

# Road User Charging & Tolling Around the World

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**SUSAN BUSE**

# Tolling Trends in North America

Susan Buse



## Background

- United States:
  - over 100 operational toll facilities, mostly roads with bridges primarily along the borders and in major ports such as New York and San Francisco
  - many more projects under construction or consideration
  - some states evaluate every new project as potentially tolled
- Canada:
  - about 20 pay-as-you-go routes, mostly bridges or tunnels, many along the Canada-U.S. border
  - only two tolled roads (the 407 in Ontario and the Cobequid Pass in Nova Scotia)
  - New projects are being considered in Vancouver and Toronto

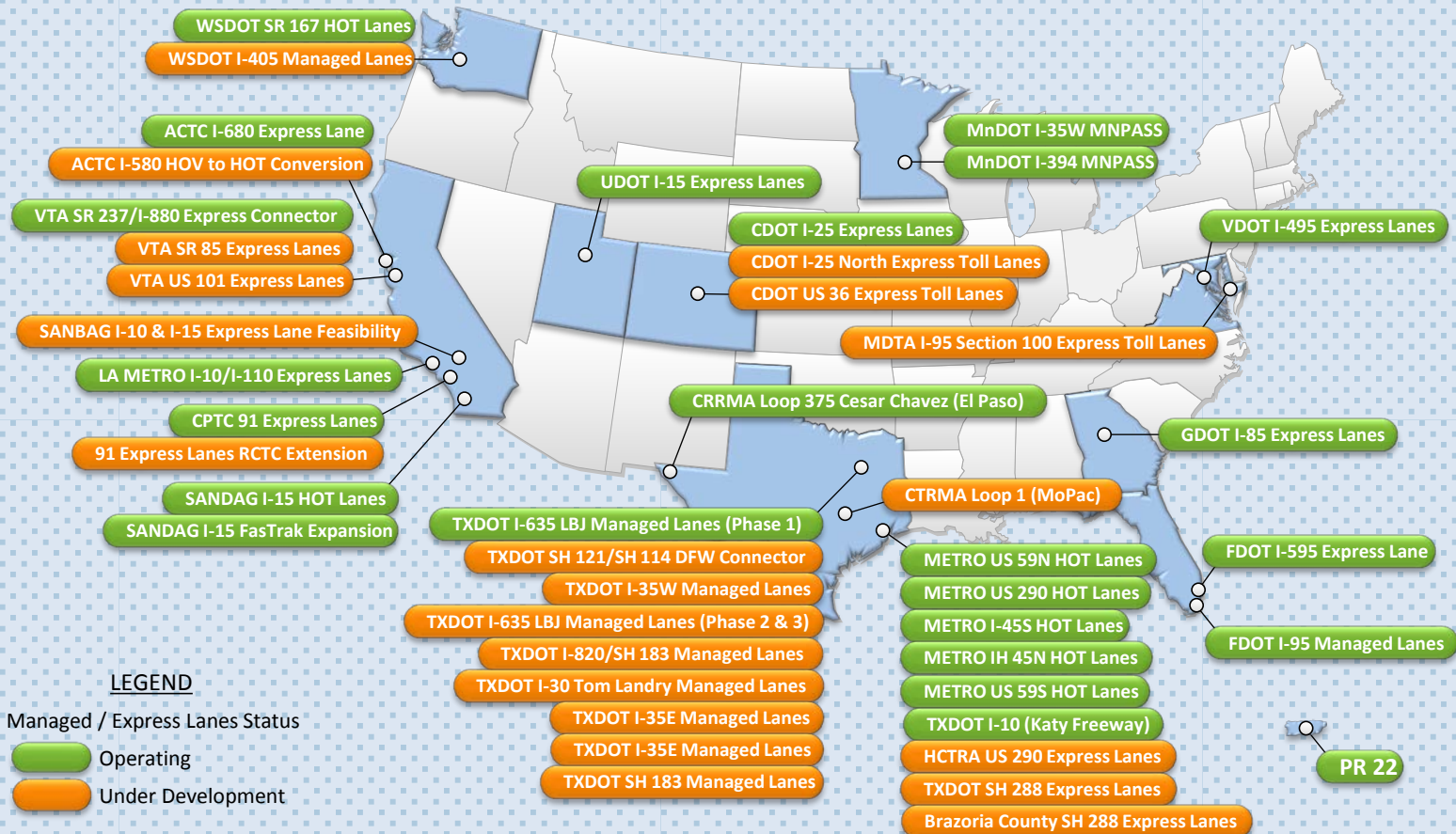
## Principal Drivers of Tolling Growth

- Regional population growth and roadway congestion continuing
- Federal and state/provincial funding sources have not kept up with needs
- Counties and cities are finding their own answers to solving the problem
- Operational demands increasing on existing toll facilities

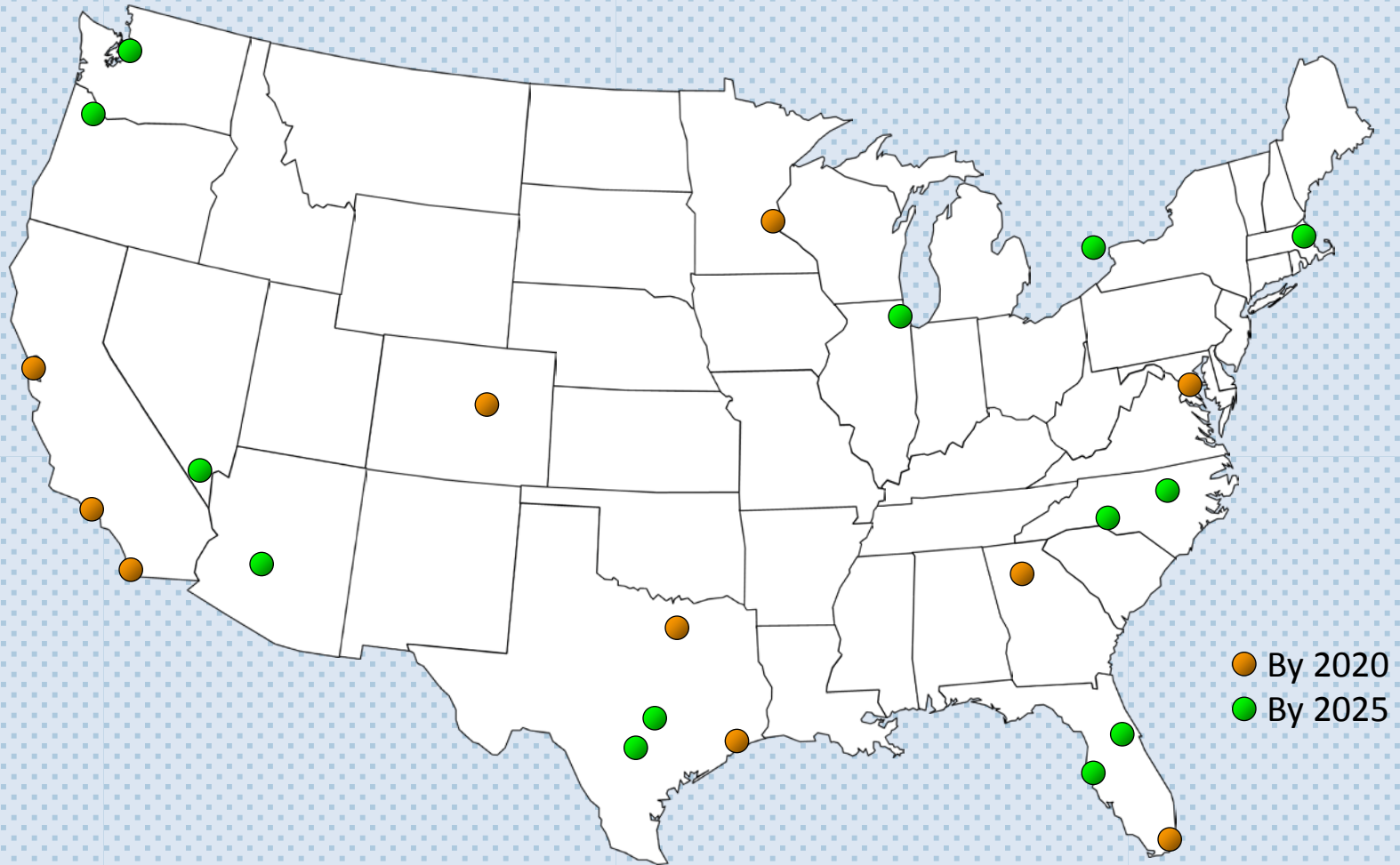
## Primary Trends

- HOV to HOT lane conversions and networks of managed lanes in the US are growing rapidly
- AET conversions had been slowing down, recent resurgence and more under study
- Traditional P3 concessions have nearly stopped but availability payment structures and managed lane facilities continue to attract private interest in both US and Canada
- Barriers to interstate tolling starting to crumble

## Operating and Planned Managed Lane Projects in the U.S.

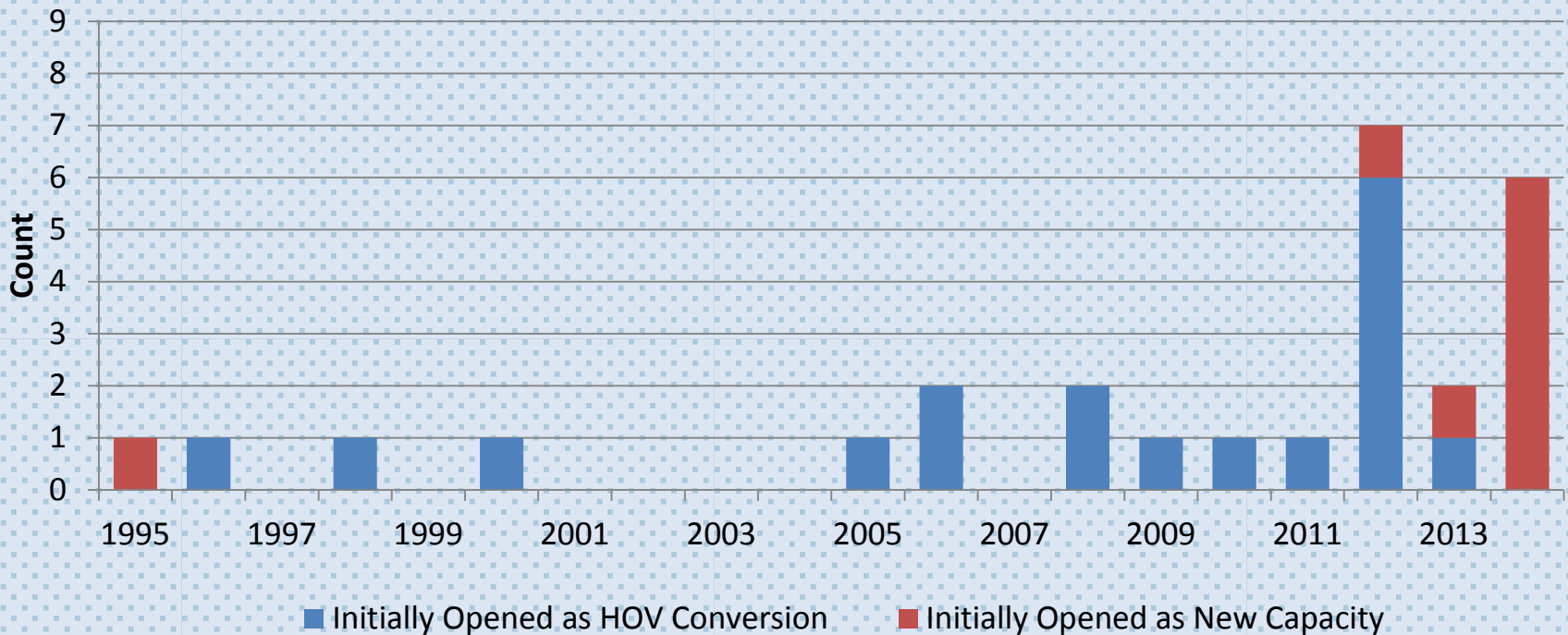


## Potential Express Lane Networks



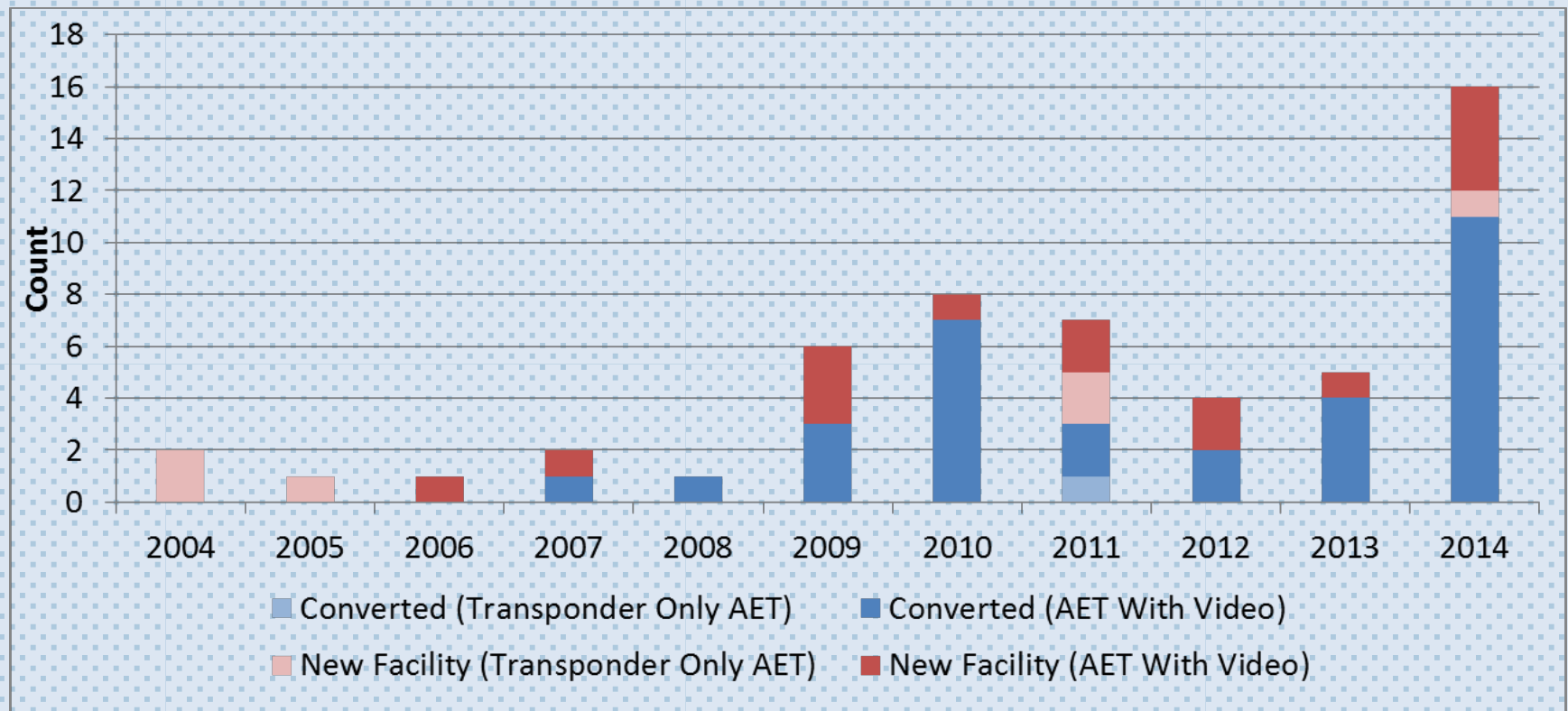


## Managed/HOT Lanes Opening per Year



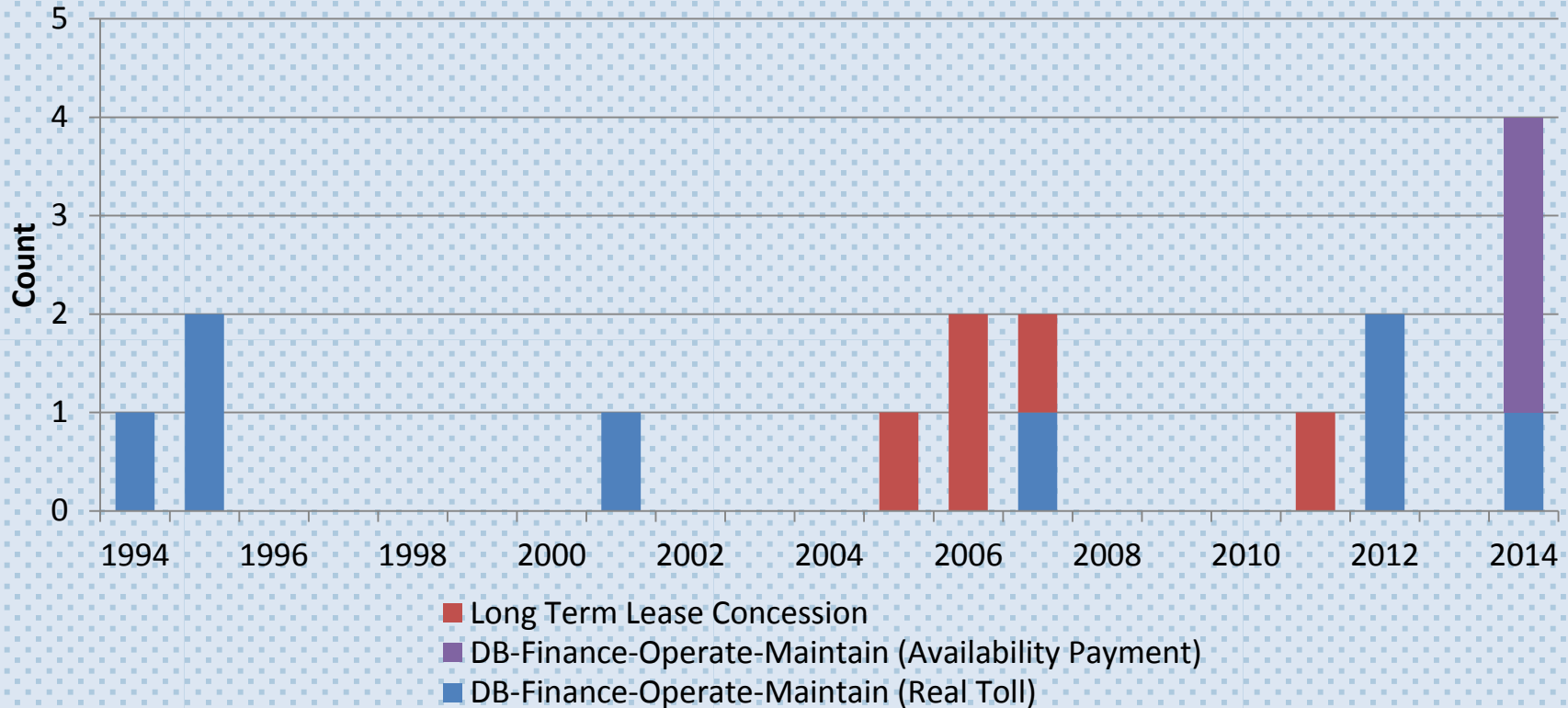
\*Figure includes only initial opening year of facilities in US. Some facilities that initially opened as an HOV conversion have later had expansions open as new capacity. Current as of 10/15/14 (projects anticipated to open by end of 2014 are included)

## AET Conversions per Year



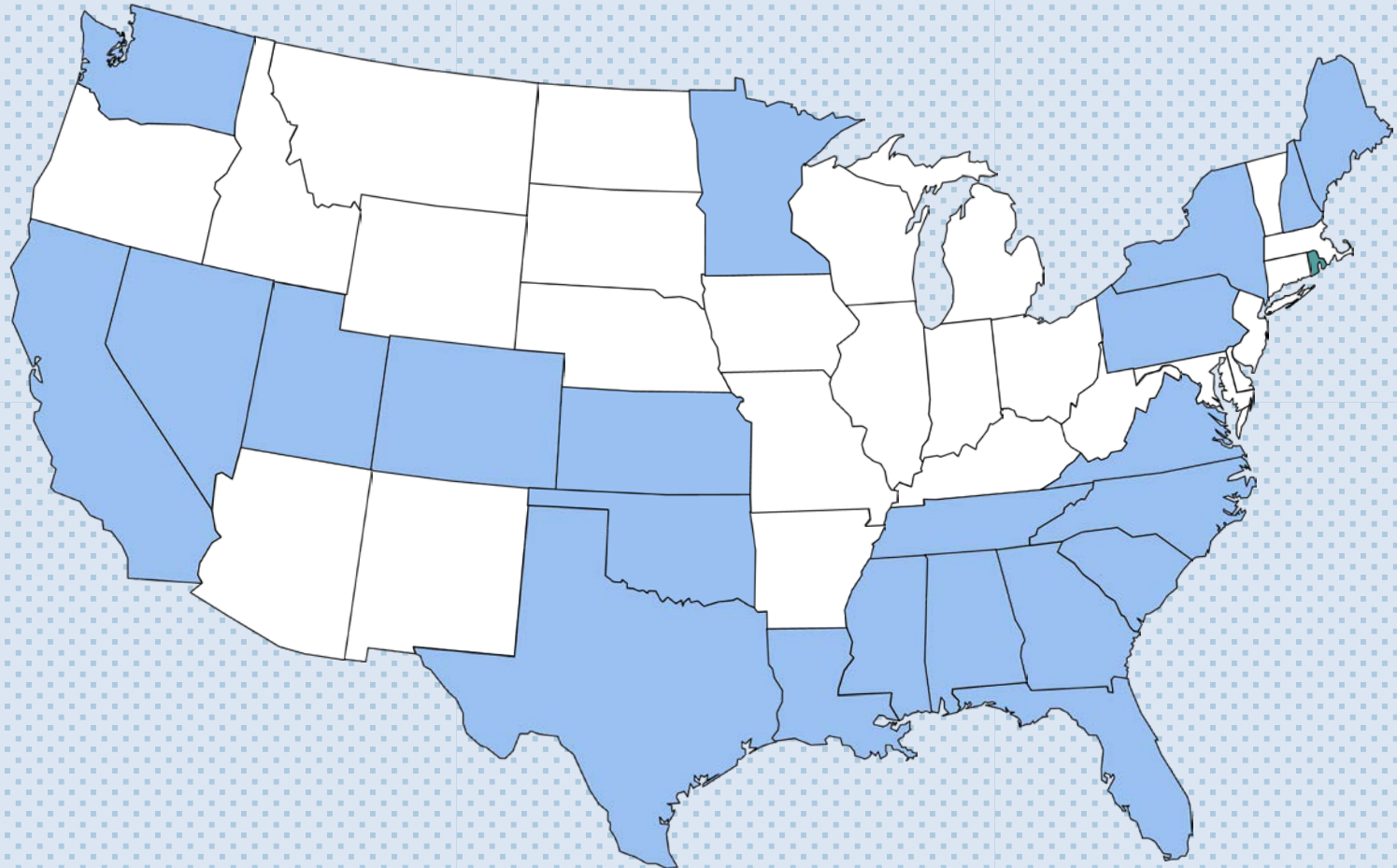
\*Figure includes only toll road, bridge, and tunnel AET facilities (not managed/HOT lanes) in US. Current as of 10/15/14 (projects anticipated to open by end of 2014 are included)

## P3 Projects Opening Per Year

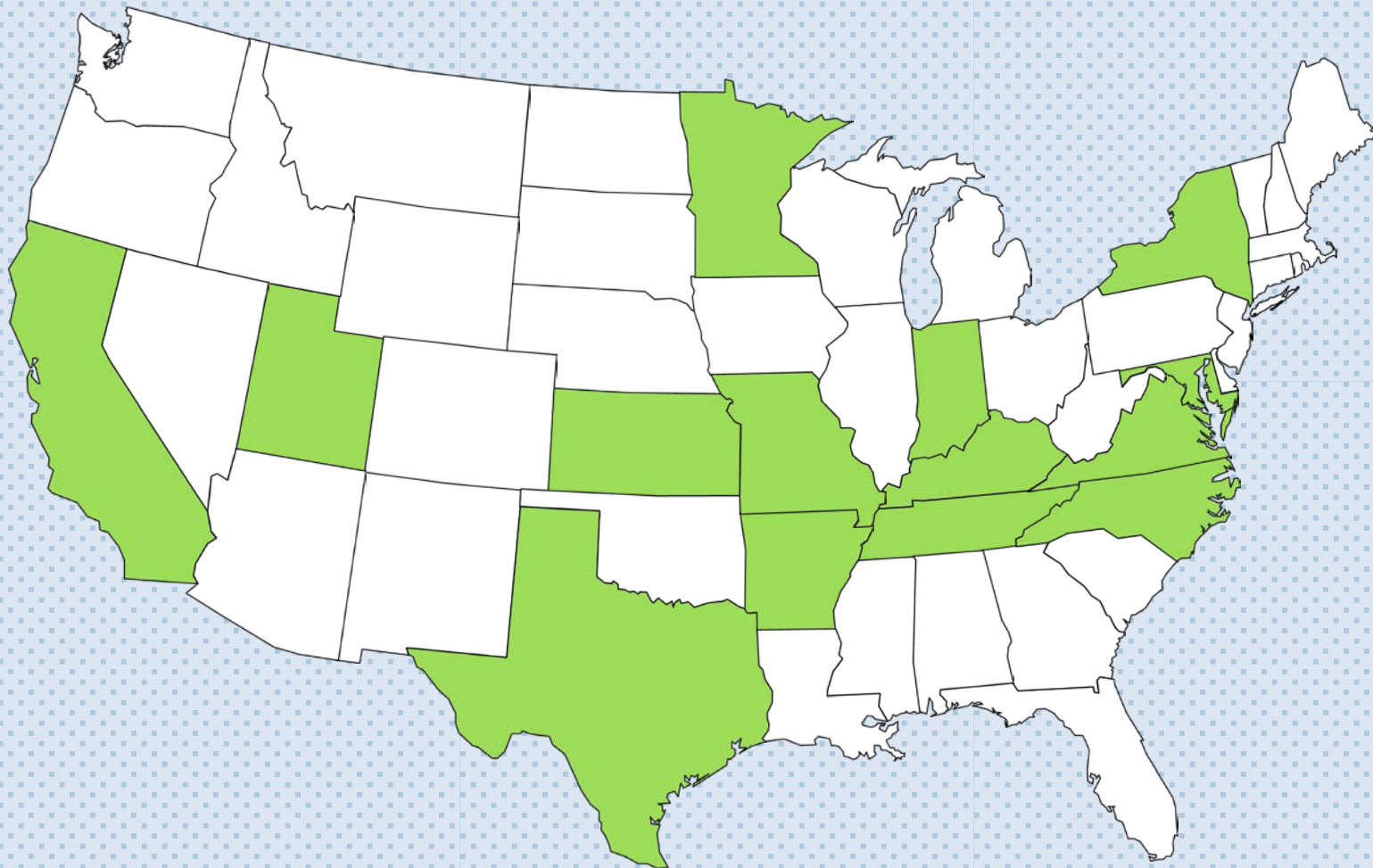


\*Data based on TIFIA project records; Figure includes all toll facilities in US and Puerto Rico. Current as of 10/15/14 (projects anticipated to open by end of 2014 are included)

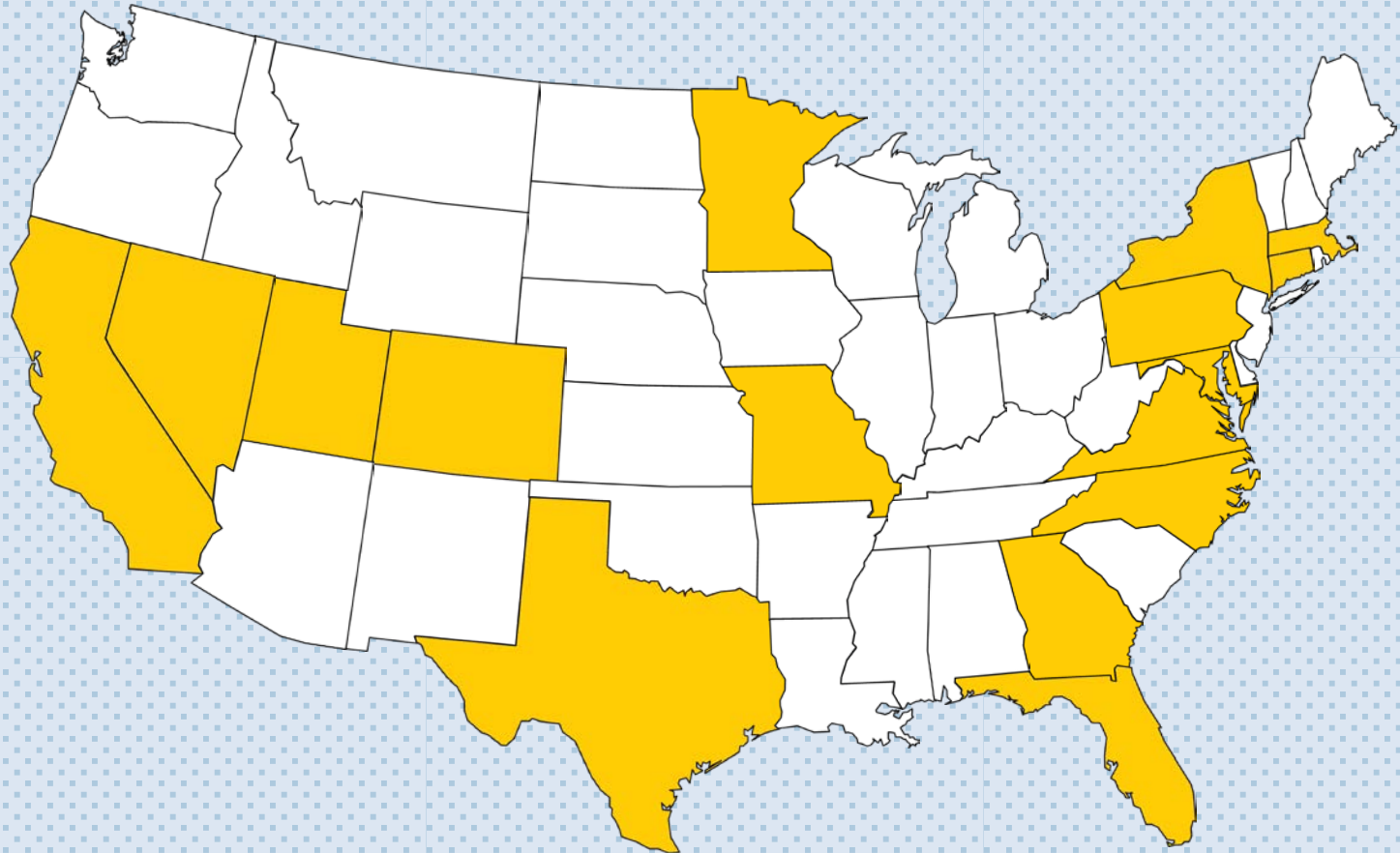
## U.S. States with Potential New Toll Roads or Extensions



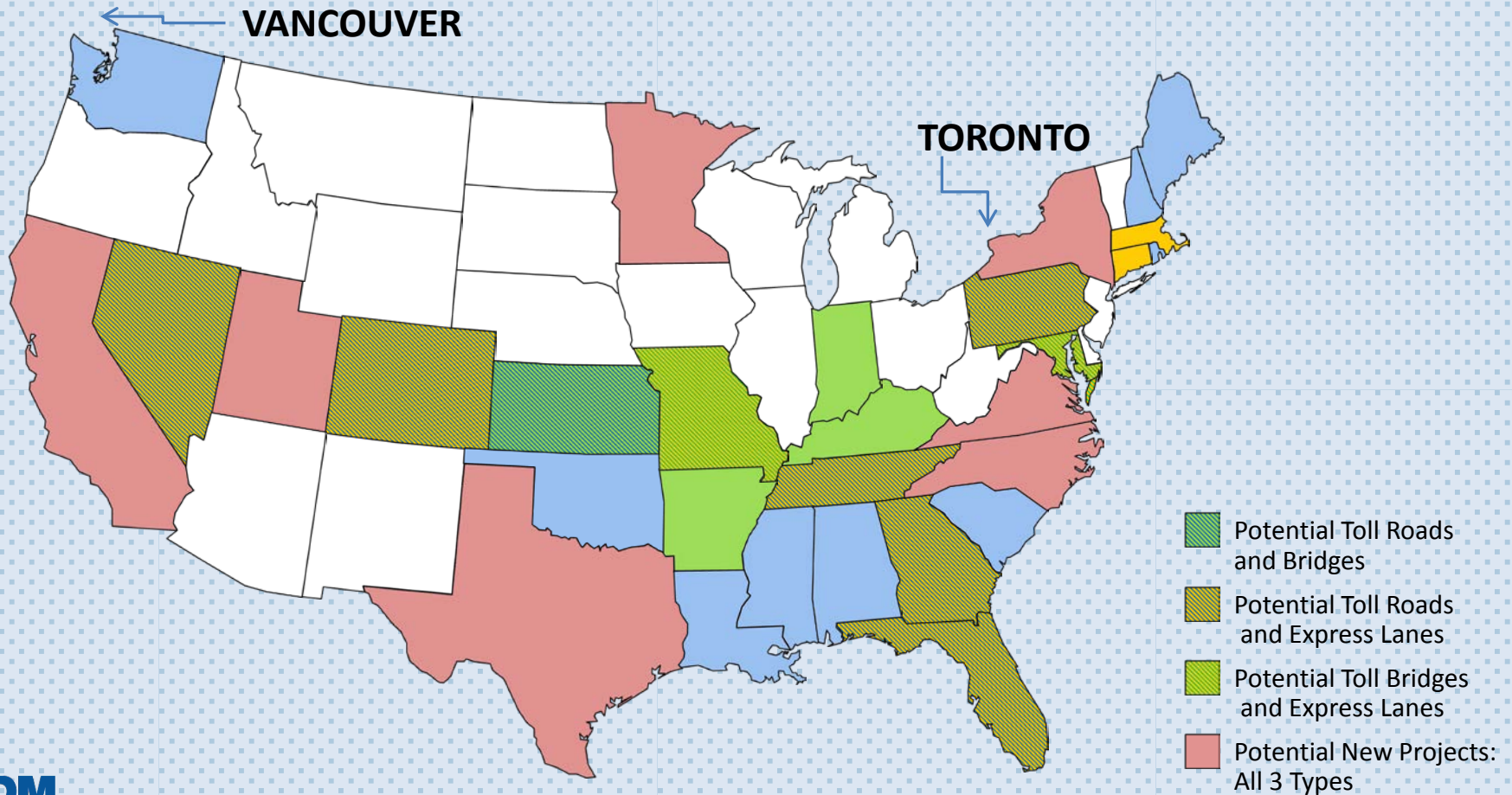
## U.S. States with Potential New or Reconstructed Toll Bridges or Tunnels



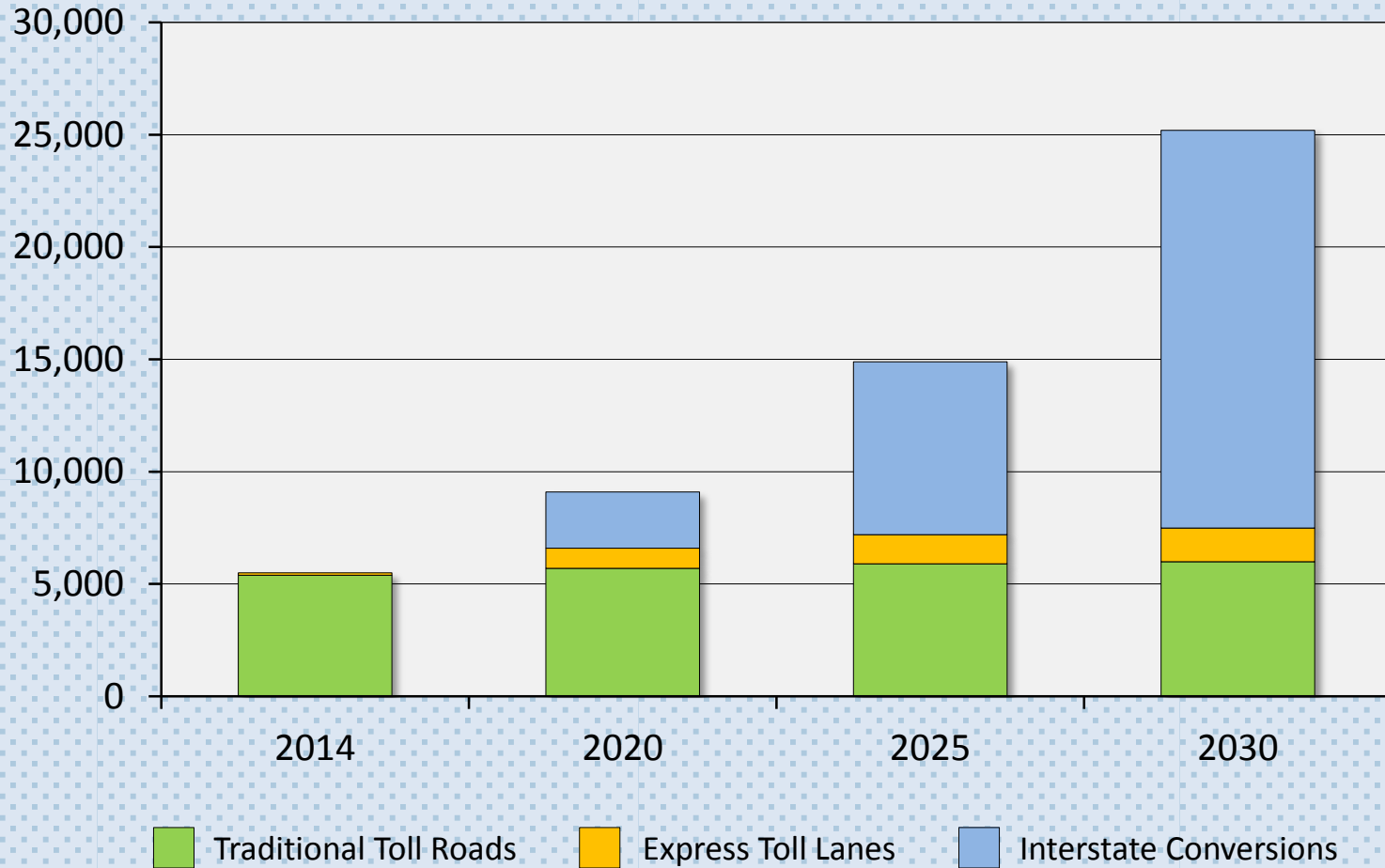
## U.S. States with Potential New Tolloed Managed Lanes



## Fertile Ground for New Tolling Initiatives



## Potential Growth in Toll Road Mileage





# Thank You

## Susan Buse

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**NEIL TOLMIE**



## **The Tolling of Existing Roads - The South African Experience**

## Overview

- Introduction
- Legal Stipulations
- Toll Road Financing
- Public Opinion
- General Matters
- Conclusion



# Introduction

- The tolling of existing roads is a challenging concept
- In South Africa various new and existing roads have been tolled
- Toll Roads were introduced in 1984
- Grown from an initial 27 kms to 3 120 kms
- 1 832kms Agency Funded and 1 288kms Concessioned
- Toll Roads = 15% of the Primary Road Network (21 403 kms)

**CAN EXISTING ROADS BE TOLLED?**



## Legal Stipulations

Tolling was enacted in 1983

Two crucial stipulations which gained public support for the tolling of new and existing roads

These are:

- Tolls collected can only be spent on toll roads
- The requirement that all toll roads must have an alternative route. (Economic sustainability and competing routes?)



# Toll Road Financing



## The Period Mid 1980s to Mid 1990s

Two funding models adopted:

- The Loan Supportable by Revenue (LSR) model
  - Capital redemption and interest payment grace period: 8 to 10 years
  - Funding shortfall covered by interest free National Road Fund (NRF) loans – toll roads were “subsidised”
  - This allowed lower tolls to be levied
- Public Private Partnerships
  - In 1986/7 the first PPPs were introduced and subsequently cancelled due to legislative non compliance

# Toll Road Financing - Continued

## The Period Mid 1990's to Date

Four policy changes introduced:

### (1) A change to LSR Model

- No NRF loans (self-funding)
- Thus higher tolls required - mitigated by **four** factors.
  - The Motorway Bonus Factor (safety and convenience factor)
    - Studies indicated: Perceived Benefit increased by 70% (LV) and 30%(HV)
  - Upgrading of portions of the road pre-tolling
  - Known traffic volumes - reduces project risk - lower toll tariffs
  - The introduction of various discount structures





## The Period Mid 1990's to Date

### Four policy changes introduced:



### (2) The re-introduction of Public Private Partnerships (PPPs)

- During 1998 /2000 three 30 year PPPs awarded - performing successfully
- To date no further PPPs awarded - lack of political support for Government Policy

### (3) Unsolicited Bid Policy

- Three proposals received - two placed on open tender but not awarded due to political resistance



# The Period Mid 1990's to Date

## Four policy changes introduced:

### (4) Open Road Tolling

- In 2010 SANRAL embarked on the first urban open road tolling project - 185kms of existing urban freeways
- Opening delayed for a number of years - court cases
- Finally opened in December 2013
- The future of the project? - many users are still resisting payment





## Public Opinion

Generally there are five mechanisms that can be used to limit adverse public opinion to tolling:

- 1 Alternative routes
- 2 Major upgrading of the existing road
- 3 Toll tariffs/discounts – early disclosure
- 4 Alternative modes of transport - choices
- 5 An informed public



## General Matters

- Toll tariffs annually adjusted with published consumer price index
- Light and heavy vehicle tariff ratios changed from 1:2 to 1:4 in the mid 1990's



## Conclusion

- Existing roads can be tolled
- Create a fair and robust legal framework
- Develop an equitable financing model
- Extensive upgrades of the existing road required – value for money!
- Keep the public informed - public opinion matters!!
- There is no fairer alternative - the user pays
- Despite the difficulties, tolling has on balance been successful in South Africa



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**RICHARD ARCE**

# Mexico

## Moving to National Interoperability

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# Interoperability Goal

Enhance and Simplify road user experience



**1**

**Tag  
Account  
Contract**



## Mexican Toll Network



- >7,500Km of Federal Toll Roads
- >77 Federal Highways and 44 Federal Bridges

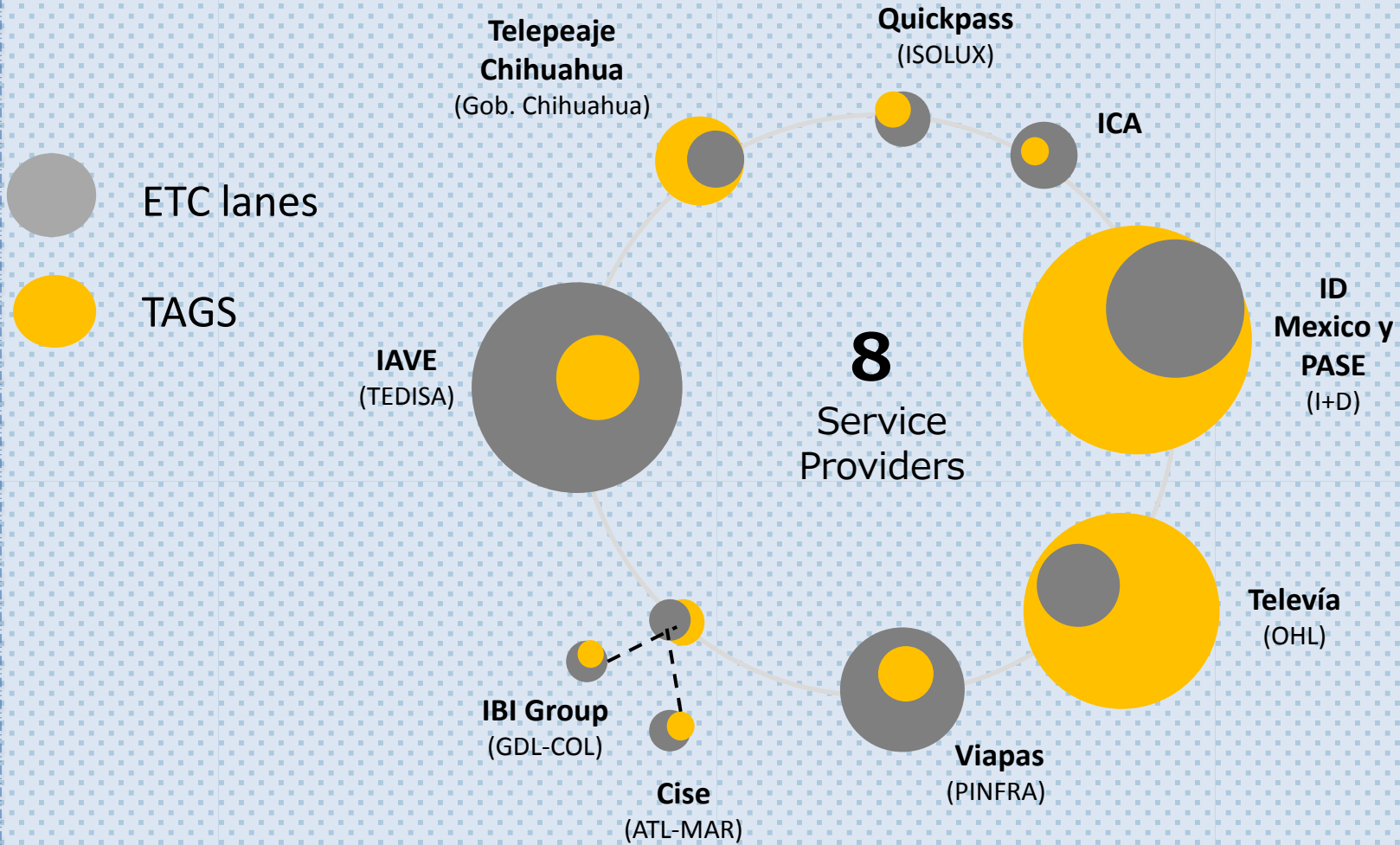
### Casetas Red Federal

- Sin Telepeaje
- Con Telepeaje\*
- Con Uniprotocolo
- Con Multiprotocolo
- Red Quick Pass
- Red Telepeaje Dinámico
- Red Epass
- Red Televia
- Red Vias Pass
- Red I+D
- Red Banobras
- Red Sin Telepeaje

Fuente: Casetas - Red de Cuota Federal SCT 2012  
 \* Multiprotocolo o Uniprotocolo



## ETC Service Providers



## ETC in Mexico

- >2.5 million customers
- 250 million ETC transactions in 2013
- 15% increase per year
  
- ETC on average represents:
  - 20% of toll payment
  - 40% of revenue
  - 20% of users are post-pay
  - 80% are prepaid

# Federal Norms for Tolling and ITS

- On June 27 of 2013, norm established for communications protocols for tolling antennas and tolling transponders.
- The norm standardizes that tolling antennas must read **6C** (air interface communications at 902-928 MHz, 2400-2483.5 MHz & 5725-5850 MHz) and **TDM** (Time-Division Multiplexing).
- The norm standardizes that tolling transponders must exchange electronic information utilizing **6C** (air interface communications at 902-928 MHz, 2400-2483.5 MHz & 5725-5850 MHz ) and **TDM** (Time-Division Multiplexing).

ISO 18006B (Although not mentioned in the norm, continue use, but stop selling beginning of 2015)

# Technical Interoperability Approach

- Phase 1 – August 2014 – IAVE (Capufe) and IAVE (I+D) to mutually accept each others tags in their roadways.
- Phase 2 – September 2014 – Televia (OHL) and Viapass (Pinfra) will join the interoperability scheme.

## Discontinue Use:

- ISO 10374 ATA (Replace all tags in use by end of 2014)
- ISO 18006B (Continue use, but stop selling beginning of 2015)

## New Norm:

- ISO 18000 6C
  - TMD (ie IAG)
- } Published Standards by SCT

# Data Interoperability Approach

## Phase 1 Service Provider Agreement

- Peer to Peer
- Transaction Transfer
- Active Tag List

November 2014

## Phase 2 Central Server

- Active Tag List
- Transaction List
- Adjustment List
- Reconciliation List
- Configuration List

2015

## Phase 3 Clearing House

- Central Reconciliation of Lists
- Due Payments between ETC Providers

2015

## Crossing Borders

- The SCT (Mexico) and USDOT (USA) in preliminary discussions for a bi-national interoperability scheme.
- Goal would be to include Mexico in the 2016 USA National Interoperability.

**THANK YOU**



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**RICARDO PINTO PINHEIRO**



**Associação Brasileira de  
Concessionárias de Rodovias**

*Brazilian Association  
of Highway Concessionaires*

# **ROAD USER CHARGING & TOLLING AROUND THE WORLD**

## **A GLIMPSE OF SOUTH AMERICA**

**International Bridge, Tunnel and Turnpike Association  
IBTTA Global Summit**

October, 19 - 21  
Prague, Czech Republic

# A BRIEF OVERVIEW ON THE STATE-OF-THE-ART OF ELECTRONIC TOLL COLLECTION IN FIVE SOUTHAMERICAN COUNTRIES





# ARGENTINA

Highway concessions in Argentina started in 1990, with the decision to turn over to private entities the operation of 18 federal highways.

A special mention must be made to the highway accesses to the City of Buenos Aires, with a daily traffic volume exceeding 1,000,000 vehicles.



## PRESENT SITUATION

PAVED NETWORK	79,500 km
CONCEDED NETWORK	9,000 km
CONCESSIONAIRES	21
CONCESSIONAIRES W/ETC	17
ETC FREQUENCY	915 MHz
TAGS IN OPERATION	450,000
FREE FLOW or VMT	No



# CHILE

Chile was the first country in South America to have a National ITS Architecture, completed in August 2003.

A focus must be cast on the City of Santiago free flow multi lane system, largest urban system in the world, comprising five highways and one tunnel, with a total length of 190 km and an investment exceeding US\$1.5 billion.



## PRESENT SITUATION

PAVED NETWORK	18,000 km
CONCEDED NETWORK	3,740 km
CONCESSIONAIRES	24
CONCESSIONAIRES W/ETC	7
ETC FREQUENCY	5.8 GHz
TAGS IN OPERATION	2,400,000
FREE FLOW	5 concessionaires
VMT	No



# PERU

The Ministry of Transport and Communications of Peru has disclosed a plan to implement 12 new concessions in 4,740 km of highways, with a US\$ 3 billion investment.



## PRESENT SITUATION

PAVED NETWORK	15,086 km
CONCEDED NETWORK	6,696 km
CONCESSIONAIRES	14
CONCESSIONAIRES W/ETC	7
ETC FREQUENCY	915 MHz
<b>for sticker tags, but some concessions operate with smart cards</b>	
FREE FLOW or VMT	No



# COLOMBIA

Colombia has announced what is probably the most ambitious highway concession program in South America: intervention in 5,700 km, with 35 new concessions by 2018.



## PRESENT SITUATION

PAVED NETWORK	14,000 km
CONCEDED NETWORK	4,000 km
CONCESSIONAIRES	26
CONCESSIONAIRES W/ETC	7
ETC FREQUENCY	915 MHz
TAGS IN OPERATION	100,000
FREE FLOW or VMT	No



# BRAZIL

At this moment the electronic toll collection system in Brazil is in a migration process from 5.8 GHz to 915 MHz.

This process should be completed by August, 2017.

## PRESENT SITUATION



PAVED NETWORK	200,000 km
CONCEDED NETWORK	16,300 km
CONCESSIONAIRES	53
CONCESSIONAIRES W/ETC	48
	5 concessionaires are in process of instalation.
ETC FREQUENCY	5.8 GHz / 915 MHz
TAGS IN OPERATION	4,200,000 / 900,000
FREE FLOW	No
VMT	Yes
	Limited segments in 4 concessionaires. ("point – to – point")





## BRAZIL

### ADDITIONAL INFORMATION

ETC started in Brazil 20 years ago, in 1994.

Four service providers are in operation:

- Customer's account administration
- Tag suppliers
- Customer service



VMT – 3 segments are in operation in the State of São Paulo since 2012.  
A 4<sup>th</sup> segment started last month.

SP-340 24 km, 60,000 users

SP-75 63 km, 4,100 users

SP-360 3 km, 400 users

SP-332 operation started Sept. 15<sup>th</sup>

Free Flow

- Always a tempting proposition
- But toll evasion responsibility is not yet regulated

## CONCLUSION

Utilizing the data collected from these five countries, a preliminary information about South America is:

- Conceded highways are found practically all over the continent.
- Electronic toll collection, with different modalities and communication protocols, is a common practice.
- With the exception of Chile, free flow is still a promise for the future.
- VMT is practically inexistent, with only four short deployments in Brazil.



# Thank you

**RICARDO PINTO PINHEIRO**

Chief Executive Officer

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**GLOBAL UPDATE SESSION  
A GLIMPSE ON SOUTH AMERICA**

**International Bridge, Tunnel and Turnpike Association  
IBTTA Global Summit**

October, 19 - 21  
Prague, Czech Republic

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**PEDRO PINTO**

# MLFF Operation: From Quantity to Quality

**IBTTA**  
TOLLING. MOVING SMARTER.

**2014 IBTTA Global Summit**

*Innovations & Technologies for Sustainable Mobility, Environment and Road Safety  
Prague, Czech Republic | October 19-21, 2014*

**October 2014**



**01/ Overview**

**02/ Asset Management**

**03/ Services | Toll  
Collection**

**04/ Recognitions**

**05/ Added Value**



# 01/ Overview



# ASCENDI GROUP

Holding company **acting**  
**in transport infrastructure**  
**concessions and O&M**  
**business worldwide**





# ASCENDI GROUP in the World

Around **\$1 Bi assets**  
under management

**Over 3.000 km**  
of motorways and  
roads,  
Including 1.400 km  
operated solely by  
Ascendi

Participation in  
the capital of **16**  
**Concessionaires**

**Sustained activity**  
in Portugal, Spain,  
Mexico, Brazil  
and Mozambique



# 02/ Asset Management



10 road and 1 railway concessions  
**1.600 km**

**PORTUGAL** 78% of concessioned Assets



7 motorways | **1400km** | Under Ascendi's single Brand



Bridges – River Tejo Crossing | **19,5km** | Major Shareholder



Light Metro | **20km**



Motorway | **178km**



Motorway | **37km**



5 road concessions  
**1.400 km**

**INTERNATIONAL** 22% of concessioned Assets



Mexico | Vera Cruz  
**60km | 50%**



Brazil | Sao Paulo  
**415km | 50%**



Mozambique | Tete  
**700km | 40%**



Spain  
**75km | 50%**



Spain  
**71,5km | 15%**



# 03/ Services | Toll Collection

03.1/ Experience

03.2/ Systems

03.3/ Operations

03.4/ References

03.5/ Facts and Figures

03.6/ Innovations

**Toll Collection**



# Experience

Significant experience and know-how  
in all toll collection systems

## AET (MLFF)



Toll collection systems enabling  
Traffic free flow

## Traditional Toll Collection



Open or closed system, manual  
and electronic

**LARGEST EUROPEAN PRIVATE OPERATOR  
OF AET SYSTEMS FOR ALL TYPES OF VEHICLES**

# Experience

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## AET

150 Million annual transactions

950 M€ of collection services backlog

5 systems in full operation

128 collecting points

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Pioneer in AET (MLFF)

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## Traditional Tolling

Manual and automatic lanes

Electronic Free Flow Single Lanes

69 toll plazas

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15 years know-how

### Shareholding of 20% in Via Verde (Portuguese TAG issuer)

>3.5 Million TAGs issued

65% of Portuguese cars equipped with TAGs

300M ETC transactions

# Systems

## Architecture

### ROAD SIDE EQUIPMENT (RSE)

#### AET

- ETC (DSRC technology)
- VTC (ALPR technology)
- 128 Tolling Points

*kapsch* >>> 

#### Traditional

- Open or close configuration
- Manual and Automatic lanes
- Electronic (SLFF)
- 69 Toll Plazas

**MultiToll**

### OPERATIONAL BACK-OFFICE (OBO)

#### Integrates all tolling operations

- Prepared for technologies from different vendors (DSRC, RFID)
- Transaction validation
- Second level OCR
- Image review
- Trip aggregation engine
- Toll charge calculation
- Mobile enforcement BO

### COMMERCIAL BACK-OFFICE (CBO)

#### Integrates all tolling operations

- Account Management
- Contact and Walk-in centre
- CRM
- Billing and notice issuing
- Dunning management
- Payment processing
- External Interface (links)



# Systems

## AET | Main Features (Portugal)

### DIMENSION

- Largest European private operator of a multi-vehicle category AET (MLFF);

### FEASIBILITY

- High speed motorways – DSRC technology;
- More than 99,99% system availability;
- 99,80% of vehicles detection (no speed restriction);
- Disaster Recovery System for OBO and CBO;

### OPERATIONAL FLEXIBILITY

- Electronic Tolling using OBU identification; or
- Video Tolling, using ALPR in association with OCR engine;

### TRANSACTION AGGREGATION

- Unitary transactions of a journey aggregated into a single transaction, where:
  - Customer able to check travelled journey;
  - Optimized transaction costs;

# Operations

PROCESS & TOLLING TECHNOLOGY	RECEIVABLES	TOLL OPERATIONS	CONTRACTS MANAGEMENT
Systems Monitoring	Receivables Management	Traditional Tolls	Financials
Process Optimization	Invoicing/Notification	Customer Service (call-center/front-desk/net)	Revenue Assurance
Project & Technical Sup.		Image Review	Reporting
		Document Management	Contracts Management
		Quality Assurance	
		Mobile Enforcement	
<b>24/24h Remote Technical Supervision</b>			

**ALL AET OPERATIONS AS SERVICE PROVIDER TO PORTUGUESE ROAD AGENCY**

# Operations

## AET | Payment Methods (Portugal)

### NATIONAL VEHICLES

#### Direct Collection (without surcharges):

- Fully Electronic payment through OBU Issuer (debit card)
- Pre-payment with client identification
- Anonymous pre-payment admitted

#### Post Payment Collection (with surcharges):

- Anonymous post-payment using license plate - available for payment at Post Offices and Payshop network

### FOREIGN VEHICLES

- Interoperability with Spain (vehicles OBU equipped)
- “Easy-Toll” system (automatic registration at the borders, using credit card account)
- Electronic Vignette (casual user)

### ENFORCED COLLECTION

- Enforced Collection for non payment (with fines – fiscal offense)
- Mobile Enforcement



# Facts and Figures

**700K** Transactions  
processed daily

Transaction mode: **80%**  
ETC, **11%** VTC, **9%**  
Manual

**5.2M km** (aggregate  
distance travelled by all  
users) charged per day

**1.7M** customer  
accounts managed

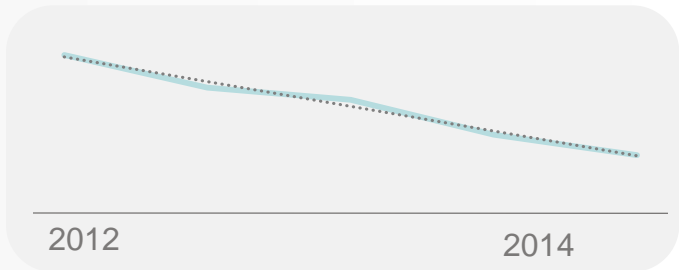
Invoices/notices:  
**42.5k** processed per  
business day

# Facts and Figures

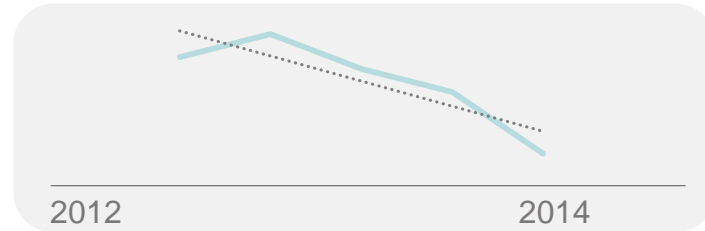
## Effectiveness Vs Efficiency



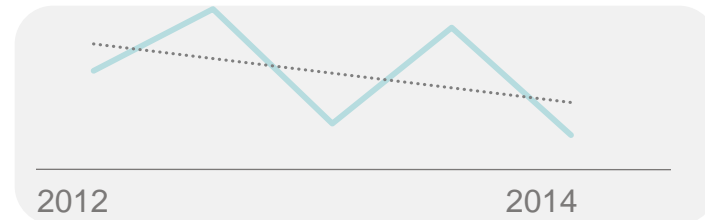
### Call Center



### Documents inflow



### Manual photo validation

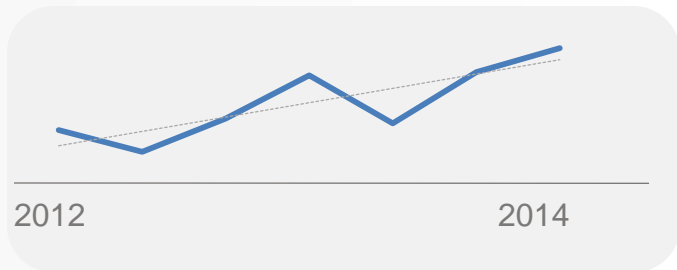


# Facts and Figures

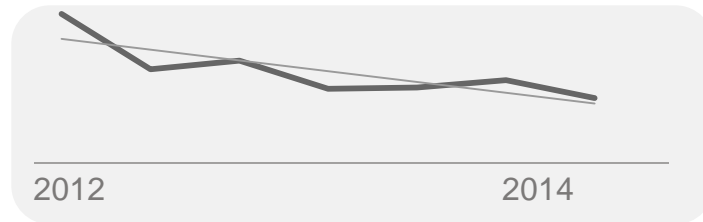
## Effectiveness Vs Efficiency



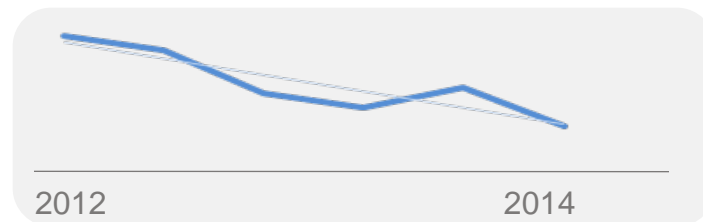
Toll revenues



Toll costs



FTE's

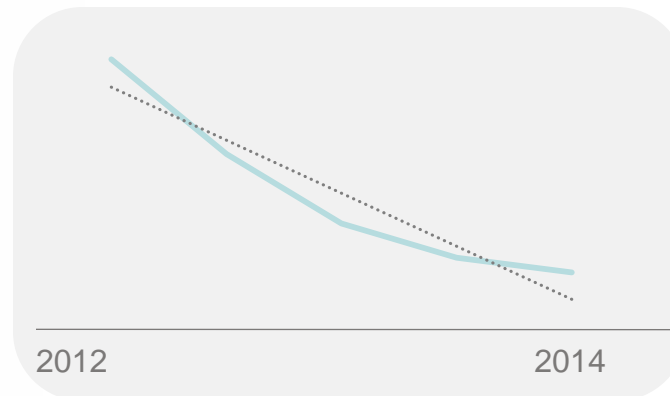


# Facts and Figures

## Effectiveness Vs Efficiency



## Cost per Transaction



# Innovations

**Process  
harmonization  
and business  
optimization**

Tolling as a service

Support for independent and  
different business models

**Ascendi's System not  
dependent upon the  
Road Side Equipment  
vendors and  
technologies**

Different technologies already  
used (DSRC, ALPR,  
Traditional) from different  
vendors, all integrated

**DEVELOPMENT OF AN INDUSTRY  
SOLUTION SUPPORTING THE CORE  
PROCESSES OF TOLL COLLECTION**





# Innovations

## Flexibility through Different Charging Schemes

Traditional, SLFF, AET, open or closed systems

## Stability and technical strength of SAP software

Multi-company, natural integration with external entities

## Scalable Solution

No limitation in sizing

**DEVELOPMENT OF AN INDUSTRY SOLUTION SUPPORTING THE CORE PROCESSES OF TOLL COLLECTION**



# 04/ Recognitions



# Recognitions



COMMITTED TO IMPROVING THE STATE OF THE WORLD

Insight Report

## The Global Competitiveness Report 2014-2015

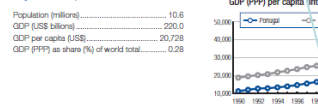
Klaus Schwab, World Economic Forum



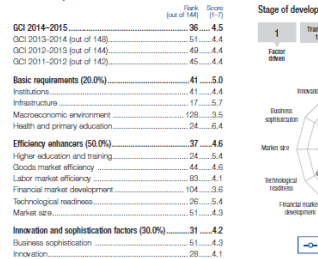
2.1: Country/Economy Profile

### Portugal

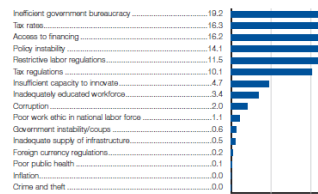
Key indicators, 2013



Global Competitiveness Index



The most problematic factors for doing business



Note: From the list of factors above, respondents were asked to select the five most problematic for doing business in their country (1 most problematic) and 5. The bars in the figure show the responses weighted according to their rankings.

212 | The Global Competitiveness Report 2014-2015

© 2014 World Economic Forum

## 2nd pillar: Infrastructure

2.02 Quality of roads 6.3 2

The Global Competitiveness Index in detail

INDICATOR	VALUE	RANK/144
<b>1st pillar: Institutions</b>		
1.01 Property rights	4.8	42
1.02 Intellectual property protection	4.6	50
1.03 Diversion of public funds	4.0	41
1.04 Public trust in politicians	3.0	67
1.05 Irregular payments and bribes	5.2	32
1.06 Judicial independence	4.5	44
1.07 Favoritism in decisions of government officials	3.3	54
1.08 Wastelessness of government spending	2.8	88
1.09 Business of government regulation	3.9	81
1.10 Efficiency of legal framework in settling disputes	3.1	111
1.11 Efficiency of legal framework in challenging reg.	3.3	77
1.12 Transparency of government policymaking	3.9	81
1.13 Business costs of arbitration	6.5	7
1.14 Business costs of crime and violence	6.0	19
1.15 Organized crime	6.9	13
1.16 Reliability of police services	6.3	29
1.17 Ethical behavior of firms	4.5	42
1.18 Strength of auditing and reporting standards	4.5	53
1.19 Efficacy of corporate loans	4.5	76
1.20 Protection of minority shareholders' interests	4.4	47
1.21 Strength of investor protection, 0-10 (best)	6.0	19
<b>2nd pillar: Infrastructure</b>		
2.01 Quality of overall infrastructure	6.0	19
2.02 Quality of roads	6.3	2
2.03 Quality of airport infrastructure	4.4	33
2.04 Quality of port infrastructure	5.4	29
2.05 Quality of air transport infrastructure	5.7	20
2.06 Available airfare (per km, million)	800.9	31
2.07 Quality of electricity supply	6.4	18
2.08 Mobile telephone subscriptions/100 pop.*	113.0	59
2.09 Fixed telephone lines/100 pop.*	42.7	18
<b>3rd pillar: Macroeconomic environment</b>		
3.01 Government budget balance, % GDP**	-4.9	107
3.02 Gross national savings, % GDP**	16.0	37
3.03 Inflation, annual, % change**	0.4	59
3.04 General government debt, % GDP**	128.8	138
3.05 Country credit rating, 0-100 (best)*	49.1	71
<b>4th pillar: Health and primary education</b>		
4.01 Malaria cases/100,000 pop.*	M.F.	n/a
4.02 Business impact of malaria	N/A	n/a
4.03 Tuberculosis cases/100,000 pop.*	20.0	56
4.04 Business impact of tuberculosis	6.5	28
4.05 HIV prevalence, % adult pop.*	0.7	97
4.06 Business impact of HIV/AIDS	6.2	32
4.07 Infant mortality, deaths/1,000 live births**	2.9	11
4.08 Life expectancy, years**	80.4	26
4.09 Quality of primary education	4.8	39
4.10 Primary education enrollment, net %*	96.6	17
<b>5th pillar: Higher education and training</b>		
5.01 Secondary education enrollment, gross %**	112.9	8
5.02 Tertiary education enrollment, gross %**	69.9	29
5.03 Quality of the education system	4.3	40
5.04 Quality of math and science education	4.5	43
5.05 Quality of management education	5.9	4
5.06 Internet access in schools	5.7	28
5.07 Availability of research and training services	4.1	34
5.08 Excess of staff training	4.2	34

INDICATOR	VALUE	RANK/144
<b>6th pillar: Goods market efficiency (cont'd)</b>		
6.06 No. procedures to start a business*	3	19
6.07 No. days to start a business*	2.0	5
6.08 Agricultural policy costs	3.7	45
6.09 Prevalence of state barriers	6.2	7
6.10 Trade tariffs, % duty**	0.8	5
6.11 Prevalence of foreign ownership	4.4	32
6.12 Business impact of rules on FDJ	4.3	79
6.13 Burden of customs procedures	5.1	29
6.14 Imports as a percentage of GDP**	46.6	66
6.15 Degree of customer obsession	5.1	33
6.16 Buyer sophistication	9.5	54
<b>7th pillar: Labor market efficiency</b>		
7.01 Cooperation in labor employer relations	4.3	65
7.02 Flexibility of wage determination	4.7	49
7.03 Hiring and firing practices	5.9	113
7.04 Job-sharing costs, weight of salary*	23.1	108
7.05 Effect of taxation on job seekers to work	2.8	121
7.06 Pay and productivity	3.4	113
7.07 Reliance on professional management	4.2	73
7.08 Country capacity to reach talent	3.1	91
7.09 Country capacity to attract talent	3.4	72
7.10 Women in labor force, ratio to men*	0.90	32
<b>8th pillar: Financial market development</b>		
8.01 Availability of financial services	4.9	43
8.02 Affordability of financial services	4.2	61
8.03 Financing through local equity market	3.0	93
8.04 Ease of access to loans	2.4	108
8.05 Venture capital availability	2.5	84
8.06 Soundness of banks	4.2	111
8.07 Regulation of securities exchanges	4.6	46
8.08 Legal rights index, 0-10 (best)*	3	113
<b>9th pillar: Technological readiness</b>		
9.01 Availability of latest technologies	6.3	11
9.02 Firm-level technology absorption	5.6	22
9.03 ICT and technology transfer	6.2	14
9.04 Individuals using internet, %*	62.1	48
9.05 Retail broadband internet subscriptions/100 pop.*	23.8	32
9.06 Text internet bandwidth, kbps per user*	18.1	14
9.07 Mobile broadband subscriptions/100 pop.*	36.7	28
<b>10th pillar: Market size</b>		
10.01 Domestic market size index, 1-7 (best)**	4.1	20
10.02 Foreign market size index, 1-7 (best)**	5.0	48
10.03 GDP (PPP) in billions*	244.8	62
10.04 Imports as a percentage of GDP**	40.9	66
<b>11th pillar: Business sophistication</b>		
11.01 Local supplier quality	5.0	27
11.02 Base of cluster development	4.4	42
11.04 Nature of competitive advantage	3.8	23
11.05 Value-chain breadth	4.0	50
11.06 Control of international distribution	4.0	66
11.07 Production process sophistication	4.4	40
11.08 Depth of marketing	4.5	49
11.09 Willingness to delegate authority	3.6	30
<b>12th pillar: Innovation</b>		
12.01 Capacity for innovation	4.3	27
12.02 Quality of scientific research institutions	5.4	18
12.03 Company spending on R&D	3.6	28
12.04 Export of innovation	4.7	23
12.05 Govt procurement of advanced tech products	3.8	42
12.06 Availability of scientists and engineers	5.2	8
12.07 PCT patents, applications/million pop.*	10.0	31

Notes: Values are on a 1 to 7 scale unless otherwise annotated with an asterisk (\*). For further details and explanation, please refer to the section "How to Read the Country/Economy Profiles" on page 101.

# Recognitions

## Technological | AET



*Best New Business Application  
(Commercial Back Office System)  
2011*



*Best technological and business  
value projects (MLFF Project)  
2011*



*Best technological and business  
value projects (Embedded  
Technology for Mobile Brigades)  
2013*

## Quality Management



*International Organization for  
Standardization (ISO) quality  
management certification for all  
Ascendi branded companies*

## Human Resources



*Recognition for applying some of  
the best human resource  
management practices*

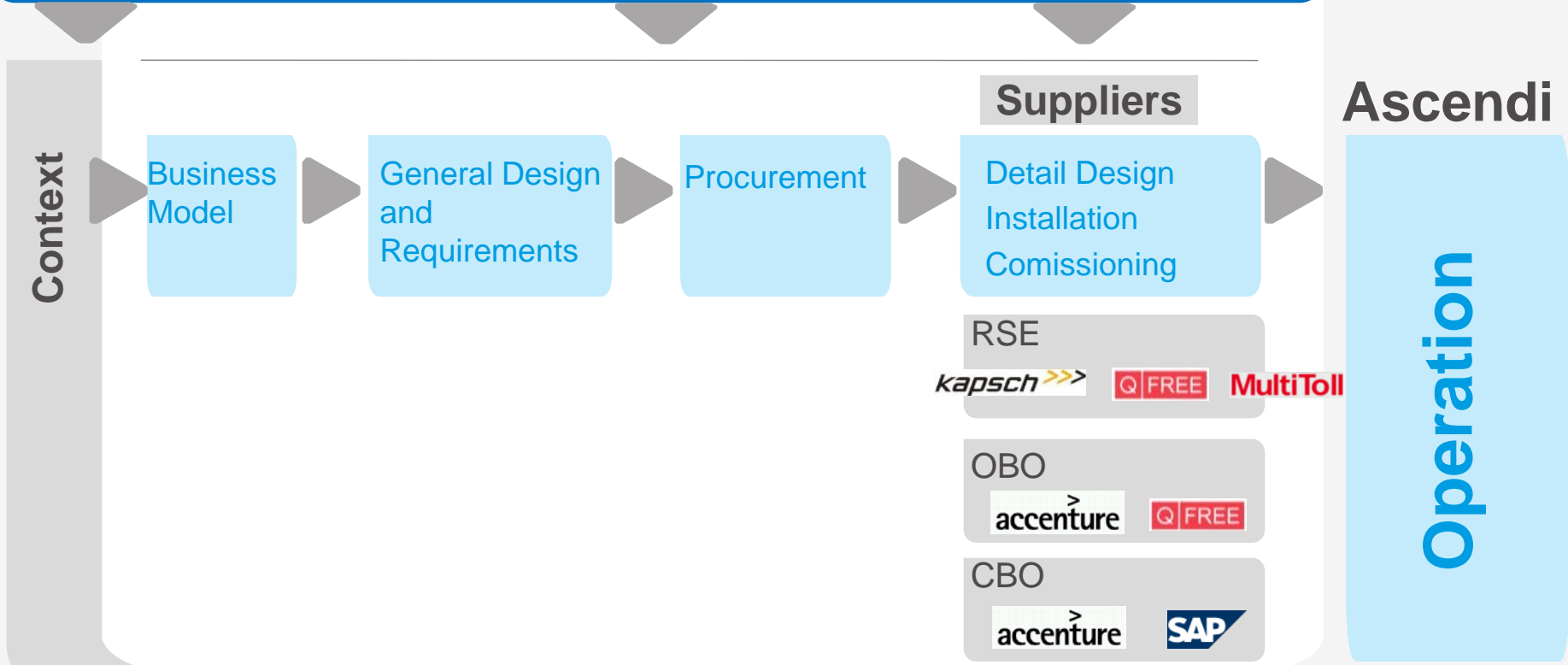
# 05/ Ascendi's Added Value



# Toll Collection Projects

Applying Expertise Intelligently

Project Management – Coordination – Quality Assurance  
**Ascendi**



# Thank You!

**IBTTA**  
TOLLING. MOVING SMARTER.

2014 IBTTA Global Summit

*Innovations & Technologies for Sustainable Mobility, Environment and Road Safety*  
Prague, Czech Republic | October 19-21, 2014

[www.ascendi-group.com](http://www.ascendi-group.com)

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**ZOLTÁN VARGA**





ELECTRONIC  
TOLL SYSTEM

# We are on the right track!

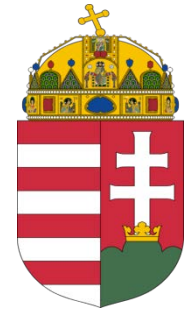
Introduction of HU-GO, the Hungarian distance based electronic toll system

by Zoltán Varga, general manager of Toll Service PLC

October 2014, Prague

# Hungary

- 35 919 mi<sup>2</sup>
- 9,9 million inhabitants
- Capital: Budapest



**Road network:**  
 Highways: 704,55 mi  
 Motorways: 127,13 mi  
 First class roads: 1 347,95 mi  
 Second class roads: 2 894,99 mi  
 Other roads: 14 285,36 mi  
**All together: 20 602,73 mi**

## Tolling history of Hungary – 1999-2006

- Toll plazas
- Concessioners
- Demolish of toll plazas
- Standardized toll system for Hungary
- Time based vignette



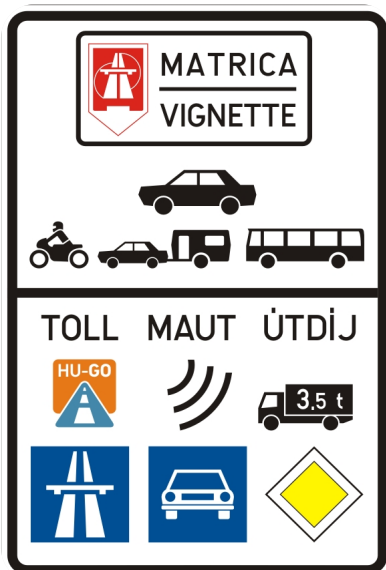
# Tolling history of Hungary – 2006-2013

- 2006 SMS purchase
- 2008 No physical vignette, only AET
- 2011 e-business



# Tolling history of Hungary – 2013-2014

- 2013 HU-GO
- Distance based AET





# Toll road network until 1st July 2013



- 1 039,55 mi long toll domain

- 9 highways
- 42 main road sections
- 5,37% of the Hungarian road network is tolled

# Toll road network - 2013

- 4 039,53 mi long toll domain

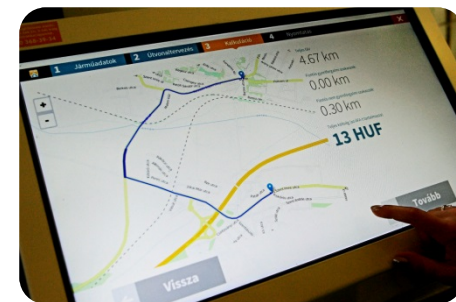
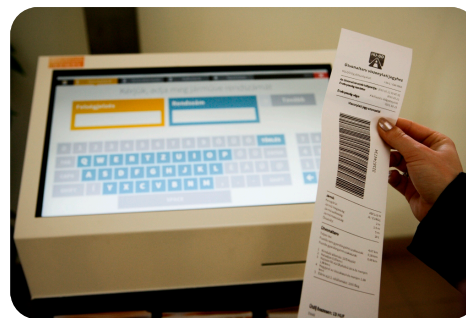
- 2 243 tolled road sections

- 20,87% of the Hungarian road network is tolled



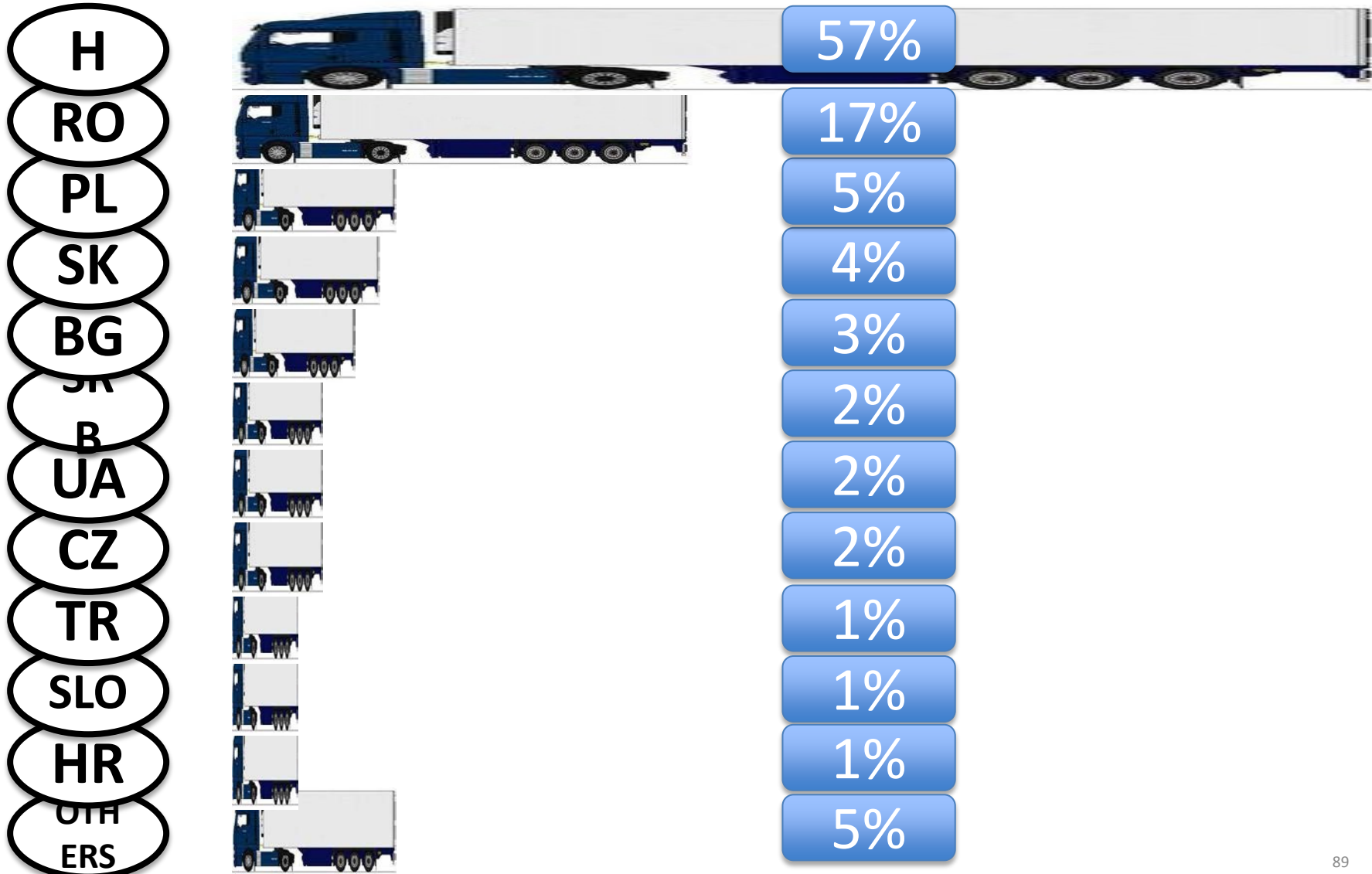
# HU-GO toll declaration modes

- **Self-declaration!**
- **Route ticket:**  
recommended for ad-hoc users
- No registration
- **On board unit:**  
recommended to frequent users
- 22 audited Toll Declaration Operators (TDO)

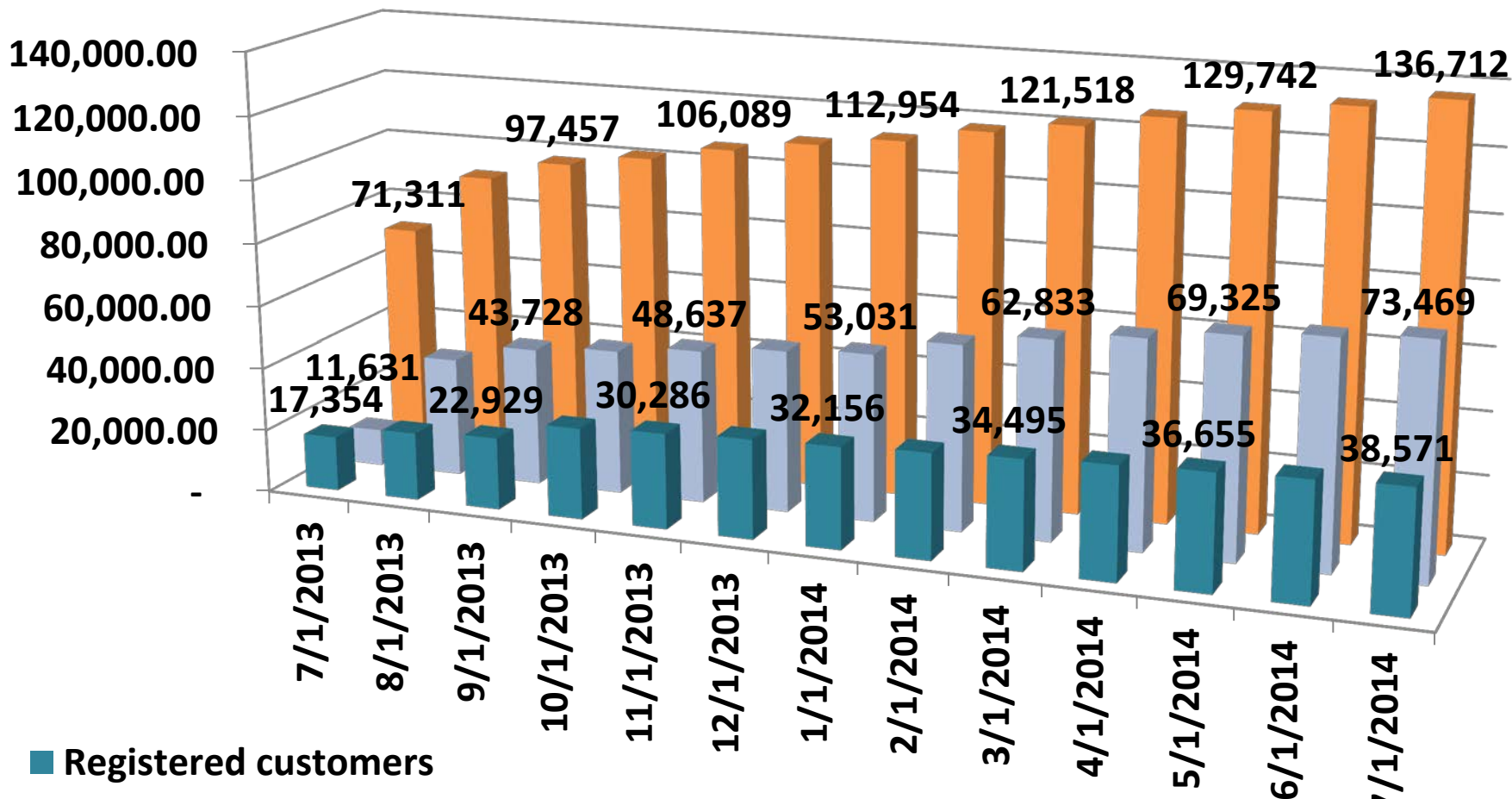




## Nationality split of paid tolls



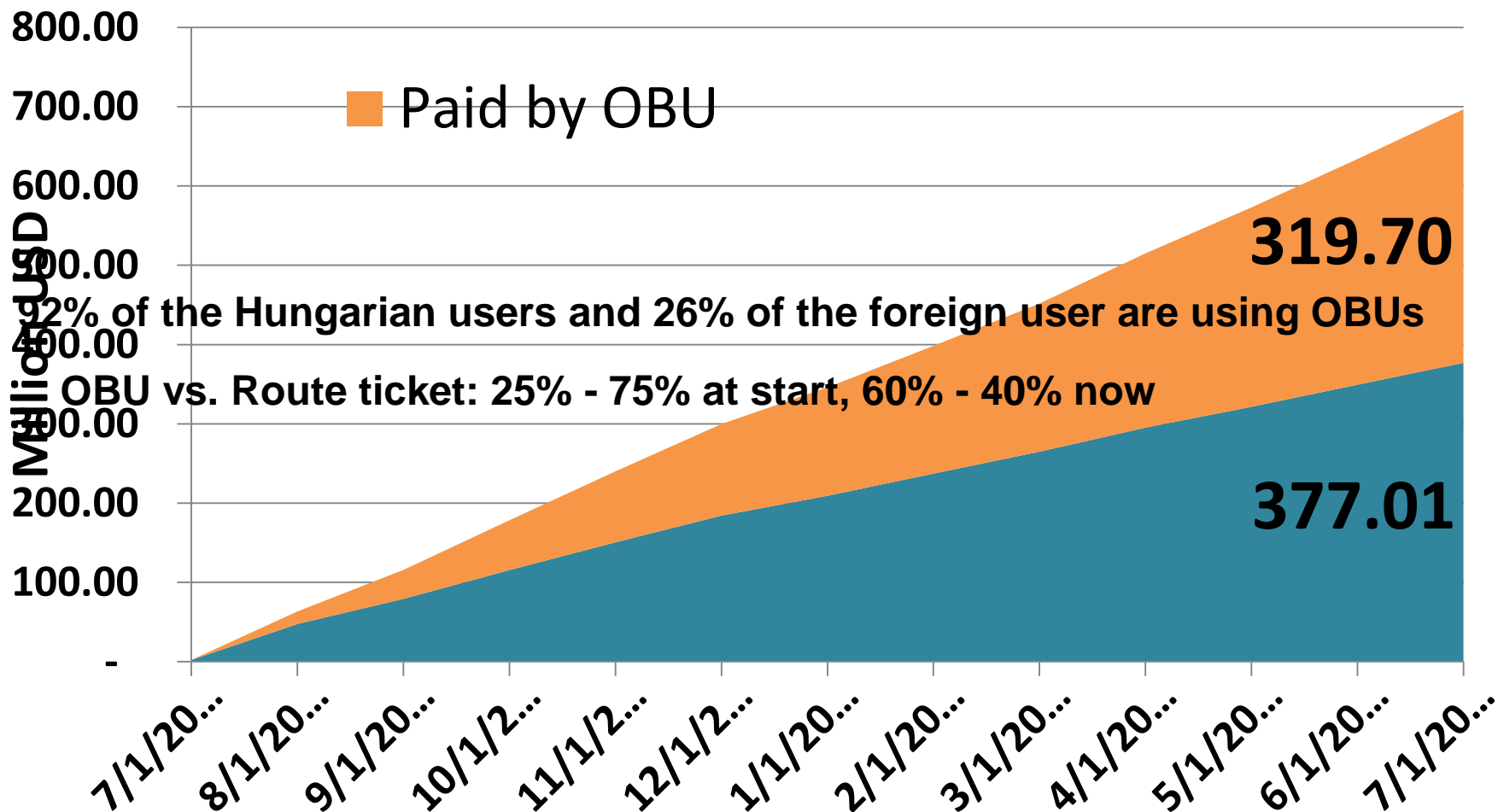
# Registered users, vehicles and OBUs



- Registered customers
- Registered OBUs
- Registered vehicles

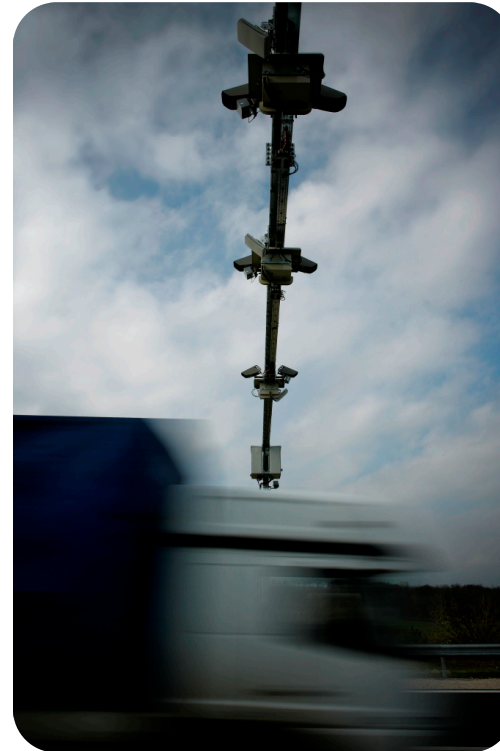
Vehicles: 147 436; OBUs: 80 262; Customers: 41 625  
 250 customers, 5 000 vehicles are in post-paid scheme

# Toll income



# Enforcement

- Without stopping
- Continuous (0-24) inspection
- With the help of fixed gantries and mobile vehicles
- Supplying real-time data towards the central system
- Continuous online connection with the central system



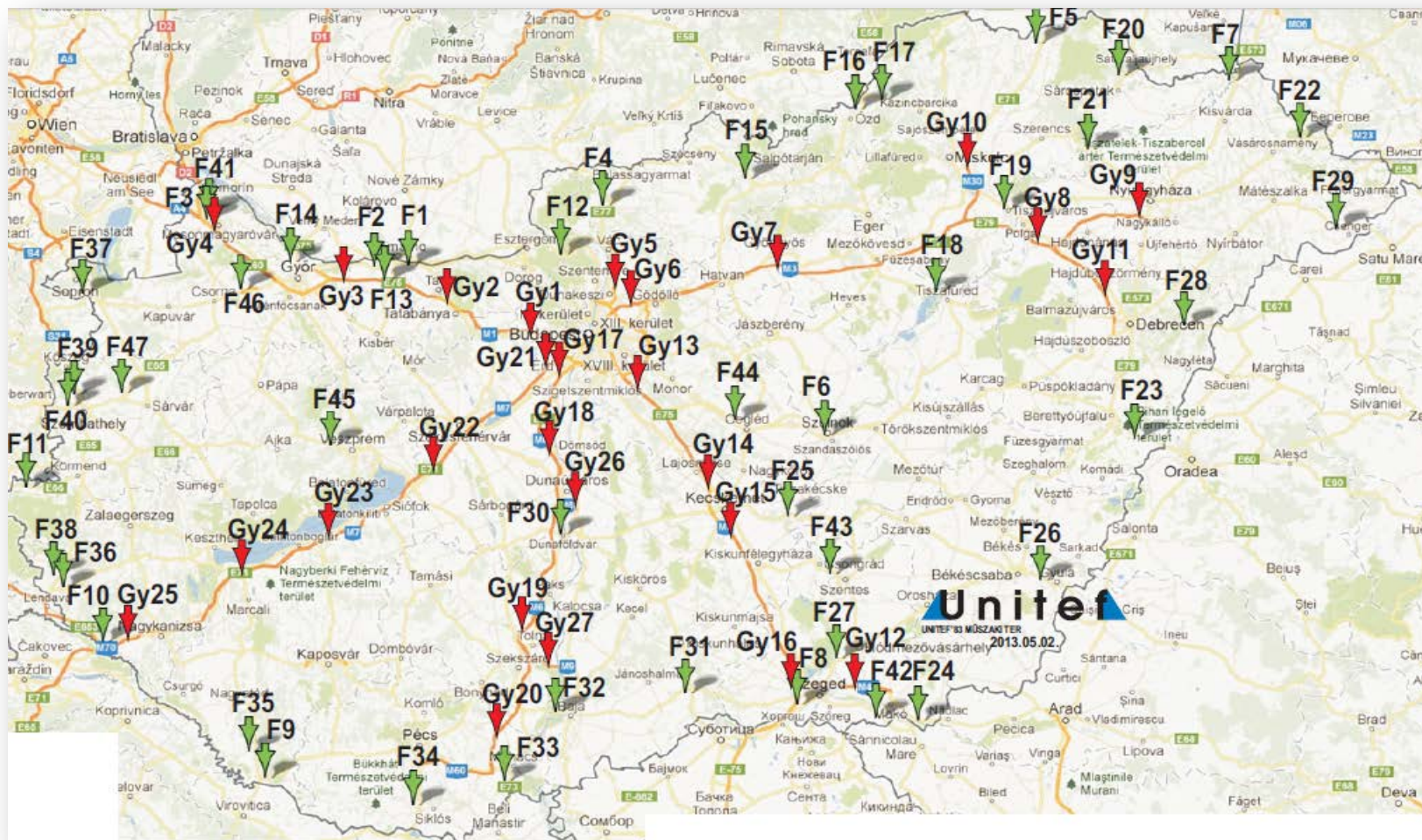
# Mobile enforcement support vehicles

- 45 mobile units (currently)
- Currently ~500 check points countrywide
- 7/24 inspection in 3 shifts
- Flexible, random appearance anywhere on the tolled sections





# Fixed toll enforcement gantries



# Enforcement

- Commenced by the Hungarian Police
- Unauthorized road usage
- Administration of penalty
- On the spot activity, foreigners
- Without stopping, objective responsibility
- Range of penalties 140 000-165 000 HUF (600-700 USD)



TI fotó - Bruzák Noémi

TI fotó - Bruzák Noémi



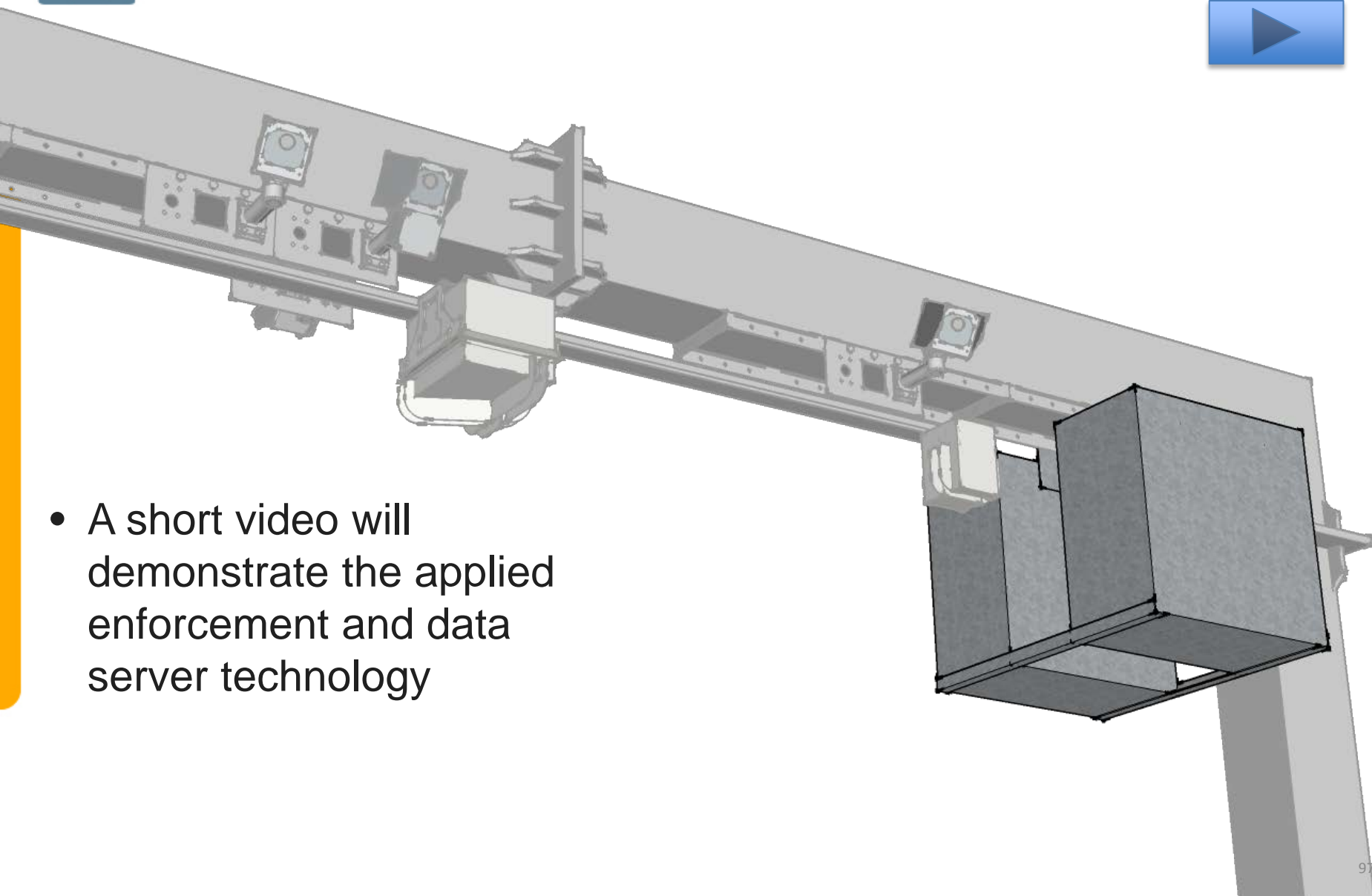


ELECTRONIC  
TOLL SYSTEM

[www.hu-go.hu](http://www.hu-go.hu)



- A short video will demonstrate the applied enforcement and data server technology



# THE SYSTEM

## HU-GO innovations

### Route ticket

- Flexible purchase solutions
- Flexible route planning solutions
- No need for registration
- On-line access



### On Board Unit platform

- Already installed GPS trackers can be used
- No need to pre-finance the OBUs by the state
- Open platform for all GPS based fleet management providers

### Enforcement with ANPR

- 98.5% on ANPR and category recognition
- Supporting road safety, traffic and transportation management, violation management, vehicle control and crime prevention



## Facts & figures

- **100 million USD** one time investment – **14,3%** of the annual toll revenue
- **2,5 month** of implementation – **2,5 month** return of investment
- **45 million USD** annual operational cost – **6,5%** of the annual toll revenue
- Monthly average sales volume of route tickets:  
**645 500 pieces**
- Monthly average number toll declarations of route section (total):  
**31 500 000 pieces**
- Monthly average vehicle checks done by enforcement support:  
**2 600 000 cases**

Please contact:



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# Road User Charging & Tolling Around the World

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