline</b>	The determinations for 2019 has pledged £12bn extra funding to increase resilience and protect the environment.
<b>References</b>	<a href="https://www.ofwat.gov.uk/wp-content/uploads/2020/12/PR24-and-beyond-Our-reflections-on-lessons-learnt-from-PR19.pdf">https://www.ofwat.gov.uk/wp-content/uploads/2020/12/PR24-and-beyond-Our-reflections-on-lessons-learnt-from-PR19.pdf</a>

## GBR - Asset Information Services Strategic Plan - as part of the Control Period 6 (2019 – 2024) for Network Rail

Info	Details
<b>Country</b>	<b>GBR</b>
<b>Sector(s)</b>	transportation; ICT
<b>Sub-sector(s)</b>	rail; information technology
<b>Administrative level</b>	national



Info	Details
<b>Key agencies in charge</b>	Department for Transport; Network rail
<b>Policy macro area(s)</b>	planning; delivery
<b>Policy specific tool(s)</b>	Data collection/analysis effort; Definition/adoption of standards; Institutional capacity/ governance; Solutions integrating resilience into infrastructure intervention
<b>Highlights</b>	The UK's Asset Information Services Strategic Plan focuses on providing a managed portfolio of services that are relevant to the users of railways, enabling the optimal and sustainable balancing of investment, safety risk, and performance of the railway. It supports the UK's Network Rail strategic asset management business plans and is a key foundation for the digital railway.
<b>Intended/ achieved outcome(s)</b>	With the broad aim of improving cost efficiency, resiliency and sustainability of rail systems and services, this is a data-driven strategy that will extend and improve the management of data in this area.
<b>Status &amp; timeline</b>	The AIS is part of the broader CP6 (Control Period 6: 2019-2024) plan, a 5-year timespan that details financial planning for Network Rail.
<b>References</b>	CP6 (Control Period 6: 2019-2024): <a href="https://www.networkrail.co.uk/who-we-are/publications-and-resources/our-delivery-plan-for-2019-2024/">https://www.networkrail.co.uk/who-we-are/publications-and-resources/our-delivery-plan-for-2019-2024/</a> Asset Information Services: <a href="https://www.networkrail.co.uk/wp-content/uploads/2019/06/Strategic-Plan-Asset-Information-Services.pdf">https://www.networkrail.co.uk/wp-content/uploads/2019/06/Strategic-Plan-Asset-Information-Services.pdf</a>

## GER - Bridge Modernization Program, Retrofitting of Older Road Bridges (part A); Research Cluster "Intelligent Bridge" (part B)

Info	Details
<b>Country</b>	<b>GER</b>
<b>Sector(s)</b>	transportation
<b>Sub-sector(s)</b>	bridges and tunnels
<b>Administrative level</b>	federal
<b>Key agencies in charge</b>	Ministry of Transport and digital Infrastructure
<b>Policy macro area(s)</b>	planning; delivery



Info	Details
<b>Policy specific tool(s)</b>	<p>Strategic plan addressing infrastructure assets management / maintenance / repairing;            Definition/adoption of standards;            Solutions improving maintenance planning / lifecycle asset management strategy / risk management;            Solution adopting integrated approach;            Solutions improving maintenance delivery;            Data collection/analysis effort;            Solutions improving maintenance planning / lifecycle asset management strategy / risk management;            Solutions improving maintenance delivery</p>
<b>Highlights</b>	<p>A) Growing traffic volume, which is expressed by higher total vehicle weights and higher axle loads as well as by a considerably increased number of transports, together with aging structures and known technical deficits make comprehensive retrofitting and modernization measures necessary. Bridge modernization includes all measures for adapting existing bridge structures to changed boundary conditions regarding load-bearing capacity, traffic safety and durability. To ensure that the modernization measures are carried out as efficiently as possible, a continuous network of particularly heavily loaded routes has been defined as the modernization network. In this network, the required load-bearing capacity of the structures is to be ensured throughout by the year 2030. The network contains about 5200 bridge structures (10000 partial structures) and it largely corresponds to the TEN-T core network.</p> <p>B) Current challenges such as increasing traffic loads and the aging bridge stock enhance the demands on bridge structures and require new, effective and efficient solutions. The research cluster "Intelligent Bridge" was established at the Federal Highway Research Institute (BAST).</p>
<b>Intended/ achieved outcome(s)</b>	<p>A) The possibilities offered by the structural assessment guideline range from more accurate resistance models that consider the structural boundary conditions of the aged structures, through traffic load models that depend on the actual traffic characteristics, to modified partial safety factors and the characteristic values required for the calculation to consider materials that are no longer in use today. As a result, the financial resources can be used in an even more targeted and efficient manner.</p> <p>B) The aim is to develop a modular system for the continuous recording and analysis of relevant measured parameters with regard to impacts and structural reactions, as well as their evaluation and the visualization of results. Information on changes in condition and forecasts will provide a basis for predictive maintenance management. In this sense, the reserves of the bridges and their components are to be fully utilized and at the same time failures are to be avoided in order to ensure the best possible availability.</p>





Info	Details
<b>Status &amp; timeline</b>	<p>A) In 2011, the Federal Ministry of Transport and Digital Infrastructure (BMVI) published a guideline for the recalculation of existing road bridges (structural assessment guideline) to ensure that the load-bearing capacity of many of the existing bridge structures, which are already between 40 and 60 years old, is assessed as realistically as possible. Since then, the guideline has been continuously developed and expanded to include new findings from departmental research conducted for this purpose.</p> <p>B) While initial conceptual projects focused on the feasibility and fundamentals of assessment methods and the development of instrumented components such as expansion joints and bridge bearings, the focus of current work is on testing and evaluating components with regard to their suitability for practical use under real conditions, as well as on their further development.</p>
<b>References</b>	<a href="http://www.bmvi.de">www.bmvi.de</a> <a href="http://www.bast.de">www.bast.de</a> <a href="http://www.intelligentebruecke.de">www.intelligentebruecke.de</a>

## GER - Quality regulation, CAPEX in period mark-up and investment measures at TSO level by Bundesnetzagentur

Info	Details
<b>Country</b>	GER
<b>Sector(s)</b>	energy
<b>Sub-sector(s)</b>	energy transmission; energy distribution
<b>Administrative level</b>	federal; national
<b>Key agencies in charge</b>	Bundesnetzagentur (Federal Network Agency for Electricity, Gas, Telecommunications, Post and Railway)
<b>Policy macro area(s)</b>	delivery
<b>Policy specific tool(s)</b>	Strategic plan addressing infrastructure assets management / maintenance / repairing; Solutions improving maintenance planning / lifecycle asset management strategy / risk management; Solutions improving maintenance delivery



Info	Details
<b>Highlights</b>	<p>Bundesnetzagentur (BNetzA), the German Federal multisector economic regulator is in charge of energy regulation since 2005 based on the Energy Industry Act and the Incentive Regulation Ordinance. As a Federal body BNetzA is responsible for all transmission system operators (TSOs) and distribution system operators (DSOs) with more than 100,000 customers or crossing more than one federal state. With regard to energy infrastructure BNetzA is responsible to implement third party access, unbundling provisions and in particular for approving grid charges with an incentive regulation (since 2009) as well as setting the rate of return on equity.</p> <p>Details about key measures:</p> <ol style="list-style-type: none"> <li>1. Quality regulation: Under a regulatory regime that provides incentives to cut costs, there is a risk that operators will neglect maintenance or necessary investments to provide a certain quality of supply. To counter this, the regime includes quality regulation for electricity distribution networks. This takes the form of a quality element in the formula for setting the revenue caps. Operators achieving above-average quality in past years will have a certain amount added to their cap, while operators with comparatively poor quality levels will have amounts deducted (bonus/penalty system). This quality element was implemented in 2014. Each DSO faces a trade-off whether to invest money in order to maintain a high level of quality of supply or to cut those costs and risk a penalty on its allowed revenues</li> <li>2. CAPEX in period mark-up: The mark-up depends on the network operators' investment activity in new assets in years different from the reference year. No distinction is made between replacement and enhancement or expansion expenditures. The mark-up only applies to DSOs and is based on cost forecasts. Operators have to apply for the mark-up six months in advance. The CAPEX mark-up is part of the so-called annual CAPEX true-up. The true-up also includes a yearly CAPEX adjustment, for depreciation which is determined prior to the regulatory period. It reflects the actual reduction of CAPEX due to amortisation in the revenue cap.</li> <li>3. Investment measures at TSO level: Having investment measures granted means that these costs are treated as "non- controllable" costs for the measures' duration and directly passed through to the allowed revenues. Non-controllable costs are an element of the formula for setting the revenue caps, too. Thus, TSOs are able to quickly and completely refinance their expansion and restructuring investments through investment measures. Proposed expansion and restructuring investments can be approved provided they are required for the stability of the system as a whole, for incorporation into the national or international interconnected grid, or for expansion of the network to meet energy supply requirements. Thus, if a maintenance measure is structured as an expansion or restructuring investment, it will be passed through directly to the allowed revenues without any deductions.</li> </ol> <p>Last but not least since 2011 BNetzA is also responsible for approving the national network development plan (NDP) for electricity transmission networks (the four German TSOs have to submit a joint national NDP) and for gas transmission networks (again the 16 German TSOs have to submit a joint national NDP).</p>



Info	Details
<b>Intended/achieved outcome(s)</b>	<p>Since 2009 BNetzA implements the incentive regulation for energy transmission and distribution network operators (TSOs and DSOs). Given the high number of operators in Germany and the aim of incentivizing efficient grid operation as well as ensuring efficient grid investment BNetzA introduced in 2009 the incentive regulation as a dynamic and predictable form of regulation. Based on an efficiency benchmark BNetzA calculates with the revenue cap formula for each operator a revenue cap setting the efficiency target (relative to the most efficient operator and factoring in a general productivity factor X-gen) to be reached during the regulatory period ("individual revenue path"). BNetzA carries out the efficiency benchmark for all operators in Germany. The incentive regulation includes all costs, i.e. capital expenditure (CAPEX) and operational expenditure (OPEX), thus following a total expenditure or TOTEX approach and splits the cost shares in the following three categories:</p> <ul style="list-style-type: none"> <li>• non-controllable costs (not subject to efficiency requirements);</li> <li>• temporarily non-controllable costs (subject to efficiency requirements);</li> <li>• controllable costs (inefficiencies have to be eliminated during the regulatory period).</li> </ul>
<b>Status &amp; timeline</b>	<p>All described regulatory elements are part of the German Incentive Regulation and already implemented:</p> <ol style="list-style-type: none"> <li>1. Quality regulation: This quality element was implemented in 2014. Each DSO faces a trade-off whether to invest money in order to maintain a high level of quality of supply or to cut those costs and risk a penalty on its allowed revenues</li> <li>2. CAPEX mark-up: A CAPEX in period mark-up was introduced into the regulatory formula supplanting the budget approach in 2016 in order to alleviate industry's concerns about time lags.</li> <li>3. Investment measures at TSO level: TSOs have the possibility to apply for so-called "investment measures" which have been introduced in 2012.</li> </ol> <p>Last but not least since 2011 BNetzA is also responsible for approving the national network development plan (NDP) for electricity transmission networks (the four German TSOs have to submit a joint national NDP) and for gas transmission networks (again the 16 German TSOs have to submit a joint national NDP).</p>
<b>References</b>	<p><a href="https://chairgovreg.fondation-dauphine.fr/sites/chairgovreg.fondation-dauphine.fr/files/attachments/180410_synthese_0.pdf">https://chairgovreg.fondation-dauphine.fr/sites/chairgovreg.fondation-dauphine.fr/files/attachments/180410_synthese_0.pdf</a></p> <p>OECD Network of Economic Regulators (NER): <a href="http://www.oecd.org/gov/regulatory-policy/ner.htm">http://www.oecd.org/gov/regulatory-policy/ner.htm</a></p> <p>Bundesnetzagentur: <a href="http://www.bundesnetzagentur.de">www.bundesnetzagentur.de</a></p> <p>Press release of 5 March 2021: <a href="https://www.bundesnetzagentur.de/SharedDocs/Downloads/EN/BNetzA/PressSection/PressReleases/2021/20210305_Netzausbaubericht.pdf?__blob=publicationFile&amp;v=2">https://www.bundesnetzagentur.de/SharedDocs/Downloads/EN/BNetzA/PressSection/PressReleases/2021/20210305_Netzausbaubericht.pdf?__blob=publicationFile&amp;v=2</a></p> <p>Report (German only): <a href="https://www.bundesnetzagentur.de/DE/Sachgebiete/ElektrizitaetundGas/Unternehmen_Institutionen/NetzentwicklungundSmartGrid/Zustand_VN/ZustandVN_node.html">https://www.bundesnetzagentur.de/DE/Sachgebiete/ElektrizitaetundGas/Unternehmen_Institutionen/NetzentwicklungundSmartGrid/Zustand_VN/ZustandVN_node.html</a></p>

## IDN - Eastern Sumatera Highway Preservation in Riau Province

Info	Details
<b>Country</b>	IDN
<b>Sector(s)</b>	transportation



Info	Details
<b>Sub-sector(s)</b>	roads
<b>Administrative level</b>	national
<b>Key agencies in charge</b>	Directorate General of Highways, Ministry of Public Work
<b>Policy macro area(s)</b>	planning; funding; delivery
<b>Policy specific tool(s)</b>	<p>Definition/adoption of standards;  Institutional capacity/ go; ernance;  Strengthened institutional framework;  Regulatory inno; ations;  Private sector investments, PPP, etc.  Solutions improving maintenance planning / lifecycle asset management strategy / risk management;  Solution adopting integrated approach;  Contractual provisions improving maintenance delivery;  Solutions improving maintenance delivery;  Private sector participation in successful delivery of O&amp;M</p>
<b>Highlights</b>	<p>Eastern Sumatera Highway Preservation in Riau Province (Non Toll Road)  The project is a concession agreement between the Directorate General of Highways, MoPWH and PT Adhi Jalintim Riau, a private sector company, to design, build, finance, operate and maintain (DBFOM) Eastern Sumatera Highway Preservation in Riau Province. The main scope of the project is to carry out the preservation of the 43 km long Riau National Road for 3 sections non toll road include 4 bridges and 1 unit weighbridge facility.</p>
<b>Intended/ achieved outcome(s)</b>	<p>The project is the second PPP project in the non toll road sector in Indonesia. As one of the alternative financing schemes, this PPP project is a form of Government support for the community through infrastructure projects that have a major impact on economic improvement (backbone of national economic growth), namely through increasing connectivity between regions, especially those used as logistics, tourism, access roads to ports and airports, and savings in Vehicle Operating Costs (BOK) and the value of travel time.</p>
<b>Status &amp; timeline</b>	<p>For the Highway Preservation in Riau the contract was signed in April 2021 and will start the preservation/construction in October 2021. The project, with investment cost of Rp654,7 billion, has a concession periode pf 15 years consisting of 3 years of construction periode and 12 years of delivery service. The project has achieved PPP Signing Agreement stage and currently under preparation financial close stage. The project granted various supports from the Ministry of Finance, namely the Project Development Facility and infrastructure guarantee from IIGF.</p>
<b>References</b>	<p><a href="https://kpbu.kemenkeu.go.id/proyek/detail/59-preservasi-jalan-nasional-lintas-timur-sumatera-di-provinsi-riau">https://kpbu.kemenkeu.go.id/proyek/detail/59-preservasi-jalan-nasional-lintas-timur-sumatera-di-provinsi-riau</a></p>



## IDN - Eastern Sumatera Highway Preservation in South Sumatera Province

Info	Details
Country	IDN
Sector(s)	transportation
Sub-sector(s)	roads
Administrative level	national
Key agencies in charge	Directorate General of Highways, Ministry of Public Work
Policy macro area(s)	planning; funding; delivery
Policy specific tool(s)	<p>Definition/adoption of standards;  Institutional capacity/ governance;  Strengthened institutional framework;  Regulatory innovations;  Private sector investments, PPP, etc.  Solutions improving maintenance planning / lifecycle asset management strategy / risk management;  Solution adopting integrated approach;  Contractual provisions improving maintenance delivery;  Solutions improving maintenance delivery;  Private sector participation in successful delivery of O&amp;M</p>
Highlights	<p>Eastern Sumatera Highway Preservation in South Sumatera Province (Non Toll Road)  The project is a concession agreement between the Directorate General of Highways, MoPWH and PT Jalintim Adhi-Abipraya, a private sector company, to design, build, finance, operate and maintain (DBFOM) Eastern Sumatera Highway Preservation in South Sumatera Province. The main scope of the project is to carry out the preservation of the 29,87 km long South Sumatera National Road for 6 section non toll road include 14 bridges and 2 unit weighbridges facility. The project, with investment cost of Rp982 billion, has a concession period of 15 years consisting of 3 years of construction period and 12 years of delivery service. The project has achieved financial close stage and currently under preparation construction stage. The project granted various supports from the Ministry of Finance, namely the Project Development Facility and infrastructure guarantee from IIGF.</p>
Intended/ achieved outcome(s)	<p>As one of the alternative financing schemes, this PPP project is a form of Government support for the community through infrastructure projects that have a major impact on economic improvement (backbone of national economic growth), namely through increasing connectivity between regions, especially those used as logistics, tourism, access roads to ports and airports, and savings in Vehicle Operating Costs (BOK) and the value of travel time.</p>
Status & timeline	<p>The PPP contract of Highway Preservation in South Sumatra between the government and the private partner was signed in August 2020 and started preservation/construction in February 2021</p>



Info	Details
References	<a href="https://kpbu.kemenkeu.go.id/proyek/detail/59-preservasi-jalan-nasional-lintas-timur-sumatera-di-provinsi-sumatera-selatan">https://kpbu.kemenkeu.go.id/proyek/detail/59-preservasi-jalan-nasional-lintas-timur-sumatera-di-provinsi-sumatera-selatan</a>

## IND - Long term Operations and Maintenance of Infrastructure Assets through Public Private Partnerships

Info	Details
Country	IND
Sector(s)	transportation
Sub-sector(s)	roads; bridges and tunnels
Administrative level	national
Key agencies in charge	Ministry of Road Transport and Highways (MoRTH); Government of India
Policy macro area(s)	planning; funding; delivery
Policy specific tool(s)	Strategic plan addressing infrastructure assets management / maintenance / repairing; Data collection/analysis effort; M&E framework focused on maintenance backlog and budgeting; Institutional capacity/ governance; Regulatory innovations; Innovative funding sources for delivering maintenance of public infrastructure; Private sector investments, PPP, etc.; Funding schemes incorporating preparedness to risk; Mitigation of disincentives to asset maintenance spending; Contractual provisions improving maintenance delivery; Private sector participation in successful delivery of O&M
Highlights	<p><b>PROBLEM STATEMENT:</b> The traditional highway maintenance is through short term O&amp;M contracts. The Ministry's staff are responsible for road inspection to identify defects and adherence to maintenance standards. Short term engagements are then issued by the Ministry for carrying out the corresponding maintenance work. Full time supervision of the contractor is through National Health Authority of India's (NHAI) Engineers.</p> <p><b>PURPOSE:</b> Ministry of Road Transport &amp; Highways (MoRTH) has encouraged Long term road (development), operations, and maintenance contracts through various innovative PPP modes such as Hybrid Annuity Mode (HAM) and Toll Operate Transfer (TOT) mode. PPP modes involve drafting of complicated and detailed contract, risk allocation and points of responsibility, etc. MoRTH has developed unique Model Concession Agreements based on market accepted standards to allow private sector efficiencies in road maintenance. Ministry of Road Transport &amp; Highways (MoRTH) has encouraged Long term road (development), operations, and maintenance contracts through various innovative PPP modes such as Hybrid Annuity Mode (HAM) and Toll Operate Transfer (TOT) mode. PPP modes involve drafting of complicated and detailed contract, risk allocation and points of responsibility, etc. MoRTH has developed unique Model Concession Agreements based on market accepted standards to allow private sector efficiencies in road maintenance.</p>



Info	Details
<b>Intended/achieved outcome(s)</b>	<p>The optimal PPP project should be one which starts from the capital works and continues with the maintenance works. This can encourage the contractor to uplift the construction quality so as to save its future maintenance cost. In the HAM model wherein the contractor is required not only to build the project, but also maintain the same for a period of 15 years. Responsibilities towards all defects and deficiencies in construction lie with the contractor.</p> <p>In case of already developed roads, the private sector can be involved in renovation or other road improvement works through the TOT mode wherein concessionaires are given responsibility for long term maintenance (15 to 30 years) of the road and toll collection of the same. In all contracts above, maintenance standards are provided by the Indian Road Congress. Overall, in India, MoRTH has successfully awarded more than 170 HAM contracts and 4 TOT contracts. National Health Authority of India (NHAI) has generated more than Rs. 17,000 crore from the TOT contracts so far. NHAI has also developed a pipeline of projects to be awarded on TOT mode (target of approx. Rs. 75,000 crore)</p>
<b>Status &amp; timeline</b>	Ongoing (MoRTH has successfully awarded more than 170 HAM contracts and 4 TOT contracts)
<b>References</b>	<a href="https://morth.nic.in/sites/default/files/Revised%20MCA%20for%20HAM-Nov.pdf">https://morth.nic.in/sites/default/files/Revised%20MCA%20for%20HAM-Nov.pdf</a> <a href="https://morth.nic.in/sites/default/files/OM_Changes%20MCA&amp;RFP_of%20TOT_Model.pdf">https://morth.nic.in/sites/default/files/OM_Changes%20MCA&amp;RFP_of%20TOT_Model.pdf</a>

## ITA - Bridge Safety National Guidelines

Info	Details
<b>Country</b>	ITA
<b>Sector(s)</b>	transportation
<b>Sub-sector(s)</b>	bridges and tunnels
<b>Administrative level</b>	national
<b>Key agencies in charge</b>	1) CIAS (Centro Internazionale di Aggiornamento Sperimentale-Scientifico) – nonprofit organization for scientific advancement in civil engineering 2) 4 EMME Service S.p.A. - a company that specialized in structural engineering diagnostic 3) Consiglio Superiore dei Lavori Pubblici - higher technical consultative body for the Ministry of Infrastructure (MIT) 4) RINA S.p.A – a multinational companies specialized in services for various infrastructure sectors (including certification)
<b>Policy macro area(s)</b>	planning
<b>Policy specific tool(s)</b>	Strategic plan addressing infrastructure assets management / maintenance / repairing; Data collection/analysis effort; M&E framework focused on maintenance backlog and budgeting; Definition/adoption of standards





Info	Details
<b>Highlights</b>	<p>This case describes innovative methodology to assess the state of degradation of bridges that (over ~ 20 years) evolved from: 1) a manual prepared by practitioners and academics, into 2) Italy's most widely-used automated bridge management system, and later 3) a law decree issuing national guidelines for bridge safety.</p> <p>These bridges safety guidelines represent a huge building block to mainstream a systematic and coordinated analysis and management of risk for bridges and viaduct in the country. The guidelines are currently been piloted (for 1,5 year) to add more validation in addition to other empirical tests already available - 15 mln euro have been earmarked to this end. The method laid out in the Bridge safety guidelines (partially incorporating the Manual) clarifies how to break inspections and vulnerability assessments in a 5 level processs:</p> <ul style="list-style-type: none"> <li>- Level 0 - census;</li> <li>- Level 1 - direct visual inspections and first survey of the structure and the geo-morphological, hydrological and hydraulic characteristics of the area;</li> <li>- Level 2 - definition of the class of attention (potential risk on parameters of danger, vulnerability and exposure);</li> <li>- Level 3 - carrying out preliminary assessments;</li> <li>- Level 4 - execution of accurate assessments (according to the Technical Standards for Construction);</li> <li>- Level 5 - to be applied to bridges considered to be of strategic importance in order to ensure essential connections within the road network.</li> </ul>
<b>Intended/ achieved outcome(s)</b>	<p>Below are some of the outcomes of this multi-year &amp; multi-staakeholder effort:</p> <ul style="list-style-type: none"> <li>- On top of the WeBridge inspection software (by 4EMME SpA), another service can be offered (including the module Exceptional Loads ("Carichi Eccezionali"), a unique navigation tool built on top of google maps that automatically suggests routes based on the bridges viability based on the load volume trucks) – the alternative would be to solicit an authorization for each critical bridge</li> <li>- There are now 132 entities (Provinces, Municipalities, etc.) equipped with the WeBridge computerized surveillance system for Inspections and / or management</li> <li>- Over last 5 years, 900 inspectors have been trained and certified with RINA certification</li> <li>- About 40.000 bridges are managed via the WeBridge / Carichi Eccezionali software]</li> <li>- The CIAS-4Emme expertise expressed by the Manual was incorporated by MIT which adopted the procedures for Level 0 and Level 1 of the MIT guidelines multi-level approach</li> <li>- the Ministry of Infrastructure's Bridge Safety Guidelines are designed in a way that is compatible with the requirements of AINOP (the a data repository currently being created that should track all the infrastructure assets in Italy)</li> </ul>





Info	Details
<b>Status &amp; timeline</b>	<p>1) Based on the collaboration of several Italian universities and practitioners (CIAS), in 2000, a Manual for the Assessment of the State of Degradation of Bridges ("Manuale per la Valutazione dello Stato dei Ponti") was developed. It established a scientific methodology for the execution of audits and inspections through a rational procedure that enables numerical identification and ranking of degradation indicators. Hence, it offered an important tool to inform the work of Public Administrations overseeing the assets.</p> <p>2) With the help of the service company 4Emme, the manual's methodology was turned into an inspection software called "We-Bridge", now the most widely-used automated bridge management system. The company offers also training courses and inspector certifications (provided by RINA S.p.A.).</p> <p>3) The above Manual and inspection expertise served as an important foundation for the preparation of the recent Ministry of Infrastructure Bridge Safety Guidelines ("Linee guida per la classificazione e gestione del rischio, la valutazione della sicurezza ed il monitoraggio dei ponti esistenti") - issued in April 2020 by the Consiglio Superiore dei Lavori Pubblici (Consultative body of the Ministry of Infrastructure), and adopted by a decree as of December 2020.</p>
<b>References</b>	<p>[in Italian]</p> <p><a href="https://4emme.it/tutto-sui-ponti/">https://4emme.it/tutto-sui-ponti/</a></p> <p><a href="https://www.cni.it/images/eventi/2020/Presentazione_WSalvatore_-_1_evento.pdf">https://www.cni.it/images/eventi/2020/Presentazione_WSalvatore_-_1_evento.pdf</a></p> <p><a href="https://www.mit.gov.it/comunicazione/news/mit-approvate-le-linee-guida-per-la-sicurezza-dei-ponti">https://www.mit.gov.it/comunicazione/news/mit-approvate-le-linee-guida-per-la-sicurezza-dei-ponti</a></p>

## ITA - ANAS multi-year planning cycle of road maintenance

Info	Details
<b>Country</b>	ITA
<b>Sector(s)</b>	transportation; ICT
<b>Sub-sector(s)</b>	roads; bridges and tunnels; information technology
<b>Administrative level</b>	national
<b>Key agencies in charge</b>	Anas S.p.A. (Italian government-owned company deputed to the construction and maintenance of Italian motorways and state highways under the control of Italian Ministry of Infrastructure and Transport.) It is owned by Ferrovie dello Stato (100% under MEF)
<b>Policy macro area(s)</b>	planning; funding; delivery



Info	Details
<b>Policy specific tool(s)</b>	Strategic plan addressing infrastructure assets management / maintenance / repairing; Data collection/analysis effort; M&E framework focused on maintenance backlog and budgeting; Institutional capacity/ gov; M&E framework focused on maintenance backlog and budgeting; Definition/adoption of standards; Institutional capacity/ governance; Strengthened institutional framework; Regulatory innovations; Earmarking of funding sources for maintenance; Regulation and practices to account for deferred maintenance costs in agencies' balance sheets; Innovative funding sources for delivering maintenance of public infrastructure; Funding schemes incorporating preparedness to risk; Coordinated allocation of various available sources of funds, including supranational; Solutions improving maintenance planning / lifecycle asset management strategy / risk management; Solution adopting integrated approach; Contractual provisions improving maintenance delivery; Solutions improving maintenance delivery; Adoption/sharing of innovation and new technology for maintenance; Solutions improving maintenance cost management; Resilience or maintenance solution relying on nature-based approaches / green infrastructure; Solutions integrating resilience into infrastructure intervention
<b>Highlights</b>	With the 2016-2020 planning contract, the biggest change has been achieved in the effectiveness of monitoring, especially of works via information systems, new internal governance processes and better planning. The approach to maintenance have moved from extraordinary spot intervention to a planned approach based on a multi-year horizon. The effort has been reflected also in an increase of dedicated funds over the last few years.
<b>Intended/ achieved outcome(s)</b>	Ultimately, ANAS is proceeding to engineering an improved maintenance strategy in which maintenance become a crucial goal. With such re-engineering of the maintenance approach, the performance of the company is improving.
<b>Status &amp; timeline</b>	With the 2016-2020 planning contract, Anas (which oversees over 30.000 km of roads nationwide plus 2.000 tunnels and 15.000 bridges and viaducts) changed its approach and shifted to a multi-year planning cycle of maintenance - which has taken a central role for the company. The change was prompted also by the transfer under its purview of over 7.000 km of roads previously under regions/provinces /municipalities. The next steps on the agenda are: 1) normative revisions; 2) smart road and digitalization; 3) digital platforms to facilitate where possible predictive maintenance.
<b>References</b>	[in Italian] <a href="https://www.stradeanas.it/it/focus-manutenzione">https://www.stradeanas.it/it/focus-manutenzione</a>

## JPN - National Strategy for Life Extension of Infrastructure

Info	Details
<b>Country</b>	JPN
<b>Sector(s)</b>	Water-Waste; transportation; social
<b>Sub-sector(s)</b>	dams and hydropower; desalination; waste water collection; waste water treatment; solid waste management; irrigation and agri-business; airports; ports; rail; roads; bridges and tunnels; civic buildings and structures; urban infrastructure
<b>Administrative level</b>	national; city; other



Info	Details
<b>Key agencies in charge</b>	Ministry of Land, Infrastructures, Transport and Tourism; Cabinet Office
<b>Policy macro area(s)</b>	planning; delivery
<b>Policy specific tool(s)</b>	Strategic plan addressing infrastructure assets management / maintenance / repairing; Data collection/analysis effort; Definition/adoption of standards; Regulatory innovations; Solutions improving maintenance planning / lifecycle asset management strategy / risk management; Solution adopting integrated approach; Contractual provisions improving maintenance delivery; Solutions improving maintenance delivery; Adoption/sharing of innovation and new technology for maintenance; Solutions improving maintenance cost management; Private sector participation in successful delivery of O&M
<b>Highlights</b>	<p>In 2013, the Inter-Ministerial Coordination Committee for Promotion of Measures Against Aging Infrastructures was established. The committee was chaired by the Cabinet Office and led primarily by MLIT in terms of planning and implementation. Aiming to enhance safety and resilience of infrastructures while controlling long-term public expenditures and fostering business in the maintenance sector, the committee adopted the Basic Plan for Life Extension of Infrastructure, a national level strategy, in 2013.</p> <p>MINISTRY AND MUNICIPAL-LEVEL PLANNING: The Basic Plan required every public agency or local government responsible for infrastructure maintenance to review all infrastructure assets under their jurisdiction and create plans for life extension. Line ministries were required to create Action Plans for Life Extension of Infrastructure, and municipalities were required to create Comprehensive Management Plans for Public Facilities, which includes maintenance plans, specification of maintenance measures (i.e. repair, rehabilitation, or reconstruction), investment plans, and implementation schedules. As of October 2020, the majority of eligible entities have created the individual Facility Plans: 1,824 entities (92%) for bridges, 712 entities (100%) for tunnels, and 64 entities (99%) for dams.</p> <p>INFRASTRUCTURE DATA PLATFORM: In 2018, MLIT introduced a new Infrastructure data platform, "National Land and Transport Data Platform." The platform will integrate all the infrastructure inspection data collected throughout the life extension initiative as well as the design data of newly procured infrastructure facilities. The platform is planned to have layers of GIS-based geological database with complete geological core sample data sets at 140,000 locations. Other datasets are linked with the platform, including traffic, climate, and economic activity, to provide a centralized data portal for future maintenance and emergency measures. The platform will offer an Application Programming Interface (API) to allow any user to utilize the database or platform to build their customized applications and services. To encourage private participation in the maintenance business, MLIT supports corporate R&amp;D for new maintenance technologies that enhance life-cycle efficiency of infrastructures. MLIT also encourages a tender system to solicit technical proposals to improve the efficiency and effectiveness of infrastructure maintenance. Successfully implemented technologies are introduced online on the 'New Technology Information System.'</p>



Info	Details
<b>Intended/ achieved outcome(s)</b>	A survey by the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) predicts that about half of all roads, tunnels, river management facilities, and port quays in Japan will be over 50 years old by 2033. Being a disaster-prone country, the Japanese government conducted a nationwide reappraisal of existing infrastructure stock to develop a national strategy for the infrastructure's life extension.
<b>Status &amp; timeline</b>	All eligible entities are now in the second phase of the five-year inspection cycle from this year. In the first phase, out of 722,942 bridges and 11,215 tunnels, 99.9% and 99.5% was inspected, respectively. The establishment of long-term investment plans for individual facilities is now in progress. MLIT provides technical guidance for rehabilitations to augment the technical capacities of small-scale entities and local governments. MLIT has adopted new inspection manuals for 14 subsectors, including roads, railways, dams, river protections, and housings. It also provides a 50% grant to local governments for large-scale maintenance projects identified in the Facility Plans.
<b>References</b>	<ol style="list-style-type: none"> <li>1. Cabinet Office, Inter-Ministerial Coordination Committee for Promotion of Measures Against Aging Infrastructures, <a href="http://www.cas.go.jp/jp/seisaku/infra_roukyuuka/index.html">http://www.cas.go.jp/jp/seisaku/infra_roukyuuka/index.html</a></li> <li>2. MLIT, Basic Plan for Life Extension of Infrastructure, <a href="https://www.mlit.go.jp/sogoseisaku/sosei_point_mn_000010.html">https://www.mlit.go.jp/sogoseisaku/sosei_point_mn_000010.html</a></li> <li>3. MLIT, Action Plan for Life Extension of Infrastructure, <a href="https://www.mlit.go.jp/sogoseisaku/maintenance/03activity/03_01_03.html">https://www.mlit.go.jp/sogoseisaku/maintenance/03activity/03_01_03.html</a></li> <li>4. MLIT, Monitoring of the Action Plans for Life Extension of Infrastructure, <a href="https://www.mlit.go.jp/sogoseisaku/maintenance/03activity/pdf/202010koudoufu.pdf">https://www.mlit.go.jp/sogoseisaku/maintenance/03activity/pdf/202010koudoufu.pdf</a></li> <li>5. National Land and Transport Data Platform, <a href="https://www5.cao.go.jp/keizai-shimon/kaigi/special/reform/wg6/20191105/pdf/shiryoku2.pdf">https://www5.cao.go.jp/keizai-shimon/kaigi/special/reform/wg6/20191105/pdf/shiryoku2.pdf</a> , <a href="https://www.mlit-data.jp/platform/">https://www.mlit-data.jp/platform/</a></li> </ol>

## JPN - Fundamental Policy and Guideline for Pre-Flood Emergency Reservoir Drawdown Operational Procedure for Enhanced Flood Management

Info	Details
<b>Country</b>	JPN
<b>Sector(s)</b>	energy; Water-Waste
<b>Sub-sector(s)</b>	energy generation, dams and hydropower
<b>Administrative level</b>	national; region; city
<b>Key agencies in charge</b>	Ministry of Land, Infrastructure, Transport and Tourism (MLIT); Japan and Cabinet Secretary of Gov of Japan; Other ministries and agencies related to water uses / hydropower generation through dams reservoirs
<b>Policy macro area(s)</b>	planning; funding; delivery



Info	Details
<b>Policy specific tool(s)</b>	<p>Strategic plan addressing infrastructure assets management / maintenance / repairing;  Data collection/analysis effort;  Institutional capacity/ governance;  Funding schemes incorporating preparedness to risk;  Solutions improving maintenance planning / lifecycle asset management strategy / risk management;  Solution adopting integrated approach;  Adoption/sharing of innovation and new technology for maintenance;  Solutions integrating resilience into infrastructure intervention</p>
<b>Highlights</b>	<p>The reservoir operation including emergency drawdown is conducted in the following manner: i) rainfall forecasting in the catchment, ii) dam inflow simulation using rainfall forecasts, iii) dam operation simulation with targeted reservoir drawdown and inflow forecasts, and iv) determination of emergency drawdown operation and preliminary discharge before floods. For this emergency reservoir operation, the advanced hydrological/meteorological data monitoring and acquisition system and rainfall forecasting capacity is most critical. The numerical weather prediction provided by the JMA includes the Global Spectral Model (GSM), Meso Scale Model (MSM) and ensemble prediction system. The ensemble forecasting uses simulation results based on several initial or boundary conditions and can provide a quantitative range of rainfall forecasts in real time reflecting ongoing meteorological conditions. This allows dam operators for optimal reservoir operation by quantitatively evaluating two risks: i) inadequate drawdown resulting in insufficient control of subsequent high peak flood and ii) excessive drawdown resulting in insufficient recovery of water storage by flood. Moreover, the International Centre for Water Hazard and Risk Management under the auspices of UNESCO (ICHARM) has developed a dam inflow prediction system by integrating precipitation forecasting data estimated by an ensemble numerical weather forecasting model and the Water and Energy Budget-based Distributed Hydrological Model with Snow, which can estimate snowfall, snow cover and snowmelt in order to increase the efficiency of water use and the effectiveness of flood control. This system has been applied to two hydropower dams in which the dam inflow was estimated for several flood events in those basins and used to optimize the dam operations in order to reduce ineffective water discharges, increase the efficiency of power generation, and recover the reservoir water volume after floods.</p>
<b>Intended/ achieved outcome(s)</b>	<p>This guideline capitalizes on advanced rainfall/flood forecasting systems to inform decision-making processes associated with the management of dam reservoirs and to ensure water draw-down processes reduce flood risks on downstream communities. These guidelines are being applied to all major dams in Japan and across sectors under an integrated river management system guided by the MLIT. The processes are coordinated for each river basin by its river managers under the guidance of the MLIT in coordination with dam owners for water uses and hydropower generation under the guidance of aforementioned sectoral ministries as well as prefectural and municipal governments in charge of disaster management.</p>



Info	Details
<b>Status &amp; timeline</b>	In December 2019, the Cabinet Secretary of GOJ issued a fundamental policy for enhancing flood control functions of existing dams based on a working group including the Ministry of Land, Infrastructure, Transportation and Tourism (MLIT), Ministry of Economy, Trade and Industry (METI), Ministry of Health, Labor and Welfare (MHLW), Ministry of Agriculture, Forestry and Fisheries (MAFF), Japan Meteorological Agency (JMA), and Agency for Natural Resources and Energy (ANRE). Subsequently, the MLIT issued a guideline for pre-flood emergency reservoir drawdown operational procedures for enhanced flood disaster management applied for single and multipurpose dams including hydropower generation, urban, industrial and irrigation water supply in addition to flood control in April 2020.
<b>References</b>	<a href="https://www.kantei.go.jp/jp/singi/kisondam_kouzuichousetsu/">https://www.kantei.go.jp/jp/singi/kisondam_kouzuichousetsu/</a> <a href="https://www.mlit.go.jp/report/press/content/001341537.pdf">https://www.mlit.go.jp/report/press/content/001341537.pdf</a>

## KOR - Master Plans for Managing Infrastructure (2020-2025)

Info	Details
<b>Country</b>	KOR
<b>Sector(s)</b>	energy; Water-Waste; transportation; information and communications; other
<b>Sub-sector(s)</b>	energy transmission; water supply; drinking water distribution; waste water collection; waste water treatment; airports; ports; rail; roads; bridges and tunnels; telecommunications; other sector (damage prevention facilities, e.g. river, reservoir, dam; underground pipelines, e.g. gas, heat transport, oil; underground pipe utilities)
<b>Administrative level</b>	national; region
<b>Key agencies in charge</b>	Ministry of Land, Infrastructure and Transport (for policy generation); Korea Authority of Land and Infrastructure Safety (to support the MLIT on infrastructure management policy direction and execution)
<b>Policy macro area(s)</b>	planning; delivery
<b>Policy specific tool(s)</b>	Strategic plan addressing infrastructure assets management / maintenance / repairing; Strengthened institutional framework; Coordinated allocation of various available sources of funds, including supranational



Info	Details
<b>Highlights</b>	<p>This Master Plans for Managing Infrastructure, formulated and implemented by the Ministry of Land, Infrastructure and Transport is established as per Article 8 of the Framework Act on Sustainable Infrastructure Management (Enacted Dec. 2018). The Master Plan functions as a basis of Infrastructure Management Plans, which the supervisory agency formulates and implements for managing infrastructure within its jurisdiction. The Master Plan is a nation-wide policy planning on systematic maintenance and management of infrastructure and improvement of infrastructure performance. Bearing in mind the rapid increase in maintenance cost of aged infrastructure facilities, construction of which were concentrated in the 1970s, through the Master Plan the government expects to provide comprehensive policy direction to infrastructure management.</p> <p>Main tasks of the 2020~2025 Master Plan consist of four pillars:</p> <ul style="list-style-type: none"> <li>(1) establish comprehensive and preemptive maintenance and management governance system</li> <li>(2) increase level of infrastructure maintenance overseeing and decrease blind spots</li> <li>(3) establish foundation for 'smart maintenance and management of infrastructure' and promote related industries</li> <li>(4) invest in preventive safety measures for aged infrastructure and diversify investment sources</li> </ul>
<b>Intended/ achieved outcome(s)</b>	<p>POLICY DIRECTION: The Master Plan seeks to establish long term vision for management of infrastructure. The mission of 2020~2025 Master Plan is "establishing smart foundation for operation and management of sustainable infrastructure." As the 2020~2025 Plan is the first formulated master plan since the enactment of the Framework Act on Sustainable Infrastructure Management, it primarily focuses on setting the foundation of infrastructure management governance in order for the system to safely settle down. Meanwhile, an increased investment amount is required to be able to secure the golden time for sustainable infrastructure management. The central government should not only focus on large-scale public facilities, but also render support to building operation and management capacity of local governments and the private sector. Finally, smart maintenance system needs to be introduced to promote related industries.</p>
<b>Status &amp; timeline</b>	<p>Government of Korea announced the Master Plans for Managing Infrastructure in May 2020 with the purpose of providing new policy vision to manage aging infrastructure assets. Time scope of the Master Plan is from 2020 to 2025.</p>
<b>References</b>	<p><a href="http://www.molit.go.kr/USR/NEWS/m_71/dtl.jsp?id=95083872">http://www.molit.go.kr/USR/NEWS/m_71/dtl.jsp?id=95083872</a> (Korean)</p>

## KOR - Seoul Metropolitan City's Sustainable Infrastructure Management Plan

Info	Details
<b>Country</b>	<b>KOR</b>
<b>Sector(s)</b>	Water-Waste; transportation; other
<b>Sub-sector(s)</b>	water supply; other water & waste (Environmental basic infrastructure (sewerage)); rail; roads; other sector (Distribution and supply facilities - heat supply- and Disaster prevention facilities -river maintenance)





Info	Details
<b>Administrative level</b>	city
<b>Key agencies in charge</b>	Supervision agency: Seoul City (Safety Management Division) Management agencies: Seoul City (15 departments including Road Management Division), 25 districts of Seoul city (50 departments related to roads and sewerage), affiliated agencies (Seoul Facilities Corporation, Seoul Metro, Seoul Energy)
<b>Policy macro area(s)</b>	planning; funding; delivery
<b>Policy specific tool(s)</b>	Strategic plan addressing infrastructure assets management / maintenance / repairing; Tax expenditures allocated to maintenance or rehabilitation purposes; Solutions improving maintenance planning / lifecycle asset management strategy / risk management
<b>Highlights</b>	<p>In 2017 the Seoul Metropolitan Government announced the Sustainable Infrastructure Management Plan 'the Seoul Infrastructure Next 100-Year Project' to prepare for the next century in the era of threatened safety and financial difficulties due to the rapid increase of aged city infrastructure.</p> <p>The main tasks of the project are as follows;</p> <ol style="list-style-type: none"> <li>(1) Update a 'Condition Report' for facilities (bridges, tunnels, water supply and drainage systems) that are 30 year or older and update the information every five years.</li> <li>(2) Technology advancement is pursued through the use of the latest ICT technology such as big data analysis.</li> <li>(3) The government will establish a mid to long-term investment plan and invest accordingly to reduce overall life-cycle maintenance costs.</li> <li>(4) Establish a system of cooperation between the central government, citizens and experts and related organizations to maximize the effects of urban infrastructure maintenance.</li> </ol>
<b>Intended/ achieved outcome(s)</b>	<p>The purpose of the project is changing the current facility management technique which has focused on 'short-term maintenance and post management' to 'preemptive mid- to long-term response in preparation for the future'.</p> <p>Specifically, the facility maintenance system, which has been operated independently for each facility will be integrated. Also, a big data database of management details will be established and it will predict the best time for maintenance and reinforcement for each facility based on this data.</p> <p>This future-predicting model is expected;</p> <ol style="list-style-type: none"> <li>(1) to save KRW 193.9 billion every year (KRW 5.8 trillion during 30 years).</li> <li>(2) to increase an average life span of infrastructure facilities up to 15 years.</li> <li>(3) to increase an average safety performance by 5.6%</li> </ol>





Info	Details
<b>Status &amp; timeline</b>	<p>The milestones since 2017 are as follows;</p> <ul style="list-style-type: none"> <li>- The Seoul Metropolitan City Ordinance to promote performance improvement for aged facilities (Enacted Jul. 14, 2016 and abolished May 19, 2020).</li> <li>- Conducted the research for improvement strategies of a maintenance system (Feb. 2017)</li> <li>- Establishment of the implementation plan for Seoul Infrastructure Next 100-Year Project (Jul. 11, 2017.)</li> <li>- Establishment of the implementation plan for the development of an integrated management system for infrastructure big data (Aug. 16, 2016)</li> <li>- Developed the condition evaluation and the big data analysis system for each facility (Sept. 2018 ~ Dec. 2020)</li> <li>- Composition of the Seoul Infrastructure Management Committee (Apr. 2019)</li> <li>- Enforcement of the Framework Act on Sustainable Infrastructure Management (Jan. 1, 2020)</li> <li>- Enactment of the Framework Ordinance for Seoul Metropolitan City's Sustainable Infrastructure Management (May 19, 2020)</li> <li>- Establishment of the Seoul Metropolitan City's first Infrastructure Management Plan (Jan. 6, 2021)</li> <li>- Announcement of the standards for minimum maintenance and performance management of the infrastructure (Mar. 25, 2021)</li> </ul>
<b>References</b>	<a href="http://opengov.seoul.go.kr/sanction/21985497">http://opengov.seoul.go.kr/sanction/21985497</a> (In Korean)

## MEX - Mexico Tollroads MRO (Maintainer – Rehabilitator – Operator) Model

Info	Details
<b>Country</b>	<b>MEX</b>
<b>Sector(s)</b>	transportation
<b>Sub-sector(s)</b>	roads, urban mobility
<b>Administrative level</b>	federal; national
<b>Key agencies in charge</b>	Fondo Nacional de Infraestructura (FONADIN)
<b>Policy macro area(s)</b>	planning; funding; delivery



Info	Details
<b>Policy specific tool(s)</b>	<p>Strategic plan addressing infrastructure assets management / maintenance / repairing;            Data collection/analysis effort;            Definition/adoption of standards;            Institutional capacity/ governance;            Strengthened institutional framework;            Regulatory innovations;            Innovative funding sources for delivering maintenance of public infrastructure;            Private sector investments, PPP, etc.;            Funding schemes incorporating preparedness to risk;            Mitigation of disincentives to asset maintenance spending;            Coordinated allocation of various available sources of funds, including supranational;            Solutions improving maintenance planning / lifecycle asset management strategy / risk management;            Solution adopting integrated approach;            Contractual provisions improving maintenance delivery;            Solutions improving maintenance delivery;            Adoption/sharing of innovation and new technology for maintenance;            Solutions improving maintenance cost management;            Resilience or maintenance solution relying on nature-based approaches / green infrastructure;            Solutions integrating resilience into infrastructure intervention;            Private sector participation in successful delivery of O&amp;M</p>



Info	Details
<b>Highlights</b>	<p>The MRO (Maintainer - Rehabilitator - Operator) TOLLROADS MODEL is based on an Operation Model by Performance Standards implemented in its beginnings in 2012 by BANOBRAS, the Trustee of FONADIN.</p> <p>MAIN AGENTS:</p> <ul style="list-style-type: none"> <li>- FONADIN (National Infrastructure Fund) currently manages the largest concessional toll roads network in the country (~40%) composed of 57 toll roads with a total length of nearly 5,000 km. In accordance with its legal framework, FONADIN may use the governmental agency in charge of maintenance of roads in the country or, like the private sector, can select (through a competitive bidding processes) private firms to operate, maintain, and rehabilitate the toll roads.</li> <li>- Supervisory Administrator Agent - AAS - which manages and supervises compliance with performance standards, supports planning and elaborates Master Development Programs. Supports the hiring of the Maintainer-Rehabilitator-Operator);</li> <li>- Maintainer, Rehabilitator, Operator - MRO - which is in charge of operating and maintaining toll roads with levels of service, responsible for Operation, Maintenance and Rehabilitation)</li> </ul> <p>The model allowed to maintain the level of service to users, to reduce costs and to promote quality in the provision of services. Further it enables the control of entrances by toll rates, the exploitation of the route decision, the transfer of derived risks of O&amp;M. Through the competitive bidding processes, FONADIN transfers the concession to the private sector to maintain the road, the private sector operates the toll road for a period of time to recover the investment, and the toll roads has to keep a standard grade evaluated by national indicators. Two stages are required:</p> <ol style="list-style-type: none"> <li>1) An initial investment to reach the top level qualifier degree set by authorities. Process called "Puesta a Punto" in Spanish, and it is estimated for 2 years in order to reach high levels of service on the toll roads and migrate to a preventive maintenance scheme based on later compliance with performance standards.</li> <li>2) Operation and Maintenance. It is estimated a contract for 10 years under the payment scheme subject to compliance with performance standards.</li> </ol>



Info	Details
<b>Intended/ achieved outcome(s)</b>	<p>The implementation of the MRO model promotes competition, stimulates private operators to improve the quality of service to users while they optimize spending on O&amp;M on the toll roads network. Establishing performance standards has encouraged a better service provision quality, as well as greater control over income from tolls and exploitation of the right of way.</p> <p>The possibility to establish transparent long-term contracts, giving certainty for both sides of the contract, especially for FONADIN, allows transferring risks and responsibilities to the private operator in charge of operation and maintenance. Better toll roads management allows to use better systems and make technological improvements, in view of toll roads as an asset class for future financial operations. It is expected the model will obtain certifications and implement programs as The distinctive ESR® (Empresa Socialmente Responsable), ISO 14001 (Environmental), ISO 45000 (Health and Safety at work), Sustainable Building Certification (LEED)</p> <p>Some examples of benefits are in these toll roads:</p> <ul style="list-style-type: none"> <li>• Corridor Guadalajara-Colima (launched at 2012) with a 148km length: [10 years Contract as Operator &amp; 10 years Contract as Maintainer, Rehabilitator / Their income expected in real term from 2012 to 2016 increased 32% / Costs O&amp;M decreased 9% annually / Accident Rate from 2012 to 2016 decreased 58%]</li> <li>• Corridor Atlacomulco-Maravatío (launched at 2012) with a 64km length: [7 years Contract as Operator &amp; 7 years Contract as Maintainer, Rehabilitator/ Their income expected in real term from 2012 to 2016 increased 20% / Costs O&amp;M decreased 20% annually / Accident Rate from 2012 to 2016 decreased 46.7%]</li> <li>• Corridor Golfo Centro (launched at 2017) with a 141.78km length: [13 years Contract as Operator &amp; 13 years Contract as Maintainer] / Their income expected in real term from Feb18 to Feb19 increased 10.58%]</li> </ul>



Info	Details
<b>Status &amp; timeline</b>	<p>In 2012, BANOBRAS, as FONADIN's trustee, implemented the model in the concessional road sections, with a total extension of 212km</p> <ul style="list-style-type: none"> <li>• Atlacomulco – Maravatío, launched at 2012, with 64km</li> <li>• Guadalajara – Colima, launched in 2012, with 148km</li> </ul> <p>A valuable feature of the implemented operating model, is that does not imply the privatization of the sections, and only allows the investment of road assets with private resources. Thus, in 2016, FONADIN launched the model in 3 road sections with a total extension of 87km</p> <ul style="list-style-type: none"> <li>• Libramiento Felipe Carrillo Puerto, launched in 2016, with 14.14km</li> <li>• Libramiento Villahermosa, launched in 2016, with 24km</li> <li>• Libramiento Cd. Valles y Tamuín, launched at 2016, with 49.14km</li> </ul> <p>Due to the good results FONADIN continued in 2017 implementing the model in 3 routes in the country, with an extension of 280km</p> <ul style="list-style-type: none"> <li>• Jala-Compostela-Las Varas Highway + Compostela Extension, launched in 2017, with 96km</li> <li>• Golfo Centro, launched in 2017, with 141.78</li> <li>• Libramiento Oriente de Chihuahua, launched in 2017, with 42.30</li> </ul> <p>Since 2018, FONADIN started working in the next step to implement the model. That is to group a set of 6 assets, with stable cash flows, and with almost 20 years in operation and put it together and called it the Northwest Package with a total of 348km. In 2019 start the competitive bidding processes, and in 2020 it starts to operate. These were the assets:</p> <ul style="list-style-type: none"> <li>• Tramos Monterrey – Nuevo Laredo, with 123.1km</li> <li>• Cadereyta – Reynosa, with 132.015km</li> <li>• Libramiento de Reynosa, with 43.54km</li> <li>• Reynosa – Matamoros, with 44.04km</li> <li>• Puente Internacional Reynosa – Pharr, with 5.129km</li> <li>• Puente Internacional Ignacio Zaragoza with 0.81km</li> </ul>
<b>References</b>	<p><a href="https://www.proyectosmexico.gob.mx/wp-content/uploads/2019/10/Paquete-Noreste-Octubre-2019.pdf">https://www.proyectosmexico.gob.mx/wp-content/uploads/2019/10/Paquete-Noreste-Octubre-2019.pdf</a></p> <p><a href="https://www.fonadin.gob.mx/fni2/">https://www.fonadin.gob.mx/fni2/</a></p>

## NLD - Procurement of Innovative Circular and Modular Bridges

Info	Details
<b>Country</b>	NLD
<b>Sector(s)</b>	transportation; social; other (sustainability)
<b>Sub-sector(s)</b>	bridges and tunnels; urban mobility; civic buildings and structures; other social infrastructure (specify: Circular infrastructure); other sector (specify Durability, Circular economy)
<b>Administrative level</b>	supranational; national



Info	Details
<b>Key agencies in charge</b>	Rijkswaterstaat (part of the Dutch Ministry of Infrastructure and Water Management and responsible for the design, construction, management and maintenance of the main infrastructure facilities in the Netherlands)
<b>Policy macro area(s)</b>	planning; funding; delivery
<b>Policy specific tool(s)</b>	Strategic plan addressing infrastructure assets management / maintenance / repairing; Definition/adoption of standards; Regulatory innovations; Private sector investments, PPP, etc.; Solution adopting integrated approach; Contractual provisions improving maintenance delivery; Adoption/sharing of innovation and new technology for maintenance; Solutions improving maintenance cost management; Resilience or maintenance solution relying on nature-based approaches / green infrastructure Solutions integrating resilience into infrastructure intervention
<b>Highlights</b>	<p>Rijkswaterstaat (Directorate-General for Public Works and Water Management of the Netherlands) aim is to become fully circular and climate neutral by 2030. Hence, it first needs to co-create and procure innovations full scale and subsequently provide companies the opportunity to market these concepts and solutions further (inter)nationally. This is done by means of an SBIR (Small business innovation request). With this SBIR call, Rijkswaterstaat intends to increase the supply of validated circular solutions and the number of parties that can offer those. Within the object group of bridges and viaducts, Rijkswaterstaat initially focuses on solutions for the object type 'Viaducts' where road traffic of all weight classes is able to pass without hindrance. Rijkswaterstaat intends to start other SBIR calls at a later date aimed at other object groups and object types. Especially relevant in relation to the SBIR call is the fact that Rijkswaterstaat, together with the national Bouwcampus network, initiated an Open Learning Environment Circular Viaducts and Bridges (<a href="http://www.openleeromgeving.nl">www.openleeromgeving.nl</a>). In it, 60 participants from the private sector, government bodies and knowledge institutions exchanged knowledge and best practices on the circular (de)construction of viaducts and bridges. The participants looked for depth on different themes:</p> <ul style="list-style-type: none"> <li>- Business and Value Case</li> <li>- Procurement and tendering</li> <li>- Chain cooperation</li> <li>- Materials</li> <li>- Design</li> <li>- Technology and data</li> </ul> <p>By progressing this way a common picture of what can already be procured in a circular manner was developed, together with innovation/procurement issues that will need to be developed further. In addition, in equal cooperation with two market parties, Rijkswaterstaat realized a prototype of a circular viaduct as a physical structure. Government, the contractor and other stakeholders openly shared their insights on design philosophy, performance, cooperation and the D&amp;C process.</p>



Info	Details
<b>Intended/ achieved outcome(s)</b>	Rijkswaterstaat's ambition is to be a Launching Customer for sustainability transitions in order to make a maximum contribution to reducing CO2 emissions and material use within its own sphere of influence. Rijkswaterstaat's aim is to become fully circular and climate neutral by 2030. The aim of this SBIR call is to develop validated solutions for circular viaducts for roads and motorways that can be repeatedly procured and applied in other projects (replacement as well as new construction) by Rijkswaterstaat, as well as in projects by other public and semi-public organizations and/or private parties (inter)nationally.
<b>Status &amp; timeline</b>	Launched in 2019, the procurement of innovative circular and modular bridges is in line with Rijkswaterstaat's aim is to become fully circular and climate neutral by 2030.
<b>References</b>	

## NLD - Vital Assets Program

Info	Details
<b>Country</b>	NLD
<b>Sector(s)</b>	transportation
<b>Sub-sector(s)</b>	roads; bridges and tunnels; other (locks)
<b>Administrative level</b>	national
<b>Key agencies in charge</b>	Rijkswaterstaat (part of the Dutch Ministry of Infrastructure and Water Management and responsible for the design, construction, management and maintenance of the main infrastructure facilities in the Netherlands)
<b>Policy macro area(s)</b>	planning; funding; delivery
<b>Policy specific tool(s)</b>	Data collection/analysis effort; Regulatory innovations; Facilitating "just in time" predictive and cost-conscious maintenance, avoiding network availability breakdown; Solutions improving maintenance planning / lifecycle asset management strategy / risk management; Contractual provisions improving maintenance delivery; Solutions improving maintenance delivery; Adoption/sharing of innovation and new technology for maintenance



Info	Details
<b>Highlights</b>	The “Vital Assets” program was set up to optimize timing of maintenance. By using simple energy sensors, deviations from normal electricity consumption can be detected. Combining this data with other types of data (e.g. temperature, wind or usage) allows Rijkswaterstaat to investigate whether the deviations are normal or not. Abnormal deviations are reported to the asset manager and contractor, who check what kind of maintenance is required. The combination of sensors and big data analysis allows for more precise monitoring of the condition of installations, so that the maintenance interval can be more tailored and even stretched.
<b>Intended/ achieved outcome(s)</b>	“Vital Assets” allows RWS to keep the installation vital for a longer period of time with small interventions. This not only makes maintenance cheaper, but can also extend the lifespan of the asset. In addition, the reliability of the assets increases. Unexpected malfunctions are limited by intervening early. Objective, real-time data ensures that the technicians are present at the right time to resolve annoying malfunctions.
<b>Status &amp; timeline</b>	Launched in 2019, it is ongoing.
<b>References</b>	<a href="https://www.h2owaternetwerk.nl/images/knw/170622_RWS_Vitale_assets.pdf">https://www.h2owaternetwerk.nl/images/knw/170622_RWS_Vitale_assets.pdf</a> Innovatieve+voorbeelden+datagebruik+bij+het+Rijk_WEB.pdf

## RUS - Investment-Construction Model of Public-Private Partnership in the Development and Maintenance of Port and Coastal Infrastructure

Info	Details
<b>Country</b>	<b>RUS</b>
<b>Sector(s)</b>	energy; transportation
<b>Sub-sector(s)</b>	energy storage; ports
<b>Administrative level</b>	federal; region
<b>Key agencies in charge</b>	Ministry of Transport of the Russian Federation; The Federal Agency for Sea and Inland Water Transport (Rosmorrechflot); Federal State Unitary Enterprise “Rosmorport”
<b>Policy macro area(s)</b>	planning; funding; delivery





Info	Details
<b>Policy specific tool(s)</b>	<p>Strategic plan addressing infrastructure assets management / maintenance / repairing;</p> <p>Institutional capacity/ governance;</p> <p>Institutional capacity/ governance;</p> <p>Tax expenditures allocated to maintenance or rehabilitation purposes; Innovative funding sources for delivering maintenance of public infrastructure;</p> <p>Innovative funding sources for delivering maintenance of public infrastructure;</p> <p>Private sector investments, PPP, etc.; Coordinated allocation of various available sources of funds, including supranational;</p> <p>Coordinated allocation of various available sources of funds, including supranational ;</p> <p>Contractual provisions improving maintenance delivery; Solutions improving maintenance delivery;</p> <p>Solutions improving maintenance delivery;</p> <p>Solutions integrating resilience into infrastructure intervention</p>
<b>Highlights</b>	<p>This case shows an investment-construction model of PPP – mechanism of financing of objects that can only be in federal ownership at the expense of the investor under the works contract with payment by installments condition.</p> <p>The costumer is a federal state unitary enterprise (FSUE) and the contractor is a private investor. The object of the contract is the construction or reconstruction of federal property. Payment for the work to the investor-contractor is carried out in installments without advance payment and after the commissioning of facilities. The term of payment by installments for the work performed depends on the efficiency of the private investor's work at the created and/or reconstructed object, e.g. sea terminal. The contract stipulates that payment will be made at the expense of a part of the income received by the FSUE from the implementation of the project. Such income may include, depending on the investment object:</p> <ul style="list-style-type: none"> <li>- additional port charges resulting from the increased (formation of a new) cargo turnover or dimensions of design vessels;</li> <li>- additional lease payments received as a result of the improvement qualitative characteristics of the investment object;</li> <li>- additional income of FSUE from the provision of services as a result of an increased (formation of a new) cargo turnover or dimensions of design vessels</li> </ul>
<b>Intended/ achieved outcome(s)</b>	<p>When determining the amount of the return, the costs of maintaining the investment object are taken into account and deducted from the amount of additional income. The above conditions of work contracts are also defined in agreements on relations with investors (initiators of the projects). Investors guarantee provision of a cargo base, efficient operation of the created or reconstructed sea terminals i.e. they guarantee a return of investments of FSUE in the federal property. These conditions are specified by the parties based on the results of pre-design studies and after the development of the design and estimate documentation and receipt of state examinations on it.</p>
<b>Status &amp; timeline</b>	No details available.
<b>References</b>	



## RUS - Energy Efficient School Maintenance Systems

Info	Details
<b>Country</b>	RUS
<b>Sector(s)</b>	energy; ICT; social
<b>Sub-sector(s)</b>	energy efficiency; telecommunications; information technology; education
<b>Administrative level</b>	region; city
<b>Key agencies in charge</b>	The Government of Moscow; Department of Education and Science of Moscow city
<b>Policy macro area(s)</b>	delivery
<b>Policy specific tool(s)</b>	Solutions improving maintenance planning / lifecycle asset management strategy / risk management; Solution adopting integrated approach; Contractual provisions improving maintenance delivery; Solutions improving maintenance delivery; Adoption/sharing of innovation and new technology for maintenance; Solutions improving maintenance cost management



Info	Details
<b>Highlights</b>	<p>Energy efficiency is achieved by observing the standard operating conditions of the building with the rational use of the energy resources necessary for this, for example, through the use of:</p> <ul style="list-style-type: none"> <li>• weather-dependent automation as part of an individual heating point to regulate the supply of coolant to the heating system of the building, depending on the outside air temperature;</li> <li>• thermoelectric regulators on heating devices to maintain the temperature regime in the premises and reduce the consumption of thermal energy during the period of non-use (night time, weekends, vacation period);</li> <li>• sensors of illumination, temperature, humidity, CO2 concentration in order to control the operation of the executive equipment of the corresponding engineering systems in accordance with the standard operating conditions of the building.</li> </ul> <p>Automation ensures compliance with the standard operating conditions for premises by automatically adjusting the operation of engineering systems equipment when the current performance indicators deviate from the standardized ones, for example, through the use of:</p> <ul style="list-style-type: none"> <li>• control of the operation of heating devices in correspondence with the readings of the temperature sensors in the premises;</li> <li>• switching on lighting devices in recreations and lavatories in accordance with the motions sensors readings;</li> <li>• dimming of lighting devices in accordance with the level of natural light provided by light sensors.</li> </ul> <p>The digitization of engineering systems is based on data from online monitoring of the operation of the corresponding PLCs in specialized software, including the use of mobile devices. The data from the temperature, illumination, air quality and other sensors located in the premises allow to systematically and effectively manage the engineering systems of buildings to provide a comfortable environment for students in order to:</p> <ul style="list-style-type: none"> <li>• improve the psycho-emotional state;</li> <li>• reduce morbidity;</li> <li>• to increase the efficiency of mastering the educational program.</li> </ul> <p>Digital energy efficient operation will be based on the establishment of a continuous information link between the school operation service and information on the status and operation of the executive equipment of all engineering systems, which the PLC sends online to the DIM for control and monitoring. A unified information system based on the DIM contains dynamically updated data on the executive equipment of engineering systems, routine maintenance and operating rules.</p> <p>On the basis of the DIM data, the maintenance specialist receives a daily task, which includes a tour of the premises and the performance of routine maintenance.</p> <p>Consistently performing the assigned tasks and noting their fulfillment with the help of fixing in the DIM, the specialist automatically generates a report on the fulfillment of the daily task, tied to the place and time. Similar to the process of daily maintenance, the information system generates a schedule of routine examinations for a month and a year. The quality of maintenance can be subsequently assessed on the basis of the data on the operation of engineering systems, loaded directly into the DIM, not only by the criteria for the correctness and timeliness of maintenance, but by the indicators of reducing energy consumption. Infographics with the analysis of energy consumption data, available in the interactive interface of work with the DIM, will allow assessing the economic efficiency of operating the school building and making a comparative analysis with other buildings of the educational organization. At the same time, it will become possible to organize the project work of students with a practical study of the principles of work and management of modern engineering equipment at the DIM.</p>



Info	Details
<b>Intended/ achieved outcome(s)</b>	<p>In order to ensure the energy efficient operation of the schools, the modernization of their engineering systems is carried out using Build Information Modelling (BIM). At the same time, the design and construction of engineering systems is carried out using programmable logic controllers (PLC), configured for the subsequent management of the operation of the building in its Digital Information Model (DIM).</p> <p>The use of a PLC will ensure the energy efficiency of the school building: optimization of costs of energy resources will be achieved through automation of control over the operation of engineering systems equipment. As a result, conditions will be created to maintain a comfortable indoor environment and increase the efficiency of the educational process.</p>
<b>Status &amp; timeline</b>	<p>Place and term of implementation, current stage:  Pilot implementation in several schools for high school students.  Digital Operation Testing – 2022.  Digital Operation Testing in private school «Snegiri»– 2021.</p>
<b>References</b>	<p><a href="https://www.mos.ru/donm/">https://www.mos.ru/donm/</a>  <a href="https://dirstroy.dogm.mos.ru/">https://dirstroy.dogm.mos.ru/</a></p>

## SAU - Treated Wastewater Use Scheme in Al Hasa Oasis

Info	Details
<b>Country</b>	SAU
<b>Sector(s)</b>	Water-Waste
<b>Sub-sector(s)</b>	water supply; waste water collection; solid waste management; irrigation and agri-business
<b>Administrative level</b>	state; region
<b>Key agencies in charge</b>	Ministry of Environment, Water and Agriculture Saudi Irrigation Organization
<b>Policy macro area(s)</b>	delivery
<b>Policy specific tool(s)</b>	Solutions improving maintenance planning / lifecycle asset management strategy / risk management; Solutions integrating resilience into infrastructure intervention



Info	Details
<b>Highlights</b>	<p>The Saud Irrigation Organization (SIO) is a public governmental institution with a mandate to carry out the management, operation and maintenance of irrigation and drainage in the Kingdom. The SIO headquarter is located in Al Hasa Oases which is one of the largest and most famous natural palm oases in the world. The SIO has developed substantial treated wastewater use scheme in Al Hasa Oasis through investing about 2 billion Saudi riyals in treated wastewater use infrastructure and operation system. This cost included the development of pipe water transmission and distribution system and pipeline to transport of treated wastewater from Al Khobar City (160 km pipeline) to Al Hasa with a design capacity of 200,000 m3 per day.</p> <p>The SIO conducts a daily monitoring of the treated wastewater quality in in-house laboratories. Real-time analyzes are conducted before pumping the water in the irrigation system for levels of free chlorine, turbidity and total sediments as indicators of their quality and extent of their conformity with the specifications. To encourage farmers to adapt modern irrigation methods and to use the treated wastewater for irrigation, the SIO has taken the following steps:</p> <ul style="list-style-type: none"> <li>• Awareness programs for farmers to enlighten them about the importance of modern irrigation and its contribution to delivering actual water needs with minimal losses, thus reducing water consumption and improving productivity</li> <li>• Providing technical and material support through the institution's participation in the costs of introducing the modern irrigation system (network, pond and pump) with varying rates according to the area. In addition to providing technical advice regarding network design, implementation and operation method.</li> <li>• Continuous follow-up and encouragement through workshops and flyers, and allocating a prize to the ideal farmer.</li> <li>• Buying dates from farmers who apply modern irrigation methods at a higher price (5 riyals / kg instead of 3 riyals / kg for non-applicants).</li> <li>• Shortening the irrigation period for farmers who switch to modern irrigation methods.</li> </ul>
<b>Intended/ achieved outcome(s)</b>	<p>The SIO introduced the Supervisory Control and Data Collection System (SCADA) to operate the irrigation system automatically to control the scheduling and distribution of treated wastewater to farms throughout Al Hasa Oases. It became possible to control the distribution of irrigation water through valves (farm exits) distributed in exchange for each farm that opens and closes automatically to provide each farm with its actual need of water at the appropriate time. The length of the irrigation pipeline network is about 1042881 meters spread over an area of about 8,000 hectares, the SCADA system contains more than 1,368 terminal units (RTUs) to collect data and control the exits of 25,470 farms. Control of 528 exit (farm) areas of up to 200 hectares. The SIO provides farmers with treated wastewater for free based on specific irrigation programs and scheduling. The quantities of water used by each farm are monitored and recorded by SCADA control system. the size and magnitude of the treated wastewater use scheme in Al Hasa Oases are unique in size and performance. The integration of effective SCADA control system coupled with in-house water quality monitoring and control system have enhanced the performance and efficiency of treated wastewater use scheme significantly.</p>



Info	Details
<b>Status &amp; timeline</b>	<ul style="list-style-type: none"> <li>- The reuse of treated sewage water for irrigation started in Al Hassa area since 1987 with a quantity of 4000 m3 day-1 of tertiary treated sewage water from Aramco's STP, increasing to 6000 m3day-1 by the year 2006 to be mixed with groundwater and agricultural drainage water in its main irrigation canal.</li> <li>- In 2003 a quantity of 45,000 m3day-1 was received from Hofuf STP after completing the first stage of upgrading it to the tertiary level of treatment, while HIDA preceded that by building a pump station and a pipeline with a maximum capacity of 210,000 m3 day-1 to transport the treated sewage from Hofuf STP to its irrigation network.</li> <li>- This was followed in 2011 by Al Umran and Al Uyoon systems which produce treated sewage water with total treatment capacities of 30,000 and 36,000 m3 day-1 respectively.</li> <li>- In 2018 the project to supply Al-Hassa with tertiary treated sewage water from Al-Khobar and Dammam cities 150 km away was operated with a capacity of 200000 m3 day-1. After Italconsult, 2013: the study of "Investigation and Engineering Design for Treated Wastewater Reuse in the Kingdom of Saudi Arabia "submitted to MEWA.</li> <li>- In 2020 the quantity of wastewater reused for irrigation in Al Hassa amounted to 97% of the total water resources used.</li> </ul>
<b>References</b>	The Saudi Irrigation Organization website: <a href="https://www.sio.gov.sa/en">https://www.sio.gov.sa/en</a>

## SAU - Improve the Efficiency of Sea Water Desalination Plants in the Kingdom of Saudi Arabia - Shuaiba 1 Plant

Info	Details
<b>Country</b>	SAU
<b>Sector(s)</b>	energy; Water-Waste
<b>Sub-sector(s)</b>	energy efficiency; water supply; desalination
<b>Administrative level</b>	national
<b>Key agencies in charge</b>	Ministry of Environment, Water, and Agriculture (MEWA); Saline Water Conversion Corporation (SWCC)
<b>Policy macro area(s)</b>	planning; delivery
<b>Policy specific tool(s)</b>	Strategic plan addressing infrastructure assets management / maintenance / repairing; Solutions improving maintenance planning / lifecycle asset management strategy / risk management



Info	Details
<b>Highlights</b>	<p>The KSA is the largest desalinated water producer in the world. Currently desalinated water supplied about 60% of total domestic and industrial water demands in the Kingdom. The Saline Water Conversion Corporation (SWCC) owns the majority of desalination plants in the Kingdom, accounting for 73% of total installed desalination capacity. Furthermore, at present, Multi-stage flash distillation (MSF) is the prevalent technology amongst Saudi Arabia's desalination plants, accounting for 62% of total installed capacity. SWCC and inlight with the country vision 2030 has developed a comprehensive initiative to improve the efficiency of assests used in the desalatin plants. The intiative objectives are:</p> <ul style="list-style-type: none"> <li>• Increase energy efficiency;</li> <li>• Ensure the security and continuous supply of water by providing additional water capacity in accordance with the supply and demand document;</li> <li>• Optimal use of the assets and resources of the Saline Water Conversion Corporation (SWCC) and;</li> <li>• Increase environmental commitment.</li> </ul> <p>Shuaiba 1 desalination plant is one of the targeted plant for operation enhancement as part of SWCC initiative. The plant is located south of Jeddah in the Western Province of Saudi Arabia in the Red sea. It consists of 5 boilers, 5 turbines, 5 generators and 10 thermal desalination unit MSF. The plant produces 0.263 GW of electricity, and 223,000 m<sup>3</sup> of fresh water every day, Currently Shuaiba 1 plant consume 15 MBDOE of liquid fuel oil. SWCC developed a project to convert Shuaiba 1 plant from thermal desalination MSF to SWRO Technology SWRO liquid displacement Technology.</p>
<b>Intended/ achieved outcome(s)</b>	<p>The project started in 2021 and is expected to be completed in 2023. The project will:</p> <ul style="list-style-type: none"> <li>• Increase water capacity from 223,000 m<sup>3</sup>/day to 600,000 m<sup>3</sup>/day that is about 169% increase in capcity;</li> <li>• Reduce Specific Electrical Consumption from 15.9kwh/m<sup>3</sup> to 2.75 kwh/m<sup>3</sup>;</li> <li>• Reduce CO<sub>2</sub> Emission by 2.30million ton/year that is 100% removal of all CO<sub>2</sub> emissions.</li> <li>• Reduce crude oil fuel consumption from 15 to 3 MBDOe; and</li> <li>• Reduce OPEX Cost by 55%</li> </ul> <p>This case study proves the significant of the technological advancement in desalination technology and it is potential cost saving and environmental protection values.</p>
<b>Status &amp; timeline</b>	The project started in 2021 and is expected to be completed in 2023.
<b>References</b>	Saudi Water Partnership Company website at <a href="https://www.swcc.gov.sa">https://www.swcc.gov.sa</a>

## SGP - Singapore Air Traffic Management System Enhancement Project

Info	Details
<b>Country</b>	SGP
<b>Sector(s)</b>	transportation; ICT
<b>Sub-sector(s)</b>	airports; information technology
<b>Administrative level</b>	state





Info	Details
<b>Key agencies in charge</b>	Civil Aviation Authority of Singapore
<b>Policy macro area(s)</b>	planning; delivery
<b>Policy specific tool(s)</b>	Data collection/analysis effort; Contractual provisions improving maintenance delivery; Solutions improving maintenance delivery
<b>Highlights</b>	LORADS III (“Long Range Radar and Display System”) air traffic management system: The high system availability is enforced by maintenance contracts with service level agreements as well as effective spares management and after-sale support services to ensure prompt responses to incidents as well as uninterrupted supply and replacement of equipment. Due to the safety-critical nature of the system, there are continual reviews of the maintenance procedures on configuration and change management, release and deployment management, and business continuity management to ensure high service and process effectiveness.
<b>Intended/achieved outcome(s)</b>	Tapping on past experiences, the project was awarded as a single contract, with combined software development, integration, testing and acceptance, to achieve manpower and cost savings, as well as reduction in software delivery complexity. Improved integrated operational testing was also introduced to increase the effectiveness of the verification and validation of the system.
<b>Status &amp; timeline</b>	In anticipation of growing air traffic demands, CAAS adopted LORADS III, the third generation air traffic control system, in 2014. In 2020, Singapore completed the enhancement of our Air Traffic Management System (known as LORADS III) with new capabilities to support new runway operations as well as to provide higher level of safety nets and operational efficiency.
<b>References</b>	na

## SGP - Punggol Digital District

Info	Details
<b>Country</b>	SGP
<b>Sector(s)</b>	energy
<b>Sub-sector(s)</b>	energy generation; energy storage; energy distribution; energy efficiency; renewable energy
<b>Administrative level</b>	national
<b>Key agencies in charge</b>	JTC Corporation; Urban Redevelopment Authority; Economic Development Board; National Environment Agency; Land Transport Authority; Energy Market Authority; etc.





Info	Details
<b>Policy macro area(s)</b>	delivery
<b>Policy specific tool(s)</b>	Solution adopting integrated approach
<b>Highlights</b>	<p>In the search of effective energy and urban solutions for Singapore, the government has increasingly recognised the need for an integrated, system-level approach. Additionally, as part of Singapore's Smart Nation vision launched in 2014, the use of data analytics, networks, and information and communication technologies can provide opportunities to improve services by utility providers, support energy efficiency, facilitate the adoption of renewable sources, and enable people to lead more sustainable lives.</p> <p>Under the Singapore Green Plan 2030 (SGP30), which is a national sustainability movement, we aim to establish sustainable towns and districts, push for the adoption of cleaner energy vehicles, and green our infrastructure and buildings. To this end, various Singapore government agencies have worked together to implement several system-level solutions, including the Punggol Digital District, Solar Nova, and Marina Bay's underground District Cooling System. Punggol Digital District, a residential district located at the northeast of Singapore, is leading the next phase of urban development for Singapore. Punggol is slated to become Singapore's first smart town, featuring homes with built-in smart sockets and smart distribution boards that enable better monitoring of household energy consumption. This supports Singapore's target to reduce energy consumption in Housing Development Board towns by 15% by 2030 under the SGP30.</p>
<b>Intended/ achieved outcome(s)</b>	<p>Punggol is slated to become Singapore's first smart town, featuring homes with built-in smart sockets and smart distribution boards that enable better monitoring of household energy consumption. This supports Singapore's target to reduce energy consumption in Housing Development Board towns by 15% by 2030 under the SGP30.</p> <p>The Punggol Digital District (PDD) within will feature (i) smart energy grid solutions to integrate energy generation and storage systems, and optimise energy consumption; (ii) a comprehensive network of infrastructure and facilities to support greener mobility options, (iii) an Open Digital Platform that would collect real-time data from the district to roll out solutions such as optimising temperatures in buildings, and (iv) a district cooling system that centralises cooling needs, which could lead to lower capital investment and maintenance costs. The PDD is also designed to let industry and academia intermingle through sharing of work spaces and facilities. This physical integration facilitates the cross-fertilisation of ideas and nurtures collaboration in key emerging technologies.</p>
<b>Status &amp; timeline</b>	<p>The Punggol Digital District is developed by JTC Corporation, in partnership with various government agencies including the Urban Redevelopment Authority, Economic Development Board, National Environment Agency, Land Transport Authority, and in consultation with other agencies such as the Energy Market Authority. On the project timeline, foundation and infrastructure works of the PDD commenced in 2H 2018. The district is expected to be ready from 2023.</p>
<b>References</b>	<a href="https://www.ur.gov.sg/Corporate/Planning/Master-Plan/Urban-Transformations/Punggol-Digital-District">https://www.ur.gov.sg/Corporate/Planning/Master-Plan/Urban-Transformations/Punggol-Digital-District</a>



## TUR - Istanbul Seismic Risk Mitigation and Emergency Preparedness Project (ISMEP)

Info	Details
Country	TUR
Sector(s)	ICT; social
Sub-sector(s)	telecommunications; information technology; digital connectivity; other ICT (remote automation monitoring & control); education; healthcare; tourism and arts; other social infrastructure (public buildings: dormitory, police station, nursing home, children care facility etc.)
Administrative level	city
Key agencies in charge	MoF; Min Youth Sports; Min. environment; Minister of interior...; Presidency of Strategy and Budget; many Istanbul agencies; IBRD
Policy macro area(s)	planning; funding; delivery
Policy specific tool(s)	Definition/adoption of standards; Other planning [Strategic Planning via ISMEP Project Appraisal Study]; Innovative funding sources for delivering maintenance of public infrastructure; Mitigation of disincentives to asset maintenance spending; Other funding [IFI Loans]; Solutions improving maintenance planning / lifecycle asset management strategy / risk management; Solution adopting integrated approach; Solutions improving maintenance delivery; Adoption/sharing of innovation and new technology for maintenance; Resilience or maintenance solution relying on nature-based approaches / green infrastructure;
Highlights	<p>In order to improve the city of Istanbul's preparedness for a potential earthquake through enhancing the institutional and technical capacity for disaster management and emergency response, strengthening critical public facilities for earthquake resistance, and supporting measures for better enforcement of building codes and land use plans, Istanbul Seismic Risk Mitigation and Emergency Preparedness (ISMEP) Project had been prepared by the Turkish Government. The International Bank for Reconstruction and Development (IBRD) and the Republic of Turkey signed a Loan Agreement in the amount of Euro 310.00 million (US\$400.00 million equivalent) on October 18, 2005 for the funding of ISMEP. The agreement became effective on February 3, 2006.</p> <p>ISMEP Project consists of: (A) Enhancement the effectiveness and capacity of the provincial and municipal public safety organizations in Istanbul to prepare for, respond to and recover from significant emergencies, those arising from earthquakes; (B) Seismic risk mitigation for priority public facilities to ensure their function and to reduce casualties in the event of earthquake through retrofitting of hospitals, schools and other priority public facilities; (C) Enforcement of building codes made in implementation of land use plans to strengthen the institutional and technical capacity of the Metropolitan Municipality and selected district municipalities.</p>



Info	Details
<b>Intended/ achieved outcome(s)</b>	The project was found “highly satisfactory” by the World Bank and the financial return of the project with consideration of the financial damage impact in case of a disaster is estimated between 7 to 12 times higher than the project investment cost according to the Economic Impact Analysis Report prepared by Deloitte in 2016.
<b>Status &amp; timeline</b>	The [IBRD loan] agreement became effective on February 3, 2006. The project is still on progress and to date, through 7 IFIs, the project budget has reached to 2,3 billion EUR and more than 1400 public buildings (inc. healthcare facilities, educational buildings, public buildings etc.) have been retrofitted or reconstructed and became resilient to the disasters. Additionally, the project beneficiary has reached to 3.1 million people in Istanbul.
<b>References</b>	<a href="https://ieg.worldbankgroup.org/news/reducing-risk-disaster-strikes-seven-lessons-turkey">https://ieg.worldbankgroup.org/news/reducing-risk-disaster-strikes-seven-lessons-turkey</a> <a href="http://testweb.ipkb.gov.tr/downloads/NF.rar">http://testweb.ipkb.gov.tr/downloads/NF.rar</a>

## TUR - Eurasia Tunnel: Ventilation Optimization Study

Info	Details
<b>Country</b>	<b>TUR</b>
<b>Sector(s)</b>	energy; transportation; other
<b>Sub-sector(s)</b>	energy efficiency; bridges and tunnels; other sector [Environmental Good Practice about Air Quality]
<b>Administrative level</b>	national; city
<b>Key agencies in charge</b>	Ministry of Environment and Urbanisation, Istanbul Metropolitan Municipality - The Environment Protection Directorate
<b>Policy macro area(s)</b>	planning; funding; delivery
<b>Policy specific tool(s)</b>	Data collection/analysis effort; Definition/adoption of standards; Strengthened institutional framework; Regulatory innovations; Private sector investments, PPP, etc.; Solutions improving maintenance planning / lifecycle asset management strategy / risk management; Solution adopting integrated approach; Private sector participation in successful delivery of O&M



Info	Details
<b>Highlights</b>	<p>Eurasia Tunnel is two deck, 5 km long road tunnel under İstanbul Strait (Bosphorus). Longitudinal Ventilation is applied in Eurasia Tunnel with jet-fans located through the tunnel and the system is supported with axial fans located in two ventilation stacks at the end of each deck.</p> <ul style="list-style-type: none"> <li>- As the 1st stage of the project, Air Quality Monitoring Sensors are implemented in the tunnel before, after and inside of the ventilation stacks to monitor the interior air quality. Sensors are selected to monitor CO, NO, NO2 and Visibility (Particulated Matter) concentration in the air. According to the analysis on gathered data and observations air quality values are determined in correlation with the traffic data. Concentration levels are determined below both PIARC regulations and the design criteria which determines the trigger points for working schedules of the ventilation system. Also, exterior air quality monitoring stations are established at the nearest location to the ventilation stacks according to the air quality studies to understand and control possible effect of tunnel on ambient air quality.</li> <li>- At the 2nd phase, air quality measurements are done in the tunnel to model the air quality and traffic volume relations inside the tunnel with both installed sensors, hand tools and laboratory sample analysis results. According to the monitoring results new trigger points are determined in both air quality and traffic density.</li> <li>- In the 3rd phase, the effect of different working conditions of the ventilation system (axial fan number and capacity, and jet fan number) on air quality is determined with various tests. Also, energy consumption and the efficiency of the fans are determined in different numbers and capacities.</li> </ul> <p>According to the evaluation results of the phases new working schedules are determined which creates an energy consumption saving up to 80% in daily basis compared to the initial design criteria.</p> <ul style="list-style-type: none"> <li>- In the 4th phase recently an additional study is held. This study aims to create adaptive working conditions for the ventilation system (especially axial fans) according to the predetermined trigger points. System monitors and checks the air quality monitoring sensor values continuously and determines both working capacity and number of the axial fans according to the measured concentrations. Thanks to this study up to 15% energy consumption saving is done when compared to the fixed operating scenarios in hourly basis.</li> </ul>
<b>Intended/ achieved outcome(s)</b>	With these improvement studies significant energy efficiency is achieved. Both axial-fans and jet-fans working durations are reduced. Thus, lifecycle costs related with heavy maintenance/replacement requirements for the fans and bearings are also reduced significantly.
<b>Status &amp; timeline</b>	Eurasia Tunnel is commenced to the operation in December 2016.
<b>References</b>	Hataysal, Ertan & Tabarra, Mohammad & Gun, Badel & Gucuyener, Murat. (2019). Assessment of Tunnel Ventilation Operation in Eurasia Road Tunnel.

## USA - Pennsylvania Rapid Bridge Replacement

Info	Details
<b>Country</b>	USA
<b>Sector(s)</b>	transportation



Info	Details
<b>Sub-sector(s)</b>	bridges and tunnels
<b>Administrative level</b>	state; region; city
<b>Key agencies in charge</b>	Pennsylvania Department of Transportation (PennDOT)
<b>Policy macro area(s)</b>	planning; funding; delivery
<b>Policy specific tool(s)</b>	<p>Strategic plan addressing infrastructure assets management / maintenance / repairing;  Data collection/analysis effort;  M&amp;E framework focused on maintenance backlog and budgeting;  Definition/adoption of standards;  Institutional capacity/ governance;  Strengthened institutional framework;  Regulatory innovations;  Earmarking of funding sources for maintenance;  Regulation and practices to account for deferred maintenance costs in agencies' balance sheets;  Innovative funding sources for delivering maintenance of public infrastructure;  Private sector investments, PPP, etc.;  Funding schemes incorporating preparedness to risk;  Mitigation of disincentives to asset maintenance spending;  Private sector equity and debt financing through issuance of Private Activity Bonds;  Solutions improving maintenance planning / lifecycle asset management strategy / risk management;  Solution adopting integrated approach  Contractual provisions improving maintenance delivery;  Solutions improving maintenance delivery;  Adoption/sharing of innovation and new technology for maintenance;  Solutions improving maintenance cost management;  Resilience or maintenance solution relying on nature-based approaches / green infrastructure;  Solutions integrating resilience into infrastructure intervention;  Private sector participation in successful delivery of O&amp;M</p>
<b>Highlights</b>	The Pennsylvania Rapid Bridge Replacement Project is replacing 558 structurally deficient bridges in 3 years under a single contract through an availability payment-based public-private-partnership (P3). The bridges are primarily stateowned, smaller spans that are on roads with low traffic volumes in rural areas across the state.
<b>Intended/ achieved outcome(s)</b>	The project accelerated the replacement of the bridges with robust, high-quality new structures that will be well maintained and have longer lifespans. By bundling the replacement of over 500 bridges in a single P3 procurement and by applying asset management best practices throughout the 25-year concession period, PennDOT created efficiencies through economies of scale. The bridges have also been designed to minimize environmental impacts and public inconvenience during construction.



Info	Details
Status & timeline	The consortium was awarded the contract in October 2014.
References	<a href="https://www.penndot.gov/ProjectAndPrograms/p3forpa/pages/rapid-bridge-replacement-project.aspx">https://www.penndot.gov/ProjectAndPrograms/p3forpa/pages/rapid-bridge-replacement-project.aspx</a>

## USA - The Transform 66 Outside the Beltway

Info	Details
Country	USA
Sector(s)	transportation
Sub-sector(s)	roads; urban mobility
Administrative level	national; state; region
Key agencies in charge	Virginia Department of Transportation (VDOT)
Policy macro area(s)	funding; delivery
Policy specific tool(s)	<p>Innovative funding sources for delivering maintenance of public infrastructure; Private sector investments, PPP, etc.; Funding schemes incorporating preparedness to risk; Mitigation of disincentives to asset maintenance spending; Coordinated allocation of various available sources of funds, including supranational; Other;</p> <p>Solutions improving maintenance planning / lifecycle asset management strategy / risk management;</p> <p>Contractual provisions improving maintenance delivery;</p> <p>Solutions improving maintenance delivery;</p> <p>Adoption/sharing of innovation and new technology for maintenance;</p> <p>Solutions improving maintenance cost management;</p>
Highlights	<p>Transform 66 Outside the Beltway: The project is a concession agreement between the Virginia Department of Transportation (VDOT) and Cintra led consortium known as Express Mobility Partners (EMP), a private sector company, to design, build, finance, operate and maintain tolled express lane facility for 50 year period.</p> <p>“The project requires zero public investment and Virginia’s private partner will provide an upfront payment of approximately \$500 million that will be used to fund additional transportation improvements in the corridor. Additionally, the comprehensive agreement requires EMP to pay a net present value of \$800 million for transit service in the corridor and \$350 million for other projects to improve the I-66 corridor over the next 50 years.”</p>



Info	Details
<b>Intended/ achieved outcome(s)</b>	According to VDOT's public statement, "the project will modify nearly 23 miles of I-66 providing two express lanes alongside three regular lanes from I-495 to Route 29 in Gainesville in each direction, with dedicated express lane access points, and space in the median reserved for future transit. In addition, the project consists of 4,000 park-n-ride spaces, new and expanded bus service throughout the corridor, safety and operational improvements at key interchanges, auxiliary lanes between interchanges, and bicycle and pedestrian upgrades."
<b>Status &amp; timeline</b>	In December 2016 VDOT awarded a 50 year concession contract to I-66 Express Mobility Partners to design, build, operate and maintain I-66 from I-495 to Gainesville.
<b>References</b>	<a href="http://outside.transform66.org/about_the_project/default.asp">http://outside.transform66.org/about_the_project/default.asp</a>

## ZAF - Expanded Public Works Programme Integrated Grant for Municipalities

Info	Details
<b>Country</b>	ZAF
<b>Sector(s)</b>	transportation; social
<b>Sub-sector(s)</b>	roads; civic buildings; urban infrastructure
<b>Administrative level</b>	region; city
<b>Key agencies in charge</b>	Department of Public Works and Infrastructure
<b>Policy macro area(s)</b>	planning; funding; delivery
<b>Policy specific tool(s)</b>	Strategic plan addressing infrastructure assets management / maintenance / repairing; Earmarking of funding sources for maintenance; Solutions improving maintenance planning / lifecycle asset management strategy / risk management; Solution adopting integrated approach; Contractual provisions improving maintenance delivery
<b>Highlights</b>	The Expanded Public Works Programme Integrated Grant for Municipalities promotes the use of labour-intensive methods in delivering municipal infrastructure and services. To determine eligibility for funding, municipalities must have reported performance on the EPWP, including performance in the infrastructure, social and environment and culture sectors and on the full-time equivalent jobs created in these sectors in the last 18 months. A formula then determines allocations on the basis of this performance as well as the labour intensity of the work opportunities created. The number of bands in which labour intensity are recorded in the formula have been expanded from seven to eight, providing an incentive for labour-intense projects to further increase their intensity. The formula is weighted to give larger allocations to rural municipalities.





Info	Details
<b>Intended/achieved outcome(s)</b>	To incentivise municipalities to expand work creation efforts through the use of labour intensive delivery methods in the following identified focus areas, in compliance with the Expanded Public Works Programme (EPWP) guidelines: road maintenance and the maintenance of buildings; low traffic volume roads and rural roads basic services infrastructure, including water and sanitation reticulation (excluding bulk infrastructure); other economic and social infrastructure tourism and cultural industries; waste management; parks and beautification; sustainable land-based livelihoods; social services programmes; community safety programmes.
<b>Status &amp; timeline</b>	No details available.
<b>References</b>	<a href="http://www.treasury.gov.za/legislation/bills/2021/[B3%20-%202021]%20(Division%20of%20Revenue).pdf">http://www.treasury.gov.za/legislation/bills/2021/[B3%20-%202021]%20(Division%20of%20Revenue).pdf</a> - Division of Revenue. 2021. Explanatory Memorandum.

## ZAF - Provincial Roads Maintenance Grant

Info	Details
<b>Country</b>	ZAF
<b>Sector(s)</b>	transportation
<b>Sub-sector(s)</b>	roads
<b>Administrative level</b>	region
<b>Key agencies in charge</b>	National Department of Transport and Provincial Departments of Transport.
<b>Policy macro area(s)</b>	planning; funding; delivery
<b>Policy specific tool(s)</b>	Strategic plan addressing infrastructure assets management / maintenance / repairing; Earmarking of funding sources for maintenance; Solutions improving maintenance planning / lifecycle asset management strategy / risk management; Solution adopting integrated approach; Contractual provisions improving maintenance delivery
<b>Highlights</b>	Provincial Roads Maintenance Grant: This supplementary grant that supports the cost of maintaining provincial roads. Provinces are expected to fund the construction of new roads from their own budgets and supplement the cost of maintaining and upgrading existing roads. Grant allocations are determined using a formula based on provincial road networks, road traffic and weather conditions. These factors reflect the varying costs of maintaining road networks in each province. The grant requires provinces to follow best practices for planning, and to use and regularly update road asset management systems.



Info	Details
<b>Intended/ achieved outcome(s)</b>	To supplement provincial investments for road infrastructure maintenance (routine, periodic and special maintenance); to ensure that all roads are classified as per the Road Infrastructure Strategic Framework for South Africa and the technical recommendations for highways, and the Road Classification and Access Management guidelines; to implement and maintain road asset management systems; to supplement provincial projects for the repair of roads and bridges damaged by unforeseen incidents including natural disasters; to improve road safety with a special focus on pedestrian safety in rural areas.
<b>Status &amp; timeline</b>	The Department of Transport and the National Treasury agree that the grant should be used to incentivise improved performance in provincial roads departments and will work together in 2021 to revise the incentive component in time to determine allocations from the R1.7 billion unallocated incentive pool in 2022/23. The total allocation for the Medium-Term Expenditure Framework (MTEF) period is R37.5 billion.
<b>References</b>	<a href="http://www.treasury.gov.za/legislation/bills/2021/[B3%20-%202021]%20(Division%20of%20Revenue).pdf">http://www.treasury.gov.za/legislation/bills/2021/[B3%20-%202021]%20(Division%20of%20Revenue).pdf</a> - Division of Revenue. 2021. Explanatory Memorandum.