The Drive Toward Interoperability

MODERATOR

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HUBERT RESCH

IBTTA
TOLLING. MOVING SMARTER.

REETS
Regional European Electronic Toll Service

REETS: Interim Results and Outlook

2014 IBTTA Global Summit
Prague, October 20, 2014

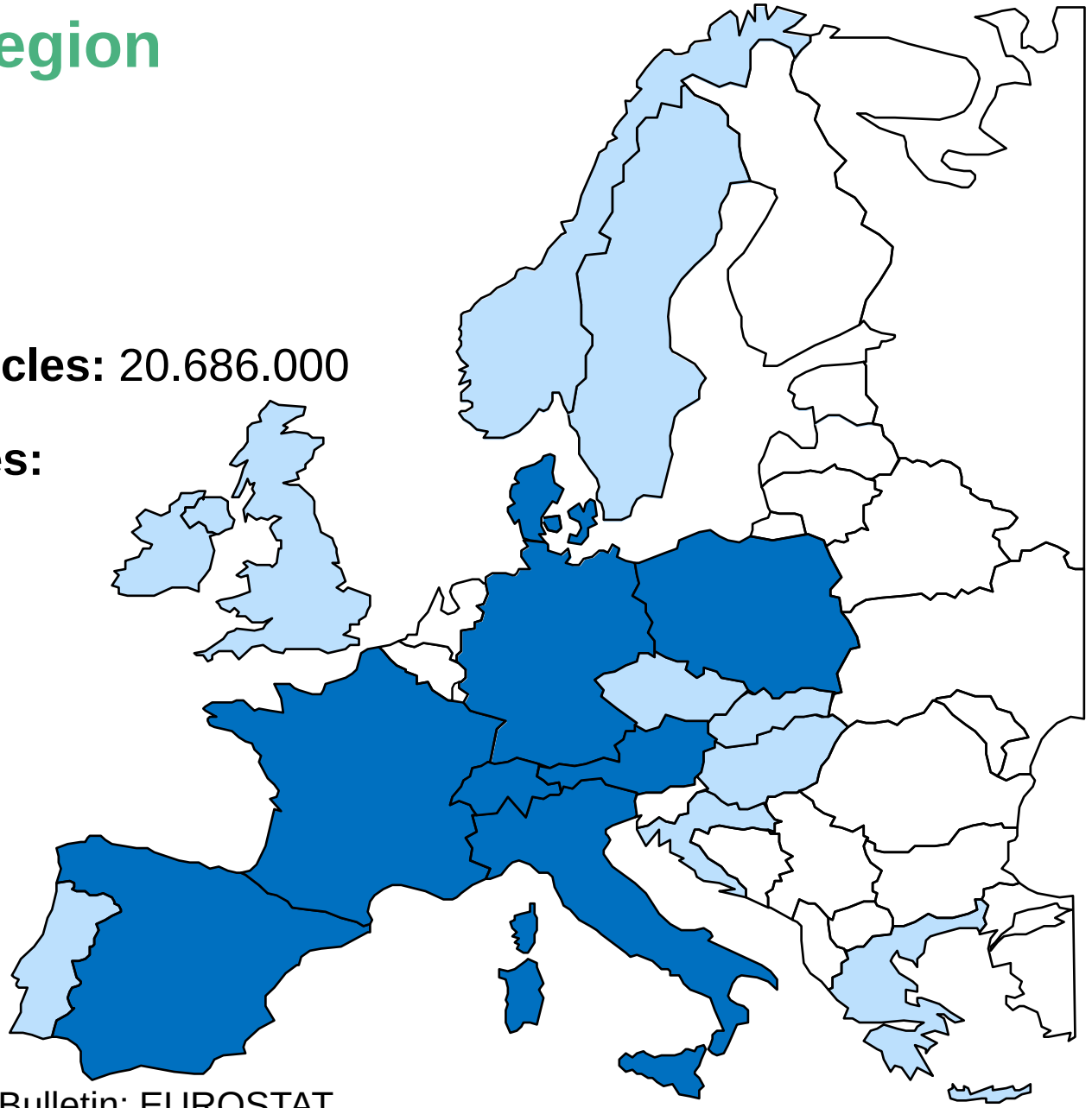
Co-financed by the European Union
Trans-European Transport Network (TEN-T)

The REETS Region

REETS Key Factors:

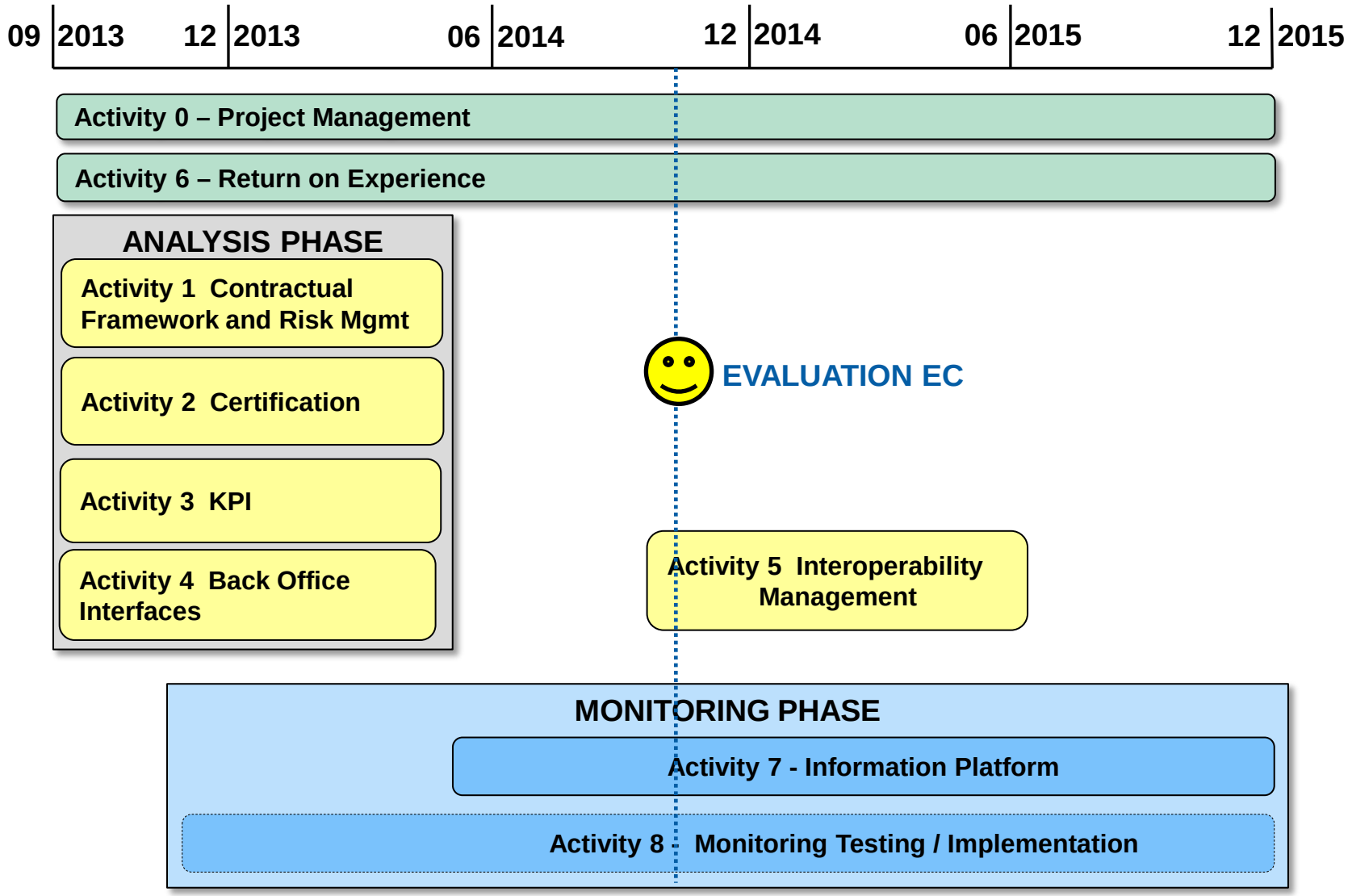
- **Tolled km:** 38.430
- **Total (heavy) vehicles:** 20.686.000
- **Total Toll revenues:**

  EUR 22,9 bn



Source: ASECAP Statistical Bulletin; EUROSTAT

Project overview



Act. 8 Testing / implementation: REETS pilot

- No Top-down design of global REETS pilot due too high complexity and interdependencies
  - → **Bottom-up approach on the basis of the declared interest of SPs**
- REETS Pilot to utilise synergies
  - testing from a technical perspective (main focus)
  - and possible other synergies according to Activities 1 - 4

REETS pilot: concept

Toll Domains participating in REETS TEN

Service Provider	Pilot YES/NO	AT ASFINAG *DSRC*	CH EZV *GNSS*	DE BMVI *GNSS*	DK Sund&Baelt *DSRC*	ES SEOPAN *DSRC*	FR 1 TIS ASFA *DSRC*	FR 2 Ecotaxe *GNSS*	IT AISCAT *DSRC*	PL GDDKiA *DSRC*
AGES (+Shell+UTA)	YES	Coverage of all REETS toll domains, no specific priorities								
ASFINAG ETS	YES	Operation			Operation					1st Step
Axxés	YES	1st Step	3rd Step	2nd Step	1st Step	Operation	Operation	Operation	3rd Step	2nd Step
BroBizz	YES	Operation			Operation					1st Step
DKV	YES	2nd Step (?)			2nd Step (?)	Operation	Operation	Operation	1st Step	2nd Step (?)
Eurotoll	YES	1st Step				Operation	Operation	Operation		
Eurowag	YES	1st Step	2nd Step	1st Step	2nd Step	2nd Step	2nd Step	2nd Step	2nd Step	1st Step
LogPay	YES	Participation with partners leading the technical demonstration and testing								
Telepass	YES	1st Step		1st Step		Operation	Operation	Operation	Operation	1st Step
Total	YES	1st Step		2nd Step	1st Step	Operation	Operation	Operation	2nd Step	1st Step

No SP activities currently

SPs in operation

REETS pilot: concept

Toll Domains participating in REETS TEN

Service Provider	Pilot YES/NO	AT ASFINAG *DSRC*	CH EZV *GNSS*	DE BMVI *GNSS*	DK Sund&Bælt *DSRC*	ES SEOPAN *DSRC*	FR 1 TIS ASFA *DSRC*	FR 2 Ecotaxe *GNSS*	IT AISCAT *DSRC*	PL GDDKiA *DSRC*
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DKV	YES	2nd Step (?)			2nd Step (?)	Operation	Operation	Operation	1st Step	2nd Step (?)
Eurotoll	YES	1st Step				Operation	Operation	Operation		
Eurowag	YES	1st Step	2nd Step	1st Step	2nd Step	2nd Step	2nd Step	2nd Step	2nd Step	1st Step
LogPay	YES	Participation with partners leading the technical demonstration and testing								
Telepass	YES	1st Step		1st Step		Operation	Operation	Operation	Operation	1st Step
Total	YES	1st Step		2nd Step	1st Step	Operation	Operation	Operation	2nd Step	1st Step

GNSS

DSRC CEN

DSRC ETSI

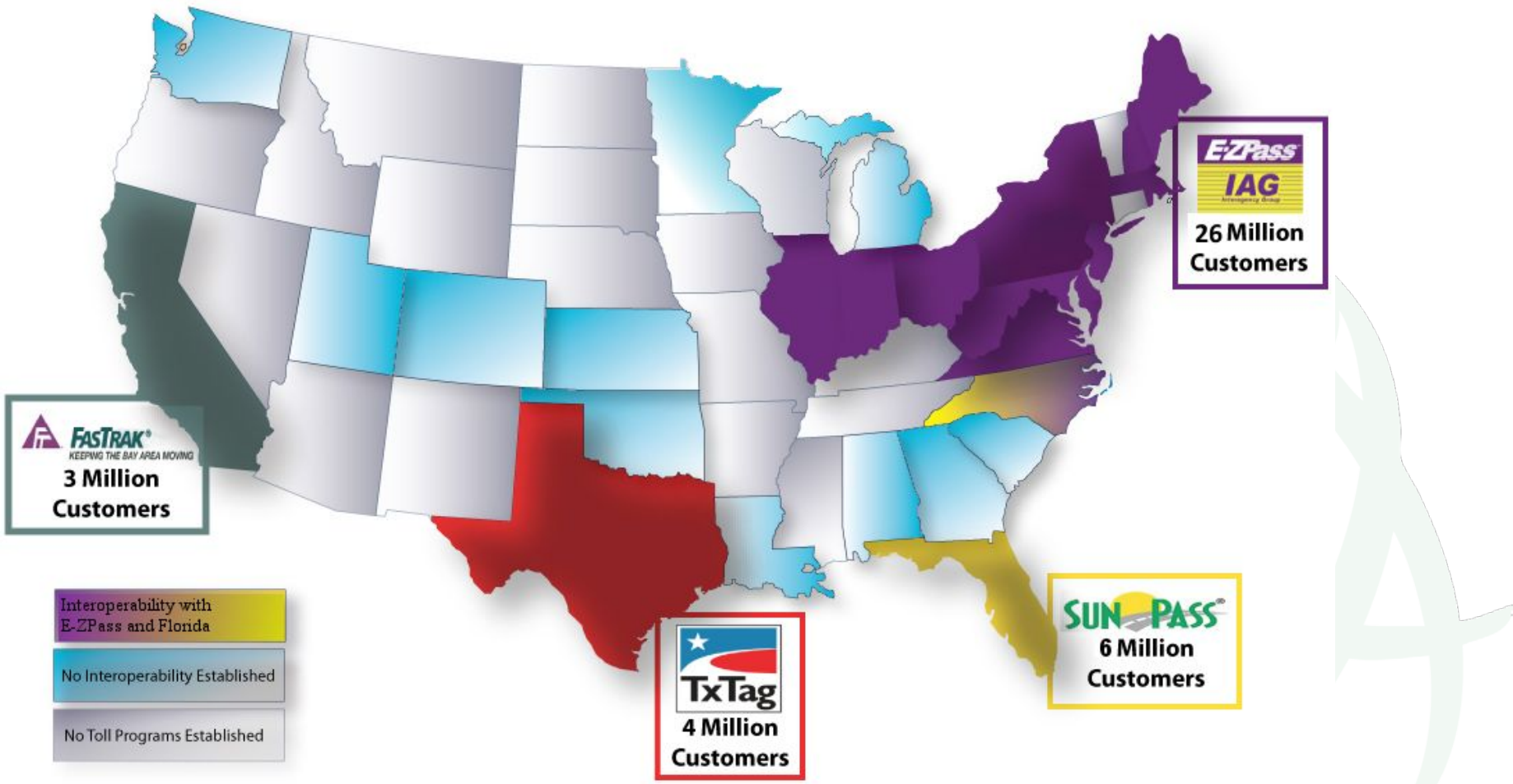
REETS Pilot: Next steps

- Approval of concept and approach by REETS Steering Committee on 09.10.2014
- Possibility to update declaration of interest by SP
  - When: Until 24.10.2014
  - Who: Service Providers
- Bilateral activities SPs / TCs
  - When: Ongoing
  - Who: SPs / TCs
- Meeting of REETS Pilot Coordination Group
  - When: December 2014
  - Who: Activity 8 Leader

REETS

Europe-US: ways towards Interoperability

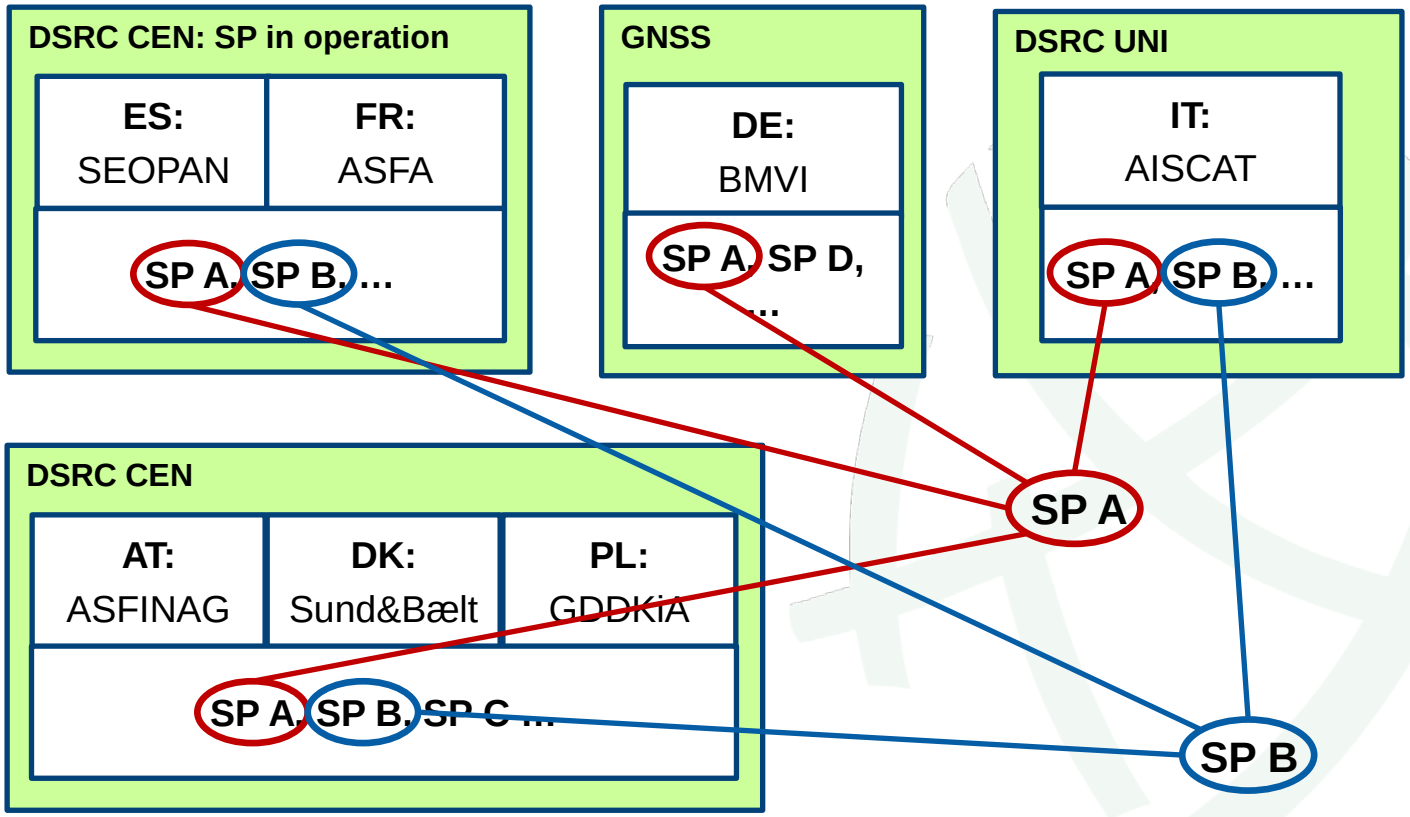
US-Overview*



* Thanks to PJ Wilkins for providing the graph

REETS Pilot: cross-border dimension

- Following the EETS model: cross-border linkage depends on SP-activities



EETS: More than Interoperability

EETS

A better service for the customer

Market, Competition and Cost Efficiency

Migration of existing Toll Systems

New Toll Systems and new players

Opens the market for different technologies

REETS

Regional European Electronic Toll Service

info@reets.eu

www.reets.eu

REETS

Regional European Electronic Toll Service

Co-financed by the European Union

Trans-European Transport Network (TEN-T)

FRANCESCO DEL PIZZO


Reaching for Interoperability:
A Successful
European Experience
TELEPASS®


The Company
TELEPASS®

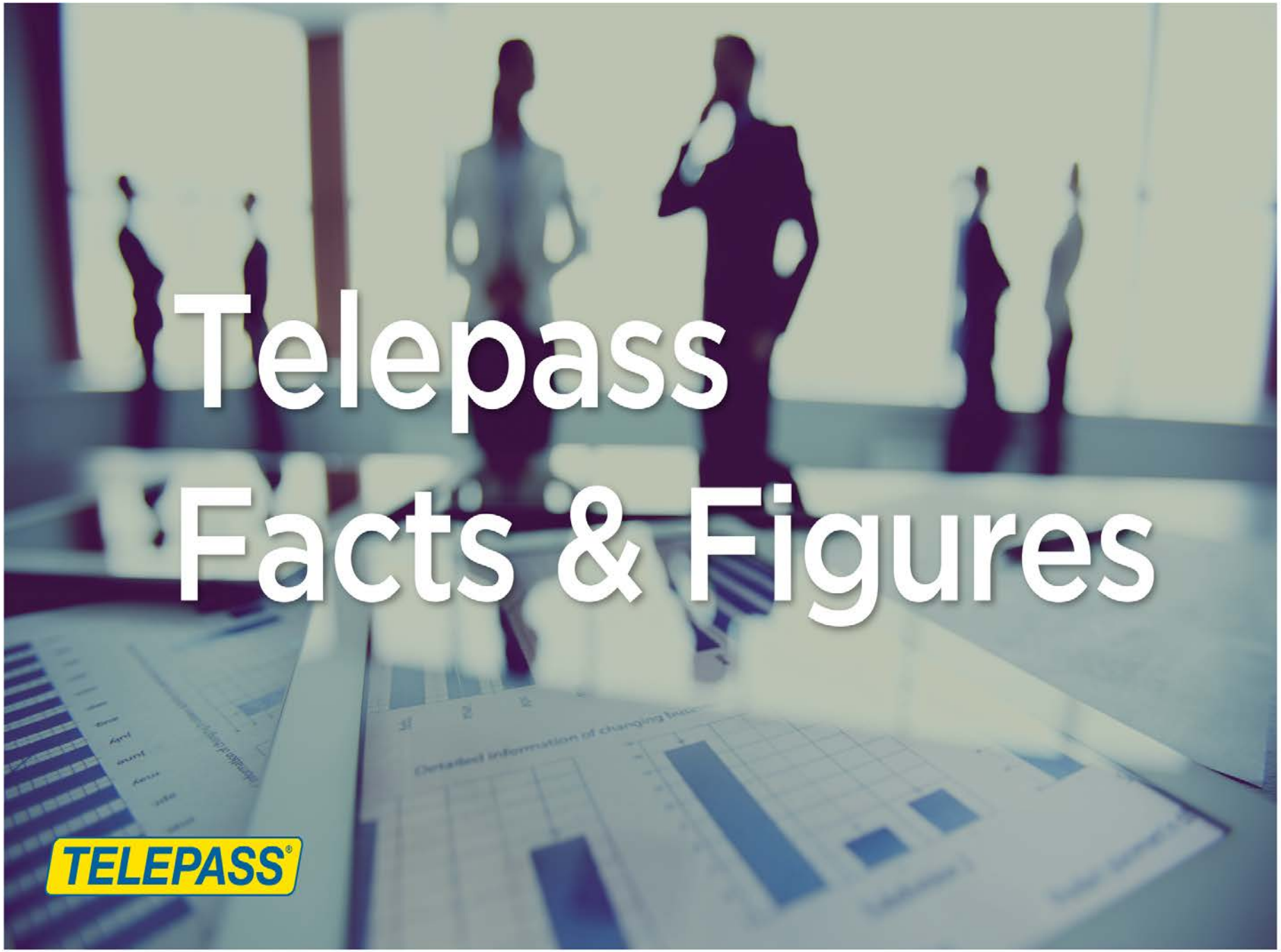

Atlantia

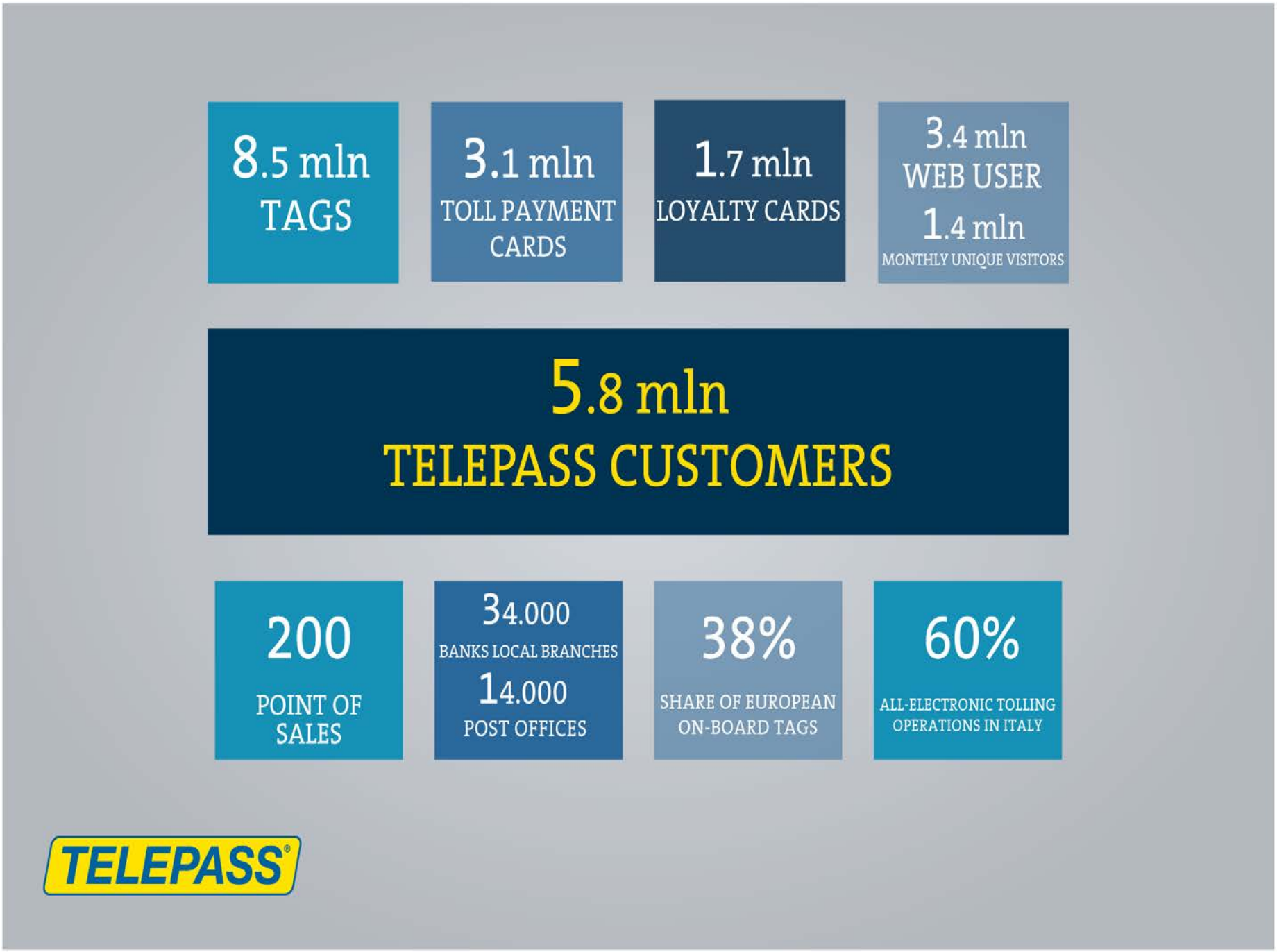

autostrade per l'italia

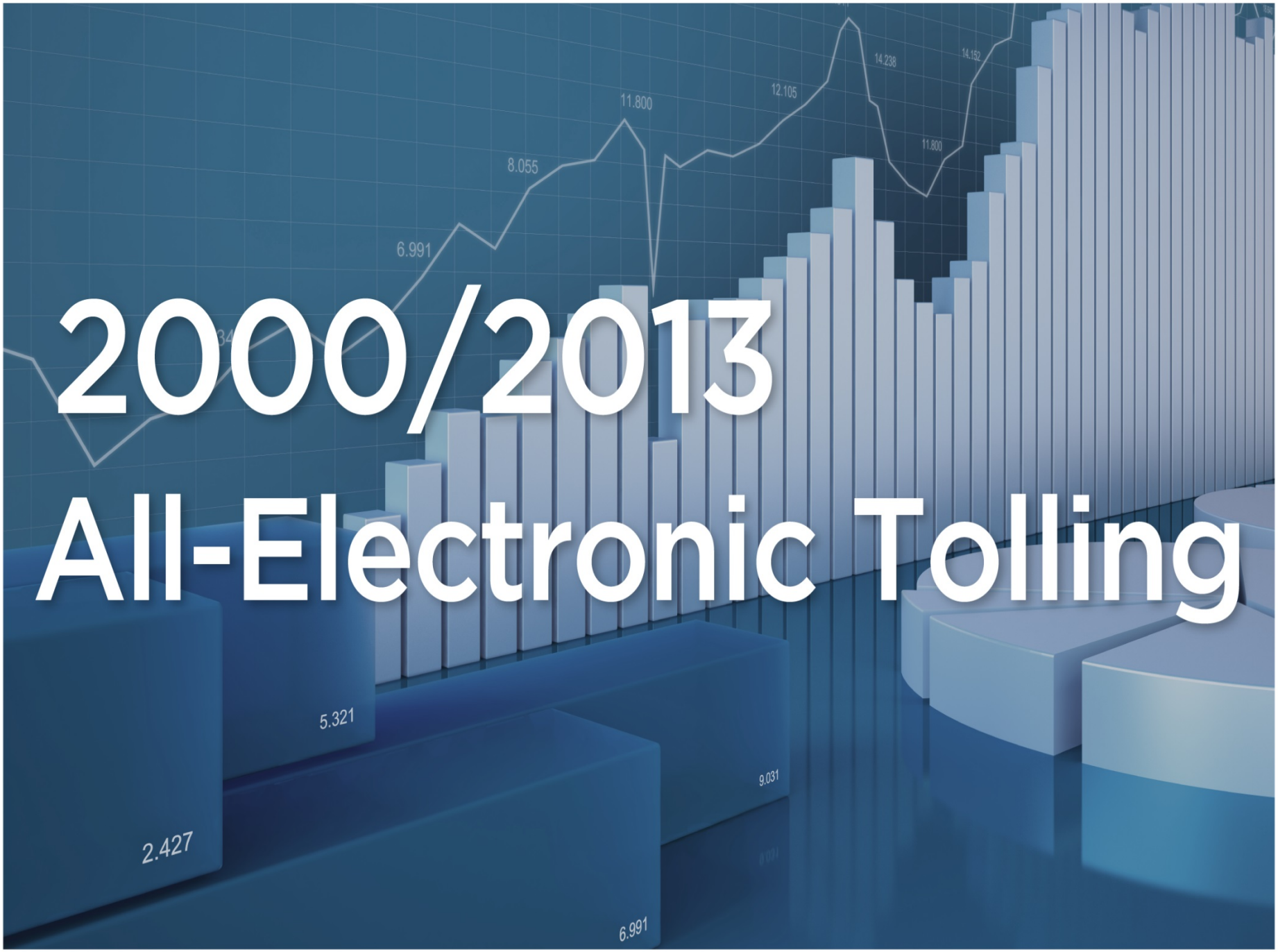

TELEPASS®

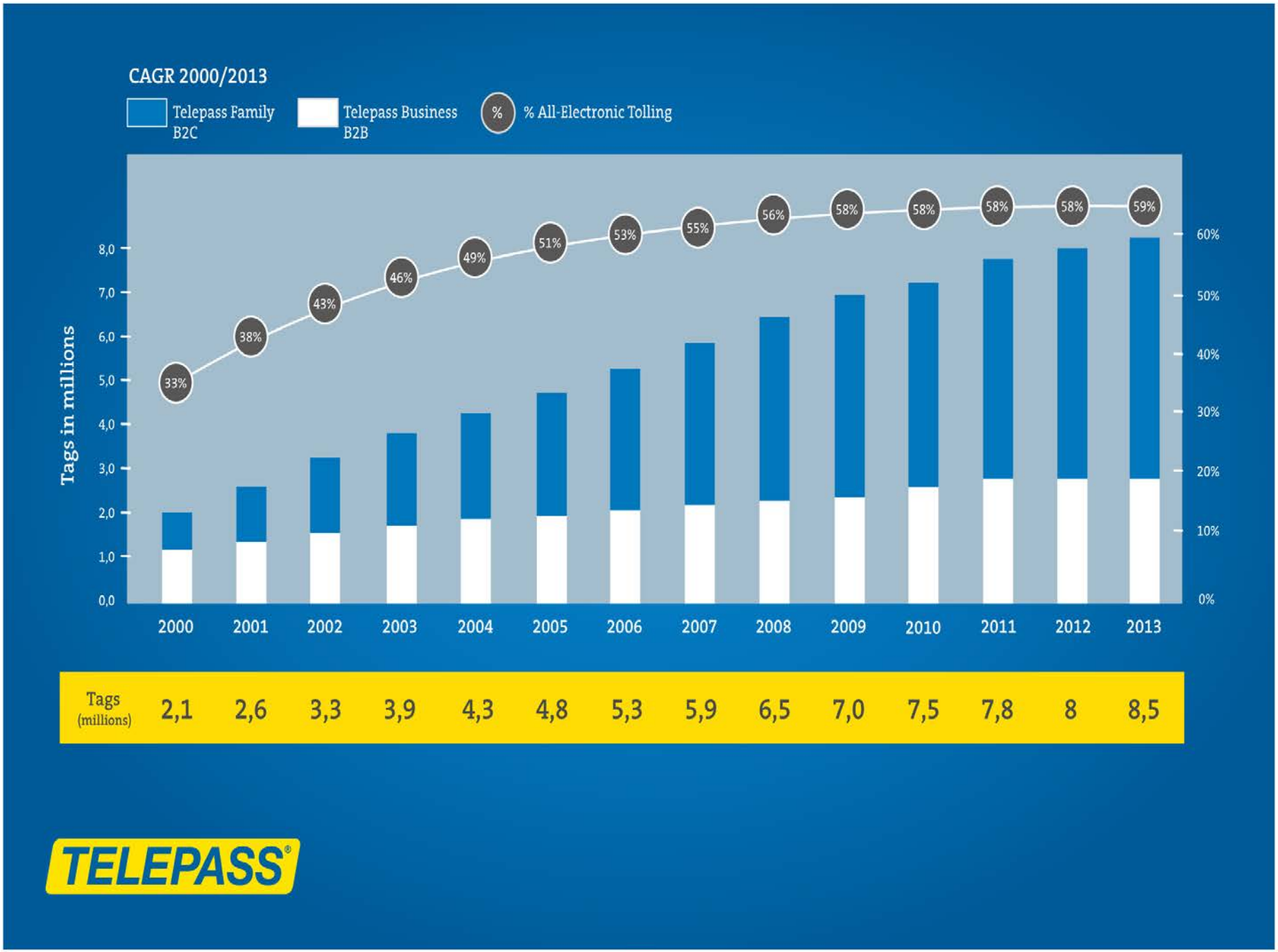

Atlantia
in the world
TELEPASS®


Belgium
Poland
France
Italy
Portugal
Spain
USA
India
Brazil
Chile
TELEPASS®


Telepass
Facts & Figures
TELEPASS®


8.5 mln
TAGS
3.1 mln
TOLL PAYMENT CARDS
1.7 mln
LOYALTY CARDS
3.4 mln
WEB USER
1.4 mln
MONTHLY UNIQUE VISITORS
5.8 mln
TELEPASS CUSTOMERS
200
POINT OF SALES
34.000
BANKS LOCAL BRANCHES
14.000
POST OFFICES
38%
SHARE OF EUROPEAN ON-BOARD TAGS
60%
ALL-ELECTRONIC TOLLING OPERATIONS IN ITALY
TELEPASS®

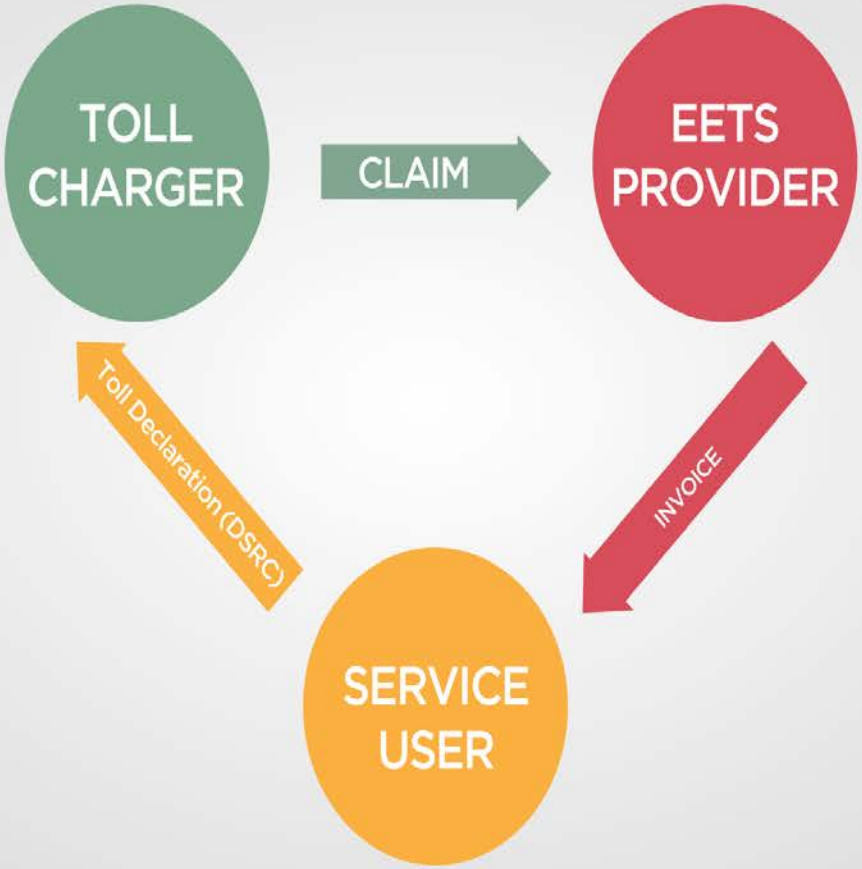

2000/2013
All-Electronic Tolling
2.427
5.321
6.991
9.031
6.991
8.055
11.800
12.105
14.238
11.800
14.152


CAGR 2000/2013
Telepass Family B2C
Telepass Business B2B
% All-Electronic Tolling
Tags in millions
8,0
7,0
6,0
5,0
4,0
3,0
2,0
1,0
0,0
60%
50%
40%
30%
20%
10%
0%
33%
38%
43%
46%
49%
51%
53%
55%
56%
58%
58%
58%
58%
59%
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
Tags (millions)
2,1
2,6
3,3
3,9
4,3
4,8
5,3
5,9
6,5
7,0
7,5
7,8
8
8,5
TELEPASS®


The European Interoperability
TELEPASS®
European Directive 2004/52
European Decision 2009

EETS Stakeholders & **DSRC** Business Model

EETS - European Electronic Toll Service



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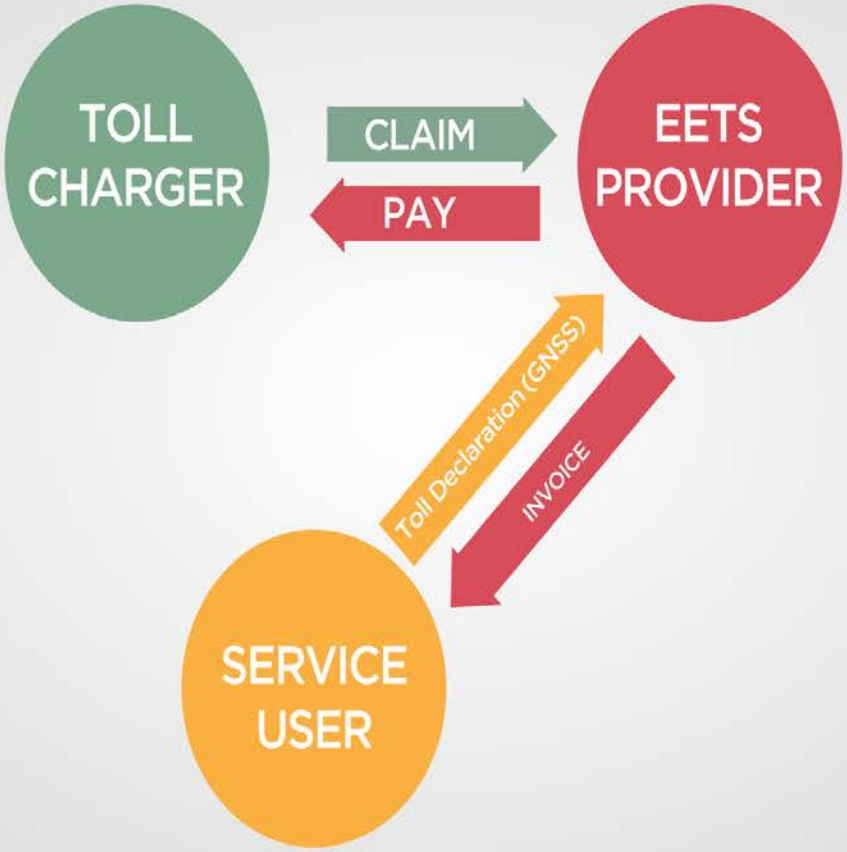
EETS Stakeholders & **GNSS** Business Model

EETS - European Electronic Toll Service



TELEPASS®

TELEPASS TAGS

Telepass **EU**

It allows the payments of highway tolls electronically through one device on all French, Spanish, Portuguese and Belgian roads networks.

Telepass **SAT**

It provides the same services of telepass EU & Telepass Italy, and, additionally, allows GPS payments on Road Networks subject to Tax or Tolls.

Telepass **ITALY**

It allows electronic payment of tolls on the Italian motorway network.

TELEPASS®

aetis

ASSOCIATION OF ELECTRONIC TOLL AND INTEROPERABLE SERVICE

TELEPASS®

REETS Macro Region

Tolled 23 879 miles

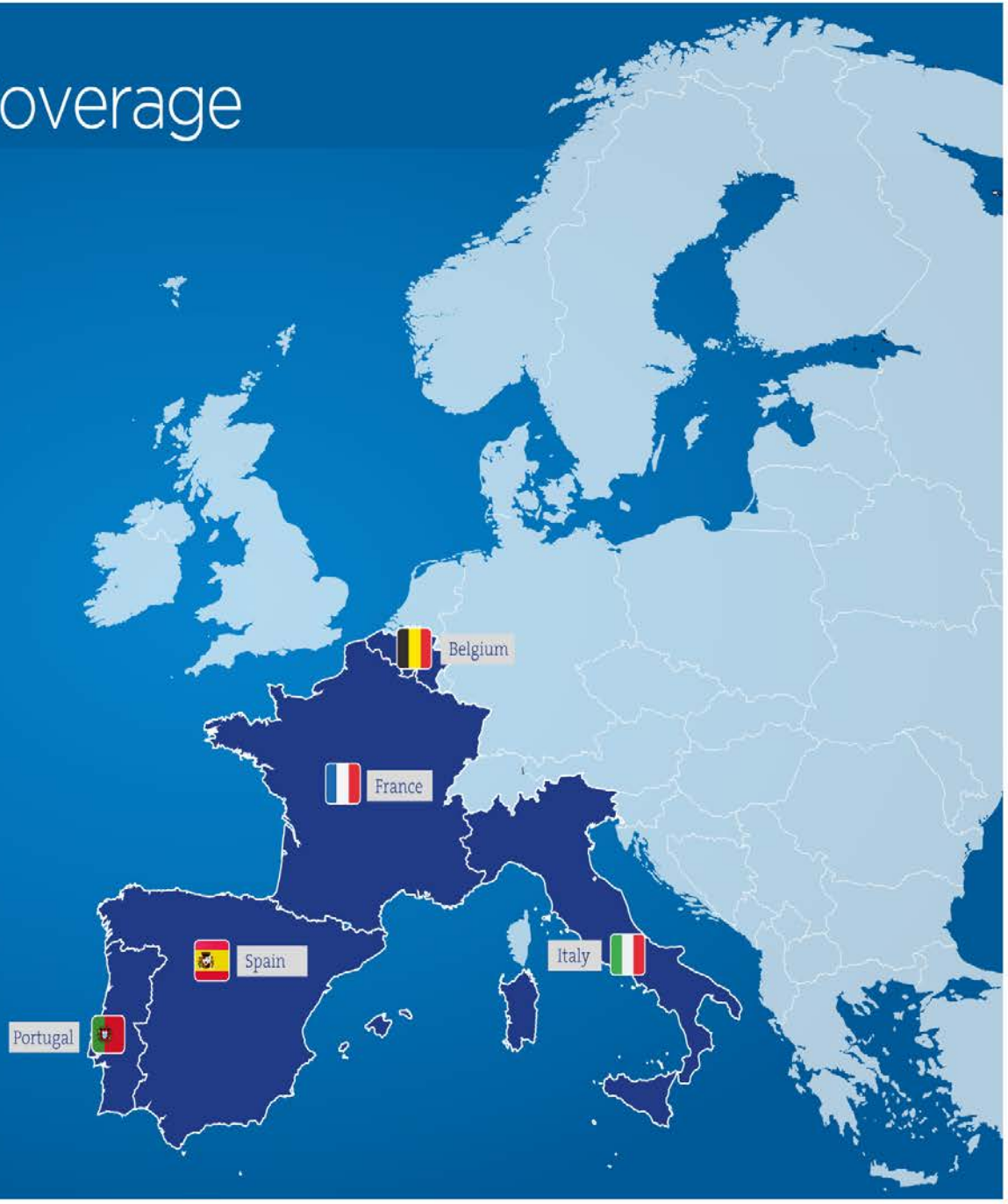
Total (heavy) vehicles: 20.686.000

Total Toll revenues: EUR 22,9 bn

TELEPASS®

Source: ASECAP Statistical Bulletin; EUROSTAT

Telepass Current Coverage



TELEPASS®

Telepass Future Contries

TELEPASS®

Telepass At The End Of 2015

TELEPASS®

Why Telepass will succeed in a global market?

TELEPASS®

Enhanced Services to the Customers

N. 1 SERVICE TO THE CLIENT

- 1 On Board Unit
- 1 Contract
- 1 Interface
- 1 Toll Statement

Easy access / Lower costs / Time Saving

TELEPASS®

IBTTA Global Summit, October 19-21, 2014, Prague

Thank You Prague

Thank You All

TELEPASS®

IBTTA Global Summit, October 19-21, 2014, Prague

Francesco Del Pizzo

fdelpizzo@autostrade.it

TELEPASS®

RICARDO PINTO PINHEIRO

Associação Brasileira de Concessionárias de Rodovias

Brazilian Association of Highway Concessionaires

DRIVE TOWARD INTEROPERABILITY

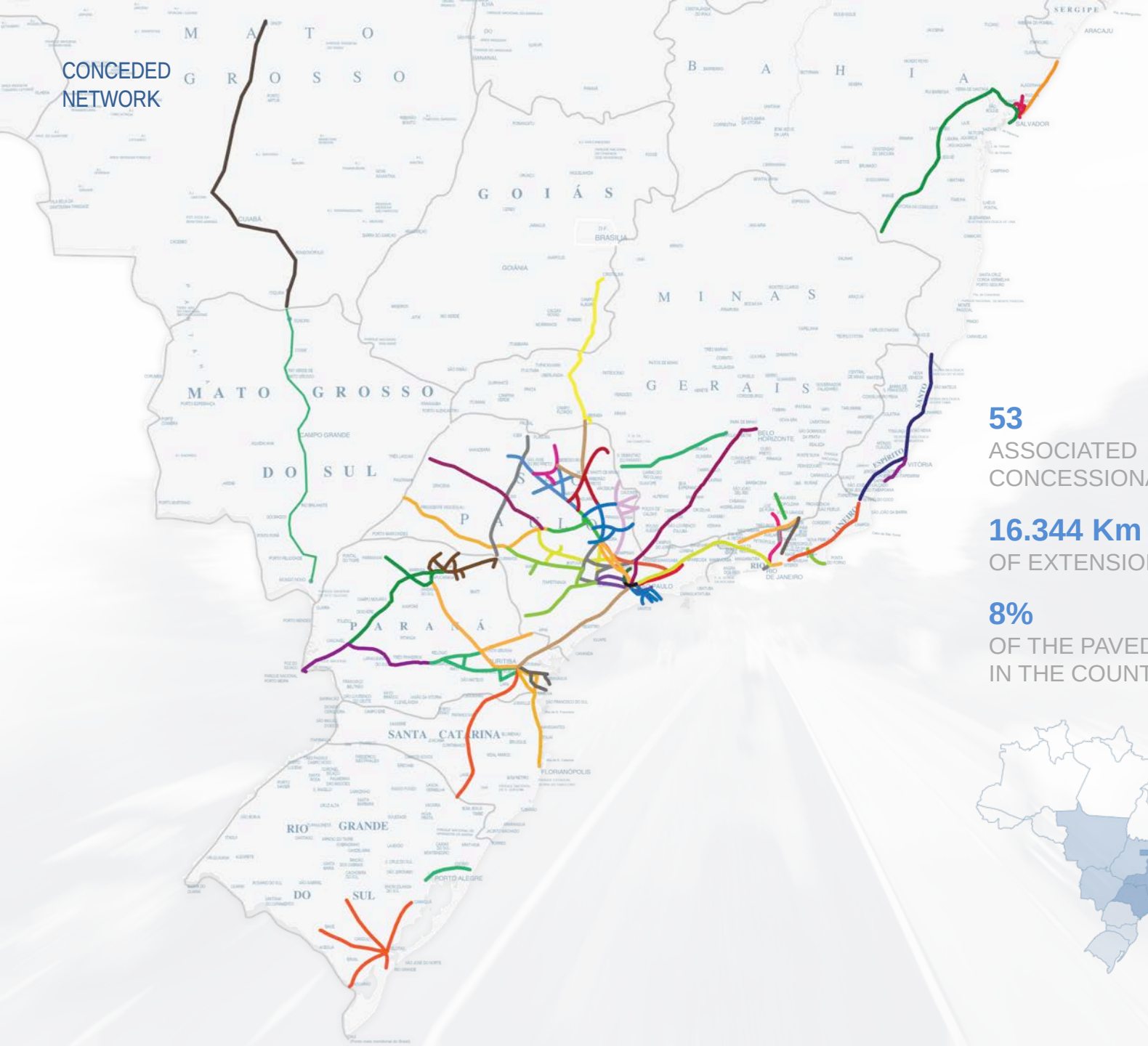
ETC and VMT on Conceded Highways in Brazil

International Bridge,Tunnel and Turnpike Association

IBTTA Global Summit

October, 19 - 21

Prague, Czech Republic



53
ASSOCIATED
CONCESSIONARIES

16.344 Km
OF EXTENSION GRANTED

8%
OF THE PAVED NETWORK
IN THE COUNTRY

CONCEDED NETWORK
OVERVIEW

MIDWEST REGION

MGO RODOVIAS
MSVIA
ROTA DO OESTE

NORTHEAST REGION

BAHIA NORTE
CLN
ROTA DO ATLÂNTICO
ROTA DOS COQUEIROS
VIA BAHIA

SOUTHERN REGION

CAMINHOS DO PARANÁ
CONCEPA
ECOCATARATAS
ECONORTE
ECOSUL
ECOVIA
LITORAL SUL
PLANALTO SUL
REGIS BITTENCOURT
RODONORTE
VIAPAR

SOUTHEAST REGION

AUTOBAN
AUTOVIAS
CART
CENTROVIAS
COLINAS
CONCER
CRT
ECO101
ECOPISTAS
ECOVIAS
FERNÃO DIAS
FLUMINENSE
INTERVIAS
LAMSA
NASCENTES DAS GERAIS
NOVA DUTRA
PONTE
REGIS BITTENCOURT
RENOVIAS
RODOSOL
ROTA 116
RODOANEL OESTE
RODOVIA DO AÇO
RODOVIAS DO TIETÊ
ROTA DAS BANDEIRAS
SPMAR
SPVIAS
TEBE
TRANSBRASILIANA
TRIÂNGULO DO SOL
VIALAGOS
VIANORTE
VIAOESTE
VIA RONDON

BRAZILIAN HIGHWAY CONCESSION PROGRAM
STARTED IN 1995 > RIO-NITERÓI BRIDGE

Conceded network (as of October, 2014)

FEDERAL CONCESSIONS	18 highways	7,386 km
STATE CONCESSIONS	33	8,927 km
MUNICIPAL CONCESSIONS	2	31 km
	53	**16.344 km**

➔ **8%** of the paved network of the Country

New concessions to join ABCR in 2014

FEDERAL Highways	3	2,738 km
STATE Highways	1	220 km
	4	**2,958 km**

New concession offered for bid in 2014 / 2015

STATE Highways	1	72 km
FEDERAL Highways	4	2,666 km
	5	**2,738 km**

Conceded network projected for 2014 / 2015 **62 highways** **22,040 km**

BRAZILIAN HIGHWAY CONCESSIONAIRES

Holdings	Concessionaires	Extension (km)
ARTERIS	9	3,247
CCR	9	2,931
ECORODOVIAS	6	2,040
TRIUNFO	4	967
ODEBRECHT TRANSPORT	3	1,154
AB CONCESSÕES	5	1,620
INVEPAR	4	821
	40	**12,780**
Joint Ventures	4	524
Independent	9	3.040
	53	**16,344**

BRIEF CHRONOLOGY OF ETC DEVELOPMENT IN BRAZIL

1994 — **ETC starts in Brazil, with AMTECH´s 915 MHz proprietary protocol.**
Three concessionaires adopt this protocol – Rio-Niterói Bridge, CRT and LAMSA.

1999 — **The State of São Paulo adopts CEN standards – 5.8 GHz.**

An independent company is contracted as service provider, to distribute tags and operate ETC.
This company expands its operation to cover all conceded network in the Country.

NOTE: AT THE PRESENT MOMENT, THREE ADDITIONAL SERVICE PROVIDERS ARE IN OPERATION.

2009 — **The Federal Government develops a new communications protocol, SINIAV (National System for Automatic Vehicle Identification), 915 MHz, based on ISO 18000 6C.**

2010

ARTESP (regulatory agency of conceded highways of the State of São Paulo) **also develops a new communication protocol: ARTEFATO, 915 MHz, based on ISO 18000 63, very similar to SINIAV but not identical, i.e., not interoperable.**

2013

ARTESP issues Resolution 13 / 1999:

As of January 2013 selling of 5.8 GHz tags in the State of São Paulo conceded network is prohibited.

As of November 2014 only 915 MHz tags will be permitted for ETC.

2014 **ANTT** (regulatory agency of conceded federal highways) **issues Resolution 4281:**

As of November 2014 selling of 5.8 GHz tags for utilization on federal highways is forbidden.

As of May 2017 only 915 MHz tags will be permitted for ETC on federal highways.

ARTEFATO protocol must be implemented in tags for ETC on federal highways.

Readers must be potentially capable to recognize ARTEFATO and SINIAV protocols.

In other words, ANTT´s specification for RSE requires double-protocol readers.

2014 **AGEPAR** (regulatory agency of conceded highways of the State of Paraná) **issues Resolution 005:**

As of February 2015 selling of 5.8 GHz tags in the State of Paraná conceded network is prohibited.

As of August 2017 only 915 MHz tags will be permitted for ETC.

BRIEF CHRONOLOGY OF ETC DEVELOPMENT IN BRAZIL

SUMMARIZING:

	Selling of 5.8 GHz tags ends	Only 915 MHz tags after	Number of concessions
State of São Paulo	JAN 2013	NOV 2014	18
Federal	NOV 2014	MAY 2017	18
State of Paraná	FEB 2015	AUG 2017	6

Electronic toll collection - number of tags in operation

5.8 GHz, encapsulated	**4,200,000 - CEN standard**
915 MHz, encapsulated	**600,000 - ARTEFATO standard**
Sticker tags	**300,000 - ISO 18000 6C standard**

Migration from CEN 5,8 GHz to ARTEFATO 915 MHz in São Paulo State

PROCESS IS UNDERWAY, ALTHOUGH MEETING THE NOVEMBER DEADLINE DOES NOT SEEM PROBABLE.

And even if the deadline is met, a few so far unsolved problems linger in the future:

How to handle cars with 5.8 GHz tags sold outside of São Paulo that will drive in the State after November.

For federal conceded highways in the State o São Paulo the deadline is not November 2014, but may 2017.

In addition to conceded highways, a large number of parking lots and access controlled areas will have to migrate too.

ARTEFATO PROTOCOL

Purpose

Implement Free Flow tolling and Vehicle Miles Travelled – VMT in the State of São Paulo.

Deployment

The **VMT** program of the State of São Paulo, has already started, under the denomination of **"point-to-point"**, utilizing ARTEFATO tags.

Pilot projects were deployed in 2012 on stretches of 4 conceded highways and are now in evaluation under commercial operation:

SP-340 24 KM	SP-75 63 km	SP-360 3 km	SP-332
60,000 REGISTERED USERS	4,100 REGISTERED USERS	400 REGISTERED USERS	OPERATION STARTED SEPT. 15th
OPINION OF HIGHWAY CONCESSIONAIRES: FAVORABLE	INTEROPERABILITY BETWEEN SINIAV AND ARTEFATO TAGS WILL BE ACHIEVED TROUGH THE USE OF DOUBLE PROTOCOL READERS	FREE FLOW IS AN ALLWAYS TEMPTING POSSIBILITY. BUT BEFORE DEPLOYMENT, TOLL EVASION MUST BE REGULATED.	

SINIAV
PROTOCOL

Concept

Traffic management
Identification and recovery of stolen vehicles
Collection of traffic infractions and enforcement of annual licensing

Deployment

Federal Government plans to install a tag, denominated **“electronic license plate”**, in every vehicle in circulation in Brazil, a fleet estimated in 80 million.

The established deployment schedule is the following:
Beginning – January 1st, 2013
Conclusion – June 30th, 2015

First installation of SINIAV-compliant equipment was deployed at the end of 2013, in the State of Roraima, northern-most state of Brazil.

Although small – only 300 tags in operation – the installation is complete, including ANPR to identify violators.

Two other states, Rondônia and Sergipe, are also negotiating similar installations.

SINIAV PROTOCOL

OPINION OF HIGHWAY CONCESSIONAIRES

FAVORABLE

AS MENTIONED BEFORE, THE ORIGINAL CONCEPT OF SINIAV DID NOT CONTEMPLATE ITS UTILIZATION IN ETC OR VMT.

NEVERTHELESS, THERE IS NO LEGAL OR TECHNICAL LIMITATION TO THESE APPLICATIONS.

Therefore, when electronic license plates are installed in a large number of vehicles, this OBU can also be employed for ETC, enlarging the quantity of paying users and reducing toll tariffs.

HURDLE

FREE FLOW OR VMT WOULD BE A NATURAL EVOLUTION, ONCE AN INCREASING NUMBER OF VEHICLES ARE EQUIPPED WITH A TAG.

But in a country of continental dimensions such as Brazil, with an 80-million vehicle fleet, legal procedures not yet aligned and a far from complete number plate data base, who will assume responsibility for toll evasion is not yet determined.

CONCLUSION

- ETC is deployed – or soon will be – in all conceded highways in Brazil.
- Communications protocol is in process of migration from 5.8 GHz to 915 MHz, completion date August, 2017.
- VMT is initiating. Four short segments are already in commercial operation.
- Free Flow still under consideration – a dream for the future.

Thank you

RICARDO PINTO PINHEIRO
Chief Executive Officer
ricardopi@abcr.org.br

Associação Brasileira de Concessionárias de Rodovias
Brazilian Association of Highway Concessionaires

DRIVE TOWARD INTEROPERABILITY
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IBTTA Global Summit

October, 19 - 21
Prague, Czech Republic

MARTIN STONE

egis

ATI Hub Implementation

Financial Infrastructure for North American Toll Interoperability

Martin Stone, AICP, Ph.D.
ATI Hub General Manager

Alliance for Toll Interoperability (ATI)

A not-for-profit organization started by US public toll agencies to promote toll interoperability for the benefit of toll customers and member agencies.

Alliance for Toll Interoperability (ATI)

A not-for-profit organization started by US public toll agencies to promote toll interoperability for the benefit of toll customers and member agencies.

ATI Benefits = Improve Quality and Lower Costs

- Open Standards for Toll Technology
- Increased Private Sector Competition
- Cooperative Purchasing Power – Volume Pricing

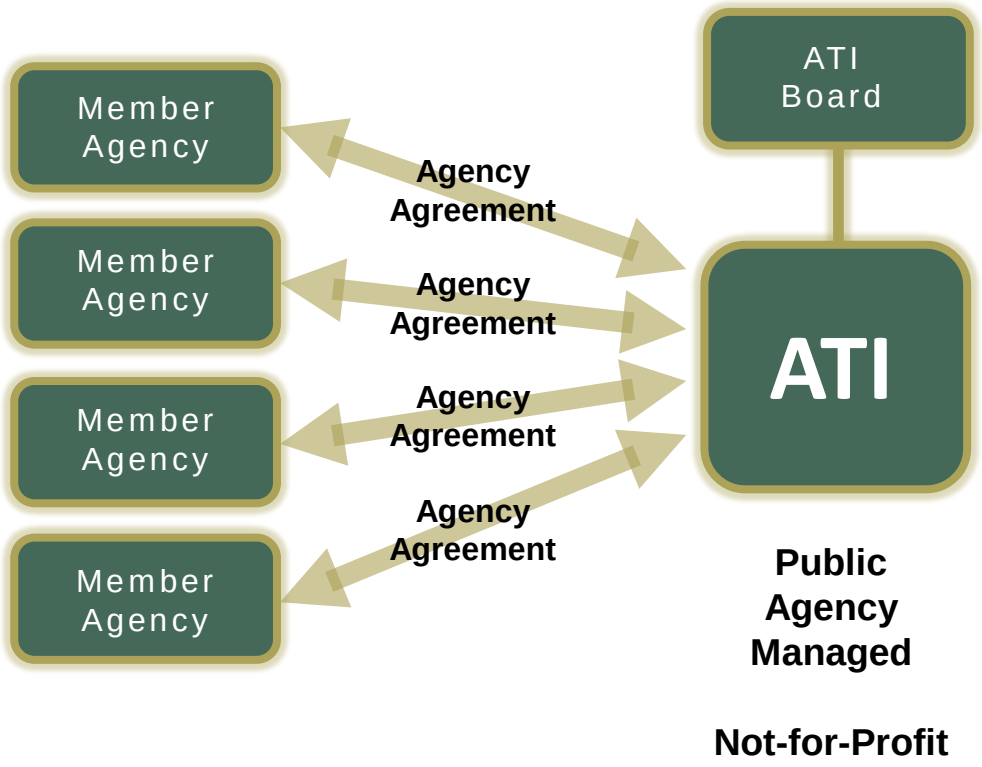
Alliance for Toll Interoperability (ATI)

- Members include:
  - Public toll agencies
  - Private operators of public facilities
  - Private toll providers
- Managed by Public Board
  - Oklahoma Turnpike Authority
  - E-470, Denver, Colorado
  - Florida Turnpike Enterprise/FLDOT
  - Illinois State Tollway Authority
  - Port Authority of New York & New Jersey
  - Central Texas Regional Mobility Authority
  - Maine Turnpike Authority
  - SANDAG, San Diego, California
  - Golden Gate Bridge, San Francisco, California
  - Halifax-Harbour Bridges, Canada

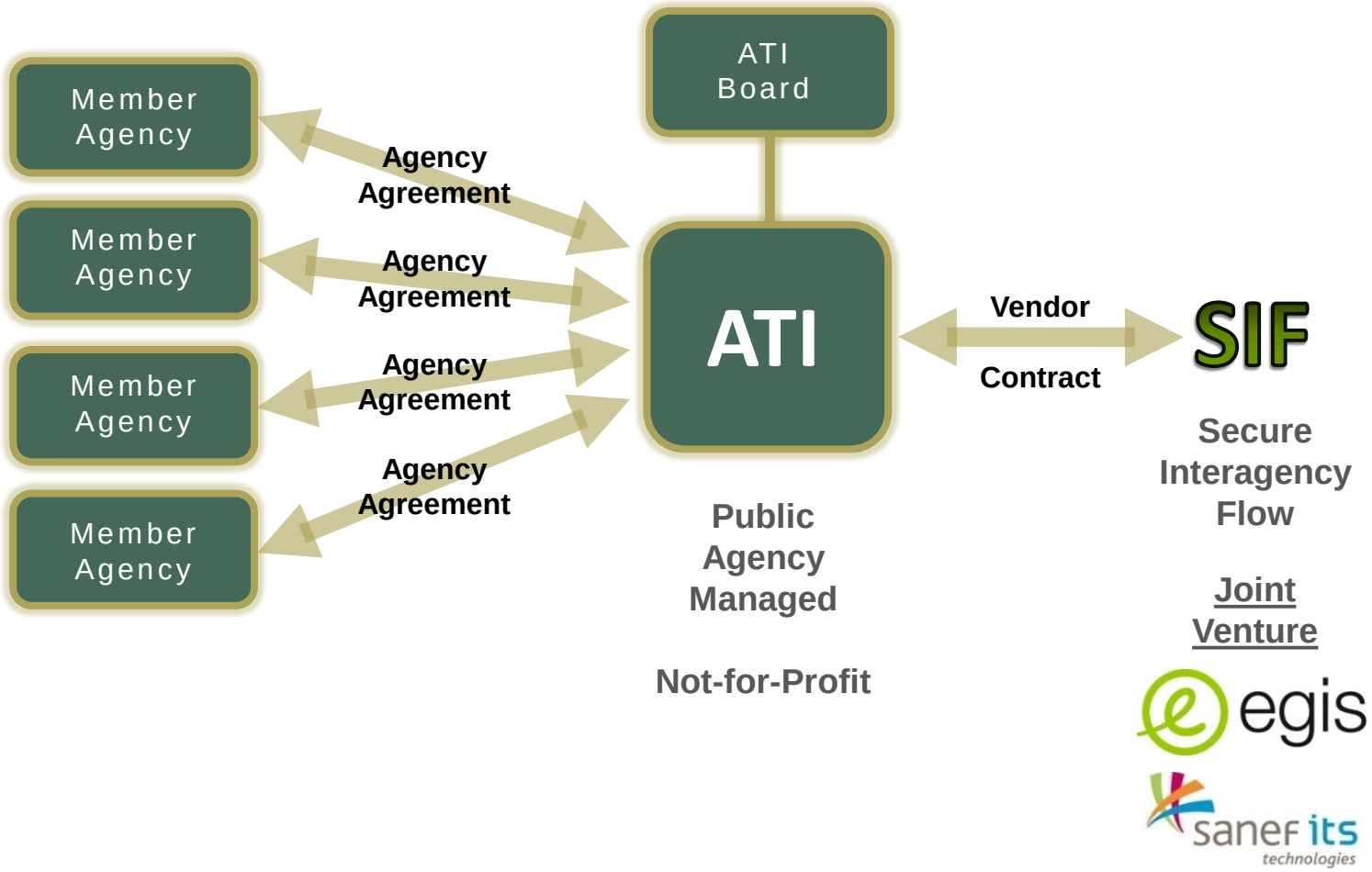
ATI Hub Concept

Support North American toll interoperability and the quality, competition and pricing goals of ATI by providing ***one location for a wide range of toll collection services*** for the driving public, public agencies and private toll providers while enhancing revenues and reducing costs for those who operate toll facilities.

ATI Hub Contractual Organization



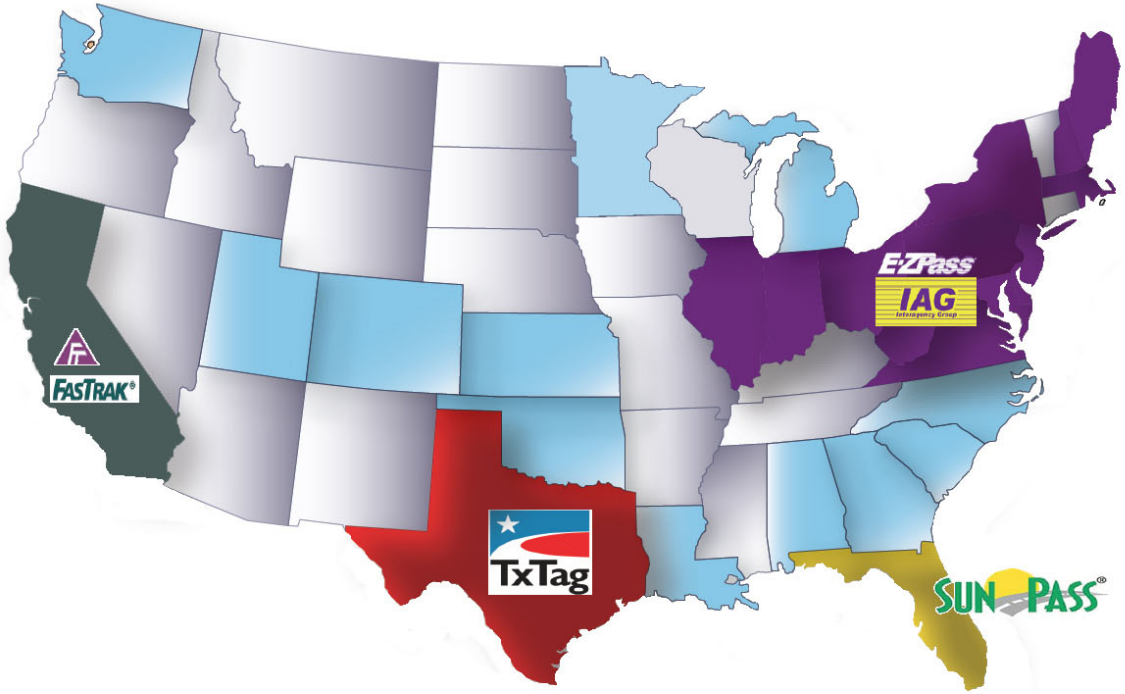
ATI Hub Contractual Organization



ATI Hub for North American Interoperability

Interoperability Issues

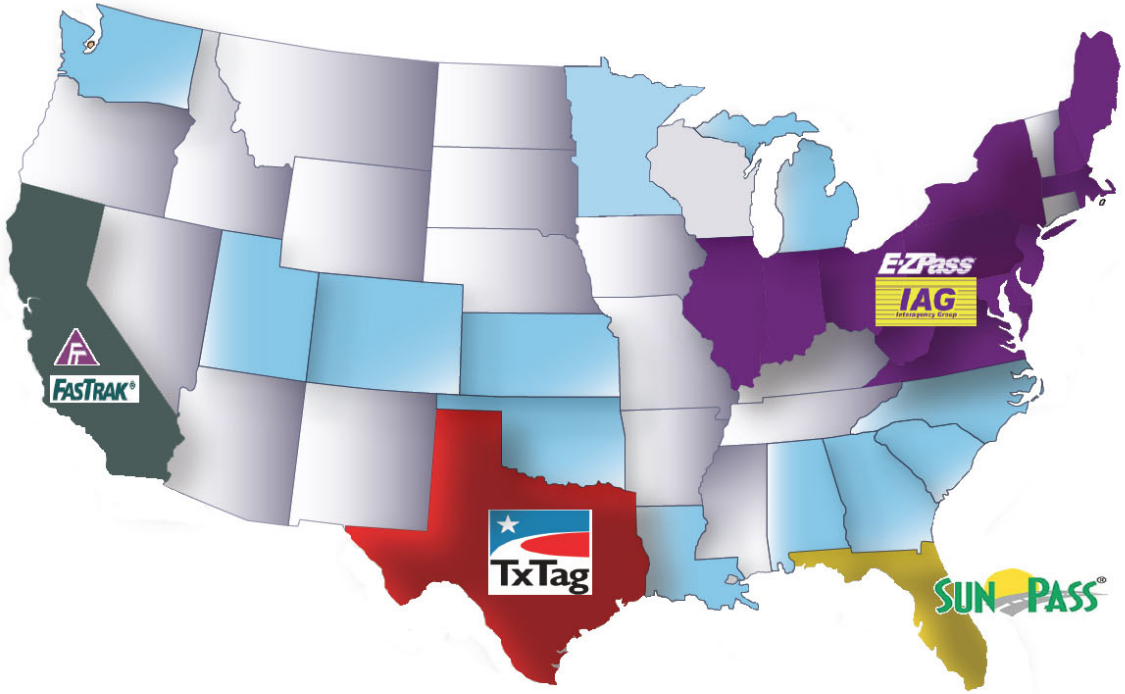
- Technical: Different roadside and OBU technologies
- Institutional: Need for uniform rules and agreements
- Financial: No existing clearinghouse infrastructure



ATI Hub for North American Interoperability

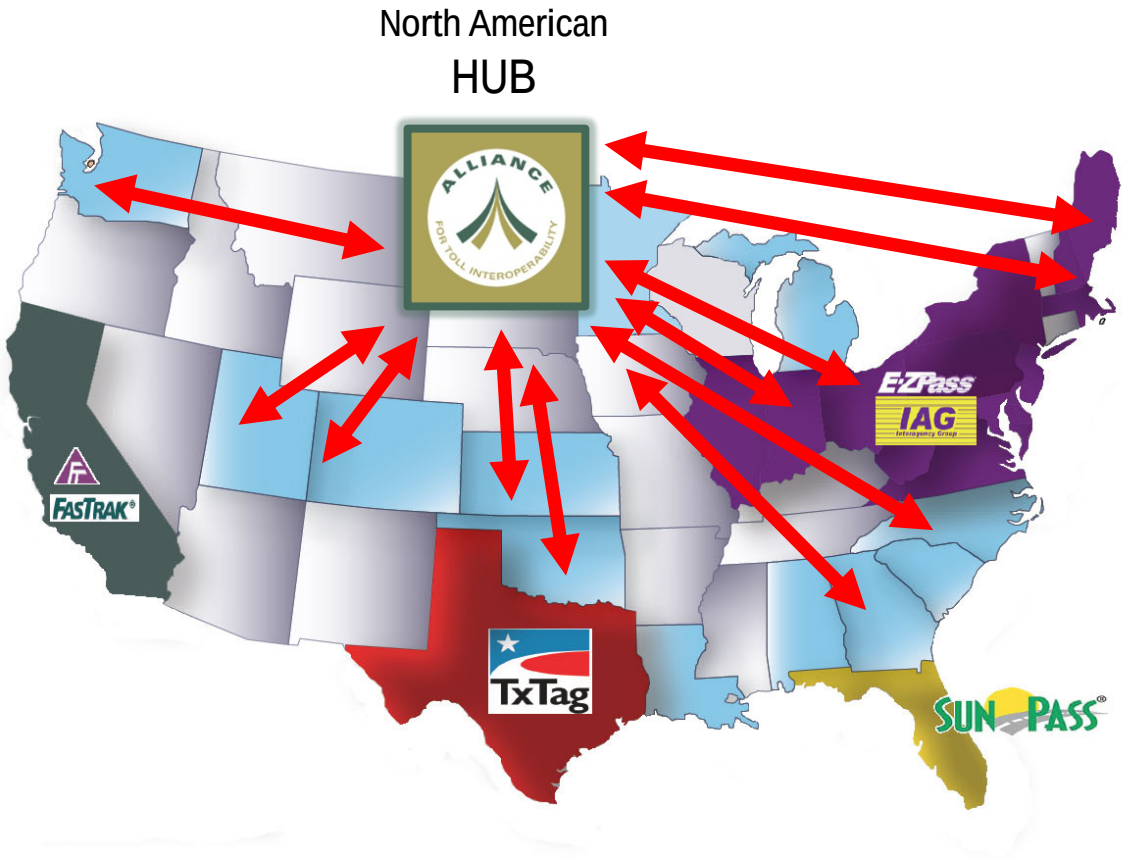
Interoperability ***Solutions***

- Technical: ***Identify national toll protocol (IBTTA)***
- Institutional: ***Create uniform business rules (IBTTA)***
- Financial: ***Implement transaction exchange hub (ATI)***



ATI Hub for North American Interoperability

Matching, Exchange and Settlement of Toll Transactions (Video and Transponders)



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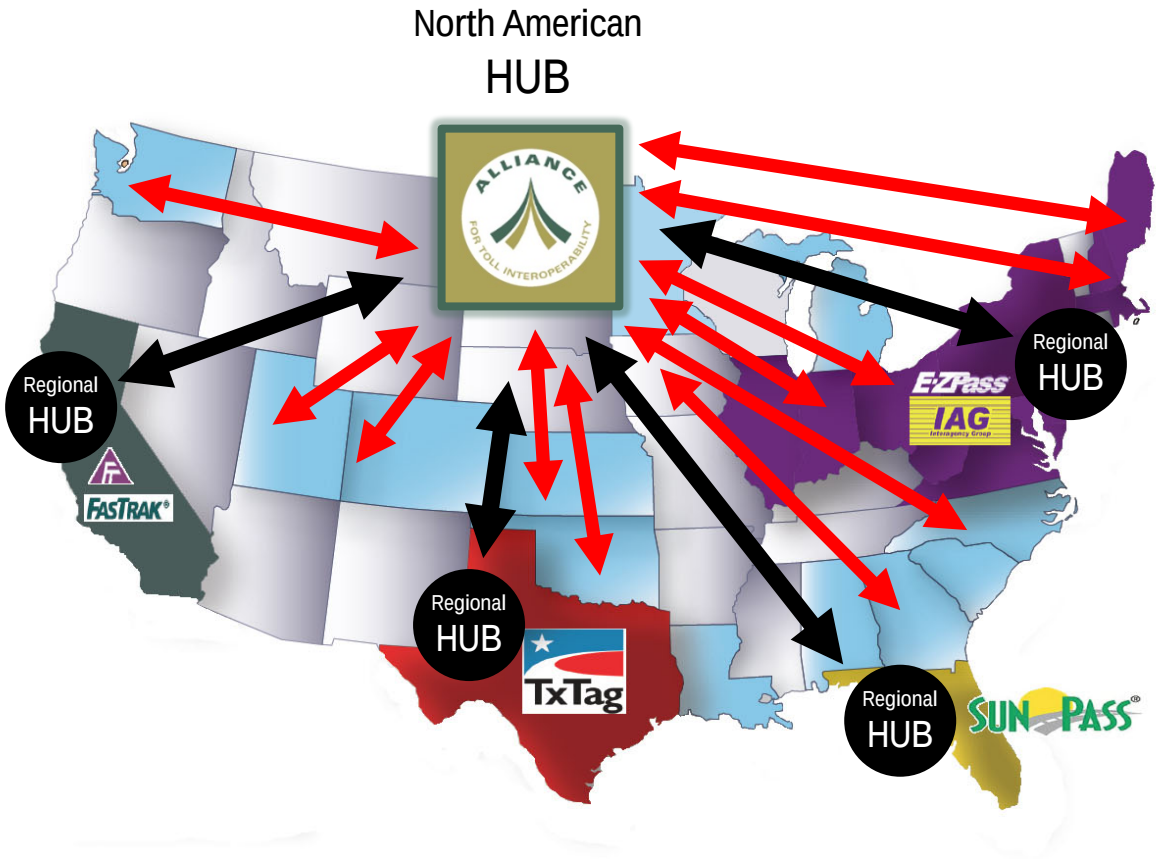
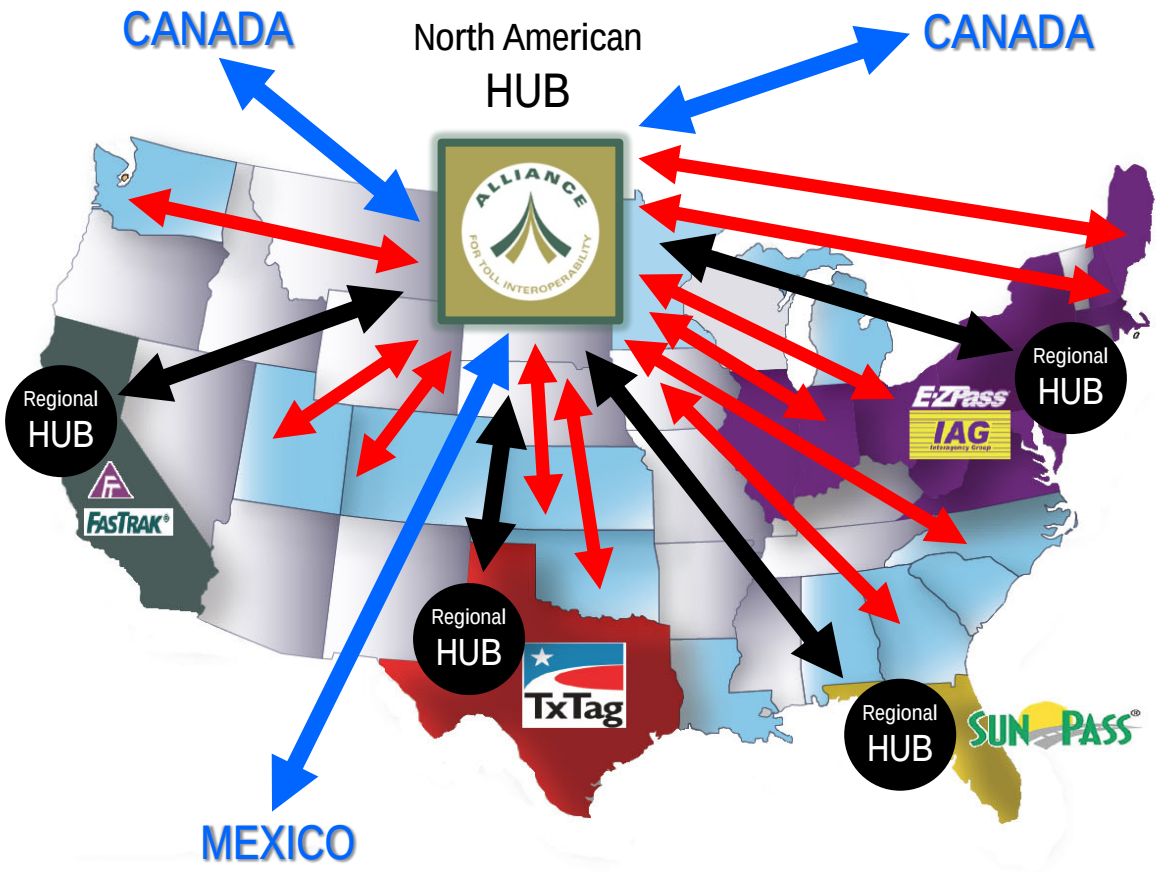
Matching, Exchange and Settlement of Toll Transactions (Video and Transponders)

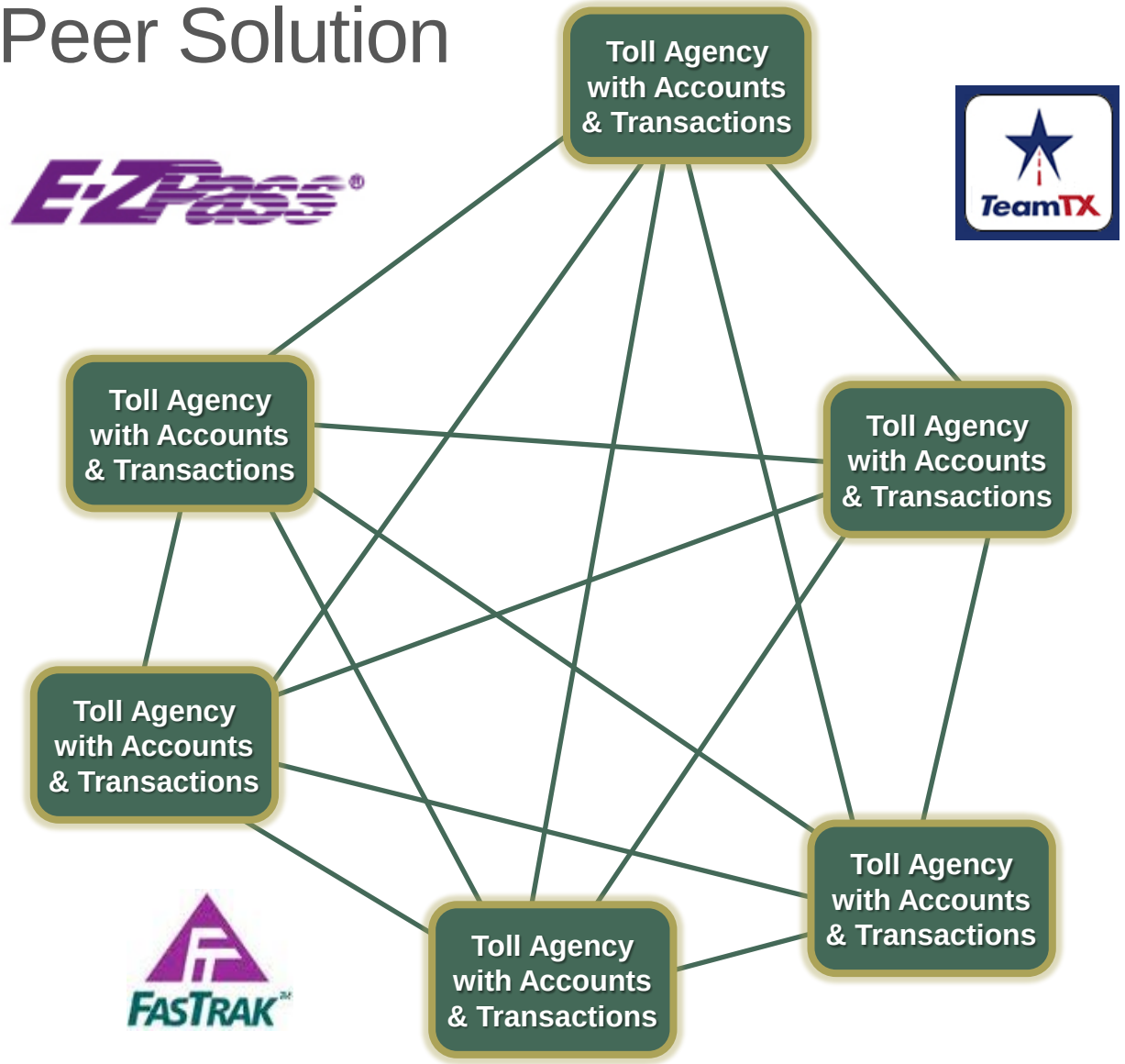


ATI Hub for North American Interoperability

Matching, Exchange and Settlement of Toll Transactions (Video and Transponders)



Peer-to-Peer Solution



ATI Hub Solution

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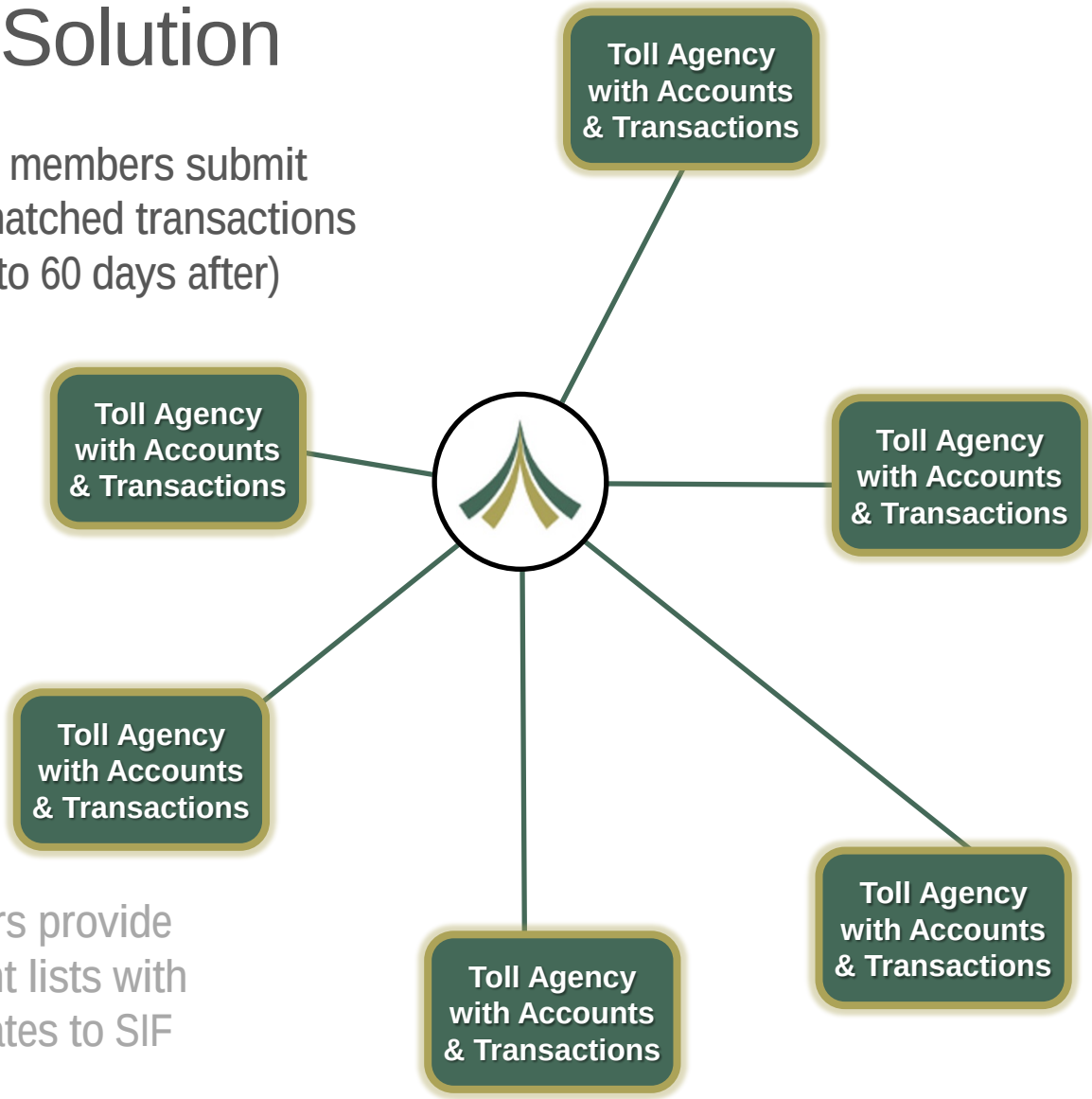
1. Hub members provide valid account lists with regular updates to SIF

ATI Hub Solution

2. Hub members submit unmatched transactions (up to 60 days after)



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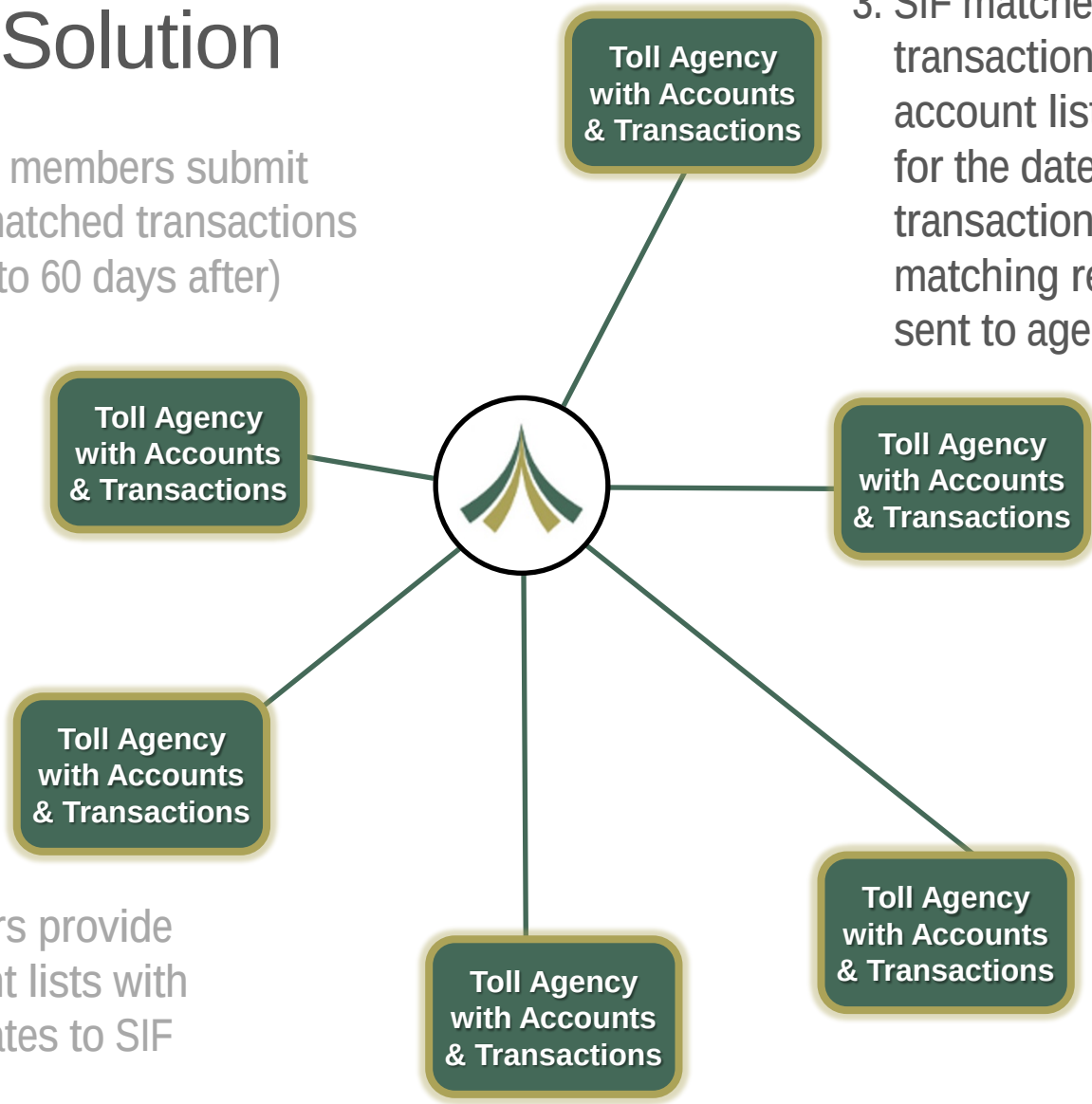

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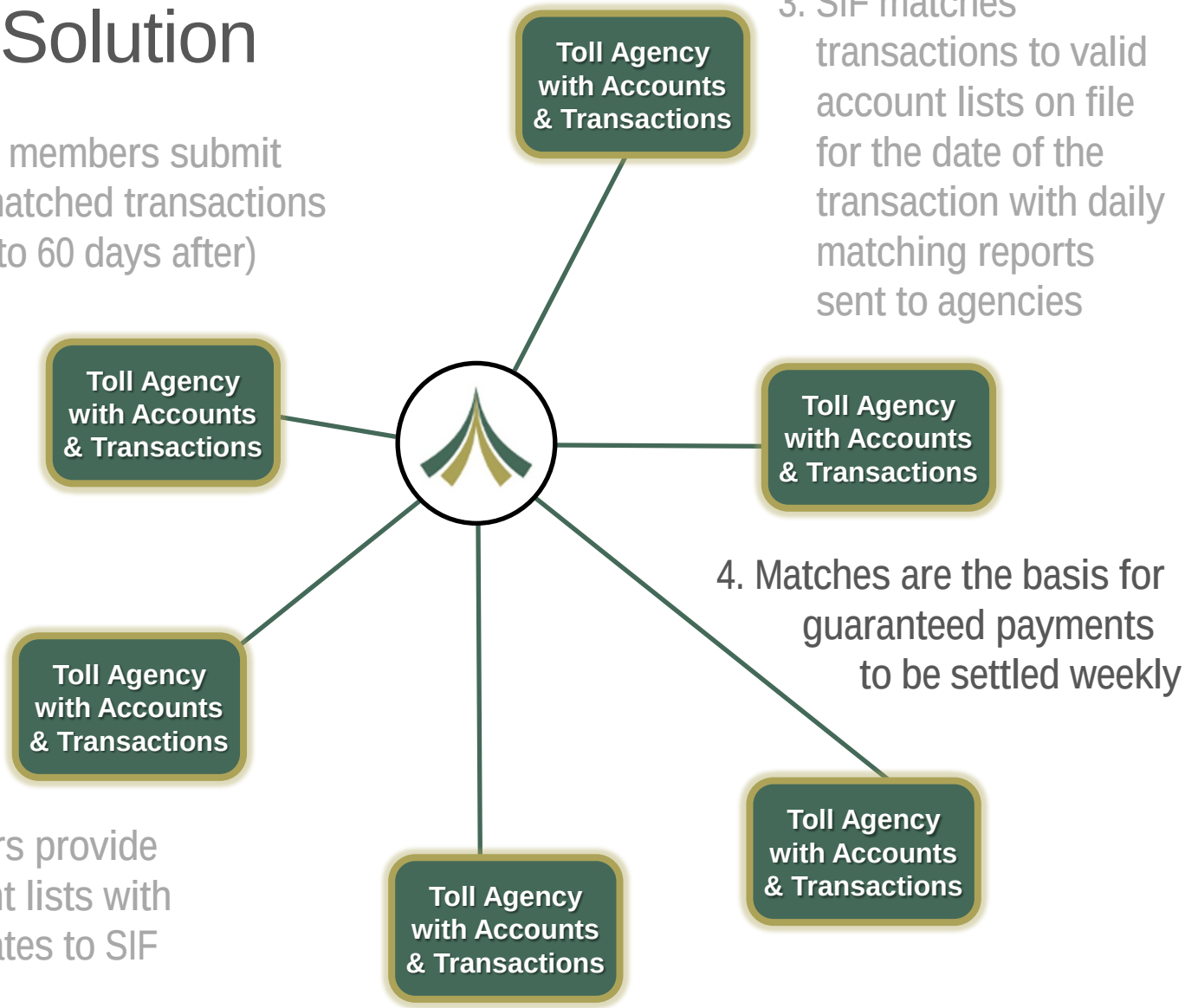

4. Matches are the basis for guaranteed payments to be settled weekly

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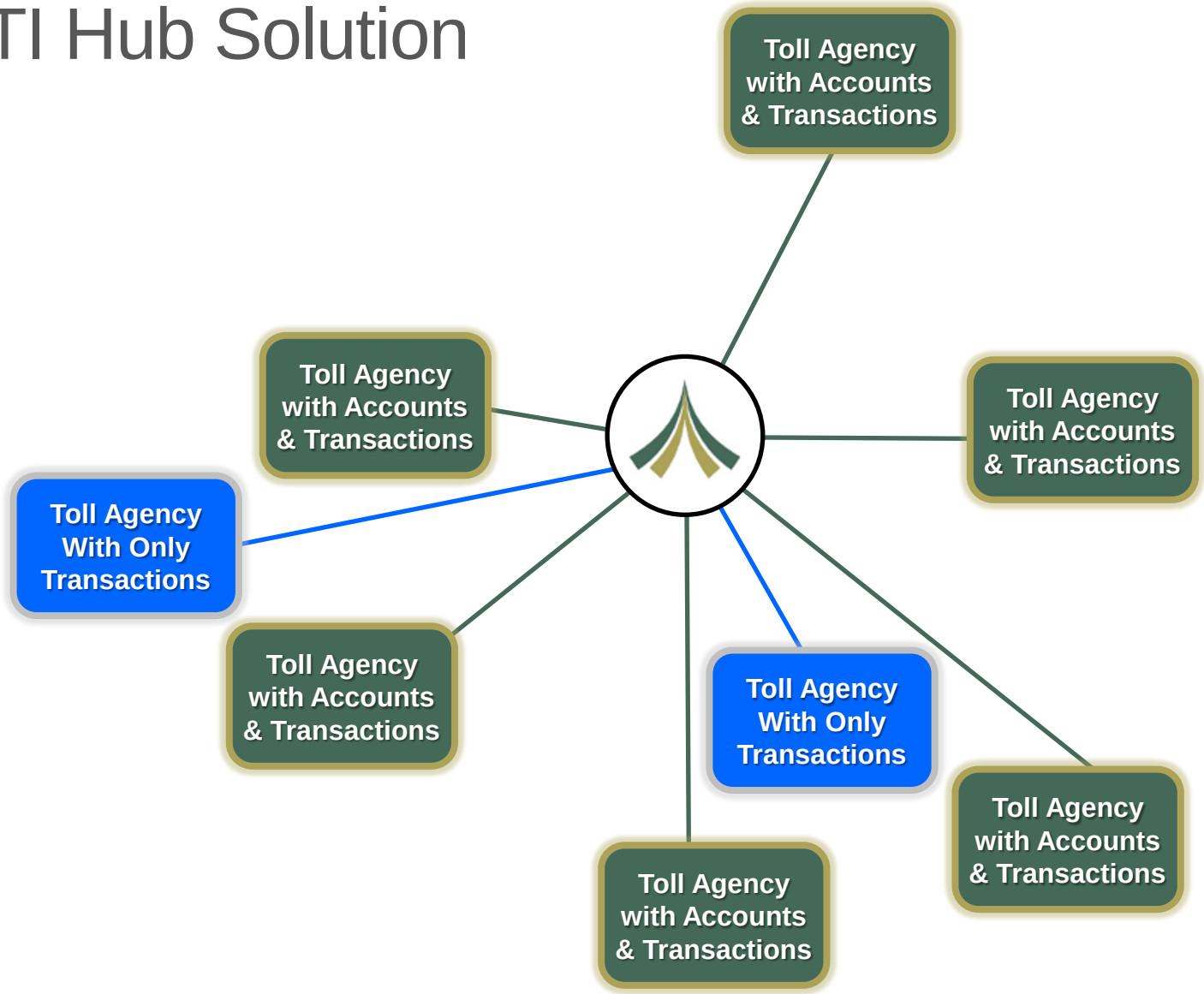

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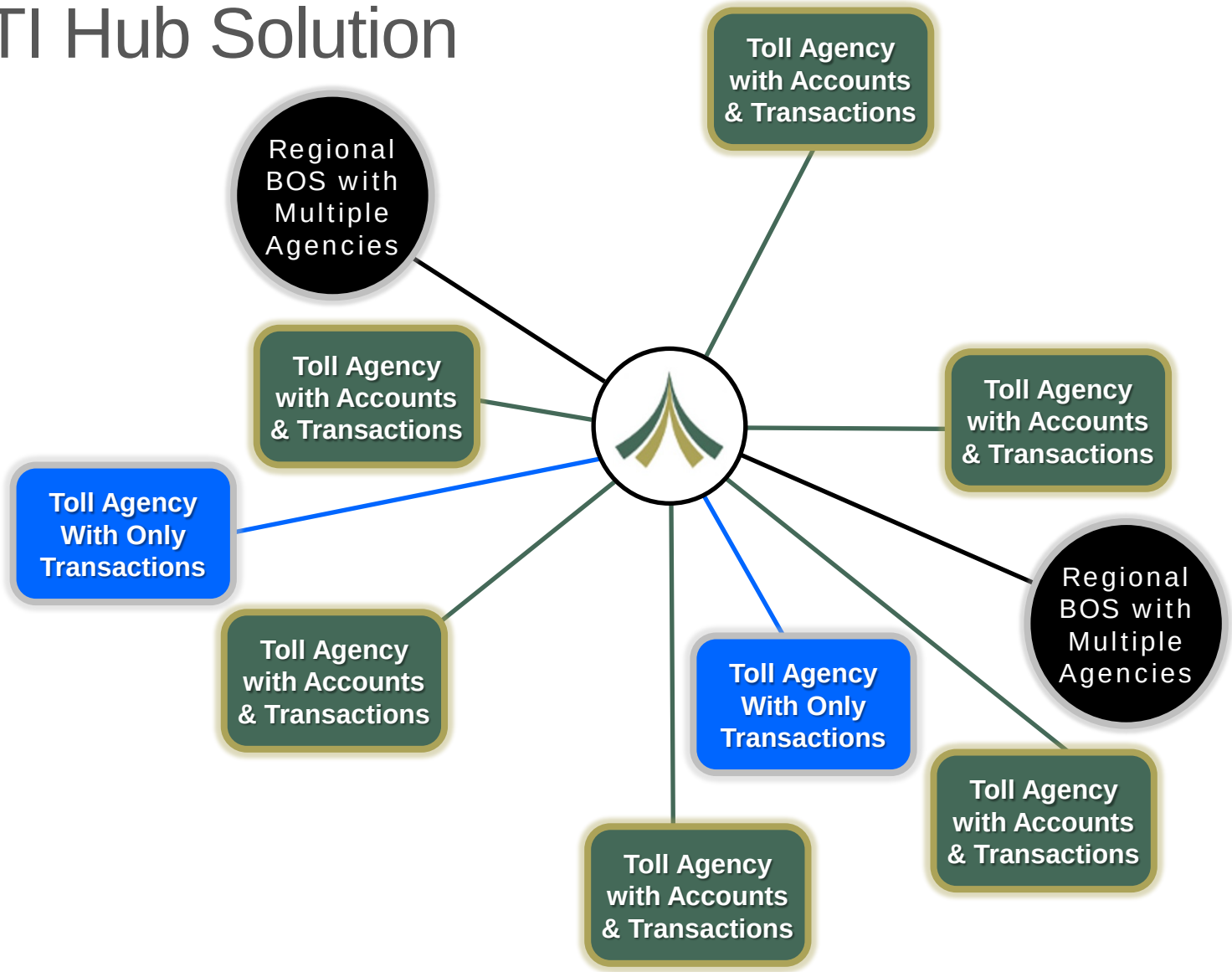

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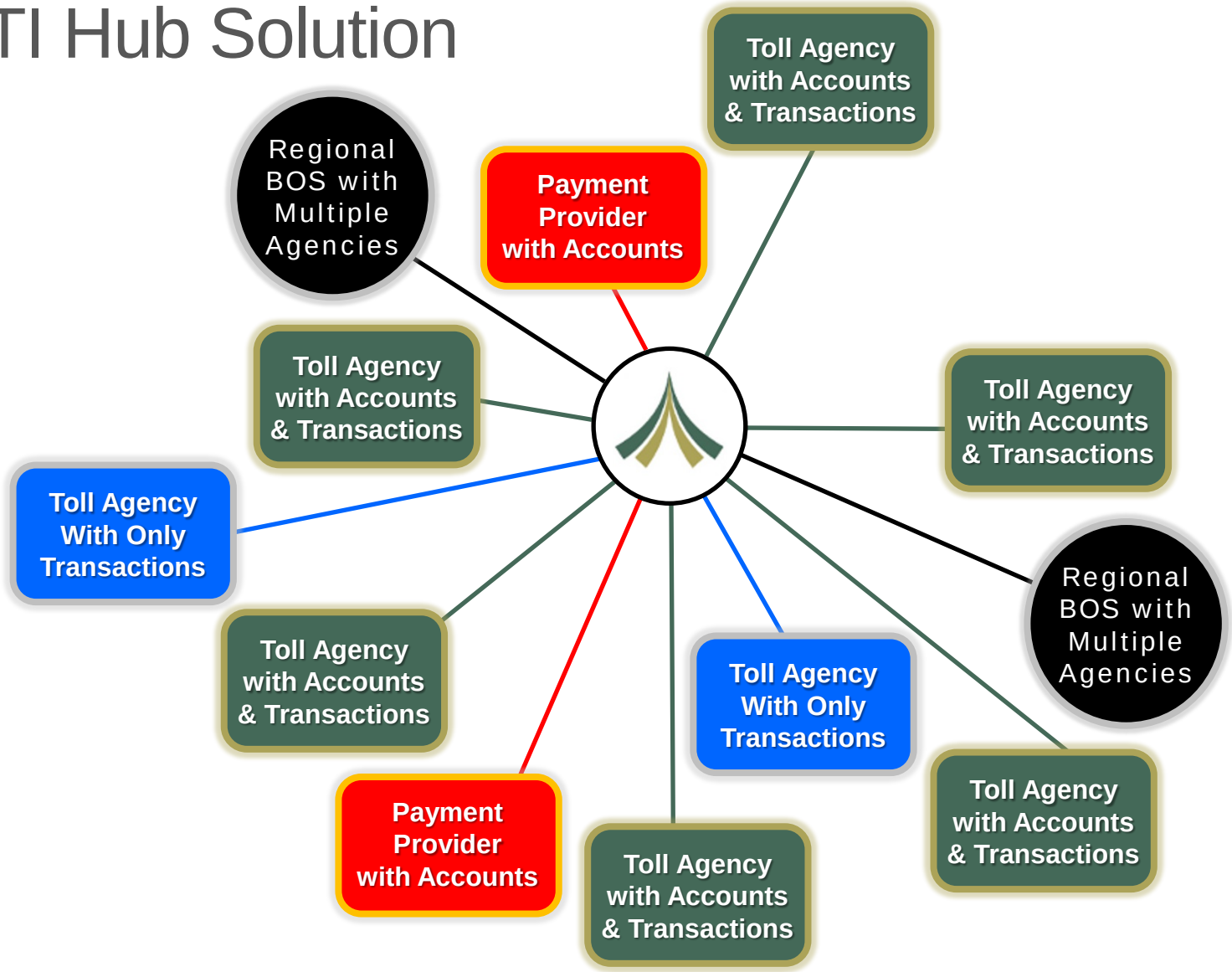
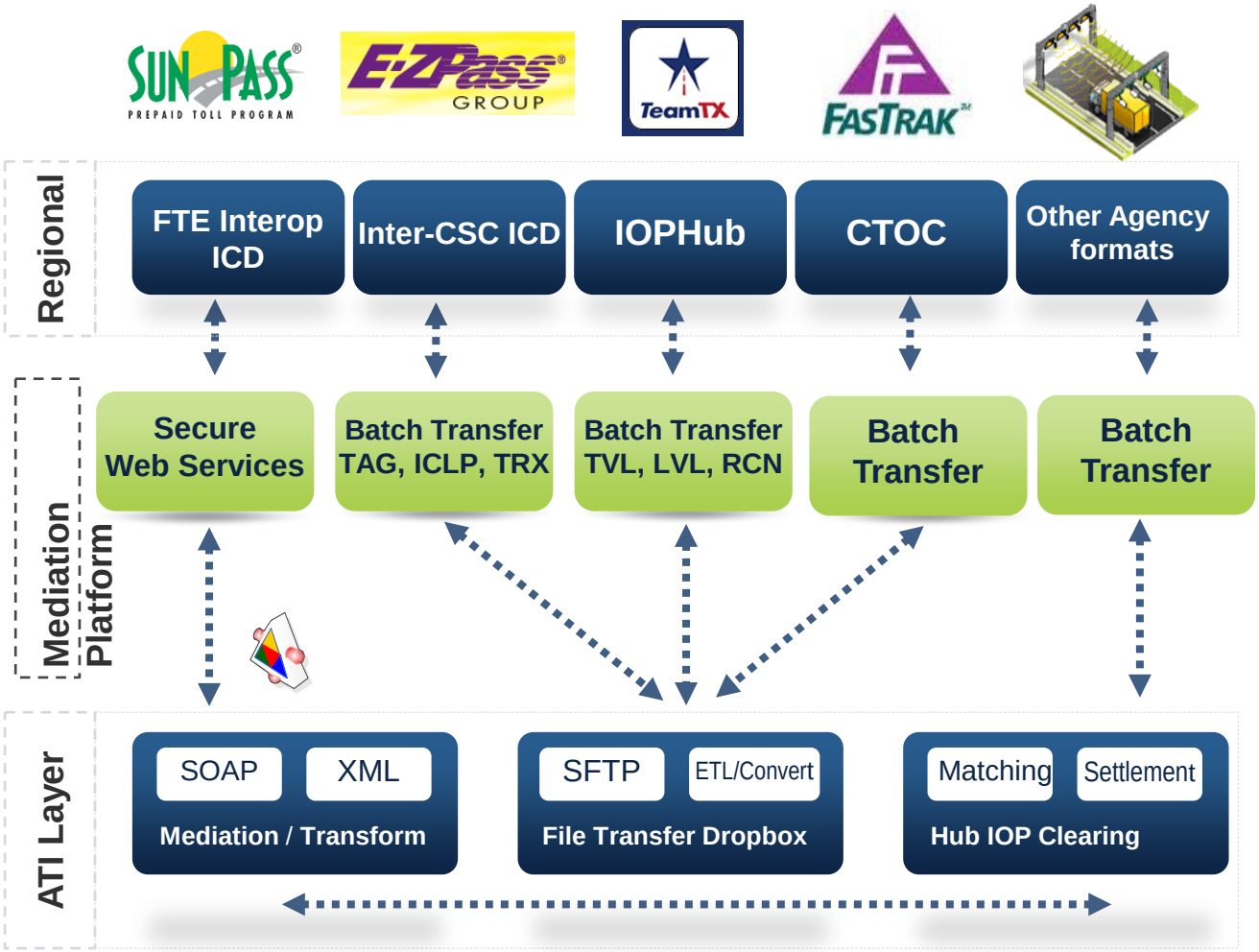


ATI Hub Solution

ATI Hub Transaction Matching



Each agency may use their own transaction format or may adopt the Hub preferred ICD (EZPass)

ATI Hub Financial Settlement

Secure US Banking System
Commercial Settlement

provided by

With ATI Settlement Account at

ATI Hub Financial Settlement

Transaction Files Processing
(Received, Matched, Posted, Acknowledged)

↓

Financial Posting
(A/R – A/P: Tolls, Toll Adjustments)

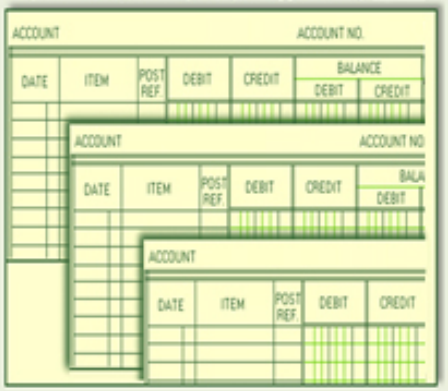
Agency: FTE

FINANCIAL SUMMARY
January 2012

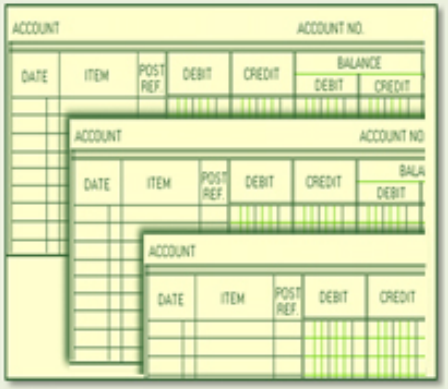
In US $

	Incoming	Outgoing			
Agency	MATCHED	MATCHED	Disputes	Pending	Receivables/ (Payables) - NET
E-470	$ 889.00	$ 1,189.85	-	-	$ (300.85)
MDTA	158.00	49.00	-	-	109.00
NJTA	500.00	828.00	-	-	(328.00)
NTTA	2,297.00	87,881.12	-	-	(85,584.12)
Total	$ 3,844.00	$ 89,947.97	-	-	$ (86,103.97)

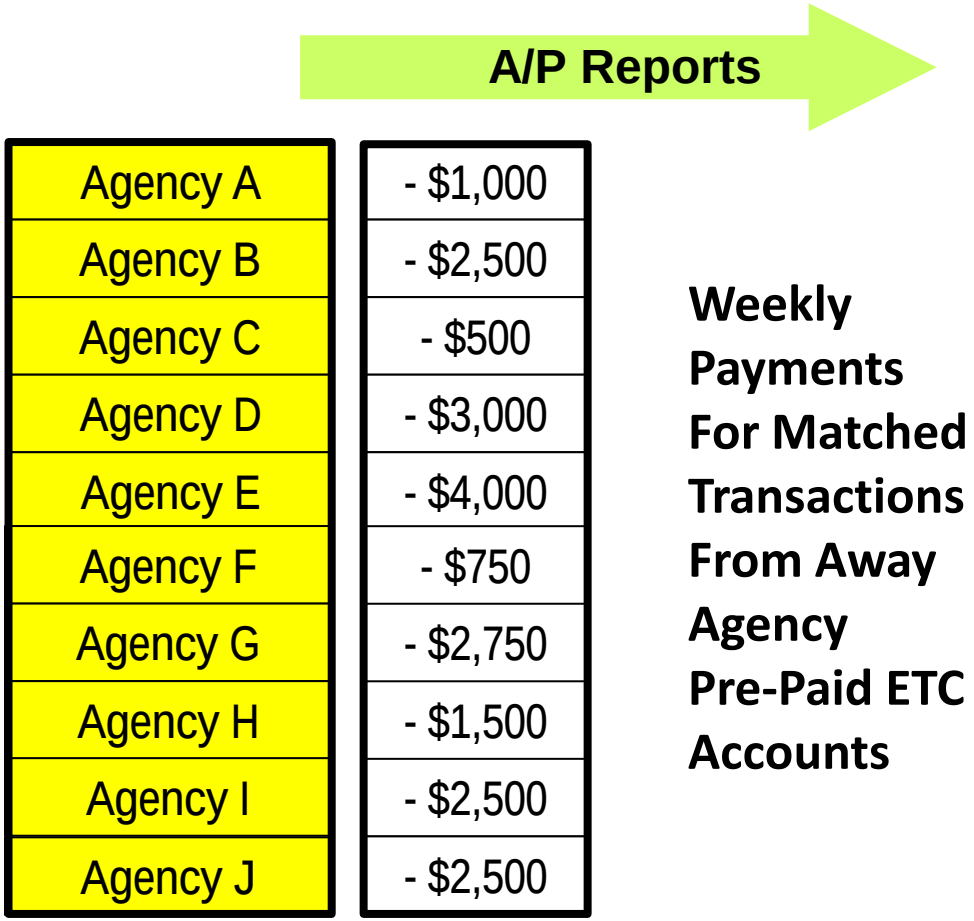
A/R Report, By Agency



A/P Report, By Agency



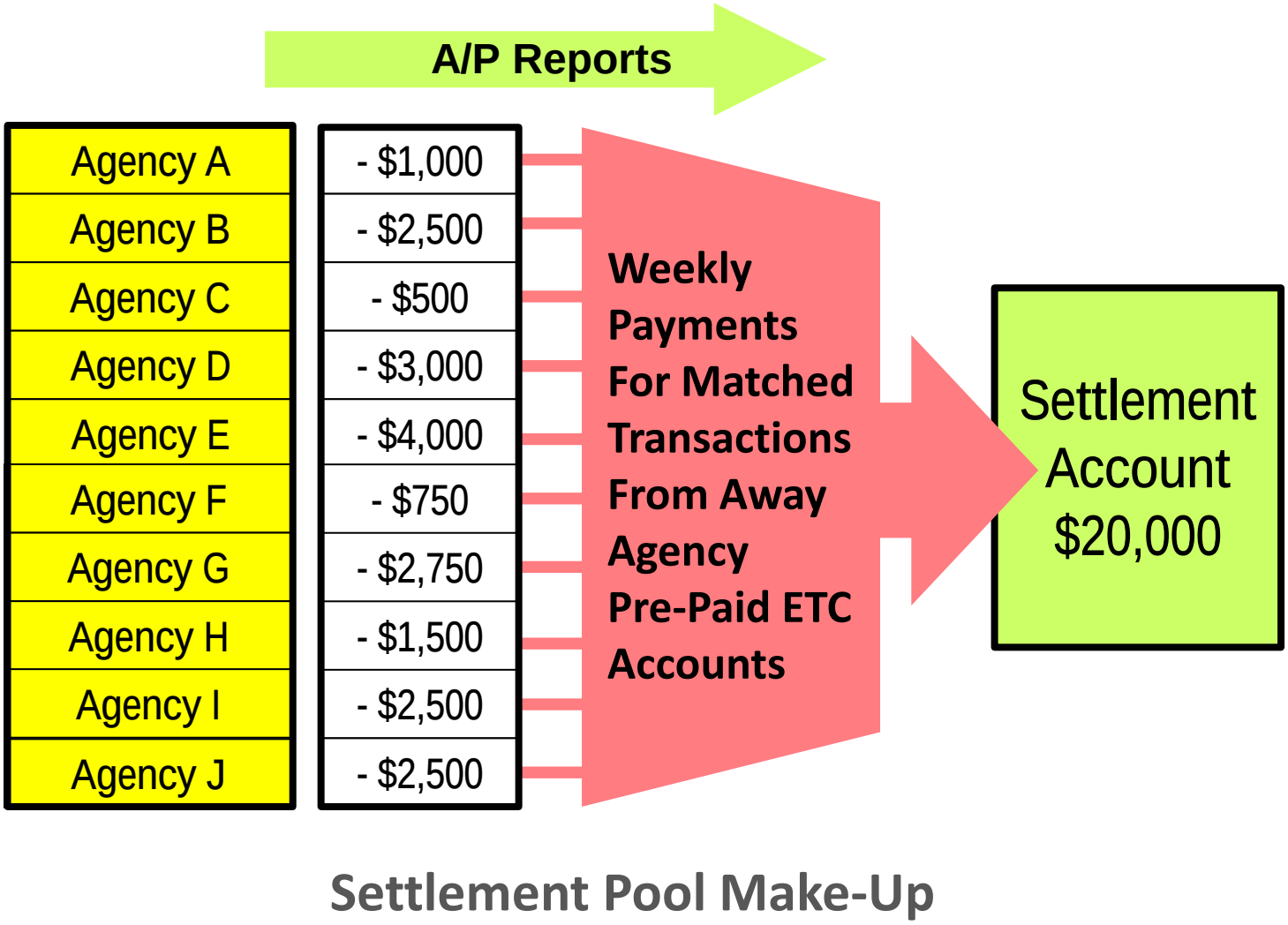
ATI Hub Financial Settlement



Weekly Payments For Matched Transactions From Away Agency Pre-Paid ETC Accounts

Settlement Pool Make-Up

ATI Hub Financial Settlement



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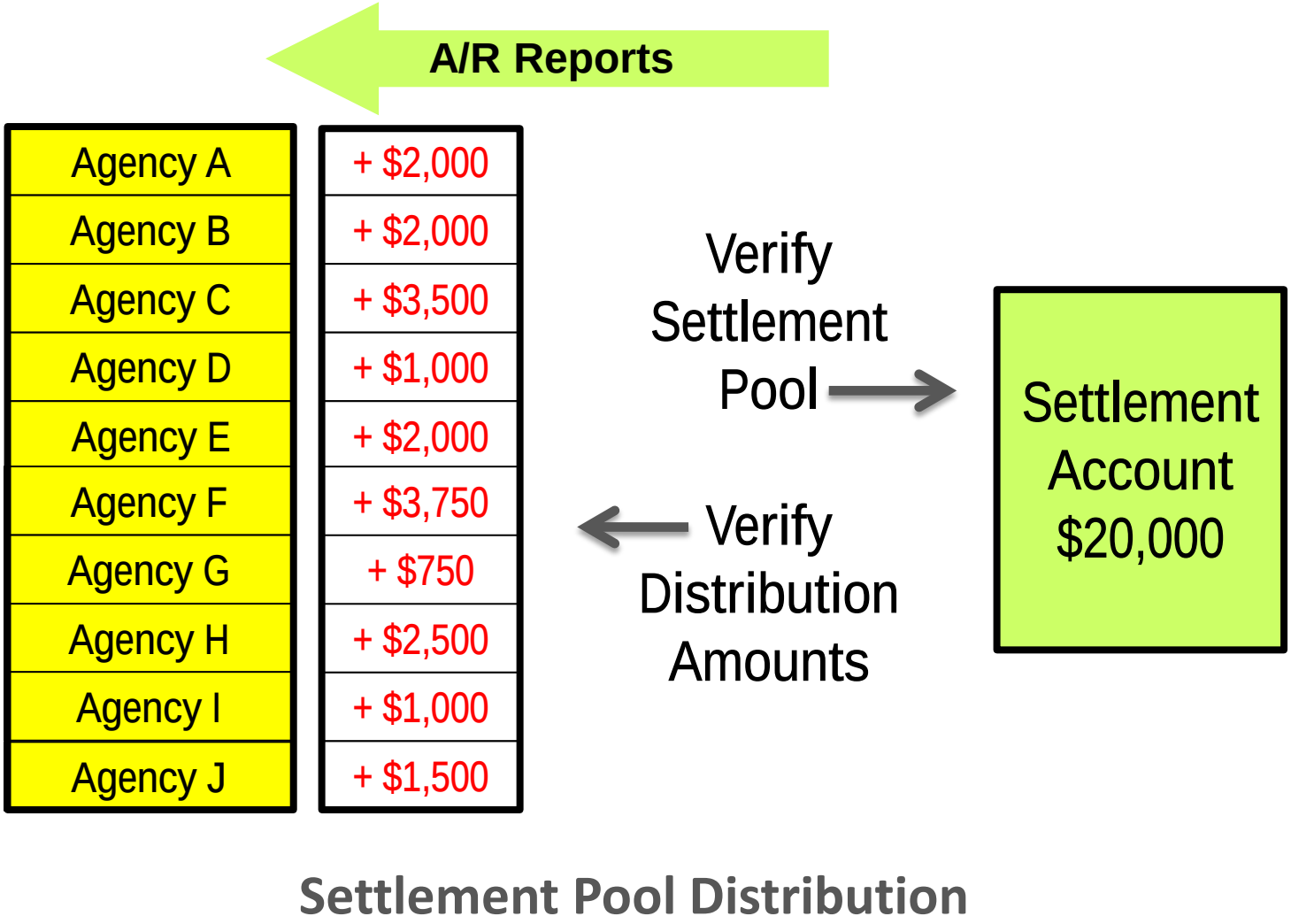
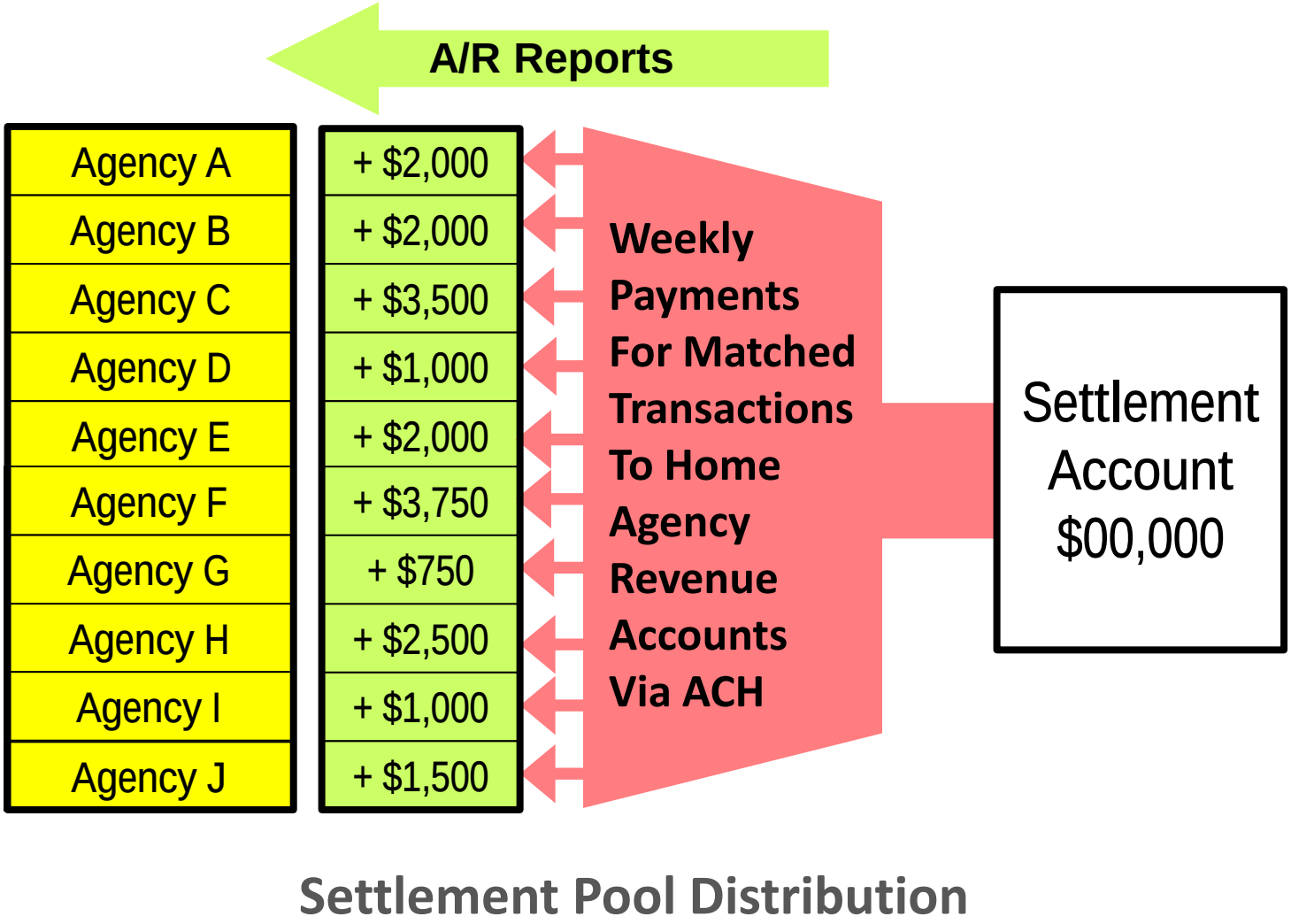


Settlement Pool Distribution

ATI Hub Financial Settlement



Settlement Pool Distribution

ATI Hub Agency Cost

- 1-Time Hub Connection Charge - $20,000
- Monthly Maintenance Fee - $1,667/month
- Transaction Fee for Matched Transactions
  (based on total monthly volume of matched transactions for the entire Hub)

ATI Hub Operations Support

- Agency Portal
  - Available 24/7/365
  - ATIHUB.org
- Dispute Resolution Uses Credit Card Model
  - Disputes are resolved between agencies
  - Hub places transaction in pending status
  - Temporary adjustment to next settlement
  - Final adjustment after resolution

ATI – Future Services

- National Vehicle Owner Information
- Video Image Processing (IP)
- Post-Paid Billing and Collections
- Out-of-State Violation Enforcement
- National Transportation Accounts (NTA) with Guaranteed Payments

Contact

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The Drive Toward Interoperability

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Martin Stone, Egis