



**XXIV<sup>th</sup> World  
Road Congress  
Mexico 2011**  
Mexico City 2011.

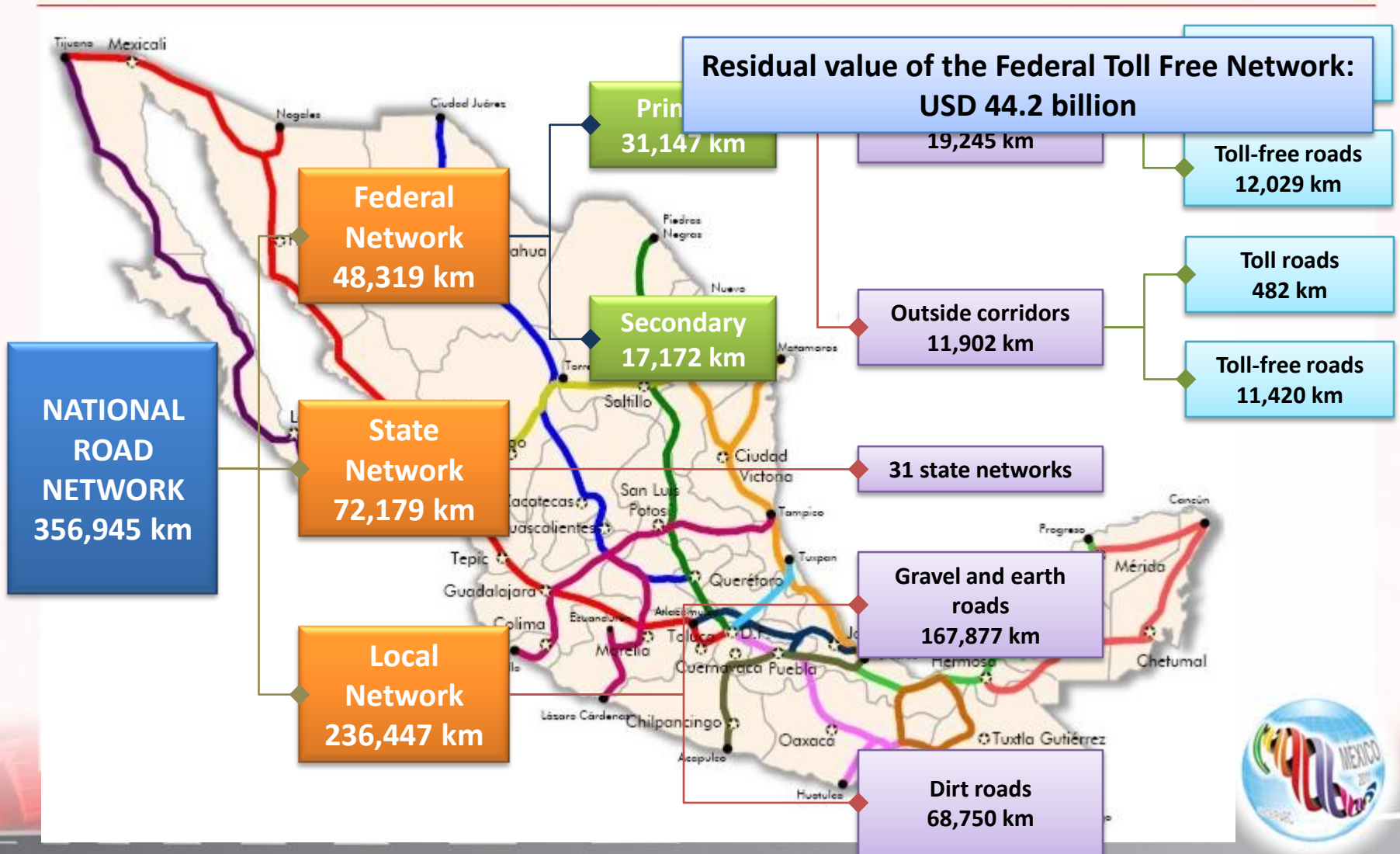
# CURRENT PRACTISE OF ROAD MANAGEMENT IN MEXICO

**Ricardo Solorio**

- Mexican Transport Institute
- Senior Researcher
- [rsolorio@imt.mx](mailto:rsolorio@imt.mx)



# THE MEXICAN ROAD NETWORK (2009)



# CONTEXT FOR THE PRESERVATION AND FURTHER DEVELOPMENT OF THE FEDERAL NETWORK

- USD 4.8 billion required annually for maintenance, upgrading and new construction of roads
- Despite public investments have been growing, allocated funds are still insufficient
- Private investments promoted to fill de gap
- Models adopted:
  - Concessions
  - Asset exploitation
  - Public-Private partnerships

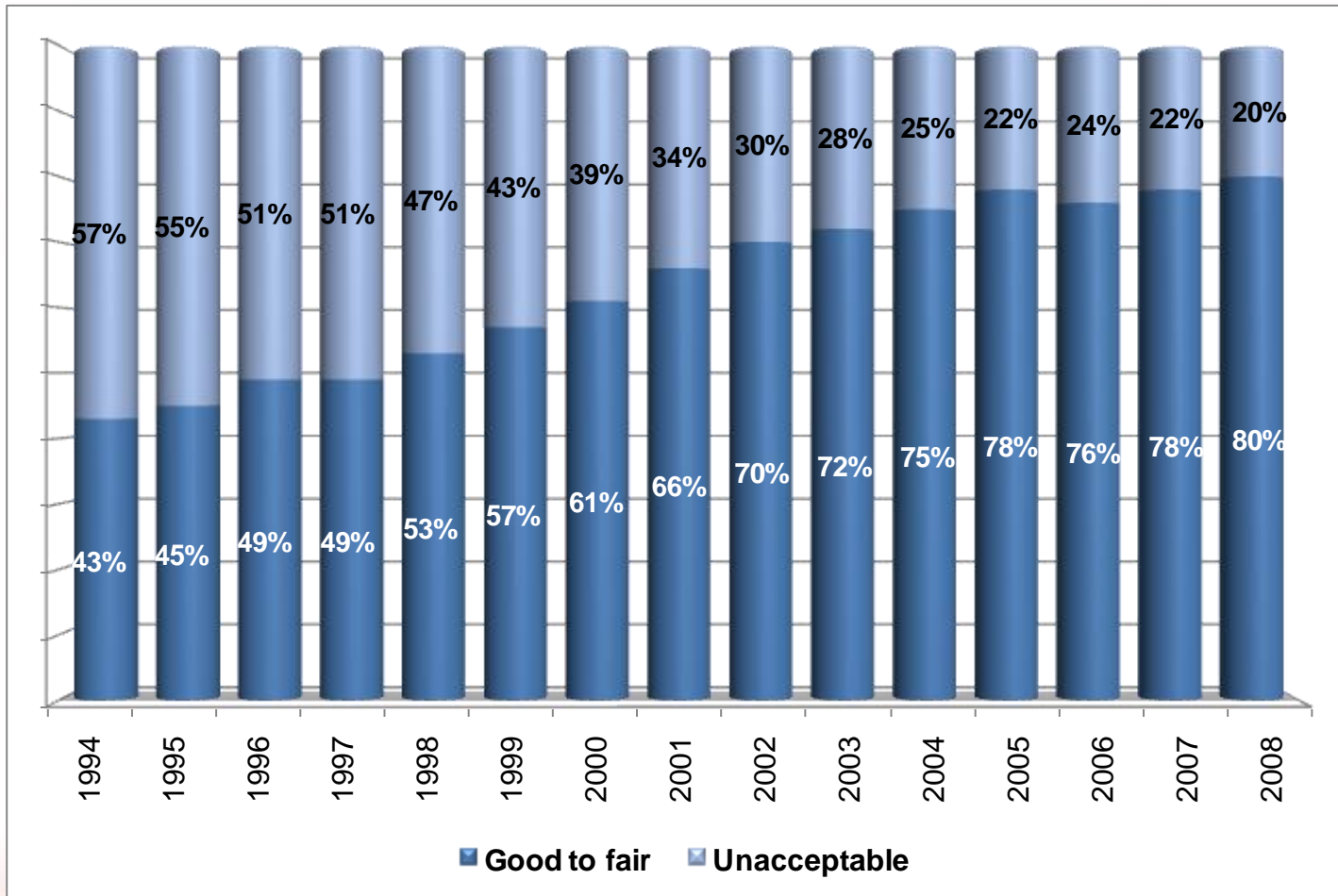


# MEXICAN BACKGROUND ON ROAD MANAGEMENT

- Interest in road management systems since late 80's
- A pavement and a bridge management systems developed by the IMT
- A PMS and a BMS implemented by SCT in the mid 90's.
- PMS updated in recent years with the adoption of HDM-4 as a key component
- Development of a PMS in CAPUFE from 2007 to 2010
- Varying levels of interest in states and municipalities, few projects actually undertaken

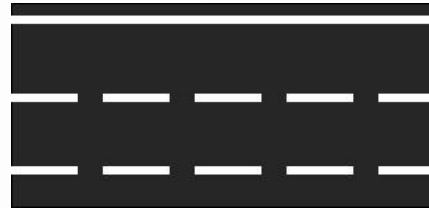


# CONDITION IMPROVEMENT OF THE FEDERAL NETWORK



# DATA BEING COLLECTED

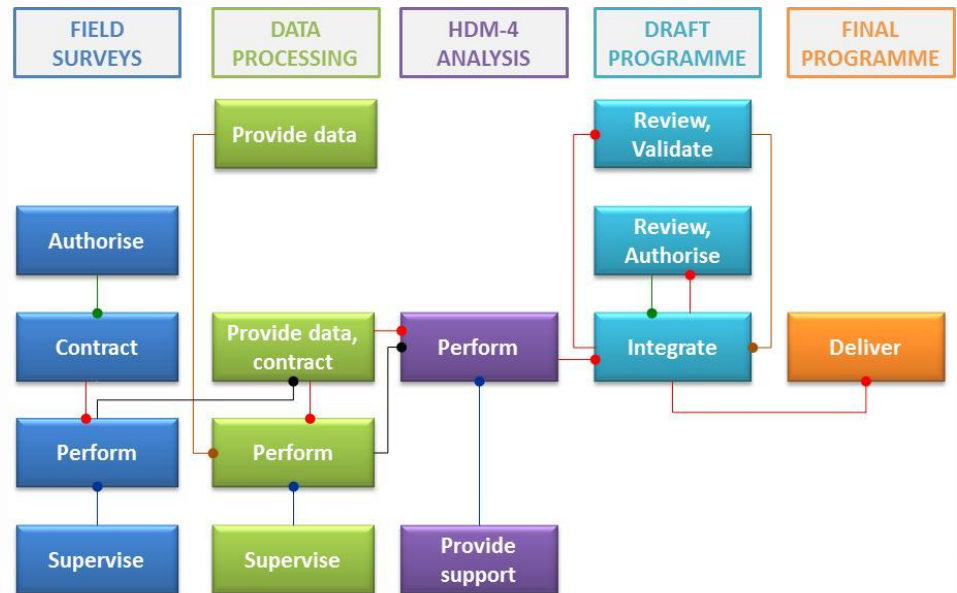

- Inventory
- Works history
- Climate
- Traffic
- Condition
  - Smoothness
  - Rutting
  - Surface distresses
  - Deflections
  - Skid resistance



# DOMINANT PERCEPTION OF A MANAGEMENT SYSTEM

**H D M - 4**  
HIGHWAY DEVELOPMENT & MANAGEMENT

DB, GIS, multimedia



# MAPPING BETWEEN SCT AND IIMM ASSET MANAGEMENT PROCESSES

Developing Asset Management Strategies (IIMM)	DGCC Asset Management Planning Process
<b>Existing Asset Knowledge</b>	2. Asset inventory, condition and performance data
<b>Identify Levels of Service</b>	3. Condition rating
<b>Predict Demand</b>	4. Treatment evaluation
<b>Assess Condition, Measure Performance</b>	3. Condition rating
<b>Failure Mode Analysis</b>	4. Treatment evaluation
<b>Assess Risks of Failure</b>	
<b>Evaluate/Select Treatment Options</b>	4. Treatment evaluation
<b>Identify Optimum Solution</b>	4. Treatment evaluation
<b>Assess Financial Cash Flows</b>	5. Preparation of the National Work Programme
<b>Prepare Asset Management Plan</b>	5. Preparation of the National Work Programme 6. Implementation of the National Work Programme
<b>Collect Data, Measure Performance</b>	1. Data Collection

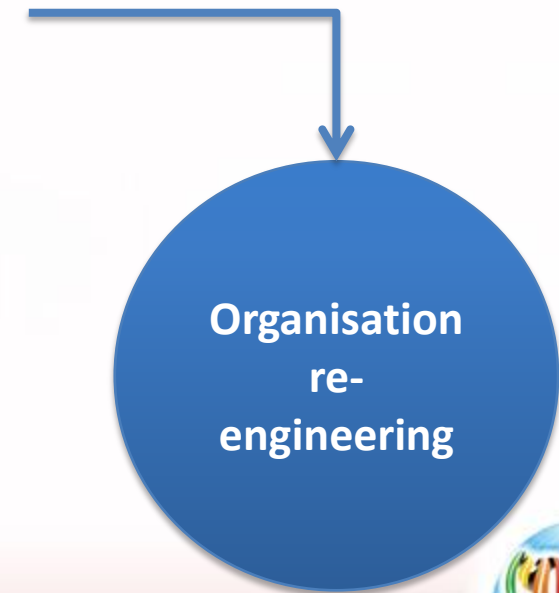






# INSTITUTIONAL LIMITATIONS

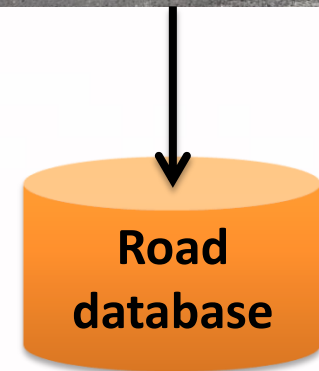
- Outdated institutional structure
- Stovepipe operation
- Infrastructure and operation managed independently
- Political pressure
- Loss of trained personnel resulting from organisational downsizing



# STANDARDS ISSUES

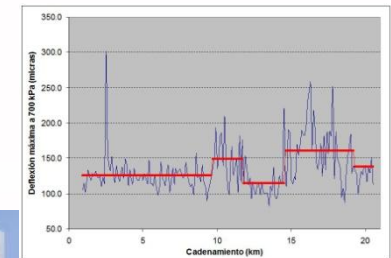
**There is a lack of standards for data collection and storing that specify:**

- Acceptable equipment
- Verification, validation and/or calibration procedures
- Parameters to be measured and measuring interval
- Measuring procedures
- Indicators and thresholds for characterising road condition
- Data structures and conventions for storing information



# TECHNOLOGICAL LIMITATIONS

- Pavement distresses: distress catalogue
- Deterioration models for pavements
- Condition assessment for asset classes other than pavements and bridges
- Relationship between data aggregation and management applications
- Risk management
- Prioritisation across asset classes
- Overall knowledge on asset management



# LACK OF EDUCATION PROGRAMMES

## MASTER'S DEGREE IN ROAD ENGINEERING

<b>Compulsory Core Subjects</b>	<b>Compulsory Subjects</b>
Transport Engineering Statistical Quality Control Applied Mathematics Traffic Engineering Surface and Drainage Hydrology	Planning and Project Evaluation Geotechnics I Geometric Design Geotechnics II Airport Planning and Design Seminar on Research Methodology
	<b>Electives</b>
	Bridge Analysis and Design Tunnel Engineering Works Assessment and Maintenance Techniques Works Programming and Control Bridge Inspection and Assessment



# ROLE OF THE MEXICAN TRANSPORT INSTITUTE

- Propose mechanisms to disseminate asset management principles among managers
- Develop standards for data collection and processing
- Undertake projects aimed at overcome the existing technological limitations
- Include asset management in IMT's course offerings
- Promote the designing of graduate programmes in asset management within universities



# CONCLUSIONS

- Mexico has valuable road assets, whose value must be preserved and increased
- Public funds are insufficient to meet current needs so various schemes of private involvement have been developed
- Management systems have been deployed to help making better decisions on road maintenance
- A number of challenges exist to implement asset management in Mexico including institutional, standards, technological and educational issues
- The IMT may help overcoming those issues

