

Mexican Institute of Transport



Mexican Institute of Transport

- Created April 15, 1987
- A decentralized facility of the Secretariat of Communications and Transportation (SCT)

1987



INITIAL OBJECTIVE

Traning transportation planning specialists and researchers in a context of increased international commerce.





2018 IMT promotes **technological development** and **knowledge** about infrastructure, logistics, systems, standards, and innovative materials applied to the context of transport.



*Aiming for increased safety,
sustainability and competitiveness of transport...*

In the fields of road, maritime, rail, air and intermodal transportation

... through:



Applied research



Technological development



Transportation standards



Specialized Services



Post-bachelor
education programs



Knowledge and
technology transfer



Advice and technical
assistance

Applied Research

- **Comprehensive transport safety**
 - **Vehicle-driver-road interaction**
 - In-port ship manoeuvres
 - Airport operations



National Experimental Center of Technological Innovation for Vehicular Safety

- Dynamic performance evaluation of heavy, medium and light vehicles.
- Identification of operational limits.
- Effects on the performance of the use of specific components: tires, suspension, trailer couplers and others.

Applied Research

- **Comprehensive transport safety**
 - Vehicle-driver-road interaction
 - **In-port ship manoeuvres**
 - Airport operations

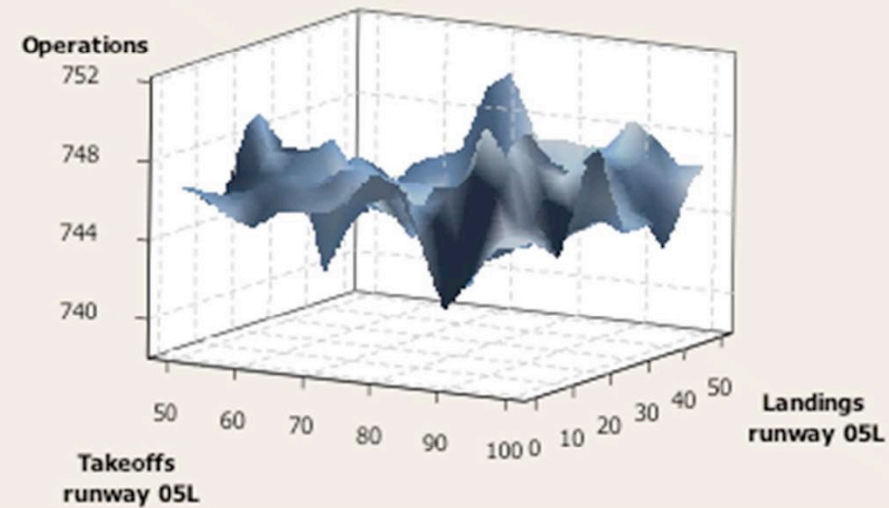


Ship-Bridge Simulator

- Detailed & comprehensive evaluation of alternatives for dimensioning of the current and future navigation areas of a port.
- Feasibility analysis in the performance of ship manoeuvres.
- Design and optimization of navigation signaling & assistance systems.

Applied Research

- **Comprehensive transport safety**
 - Vehicle-driver-road interaction
 - In-port ship manoeuvres
 - **Airport operations**



Alternative solutions to mitigate airport saturations.

- Simulation and models applied to airport congestion for the purpose of knowing how to use infrastructure at airports more efficiently, within safety limits.

Applied Research

- Integrity and preservation of infrastructure
 - Highways, airports and ports asset management
 - Risk management from climate change



Heavy Vehicle Simulator (HVS)

- Accelerated tests of pavement fatigue (deterioration curves)
- Identification of weak layers in a pavement section and its failure mode.
- Evaluation of environmental influence on performance.
- Evaluation of new construction materials, additives and performance enhancers for port, runway and road pavements.

Applied Research

- **Integrity and preservation of infrastructure**
 - Highway and airport assets
 - **Risk management for climate change**



Permanent Monitoring Center for Intelligent Structures (CEMPEI)

- Monitoring and management of operational risks and environmental changes.
- Structural evaluation, prognosis and bridge monitoring.
- Development of deterioration models and simulations of structural behaviour.

Applied Research

- **Policy planning for competitiveness and poverty alleviation**
 - **Rural transport and community development**
 - Prospective analysis of transport and its infrastructure



Rural access and mobility planning

- Comprehensive diagnosis of rural accessibility & mobility for economically disadvantaged communities
- Collaborative identification and selection of technologically appropriate solutions .

Applied Research

- **Policy planning for competitiveness and poverty alleviation**
 - Rural transport and community development
 - **Prospective analysis of transport and its infrastructure**



National Laboratory for Transportation Systems and Logistics (SiT-Log Lab)

- National and regional modelling of transport networks & scenario based planning
- National Observatory of Transport and Logistics
- Urban logistics living laboratory (LogistiX Lab)
- Logistics UAV Development (IMTx)

Applied Research

- **Environmental sustainability of transportation**
 - **Seaports and airports**
 - Construction and highway operation



Seaports and airports

- Digital and physical modeling of coastal and port protection infrastructure.
- Impact studies of noise generated by airports and ports operation.

Applied Research

- **Environmental sustainability of transportation**
 - Seaports and airports
 - Construction and highway operation



International Adaptation Framework of Road Infrastructure in face of Climate Change

- Risk identification and prescription of appropriate measures to increase the resilience of road transport

Technological Development/Integration

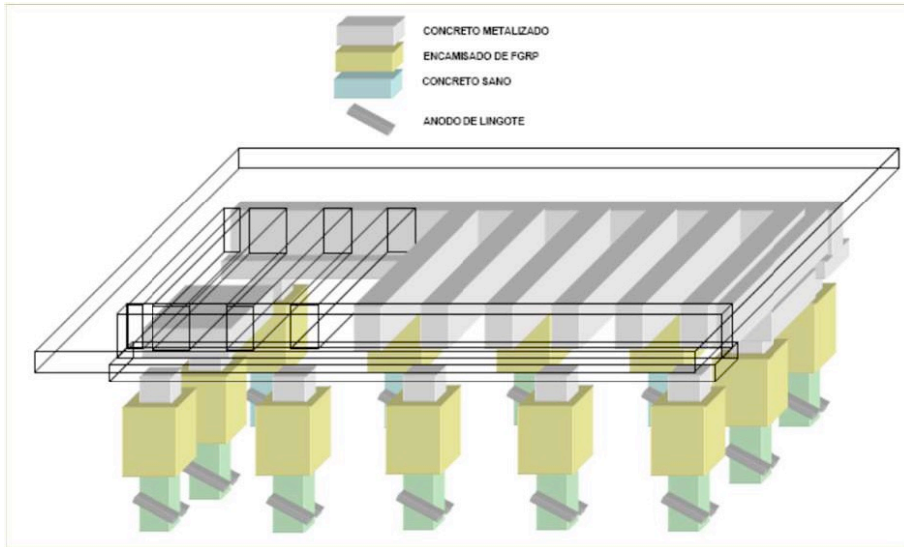


- **National Road Network**
 - Geo-referenced digital database for transport modeling and *apps* development.



- **National Network of Oceanographic and Meteorological Telemetric Stations**
 - Basic data for studies of coastlines and ports
 - National Tsunami Alert System.

Technological Development



- **Development of cathodic protection systems with enriched zinc**
 - Protections of docks and bridges.



- **Motor carrier costs calculation system**
 - Calculator of Reference Costs for the freight motor carrier small and medium size companies

Technological Development



- **Mobility and Mortality Observatory for Wild life on Mexican Roads**
 - Integrated database built with the inputs from voluntary reports from motorists.



- **Tool for the design of flexible pavements**
 - Mechanistic structural calculation for flexible pavements.

Technological Development



- Powertrain selection tool for heavy cargo and passenger service vehicles



- Vehicle renewal decision tool for freight motor carrier companies

Transport Infrastructure Technical Standards

- Formulation and revision of transport infrastructure regulations.
- The official Mexican standards applicable to road infrastructure, such as road signs and safety devices, have contributed to the reduction of deaths and injuries caused by road and highway collisions.



<http://normas.imt.mx>

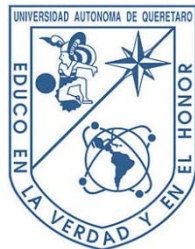
Specialized Services

- **Verification of road inspection equipment**
- **Field evaluation of pavements, bridges and docks**
- **Non-destructive tests**
- **Laboratory tests**
 - Asphalt mixtures
 - Pavements
 - Materials
 - Geotechnics



Progreso viaduct pier, Yucatán, Mexico

Post-Bachelor Education Programs



- **Graduate studies**
 - Scholarship agreements with universities for specialization and master degrees
- **Diplomas – On line education**
 - Road design, construction and maintenance
 - Road safety

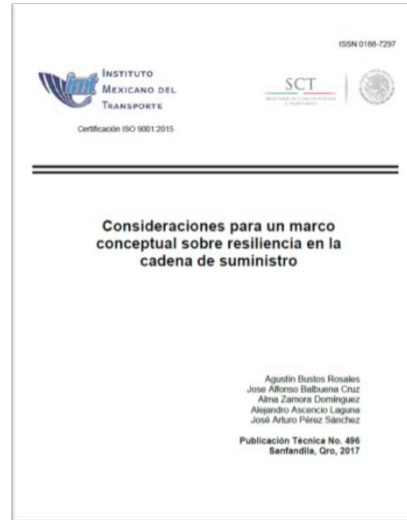
Continuous Education

- **Themes:**
 - Economic and social evaluation of road projects
 - Road assets management
 - Environmental impact evaluation
 - Road safety topics
 - Bridge maintenance
 - Pavements design
 - Port engineering topics
 - GPS & Geographic information systems topics
 - Maritime telemetric equipment care
 - Advance logistics topics



- **International executive courses**
- **Regional executive courses**

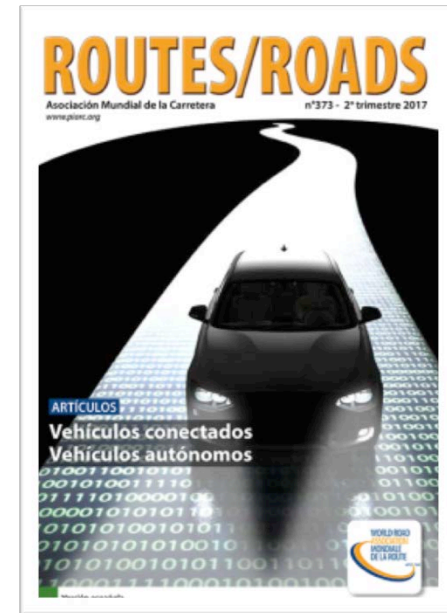
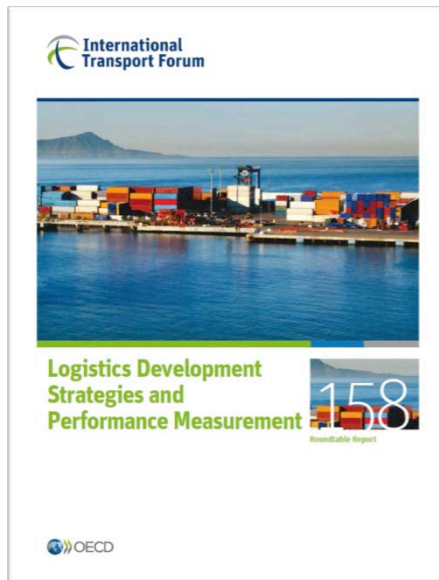
Technology and Knowledge Dissemination



- **Bimonthly newsletter**
 - Articles, academic events, projects in progress, recent publications.
- **Technical publications**

- **National technical magazines**

Technology and Knowledge Dissemination



- International Transport Forum
ITF/OECD

- World Road Association
(PIARC)

Technical Advice and Assistance



- National ITS Plan
- Road Safety Program, Road Safety Law and the NOM-012 Vehicle Weight and Dimensions Regulation
- Relevant transport and infrastructure projects

Our Clients

Federal government entities



Other federal agencies or companies



Our Clients

Private sector and international organizations



State governments



Laboratories

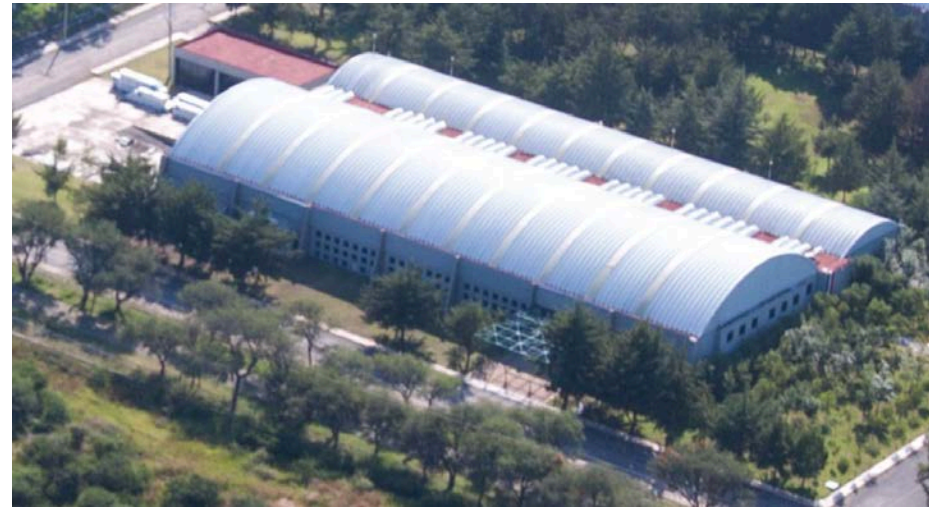
- **Infrastructure Laboratories**
 - Soil mechanics
 - Rock mechanics
 - Asphalts and asphalt mixture
 - Heavy vehicle simulator



Top view of the Infrastructure Laboratory and Heavy Vehicle Simulator, IMT.

Laboratories

- **Structural Integrity Laboratories**
 - Monitoring Center for Bridges and Smart Structures
 - Optical Fiber
 - Non-destructive inspection
 - Materials description
 - Corrosion and chemical analysis
 - Structural simulation & analysis
 - Vibrations
 - Optical and electronic microscopy
 - Materials Durability



Top view of the Durability & Structural Integrity Laboratories, IMT

Laboratories

- **Port and Coastal Engineering Laboratories**
 - Maritime and environmental hydraulics
 - Calibration of oceanographic instruments & equipment
 - Ship maneuvering simulator
 - National Network of Oceanographic and Meteorological Stations



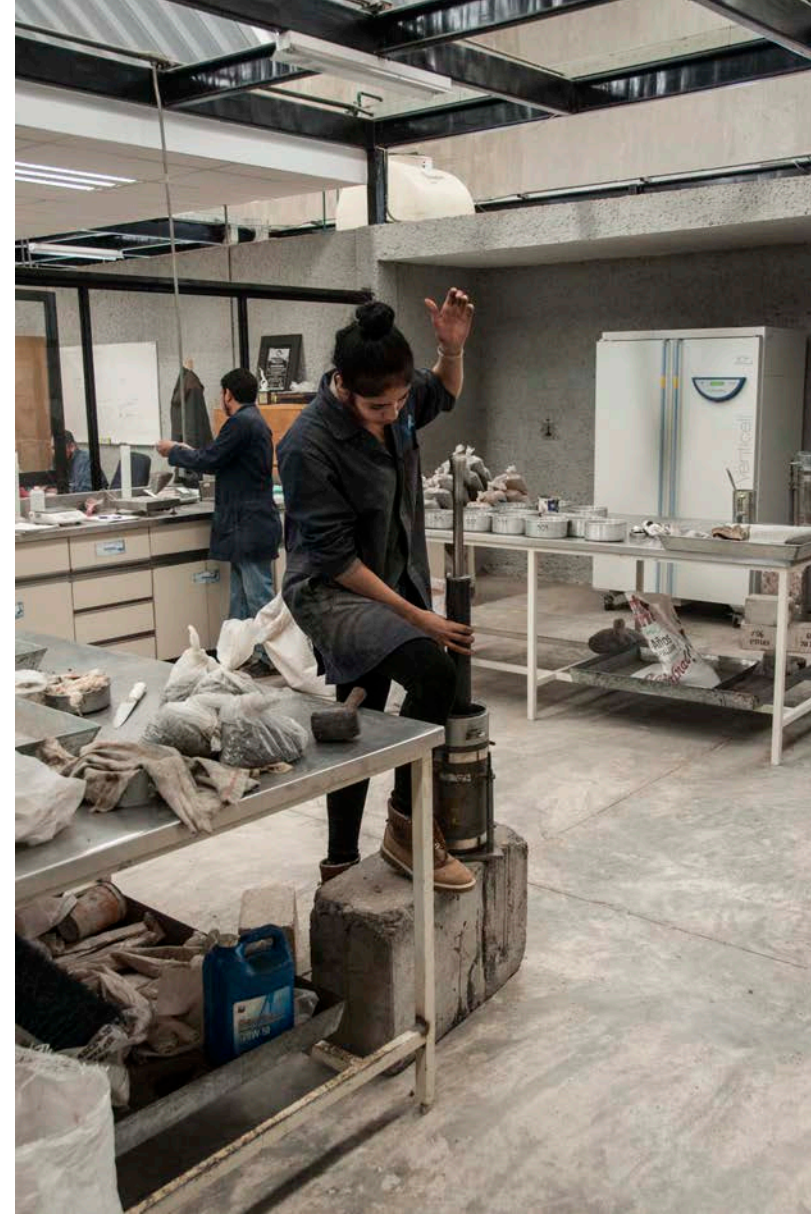
Top view of the new facilities that will soon have two-dimensional wave tanks and longer wave channels, as well as medium size flow channel .

Human Capital

- **Total staff**
 - 163 posts
 - (147 in Querétaro and 16 in Mexico City)
- **Scientific and Technological Staff**
 - 112 Eng
 - 30 PhDs
 - 56 M. Sc/Eng
 - 26 Bachelor

National System of Researchers

 - 3 candidates
 - 3 Level 1
 - 3 Level 2
- **Support Staff**
 - 51 professionals
 - Up to 70 students





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