

ITF/OECD RESEARCH ROUNDTABLE ON “LOGISTICS DEVELOPMENT STRATEGIES AND THEIR PERFORMANCE MEASUREMENT”, QUERÉTARO, MEXICO, 09-10 MARCH 2015

Performance measurement for
intermodal corridors: A
methodological approach

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OBJETIVE

- GIVEN THE INCREASING IMPORTANCE OF INTERMODAL TRANSPORT IN MEXICO
- AND THE ABSENCE OF INDICATORS TO UNDERSTAND THE LOGISTICS PERFORMANCE OF THIS SECTOR
- IT IS PROPOSED TO CONSTRUCT A METHODOLOGICAL FRAMEWORK FOR ANALYZING COMPREHENSIVELY AND SYSTEMATICALLY THE PERFORMANCE OF INTERMODAL CORRIDORS
- USING AVAILABLE DATA, CURRENTLY PRODUCED IN A DISPERSED, DISCONNECTED AND DISARTICULATED MANNER



GENERAL TRENDS IN INTERMODAL TRANSPORT IN MEXICO

- A PRIORITY IN THE NATIONAL DEVELOPMENT
PLAN 2013-2018
 - ..., INFRASTRUCTURE AND TRANSPORT
LOGISTICS SERVICES TIMELY, EFFICIENT AND
SAFE
 - FOR ..., INCREASE COMPETITIVENESS AND
PRODUCTIVITY OF ECONOMIC ACTIVITIES
 - REDUCE LOGISTICS COSTS
- BY DEVELOPING INTERMODAL LOGISTICS
PLATFORMS AND INTERMODAL CORRIDORS



GENERAL TRENDS IN INTERMODAL TRANSPORT IN MEXICO (2)

- WHAT ARE THE RECENT TRENDS IN INTERMODAL TRANSPORT?
- A STRONG INCREASE IN PARTICIPATION OF RAIL FREIGHT BETWEEN 2000 AND 2013
 - TONS FROM 2.9% TO 7.4%
 - IN TON-KILOMETER FROM 3.3% TO 8.1%
- IN THAT PERIOD THE INTERMODAL FREIGHT TRANSPORT QUADRUPLED
 - FROM 2.1 TO 8.2 MILLION TONNES
 - 1.579 TO 6.306 MILLION TON-KM

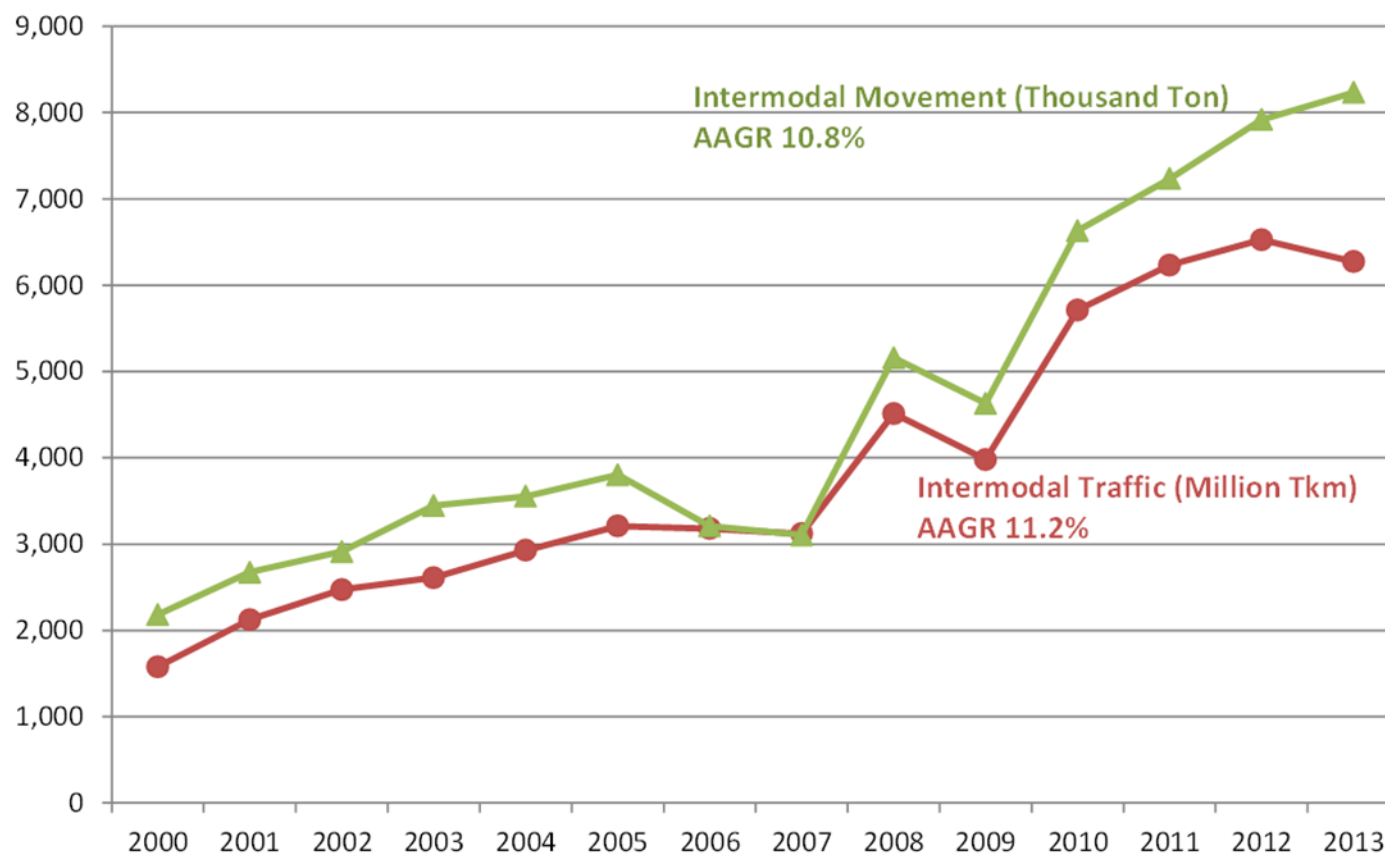


GENERAL TRENDS IN INTERMODAL TRANSPORT IN MEXICO (3)

- EVOLUTION OF INTERMODAL -Average Annual Growth Rate, AAGR
- DESPITE THE GLOBAL ECONOMIC CRISIS OF 2009, THIS SHOWS A HIGH GROWTH
 - 2000-2013 AAGR TONS = 10.8%
 - 2000-2013 AAGR TON-KM = 11.2%
 - AAGR 2000-2013 TON-KM BY COMPANY: KCSM = 8.8% FERROMEX = 15.3%, FERROSUR = 14.1%
- MUCH HIGHER THAN THE AAGR MOTOR CARRIER AND RAIL
 - TRUCKING TON-KM = 1.5%
 - RAIL TON-KM = 3.7%

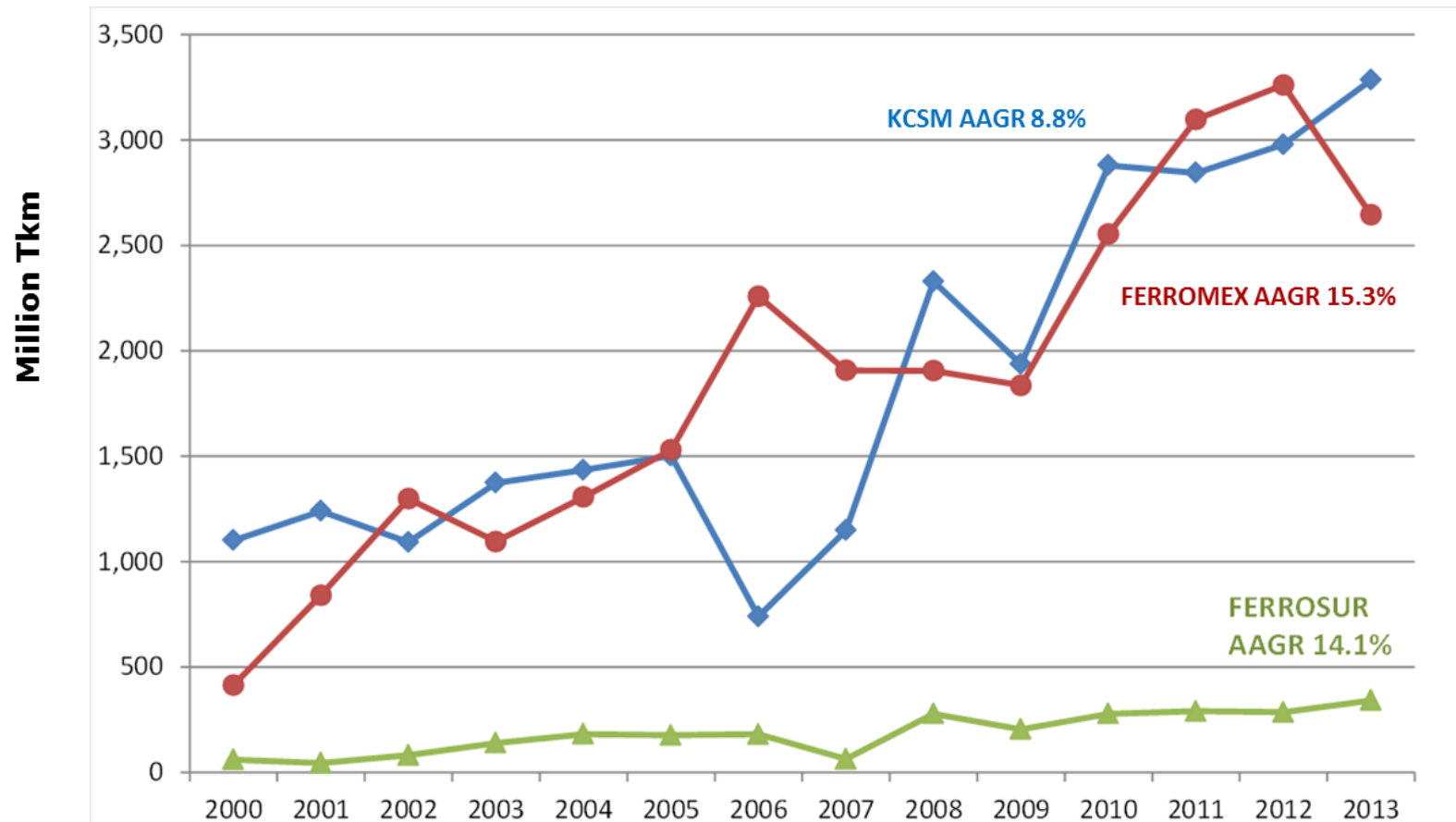


GROWTH OF RAIL-TRUCK INTERMODAL TRAFFIC IN TONNES AND TONNE-KM (AAGR 2000-2013)



Source: IMT's own elaboration, with data from DGTFM-SCT

GROWTH OF INTERMODAL TRANSPORT BY RAILWAY COMPANY (AAGR TONNE-KM)

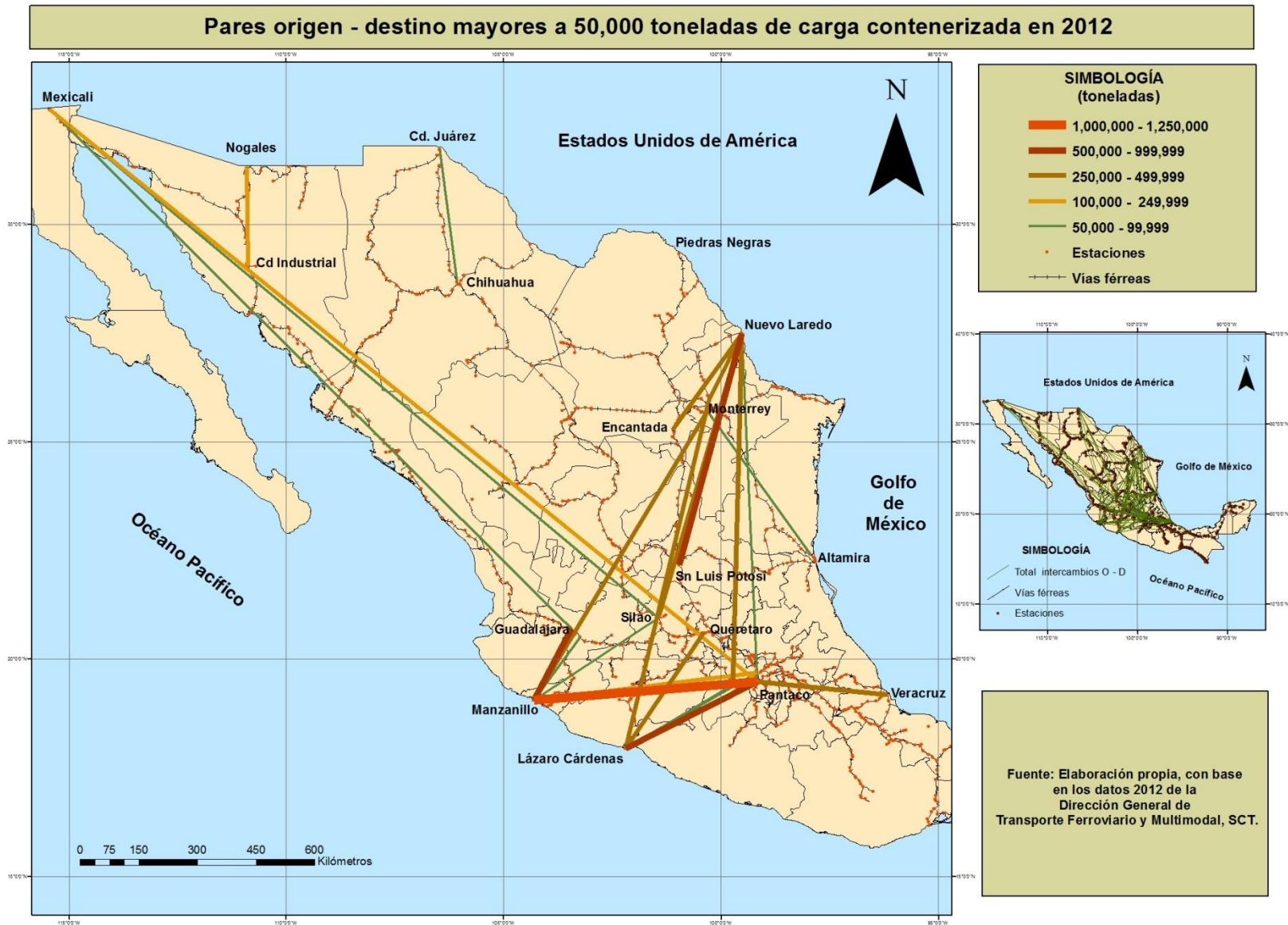


PERFORMANCE OF INTERMODAL CORRIDORS IN MEXICO

- RECENTLY, IMT AN IDENTIFIED A NUMBER OF USEFUL DATA TO DEVELOP INDICATORS
 - ESPECIALLY THOSE RELATED TO TRAFFIC VOLUMES
- WITH THESE DATA, CAN BE MODELED FLOWS ON A PLATFORM WITH GEOGRAPHICAL BASE (GIS) TO IDENTIFY
 - THE MAIN NODES AND ARCS OF THE INTERMODAL NETWORK
 - DESIRE LINES CARGO
 - THE INTERMODAL CORRIDORS OF HIGHER DENSITY (IN TONS AND TON-KM)



DESIRE LINES INTERMODAL FREIGHT FLOWS



INTERMODAL CORRIDORS IN MEXICO, BY TONNAGE



PERFORMANCE OF INTERMODAL CORRIDORS IN MEXICO

- HOWEVER, IT SHOULD DEVELOP A SET OF INDICATORS ON:
 - OPERATING,
 - PRODUCTIVITY
 - EFFICIENCY, ETC..
- TO SYSTEMATICALLY MEASURE THE PERFORMANCE OF INTERMODAL CORRIDORS IN MEXICO
- SOME SOURCES OF INFORMATION ARE AVAILABLE



PERFORMANCE OF INTERMODAL CORRIDORS IN MEXICO

- HOWEVER, THE DATA AND INDICATORS ARE PRESENTED IN A DISPERSED AND DISARTICULATED MANNER
- LACK OF INTEGRATED VISION, REQUIRED FOR ANALYZING A CHAIN OR LOGISTICS CORRIDOR
- THEREFORE, THE PROPOSAL IS TO CREATE A TOOL FOR:
 - MEASURE CONSISTENT AND REGULAR PERFORMANCE AND EFFICIENCY
 - DEVELOP INDICATORS COVERING THE DIFFERENT LINKS OF THE CHAIN



TIME ANCHORING OF SHIPS IN THE PORT OF VERACRUZ, JANUARY-AUGUST, 2014

TIPO DE CARGA	SHIP AT ANCHOR	% OF SHIPS AT ANCHOR	TIME ANCHORING (HOURS)	ANCHORING PER VESSEL (DAYS)
GRAIN BULK	50	38%	4,958.00	4.13
GENERAL CARGO	47	17%	1,648.00	1.46
CONTAINERS	38	8%	790.00	0.87
AUTOMOBILES (CARS)	17	14%	866.00	2.12
OTHERS	21	26%	527.00	1.05
TOTAL	173	15%	8,789.00	2.12

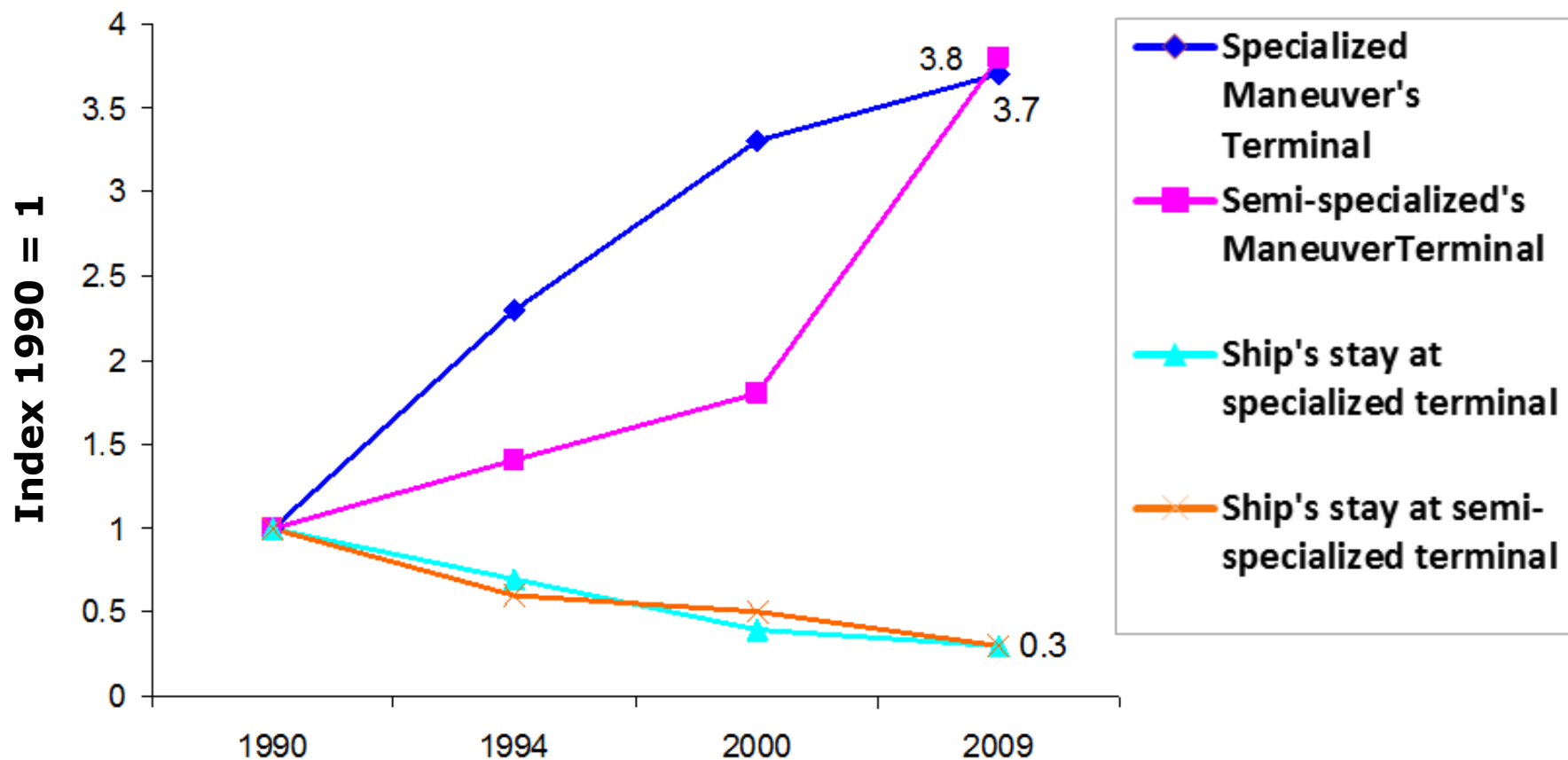
Fuente: Elaboración propia con base en datos de API Veracruz

PERFORMANCE OF INTERMODAL CORRIDORS IN MEXICO

- HIGH EFFICIENCY IN THE FIRST MANEUVER (VESSEL TO YARD AND VICEVERSA)
 - CONTAINER/ HOUR / CRANE
 - PUERTO LÁZARO CÁRDENAS = **38** CHC (2014 - FIRST HALF)
 - PUERTO PROGRESO = **30** CHC (2014 - FIRST HALF)
 - CONTAINER/ HOUR / VESSEL IN OPERATION
 - PUERTO LÁZARO CÁRDENAS = **113** CHVO (2014 - FIRST HALF)
 - PUERTO DE VERACRUZ = **80** CHVO (2014 - FIRST HALF)



- PERFORMANCE INDEX LOADING / UNLOADING VESSEL
- INDEX VESSEL STAY TIME AT PORT



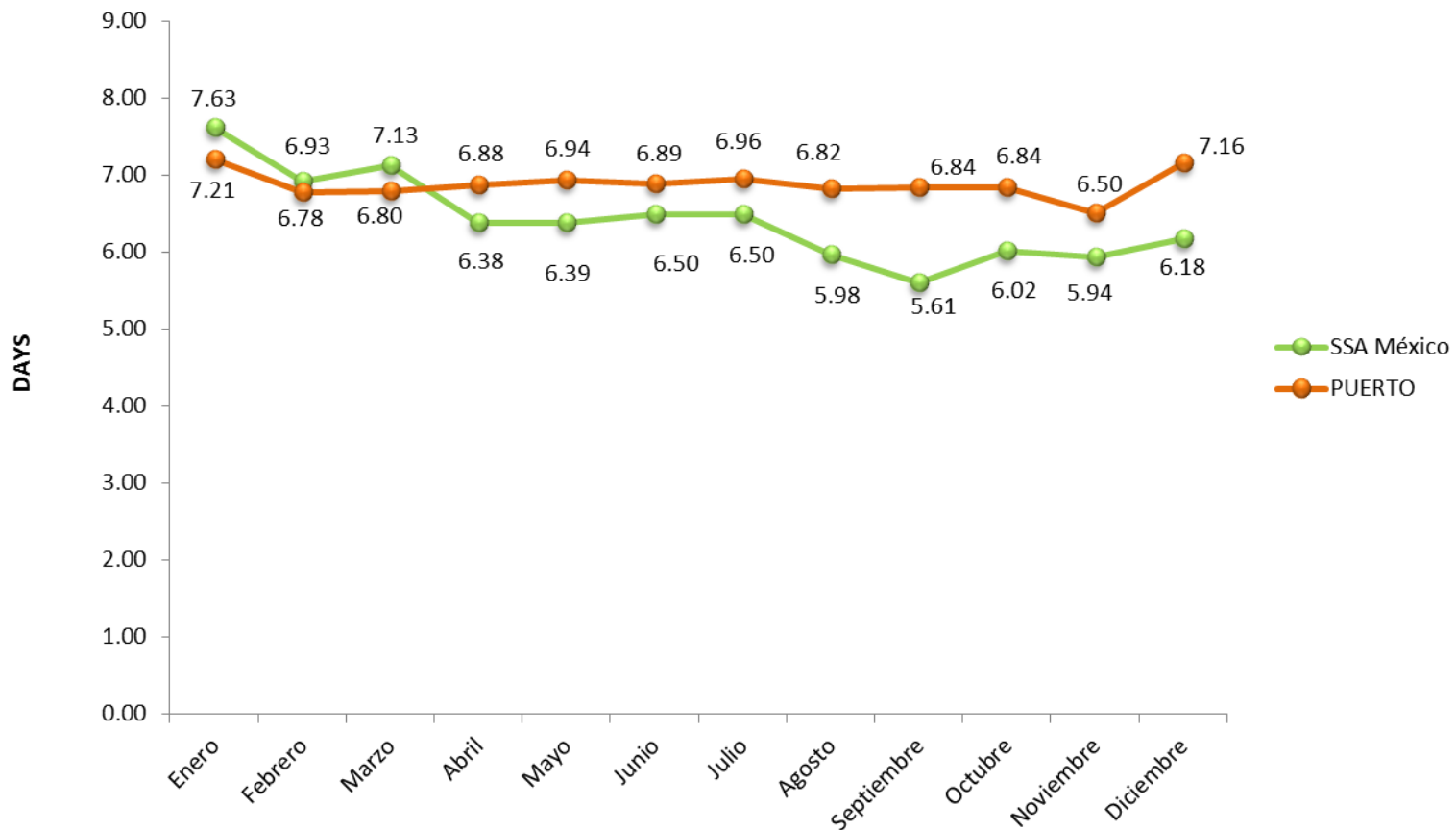
Source: Author's own elaboration with data from CGPMM

PERFORMANCE OF INTERMODAL CORRIDORS IN MEXICO

- HOWEVER, THERE IS A CRITICAL FACT: THE CONTAINER CLEARANCE TIME AT PORT TERMINAL
- TIME SPENT IN THE CONTAINER TERMINAL
 - Σ STAY TIME IN CONTAINER YARDS / Σ TOTAL OPERATED CONTAINER
 - PORT OF MANZANILLO 2013 = **5.77** DÍAS
 - PORT OF MANZANILLO 2014 = **6.88** DÍAS
 - SSA MANZANILLO 2014 = **6.42** DÍAS
- DYNAMICS CAPACITY (DC) IN THE MARITIME TERMINALS
 - $DC = (365 / \text{AVERAGE STAY}) * \text{STATIC CAPACITY}$
 - PORT OF MANZANILLO 2014 = **2.90 MILLION** TEUs
 - SSA MANZANILLO 2014 = **1.42 MILLION** TEUs



AVERAGE STAY OF CONTAINERS IN THE TERMINAL SSA MANZANILLO, 2014



PERFORMANCE OF INTERMODAL CORRIDORS IN MEXICO

■ % OCCUPANCY CONTAINER TERMINALS

- TEUS MOVED / DYNAMIC CAPACITY * 100
- PORT OF MANZANILLO 2014 = 82 %
- SSA MANZANILLO 2014 = 112 %

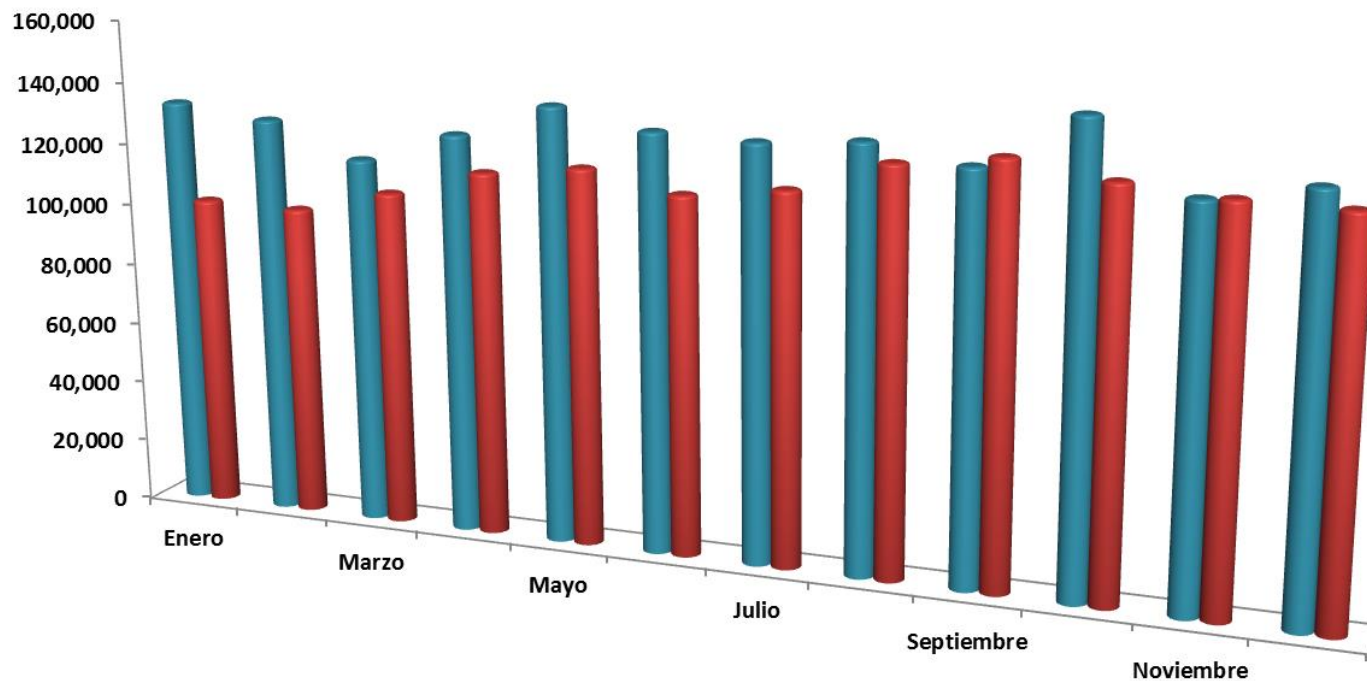
■ EFFICIENCY INDICATORS OF THE INTERNATIONAL LOGISTICS CONNECTION

- EFFICIENCY OF BORDER CROSSINGS
- EFFICIENCY OF CUSTOMS CLEARANCE AT PORT



TEUS MOVED VS DYNAMIC CAPACITY SSA MANZANILLO, 2014

TEU's Manejados vs. Cap. Dinámica



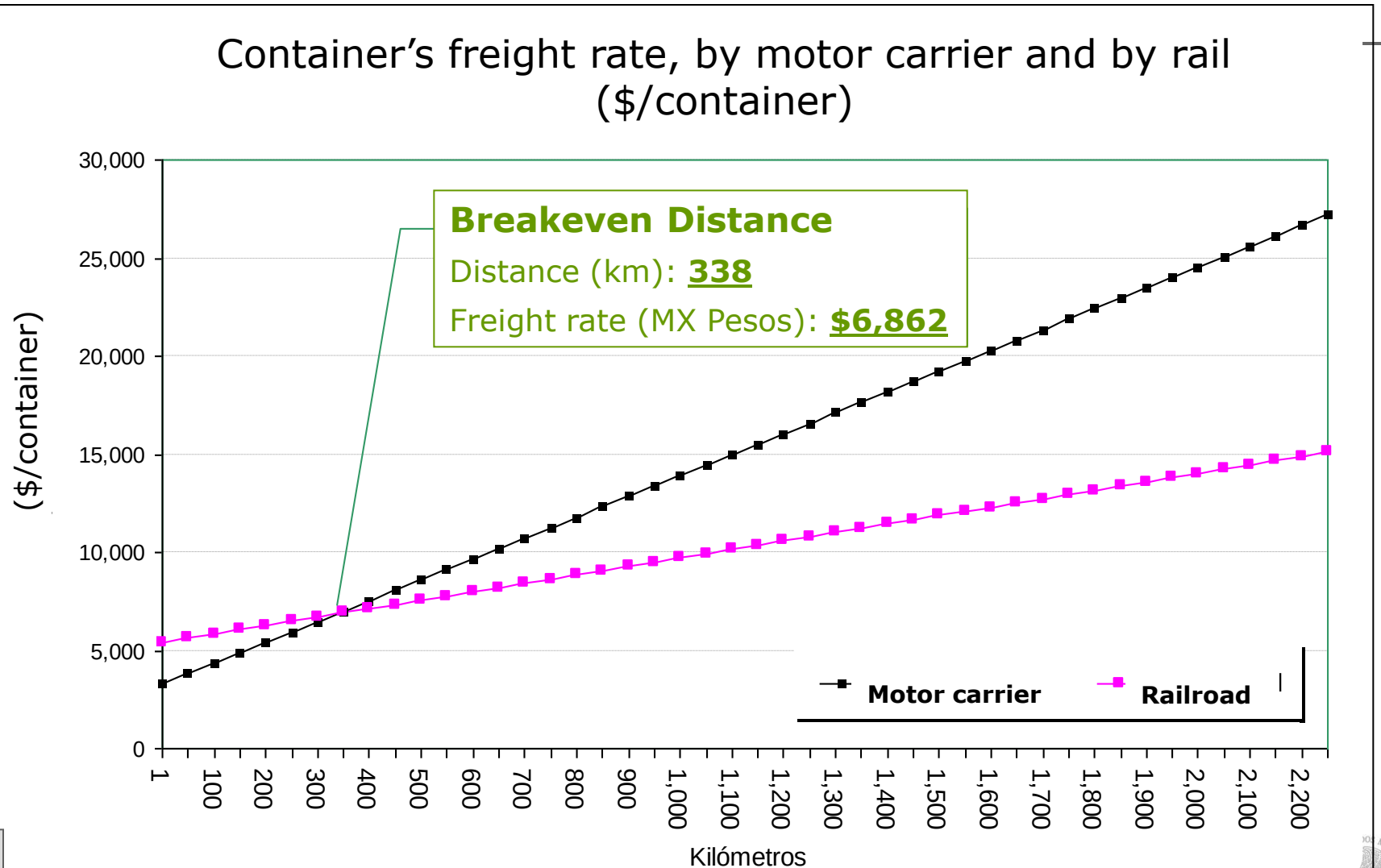
	Enero	Febrero	Marzo	Abril	Mayo	Junio	Julio	Agosto	Septiembre	Octubre	Noviembre	Diciembre
TEU's Manejados	133,201	129,547	118,836	128,949	140,030	134,211	133,144	135,525	130,274	147,504	125,583	131,368
Cap. Dinámica	101,612	101,033	108,682	117,577	121,302	115,408	119,255	129,669	133,646	128,820	126,158	125,462

PERFORMANCE OF INTERMODAL CORRIDORS IN MEXICO

- MOREOVER, IT IS IMPORTANT TO MEASURE THE EVOLUTION OF THE EFFICIENCY AND COMPETITIVENESS OF HINTERLAND CONNECTIONS
- INDICATORS OF THE INTERMODAL CHAIN
 - COMPETITIVENESS OF INTERMODAL VS TRUCK
 - (A FAVORABLE *BREAKEVEN POINT* FOR INTERMODAL TRANSPORT)
 - INLAND TRANSPORT COSTS
 - TRAVEL TIME INDICATORS (TRUCK-FFCC)
 - FREQUENCY AND RELIABILITY OF SERVICE



TECHNOLOGICAL, OPERATIONAL AND INFRASTRUCTURE CHANGES IN INTERMODAL TRANSPORT SHIFT THE EQUILIBRIUM BOUNDARY DOWN (TO LEFT)

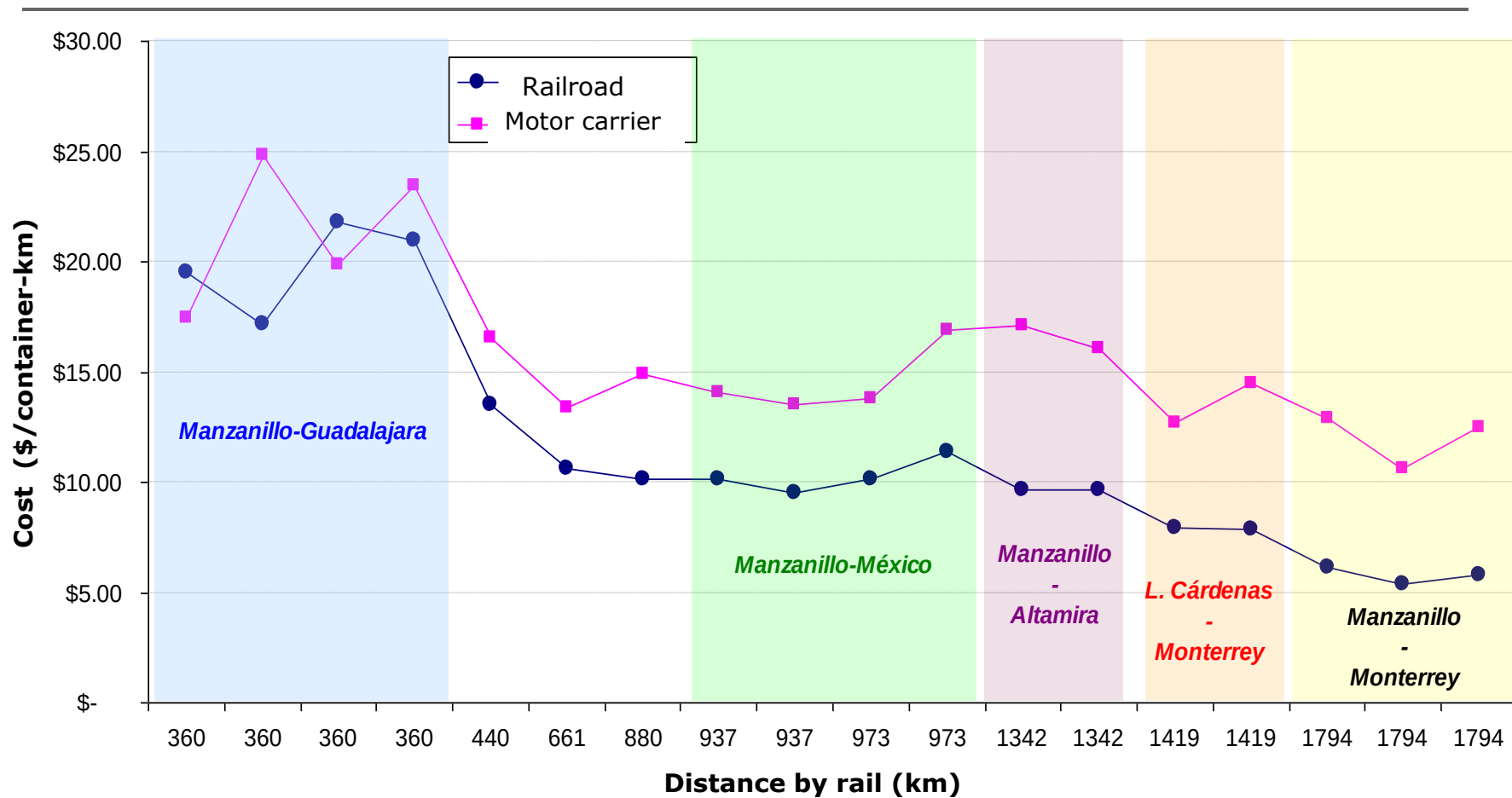


COST PER KILOMETER. TRUCK AND RAIL CONTAINERS

, 2010

MAIN ORIGIN-DESTINATION

(MEX PESOS / CONTAINER / KM)



INSTITUTO
MEXICANO DEL
TRANSPORTE

Source: IMT's own elaboration, with field gathering data and logistic operators information, 2009.

SCT



INLAND TRANSPORT PER CONTAINER 40 FEET (FEU) INTERMODAL VS TRUCK

Manzanillo-México D.F. - USD **950** -USD 0.99 FEU/Km
Travel time 48 hours - Vel. 20 Km/hours



Manzanillo - México D.F.-USD **1150** -USD 1.33 FEU/Km
Travel time 17-18 hours - Vel. 50 Km/hours



INLAND TRANSPORT PER CONTAINER 40 FEET (FEU) INTERMODAL VS TRUCK

Lázaro Cárdenas-México D.F. - USD **875** -USD 1.01 FEU/Km
Travel time 36 hours - Vel. 23 Km/hours



Lázaro Cárdenas-México D.F.- USD **1350** -USD 1.63 FEU/Km
Travel time 15-16 hours - 50 Km/hours



Fuente: International World Cargo Co.,Ltd. Shanghai, China

FINAL REFLECTIONS

- ❑ IN A SCENARIO OF HIGH GROWTH OF INTERMODAL TRANSPORT
- ❑ IT IS DESIRABLE TO DEVELOP A SET OF INDICATORS TO MEASURE THE PERFORMANCE OF INTERMODAL CORRIDORS IN MEXICO
- ❑ CURRENTLY THERE ARE SOME ISOLATED DATA USEFUL FOR THE ESTABLISHMENT OF INDICATORS
- ❑ MANY OTHERS ARE NOT COLLECTED SYSTEMATICALLY OR CONSISTENTLY
- ❑ IT REQUIRES A MECHANISM AND RULES TO ENSURE THE PERIODIC LIFTING OF TRAVEL INFORMATION:

❑ THAT WOULD BE THE ROLE OF THE NATIONAL OBSERVATORY OF TRANSPORT AND LOGISTICS



THANK YOU FOR YOUR ATTENTION

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INSTITUTO MEXICANO DEL TRANSPORTE



CORREDORES INTERMODALES EN MÉXICO

(TON-KM)

-MODELO DE ASIGNACIÓN- IMT



Fuente: Elaborado por el
IMT, con base en datos
de la DGTFM de SCT



MEXICO INLAND CHARGES IN US DOLLAR

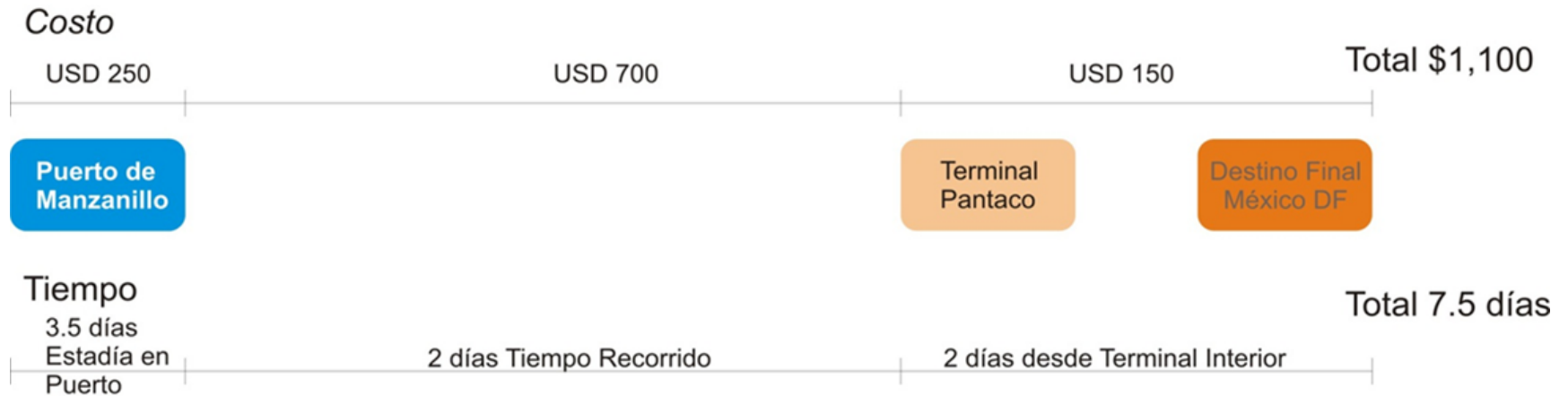
Inland City	VIA	Truck	Rail+Truck
		Camión	Intermodal
		20' / 40' / 40' HC	20' / 40' / 40' HC
Mexico City	Manzanillo	1150 / 1150 / 1150	800 / 950 / 950
Monterrey		1400 / 1400 / 1400	1050 / 1050 / 1050
Guadalajara		750 / 750 / 750	600 / 650 / 650
Mexico City	Lázaro Cárdenas	1350 / 1350 / 1350	725 / 875 / 875
Monterrey		1600 / 1600 / 1600	900 / 1050 / 1050

Fuente: International World Cargo Co.,Ltd. Shanghai, China



ESTA MEJORANDO. MEJORA COMPETITIVIDAD EN COSTO VS AUTOTRANSPORTISTAS

Corredor Intermodal



Corredor Unimodal -Truck



Fuente: Elaboración IMT, con base en datos de levantamiento de campo y de operadores logísticos,