



**XXIVth World
Road Congress
Mexico 2011**
Mexico City 2011.

Support for HDM-4 in Latin America (2): Role of the Mexican Transport Institute

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THE MEXICAN TRANSPORT INSTITUTE (IMT)

IMT's Mission Highlights

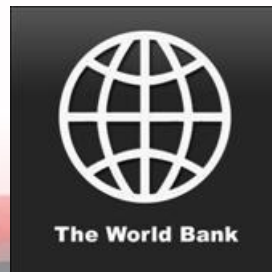
- Support the development of the transport sector (public and private) jointly with SCT
- Contribute to improving the safety, quality, modernity, reliability and efficiency of transport services taking into account its social and environmental effects
- Conduct research, technological innovation and standards formulation projects
- Contribute to educating and training human resources for the transport sector



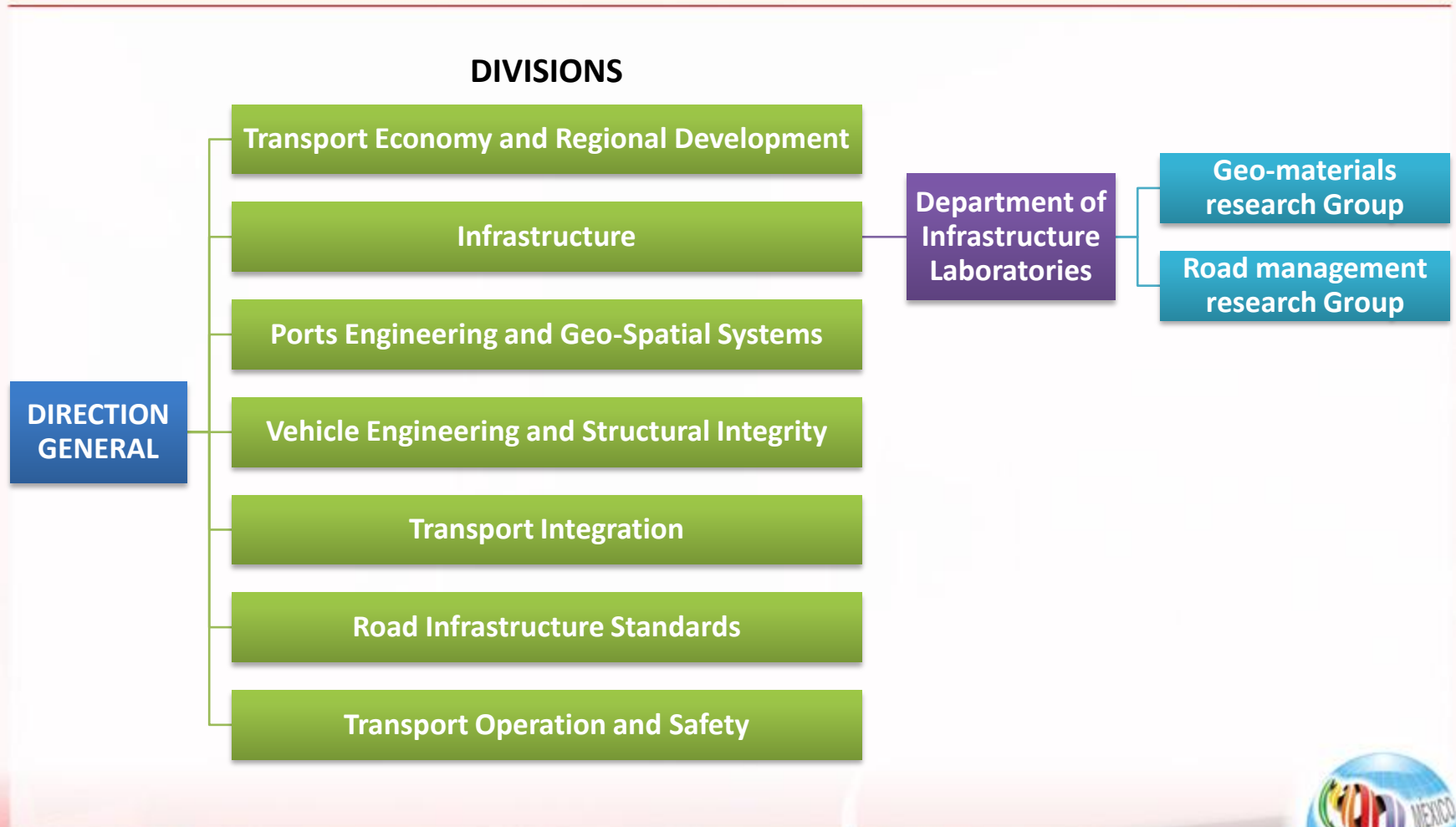
INTERNATIONAL COOPERATION OF IMT



Universidad del Cauca



ROAD INFRASTRUCTURE MANAGEMENT WITHIN THE IMT



MAIN FUNCTIONS OF THE ROAD MANAGEMENT RESEARCH GROUP

- Promote the adoption of the road asset management framework by road authorities
- Support the deployment of road management systems by public and private entities
- Develop specific tools to ease the implementation of road management processes
- Monitor international improvements related to asset management
- Disseminate knowledge

CONTEXT

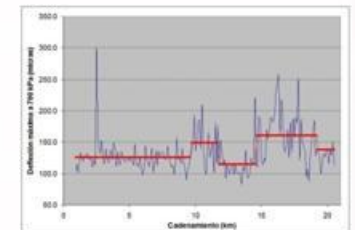


H D M - 4
HIGHWAY DEVELOPMENT & MANAGEMENT



IMT's BACKGROUND ON ROAD MANAGEMENT

- Development of the Mexican Pavement Management System (SIMAP)
- Adaptation of the VOC model for use in Mexico
- Development of the Bridge Inventory and Management System
- Execution of a HDM-4 sensitivity analysis
- Development of an algorithm for segmenting road sections based on condition data
- Provision of technical assistance in the development of a pavement management system based on HDM-4 for a toll-road subnetwork



“UNOFFICIAL” TRAINING ON HDM-4

Curso Internacional sobre Conservación de Carreteras

Sistema de Gestión de Pavimentos HDM 4
Ing. Mauricio Salgado Torres M.Sc.

Evaluación técnico – económica de proyectos de conservación de carreteras.

Curso Internacional Conservación de Carreteras
Sistemas de Gestión de Pavimentos SEP y HDM-4

Ing. Mauricio Salgado Torres M.Sc.
Pontificia Universidad Javeriana
Colombia

Principios y fundamentos de la gestión de pavimentos

Introducción al modelo HDM-4

Ricardo Solorio Murillo
Instituto Mexicano del Transporte

Pachuca, Hgo., 21 al 23 de mayo de 2003

Introducción al sistema HDM-4

Aspectos de Gestión de Infraestructura Carretera

UDLAP

Sistema para el desarrollo y gestión de carreteras

HDM - 4
ROAD DEVELOPMENT & MANAGEMENT

Ricardo Solorio Murillo

MAESTRÍA EN INGENIERÍA VIAL
Pontificia Universidad Católica del Ecuador
Quito, Ecuador, 30 de octubre al 2 de noviembre de 2008

CURSO INTERNACIONAL SOBRE Gestión de pavimentos con HDM-4 versión 2.0

Ricardo Solorio Murillo
Roberto Hernández Domínguez
GRUPO DE GESTIÓN DE INFRAESTRUCTURA CARRETERA
Coordinación de Infraestructura, IMT

SAN FANDILA, QUERÉTARO



TRANSLATION OF HDM-4 2 USER INTERFACE

- Promoted and funded by PIARC
- Based on Mexican road terminology (version 1.3 translation was based on terminology used in Spain)
- Translation performed for main application and tools
- Datasets and documentation were not translated
- Items translated:
 - Menus
 - Dialogs
 - Strings
 - Report descriptors
 - Report files
- Advice provided by the translators of the French version



TRANSLATION OF STRING ITEMS

		Assignments	Affectations	Asignaciones
12700	IDS_ALTERNATIVES_ASSIGNMENTS			
12701	IDS_MSG_SPEEDFLOW_RESETDEFAULTS	This will reset the capacity data to the default values for the selected road type. Do you wish to continue?	Les données capacité du type de route sélectionné seront ramenées aux valeurs par défaut. Souhaitez-vous continuer ?	Se restablecerán los datos de capacidad a valores por omisión para el tipo de carretera seleccionada. ¿Desea continuar?
12702	IDS_MSG_TRAFFLOW_RESETDEFAULTS	This will reset the flow distribution data to the default values for the selected Road Use. Do you wish to continue?	Les débits classés du type de route sélectionné seront ramenés aux valeurs par défaut. Souhaitez-vous continuer ?	Se restablecerán los datos de distribución del flujo a valores por omisión para el tipo de carretera seleccionada. ¿Desea continuar?
12703	IDS_STRATFLOW_LIFECYCLEOPTIONS	In order to generate a strategy you must define a base alternative and one or more other alternatives.	Pour réaliser une analyse de stratégies, il faut définir une solution de base et une ou plusieurs options variantes.	Para generar una estrategia debe definir una alternativa base y una o más de alternativas adicionales.
12704	IDS_STRATFLOW_LIFECYCLEBASEOPTION	In order to perform an analysis you must select a base alternative.	Pour réaliser une analyse, il faut choisir une solution de base.	Para ejecutar un análisis debe seleccionar una alternativa base.
12705	IDS_STRATFLOW_SECTIONSD_NOTDEFINED_NETELEMSVEHICLE	Both sections and vehicles must be selected before specifying the work standards	Les sections et les véhicules doivent être sélectionnés avant de définir les normes de travaux	Se deben seleccionar los tramos y los vehículos antes de definir los estándares de trabajo
12706	IDS_STRATFLOW_LIFECYCLEBEFOREGENERATINGRESULTS	You must generate a strategy before generating reports.	Il faut réaliser une analyse de stratégies avant de produire des rapports.	Se debe generar una estrategia para poder generar los informes.
12707	IDS_STRATFLOW_SECTIONSD_NOTDEFINED_NETELEMSVEHICLE	Sections and vehicles must be selected, and work standards defined before generating a strategy.	Les sections et les véhicules doivent être sélectionnés, et les normes de travaux définies avant de pouvoir réaliser une analyse de stratégies.	Se deben seleccionar los tramos y los vehículos y definir los estándares de conservación antes de generar una estrategia.
12708	IDS_STRATFLOW_OPT_LIFECYCLEBEFORERESULTS	You must generate a strategy before carrying out a budget optimisation.	Il faut réaliser une analyse de stratégies avant de lancer une optimisation budgétaire.	Se debe generar una estrategia antes de realizar una optimización presupuestal.



HDM-4 GLOSSARY

Traducción del sistema HDM-4 v.2

GLOSARIO DE TÉRMINOS

A	
AADT	TDPA
abort	interrumpir
Accident Classes	Clases de accidente
Accident Summary	Resumen de accidentes
actual	real
add	añadir, agregar
adequacy data	datos de la adecuación
Annual Summary	resumen anual
Asset Valuation	Valuación de activos
assignment	asignación
average horizontal curvature	deflexión promedio
average number of raises and falls per km	no. promedio de ascensos y descensos por km
Average Roughness	Irregularidad (IRI)
B	
bituminous	asfáltico (a)
Bituminous Pavement Condition	Condición del pavimento asfáltico
Bituminous Pavements	Pavimentos asfálticos
blank	vacío
Budget Scenario	Escenario presupuestal



HDM-4 AND THE REGIONAL VARIANTS OF SPANISH

- Regarding technical terms, regional variants of Spanish may strongly differ. For instance, for Mexico and Colombia:
 - Agregado, árido (aggregate)
 - Roderas, ahuellamiento (rutting)
 - Concreto hidráulico, hormigón (concrete)
- A “neutral” version of HDM-4 in Spanish may prove very difficult to develop
- Production of versions for specific countries could only be justified if demand for HDM-4 is strong
- Lexicons may help improving HDM-4 use in countries other than Mexico



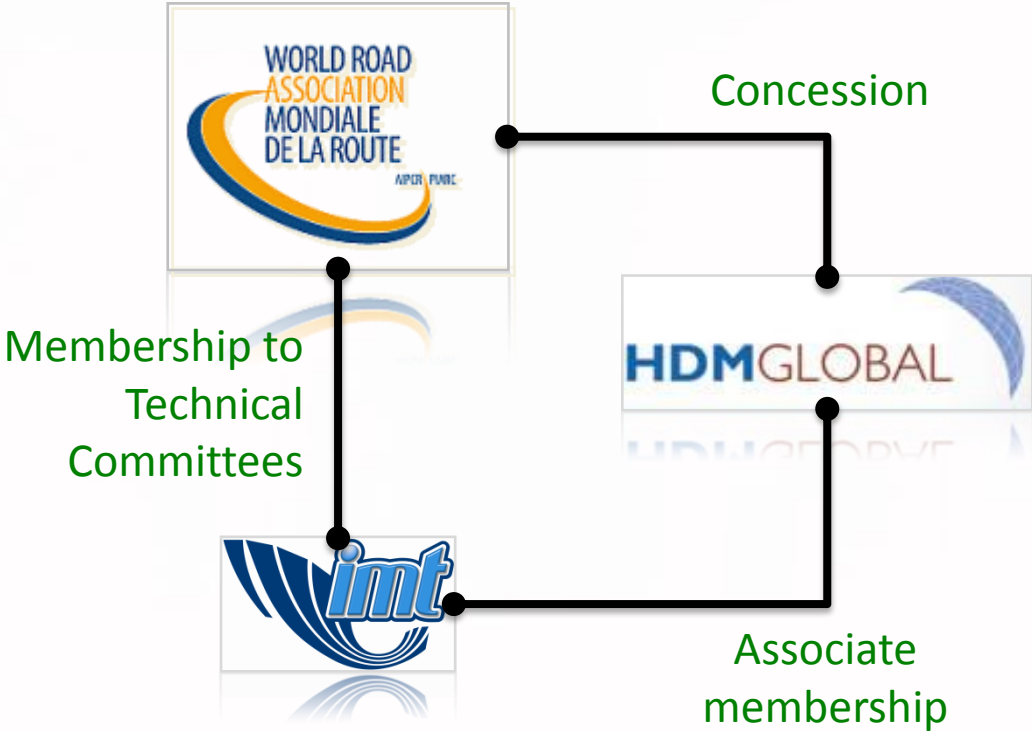
HDMGlobal BOARD MEETING & HDM-4 WORKSHOP MEXICO CITY, JANUARY 2010



- 13 speakers from HDMGlobal (UK and Australia), Chile, Colombia, Peru and Mexico.
- Almost 100 delegates from a number of public a private road organisations.



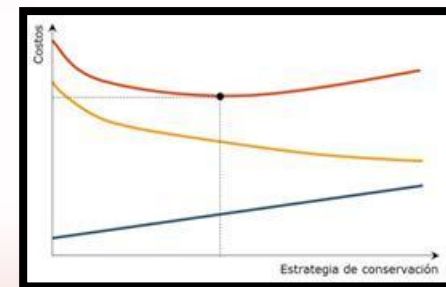
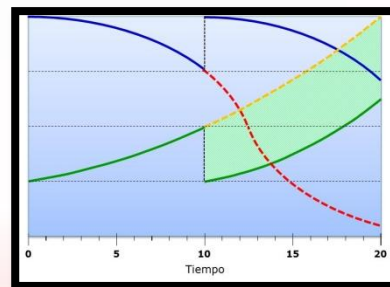
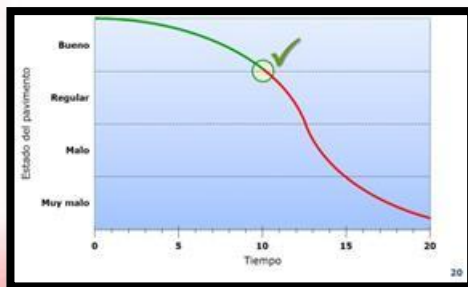
COLLABORATION BETWEEN PIARC, IMT AND HDMGlobal



IMT POSITION ON HDM-4

The Mexican Transport Institute:

- Supports the conception of road management as a short, medium and long term planning system
- Highlights the concept of total transport cost as a crucial input for the decision making process of road management
- Acknowledges that HDM-4 provides valuable tools for implementing pavement management systems and therefore recommends considering its use
- May advise using any other system that provide such tools



HDM-4 USAGE IN MEXICO

- Applications within the General Directorate for Road Maintenance, SCT
 - Annual preparation of the preliminary work programme
 - Evaluation of reference projects for Multi-annual Road Maintenance Projects (CPCCs)
- HDM-4 – based Pavement Management System for the National Infrastructure Fund Road Network
- Management of road concessions
- State and local applications



THE IMT AS A HDMGlobal ASSOCIATE MEMBER

- HDMGlobal proposed the IMT to join the consortium as an Associated Member
- Participation of IMT strongly encouraged by PIARC
- HDMGlobal already proposed an associate agreement, which is being reviewed by IMT's legal department

ASSOCIATE AGREEMENT

BETWEEN

ALTA INNOVATIONS LIMITED

and

MEXICAN TRANSPORT INSTITUTE



SERVICES TO BE PROVIDED BY THE IMT

- Advising HDMGlobal on HDM-4 use in the region
- Providing feedback and opinion on HDM-4 development
- Assisting with the promotion of HDM-4 in the region
- Delivering two training sessions in the region per annum



AREAS OF COLLABORATION

- HDM-4 user interface translation
- Translation of HDM-4 documentation
- Training
- Technical support
- Involvement in HDM-4 development
- Dissemination



HDM-4 USER INTERFACE TRANSLATION

Problems remaining

- Consistency of terminology
- Strings exceeding available space
- Untranslated items
- Translation errors
- Datasets untranslated
- Regional variants of Spanish

“Version 2”

ARVMAX: mm/s

D'acord Cancel·la

Efecto de la curvatura en el parámetro de velocidad deseada para una carretera sin pavimento



PIARC DICTIONARY

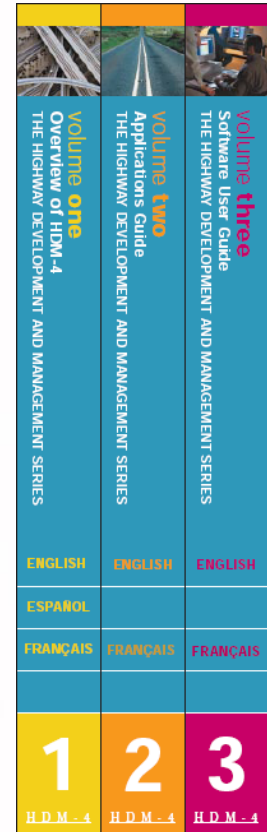
- The IMT participated in updating the Spanish section of the PIARC dictionary
- Potential use of PIARC dictionary if updated properly:
 - As lexicon for improving the use of the current Spanish version in countries other than Mexico
 - As reference to easily generate variants of the Spanish version

No.	Término
01/0006	red vial
01/0006	red viaria
01/0006	red de carreteras
01/0006	sistema vial (Nic.)
01/0006	red carretera (Méx.)
01/0007	variante
01/0007	desvío (C.R., Pan.)
01/0007	paso lateral (Ecu.)
01/0007	libramiento (Méx.)



TRANSLATION OF HDM-4 DOCUMENTATION

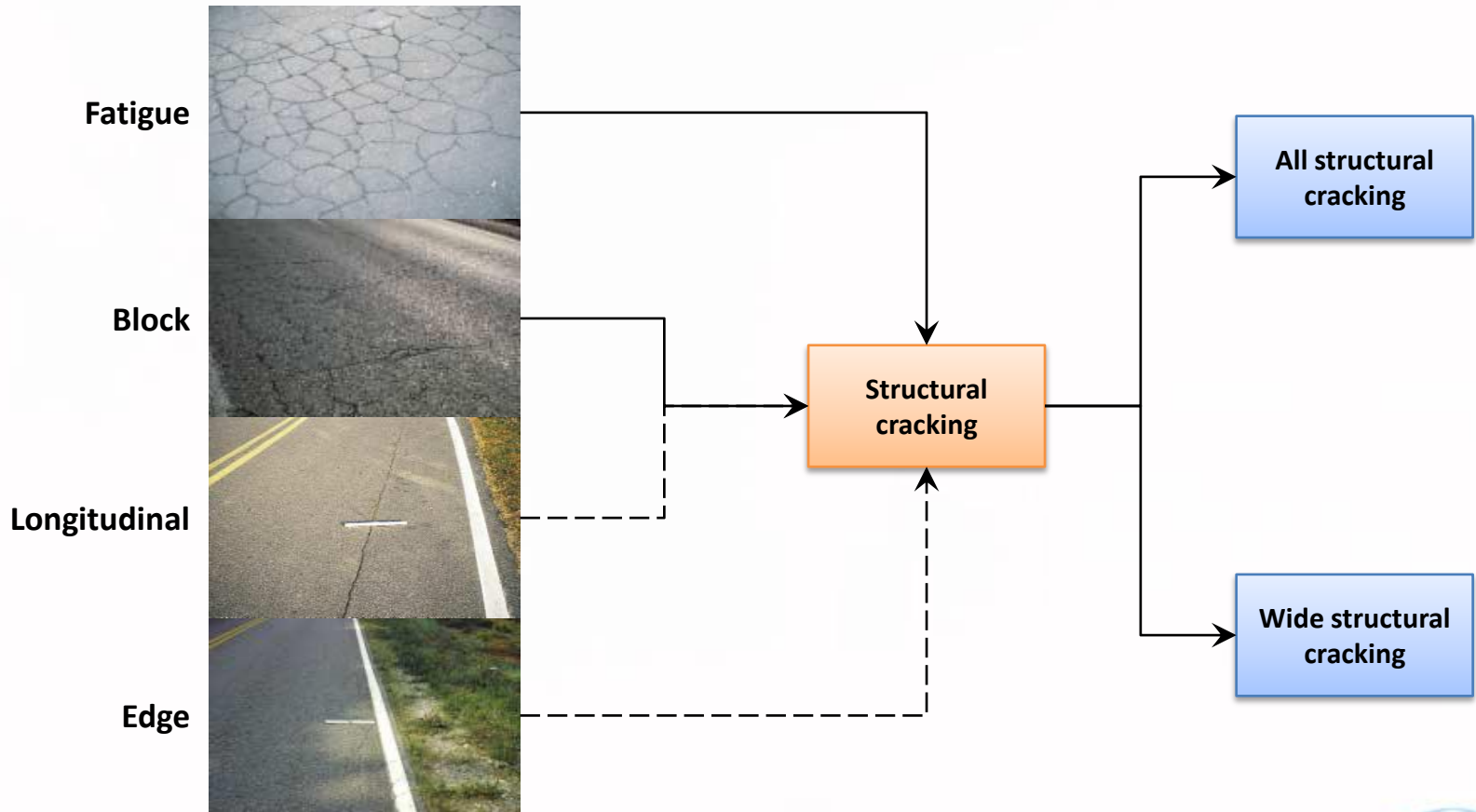
- Memorandum of agreement ready to be signed
- Involves the translation of the first three volumes
- A professional translator will perform a basic translation, which will be reviewed and validated by the IMT
- By the request of PIARC, a lexicon of Mexican and Spanish terms will be included



- IMT courses certified by HDMGlobal
- Put HDM-4 in the wider context of road asset management
- Address issues related to data collection, storing, and processing for HDM-4 use
- Include case studies relevant to local stakeholders



CALCULATING STRUCTURAL CRACKING FOR HDM-4



LTPP: Affected area or length, severity

HDM-4: % of carriageway area



TECHNICAL SUPPORT

- Aim: providing technical support in Spanish for HDM-4
- Specific mechanisms to be identified and agreed on jointly with the steering committee
- Special authorisation of IMT Direction General needed as it may require allocating dedicated resources
- Available by email or through IMT website

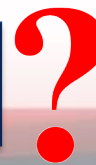


INVOLVEMENT IN HDM-4 DEVELOPMENT

Topics of interest

- Differentiated behaviour of asphalt mixes
- Deterioration models of concrete pavements
- Bear capacity representation
- Relevance of HDM-4 to urban areas
- Modelling work zones
- Road segmentation
- Aggregated analyses and reporting
- User interface improvement

HDM-4 version 3



DISSEMINATION

Specific arrangements could be made as for:

- Publish important HDM-4 updates on the IMT website (software releases, events, and the like)
- Translate the more relevant components of the HDMGlobal Website into Spanish



ACKNOWLEDGEMENTS

Jean-François Corté

Secretary General

World Road Association

Martin Snaith

Chairman of the Steering Committee

HDMGlobal

Eric Stannard

Technical Director

HDMGlobal

José-Manuel Osio

Director of Planning and Assessment

General Directorate of Road Maintenance, SCT

