MaaS
Mobility as a Service

"Un impulso al Transporte Público Metropolitano"
Valencia, 24 de octubre de 2018

Jaime Huerta
Secretario General

Contenido

1. ¿Qué es MaaS?

2. MaaS Spain

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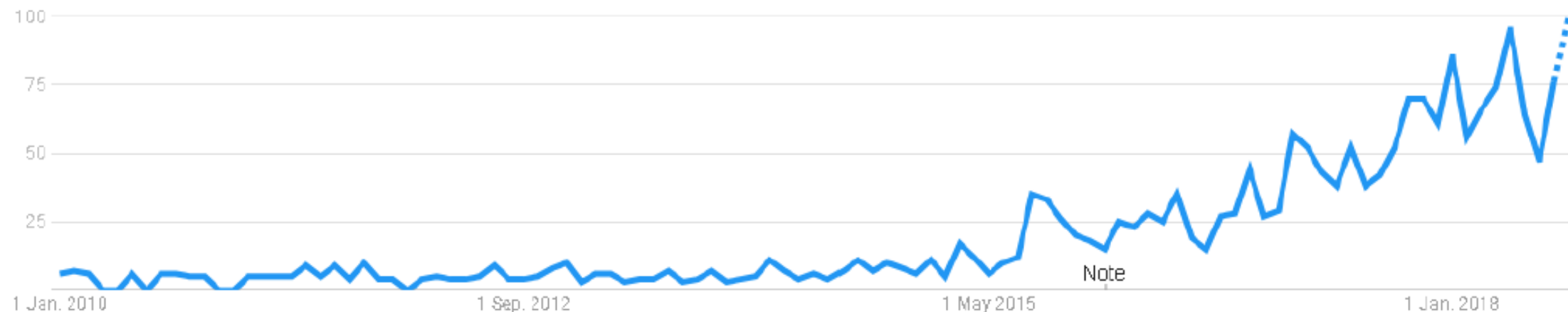4. Ticketing – (TESC-DAT4m)

5. Conclusiones

1

¿Qué es MaaS?

INTELLIGENT TRANSPORT SYSTEM

ITS ESPAÑA

"MOBILITY AS A SERVICE" IN GOOGLE SEARCH (1/1/2013 – 5/9/2018)

25TH ITS WORLD CONGRESS
COPENHAGEN
17 – 21 SEPTEMBER 2018
Quality of life

Interest over time

Concepto de MaaS

Entendemos el concepto Movilidad como Servicio (MaaS) como la integración de los procesos de información, reserva y pago de los diferentes servicios de movilidad desde la perspectiva del usuario.

Movilidad

Definición de movilidad de Carlos Cristobal Pinto
(Curso de Planificación de la Movilidad. Instituto de Estudios del Transporte. CEDEX 20.6.18)

La movilidad es el conjunto de desplazamientos de personas o mercancías en un período de tiempo determinado y en un ámbito territorial, caracterizado por las actividades socio-económicas que las originan, una estructura urbana y un sistema de transportes.

Movilidad Conectada

Usuario

Sistema de Información
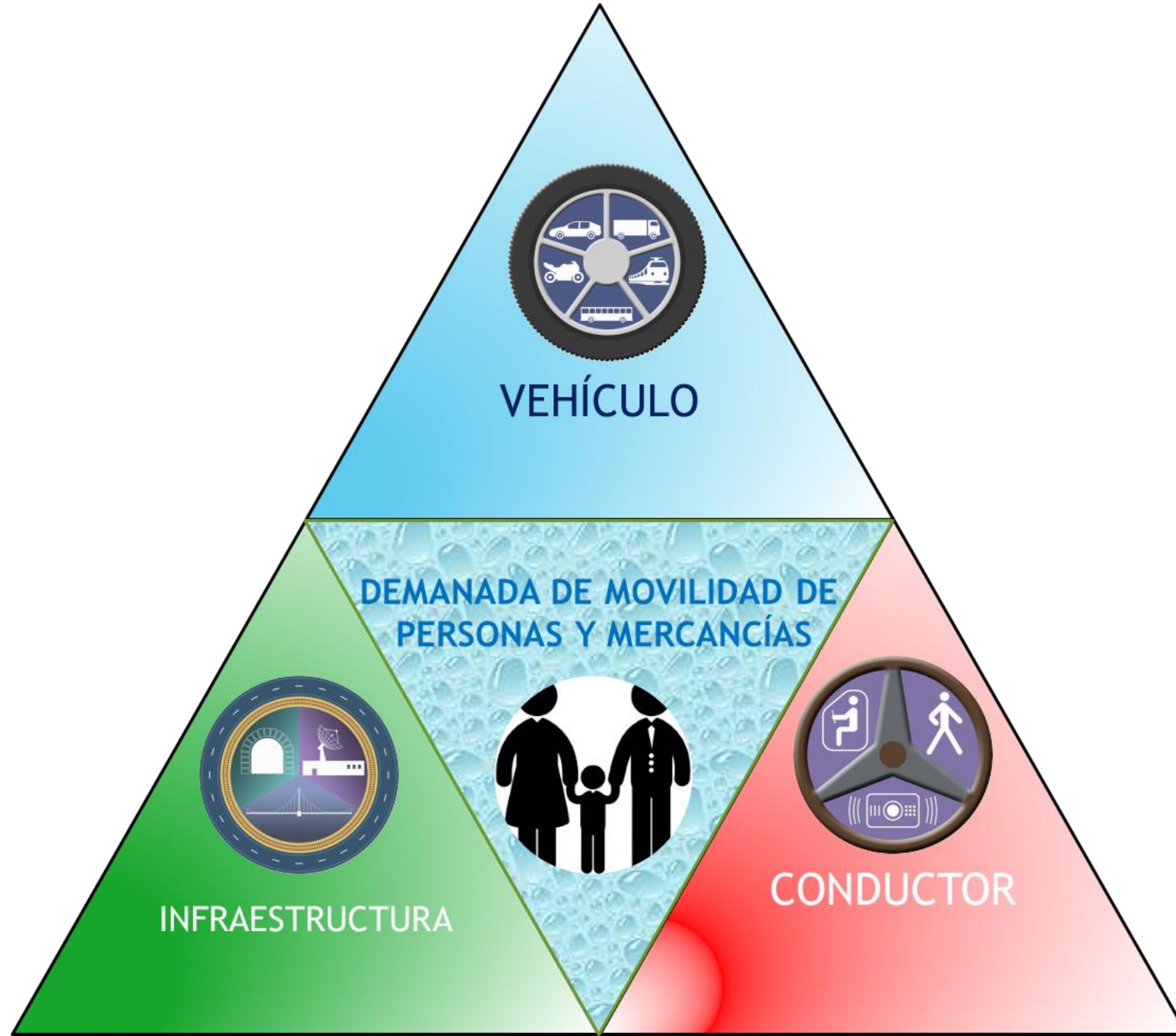
Vehículo

Infraestructura
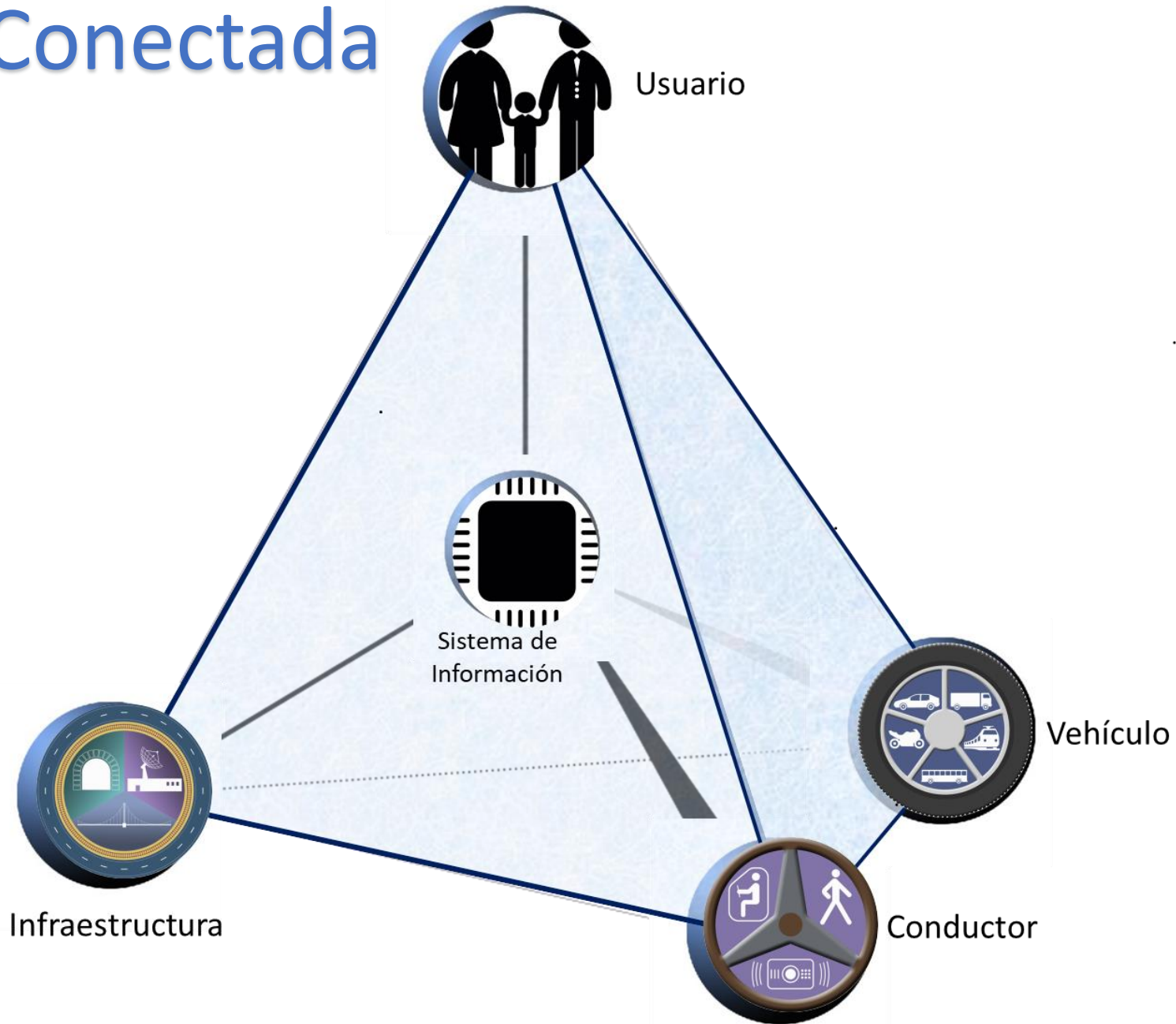
Conductor

AGENTES DE LA MOVILIDAD	INFRAESTUCTURA	VEHÍCULO	CONDUCTOR
AUTORIDADES ESTATALES, AUTONÓMICAS Y LOCALES	VIARIA TRÁFICO MEDIO AMBIENTE	INDUSTRIA TRÁFICO MEDIO AMBIENTE CONSUMO	TRÁFICO TRANSPORTE POLICÍA SANIDAD EDUCACIÓN
OPERADORES	ASESGA SEOPAN ACEX	SEGUROS UNESPA COMBUSTIBLE AOP VEHICLE SHARING RENTING REPARACIONES	AUTOMOVIL CLUB TRANSPORTE PÚBLICO LOGÍSTICA TAXI AUTOESCUELAS
OTROS	ATC-AEC AFASEMETRA ITS	ANFAC ANIACAM SERNAUTO ASEPA	PEATONES CICLISTAS MOTORISTAS AUTOMOVILISTAS MEDIOS DE COMUNICACIÓN

Agentes de la Movilidad

SEÑALIZACIÓN – MENSAJES DESDE LA INFRAESTRUCTURA

OPERADORES DE TRANSPORTE Y OTROS SERVICIOS RELACIONADOS CON LA MOVILIDAD

AUTORIDADES Y GESTORES DE LA MOVILIDAD

CONDUCTOR

S

USUARIO: DEMANDA MOVILIDAD DE PERSONAS Y MERCANCÍAS

HMI

SSCC

PROVEEDORES DE SERVICIOS ATENCIÓN AL USUARIO
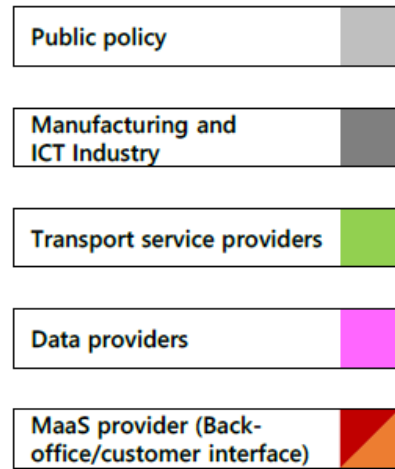
INFRAESTRUCTURA

VEHÍCULO

FACILITADORES DE CONEXIÓN
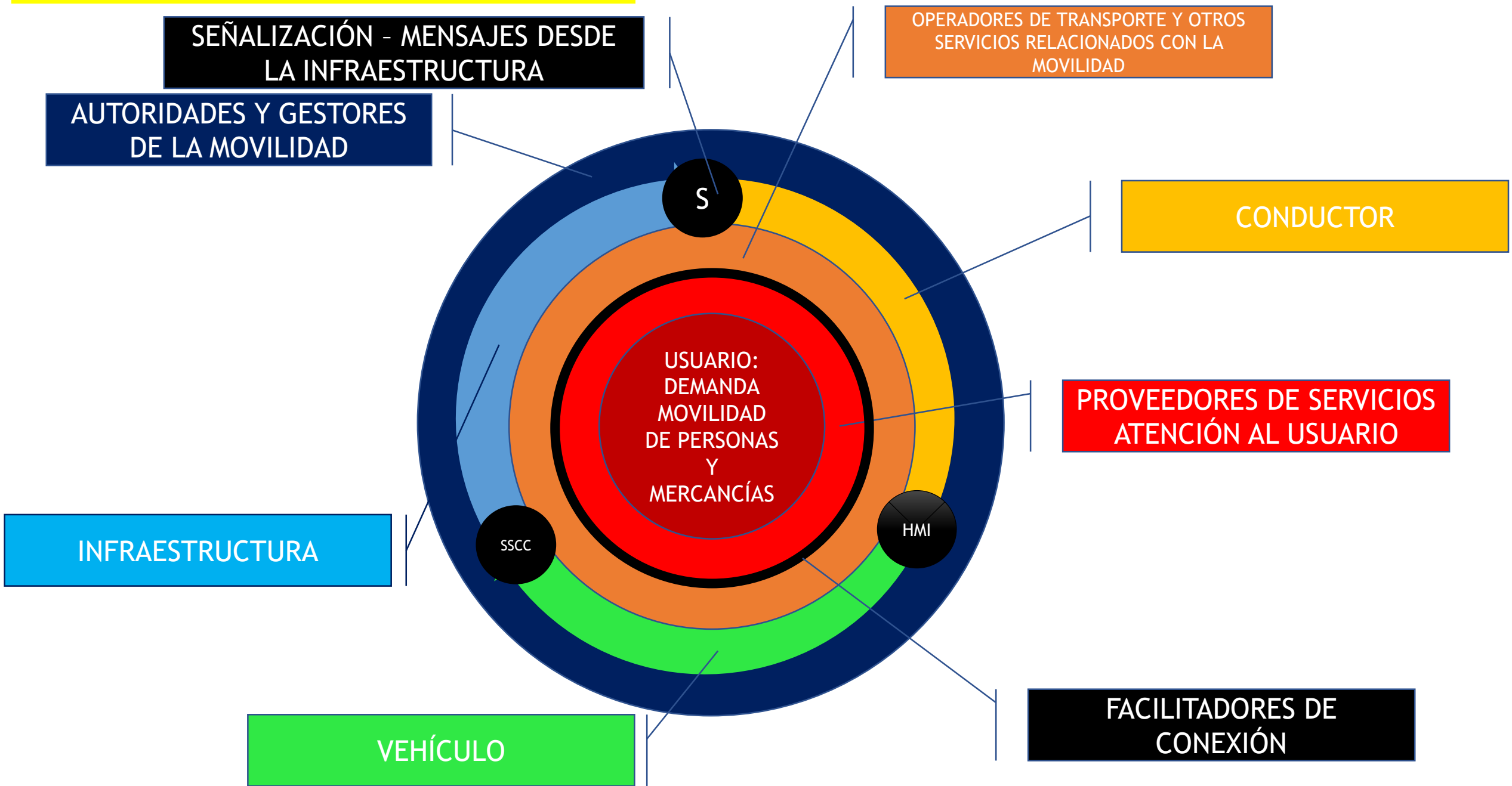
Figure 4: **The Mobility as a Service ecosystem**

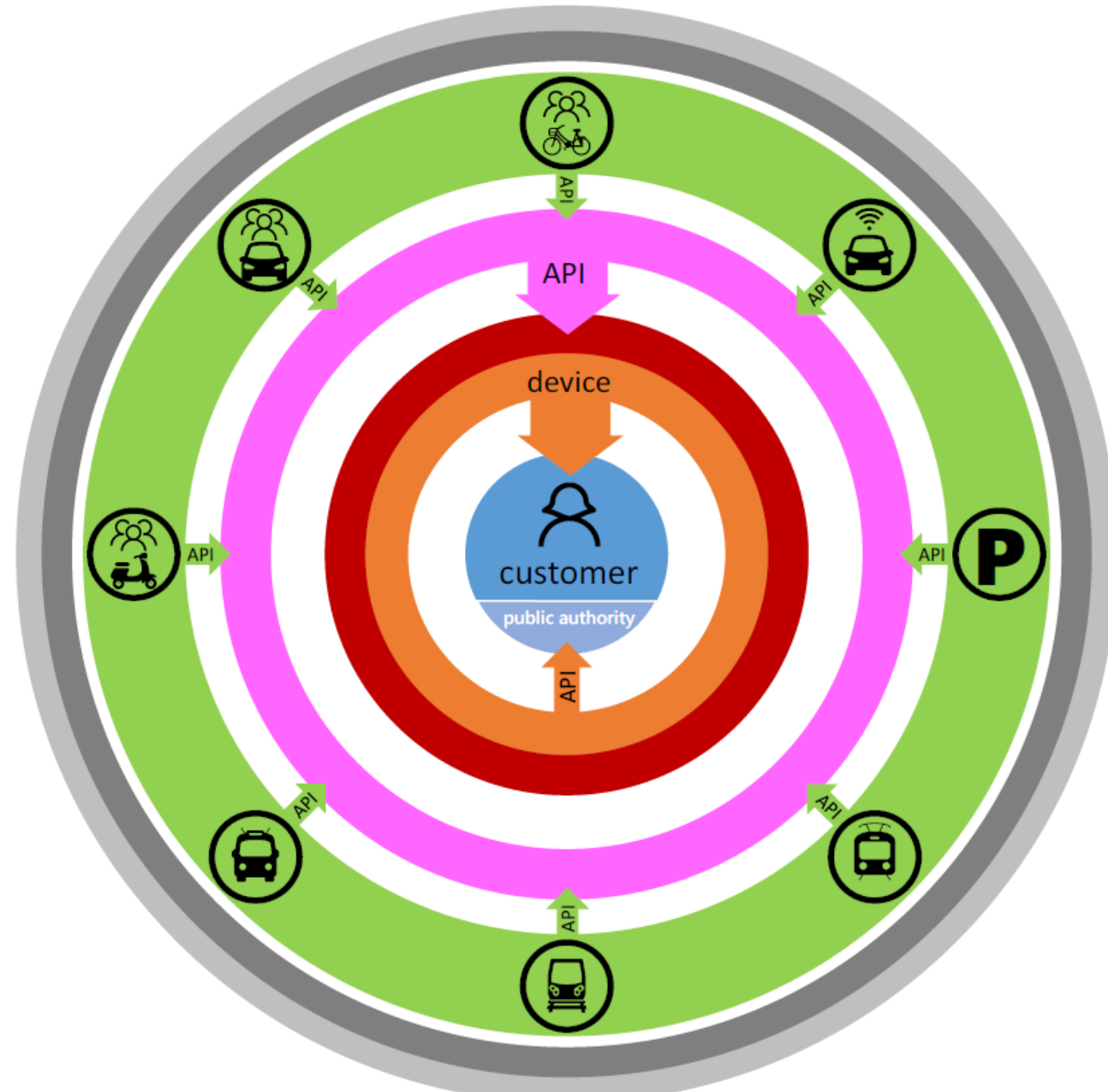# Figure 7: How distributed ledgers and blockchain enable Mobility as a Service in a "mesh-y" world

Legend:
- Public policy
- Manufacturing and ICT Industry
- Transport service providers
- Data providers
- MaaS provider (Back-office/customer interface)
- Distributed ledger: data, trust authentication, contracts

Current MaaS ecosystem

customer
public authority
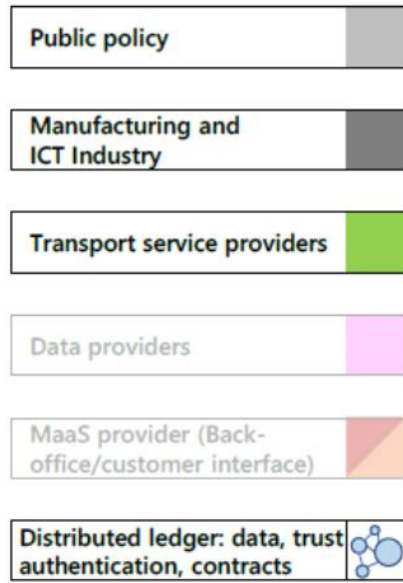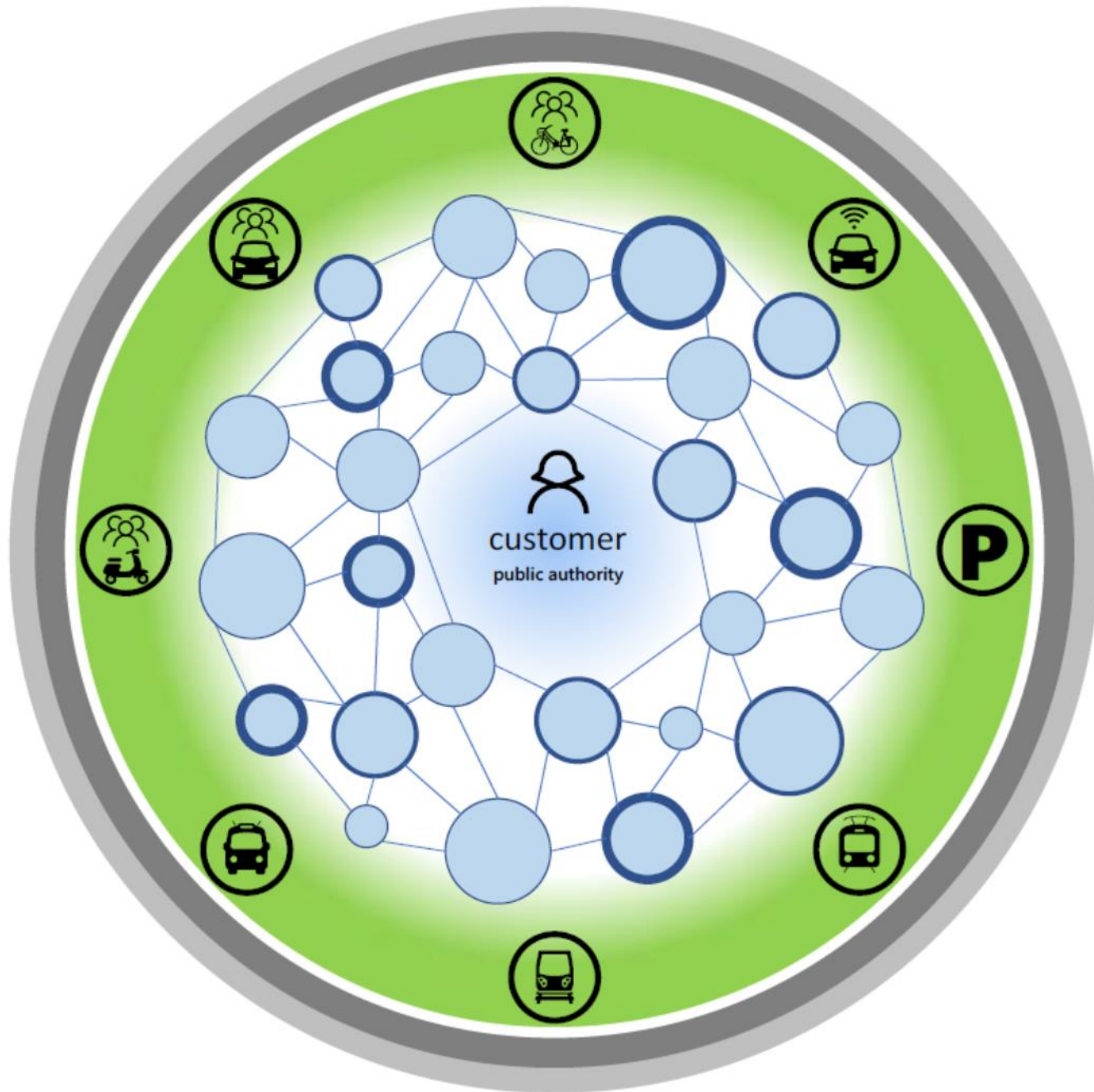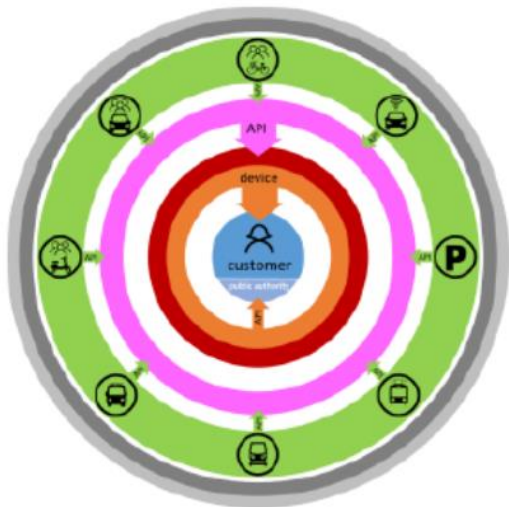
Figure 5: **States of the Market Value Systems of Mobility as a Service**

open

Regulated competition model

Mesh-y model

centralised — de-centralised

Monopoly model

Platform wars model

closed
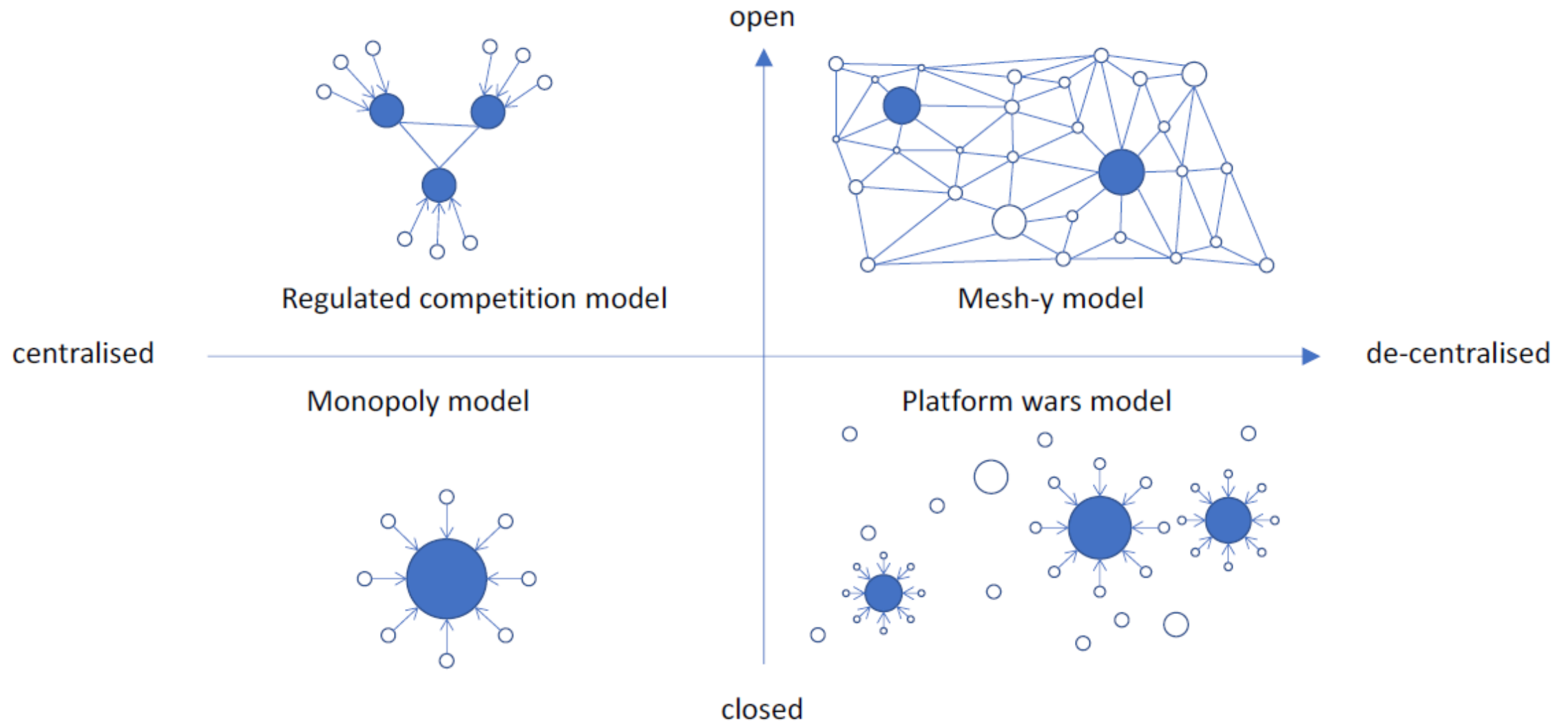
Source: Adapted from (Casey & Valovirta, 2016)

MAAS LEVEL DEFINITION

Level	Description	
4	**Integration of policy** Governance & PP-cooperation	
3	**Integration of the service offer** Bundling/subscription, contracts, etc.	**UbiGo** **whim**
2	**Integration of booking & payment:** Single trip - find, book and pay	**HANNOVERmobil** smi)e einfach mobil ♥moovit
1	**Integration of information:** Multimodal travel planner, price info	Qixxit Google
0	**No integration:** Single, separate services	TRANSPORT FOR LONDON lyft Hertz sunfleet

By Jana Sochor, Chalmers University of Technology

2

MaaS Spain

MaaS Spain

Asociación Española de la Movilidad como Servicio cuya misión es Constituirse como punto de encuentro de los interesados desde donde impulsar la implantación de MaaS en la movilidad en España.

Objetivos:

- Identificar, convocar y facilitar la coordinación del mayor número de actores posible
- Construir una visión compartida, analizando la de cada uno
- Impulsar el desarrollo de MaaS en España, identificando y ayudando a derribar barreras existentes
- Asistir a foros internacionales, representar a España cuando corresponda
- Recopilar información, documentación y experiencias de interés.
- Respaldar y servir de cauce de iniciativas de interés sectorial

AUTORIDADES

COMERCIALIZADORES

OPERADORES

OPERADORES

- Transporte Público Urbano
- Transporte Público Interurbano
- Vehículo con conductor
- Vehículo sin conductor
  - Car-Sharing
    - Free Floating
    - Round Trip
  - Moto - Sharing
  - Bicicleta Pública
  - Patinete eléctrico, etc.
- Autopistas
- Aparcamientos: on & off Street
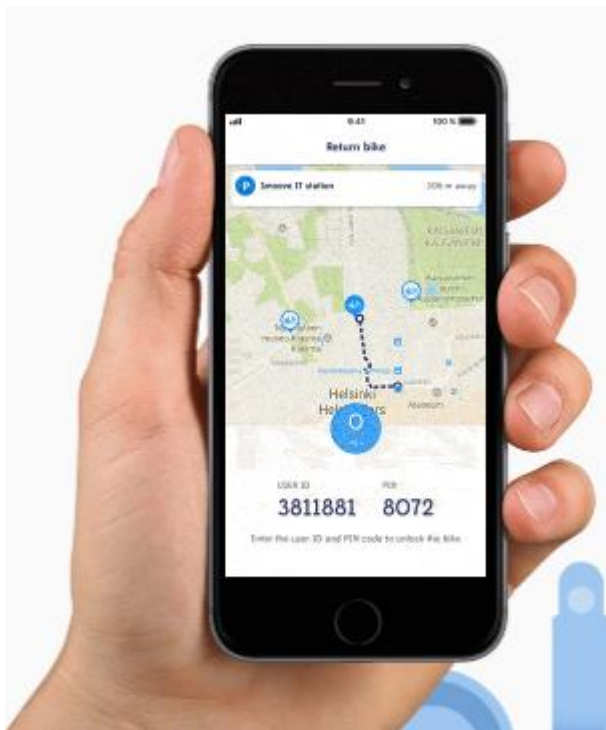- Seguros
- Energía, etc.

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3
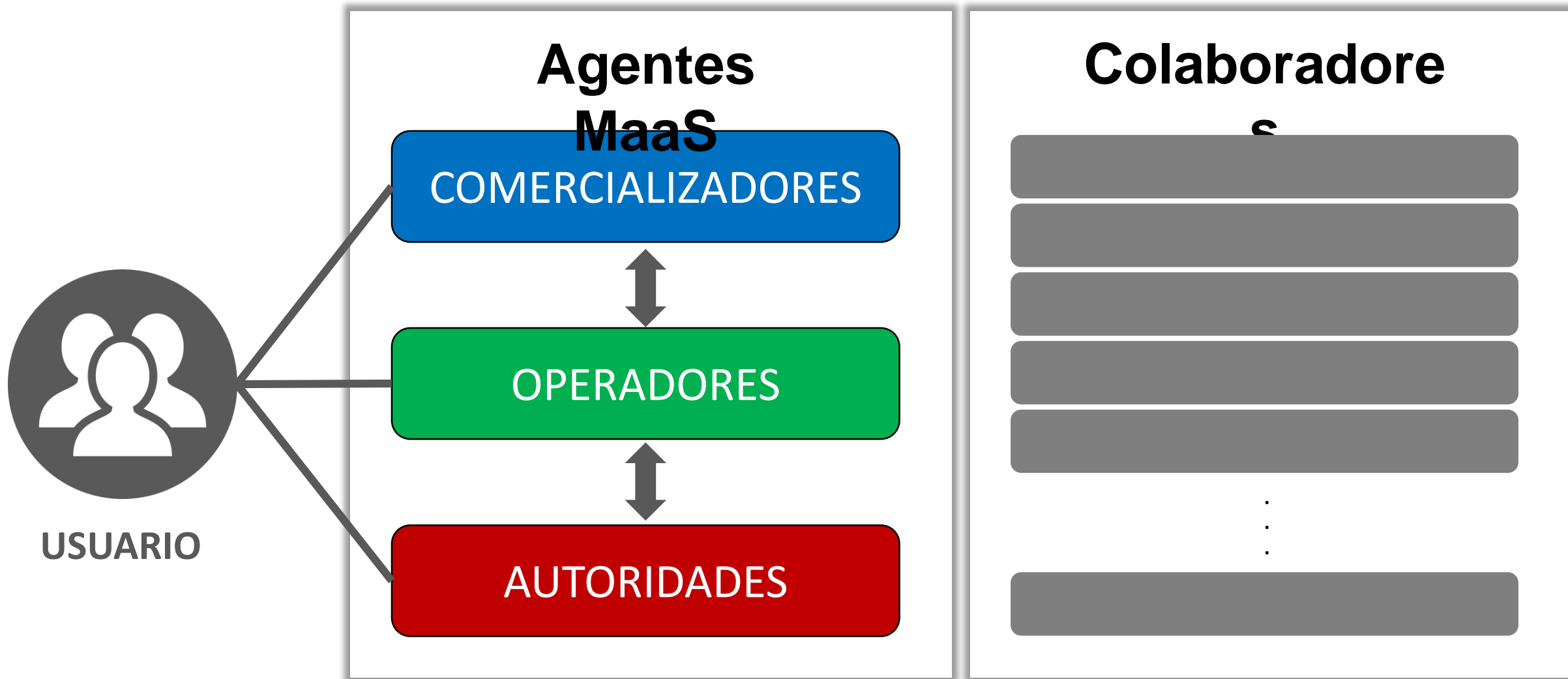
Ciudades MaaS

- **Helsinki**
- **West Midlands. Birminghan**

Anuncios
- **Amsterdam (*)**
- **Amberes (*), etc.**

Helsinki

Whim to Go
For those who want to try Whim first or simply don't travel that much. Pay per ride, no commitment, no surcharges.

0€
per month

Whim Urban
For regular travellers who could use the flexibility of a taxi or car occasionally.

49€
per month (cancel any time)
INTRODUCTORY OFFER

Whim Unlimited
Modern alternative for owning a car. At the price of owning a car you get unlimited access to public transport, taxi or a car according to your daily need.

499€
per month (cancel any time)
INTRODUCTORY OFFER

	Whim To Go	Whim Urban	Whim Unlimited
Monthly payment	Free	49€	499€
Local public transport	Pay per ride	Unlimited Single Tickets	Unlimited Single Tickets
City Bike	Not included	Unlimited (30min)	Unlimited
Taxi (5km radius)	Pay per ride	10€ per ride	Unlimited
Car rental	Pay per ride	49€ per day	Unlimited
Car share	Coming soon	Coming soon	⊘
Cancel anytime	⊘	⊘	⊘
Add-ons incl regional HSL ❯			
	Read more	Read more	Read more

West Midlands - Birminghan

Pay as you Go
For those who want to try Whim first or simply don't travel that much. Pay per ride, no commitment, no surcharges.

£0
per month

Whim Everyday
For regular travellers that could use the flexibility of a taxi or car occasionally - with price-capping for peace of mind.
And bikes are included as soon as they arrive, of course!

£99
per month (cancel any time)
INTRODUCTORY OFFER

Whim Unlimited
A modern alternative to owning a car! For the cost of owning a car, you get unlimited access to public transport, taxis or a car depending on your daily need. And bikes are included as soon as they arrive, of course!

£349
per month (cancel any time)
INTRODUCTORY OFFER

	Pay as you Go	Whim Everyday	Whim Unlimited
Monthly payment	£0	£99	£349
Public transport	Pay as you Go	Unlimited	Unlimited
Taxi	Pay as you Go	Pay as you Go	Unlimited
Car	Pay as you Go	Pay as you Go	Unlimited
Bike share	Coming soon!	Coming soon!	Coming soon!
Cancel anytime	✓	✓	✓
	Read more	Read more	Read more

MaaS Pilot in Gothenburg, Sweden

CHALMERS
UNIVERSITY OF TECHNOLOGY

Participants (173 adults and 22 children)
• Before-During-End questionnaires (164, 161,160 responses completing all) + a "6-months after" questionnaire
• 2 x one-week travel diaries (40 & 36 responses)
• 3 post-FOT focus groups
• Post-FOT interviews (14 individuals & 3 households)
• Customer service errands

Non-participants (but who had expressed interest):
• Questionnaire (145 responses of 316 invitations)
• 24 individual interviews

Who participated?

83 households (subscriptions), 195 individuals
20 private vehicles set aside, 17 from single-vehicle households

The majority…
• live in an apartment & work full-time
• have a driver's license and PT card, but do not necessarily have daily access to a car
• do <u>not</u> subscribe to a carsharing or bikesharing system
• are highly connected
• are likely innovators/early adopters (e.g. change-seeking, curious)

Socio-demographic differences
• Car ownership/access/use (shedders & keepers vs carsharers & accessors)
• Keepers – live in a "house" to a greater extent
• Keepers (vs accessors) – more adults, higher household income

Travel Behavior (use, travel diaries)

Participants reduced use of (private) car and increased use of other modes.

Mode	"Before" Travel Diary from UbiGo participants, n = 40	"During" Travel Diary from UbiGo participants, n = 36
Walk / Run	25%	- 5%
Bicycle	10%	+ 35%
Private Car	25%	- 50%
Carsharing	2%	+ 200%
Tram	15%	+ 5%
Bus (Local)	15%	+ 35%
Bus (Express)	3%	+ 100%
Train	2%	+ 20%

CHALMERS
UNIVERSITY OF TECHNOLOGY

Participants reduced use of (private) car and increased use of other modes.

	USE (less-equal-more)	ATTITUDE (worse-same-better)
Bus/tram:	4% – 46% – 50%	2% – 46% – 52%
Local train:	7% – 75% – 18%	3% – 71% – 26%
Bikesharing:	16% – 61% – 23%	1% – 57% – 42%
Private bicycle:	19% – 65% – 16%	3% – 83% – 14%
Carsharing:	6% – 37% – 57%	3% – 36% – 61%
Car rental:	13% – 59% – 28%	4% – 75% – 21%
Private vehicle:	48% – 48% – 4%	23% – 74% – 3%
Taxi:	12% – 68% – 20%	6% – 76% – 18%
Walking:	6% – 73% – 21%	2% – 82% – 16%

Behavioral changes…over time?

97% of those who reported behavioral changes were satisfied with those changes…

…but will the changes remain?

- 50% claim the changes will remain
- 32% claim the changes will remain, given that
  - *"… we have the same 'punch card' system as in UbiGo"*
  - *"… it is as easy to travel"*
- 17% say the changes will not remain
  - Because of moving
  - *"… because I will not have access to UbiGo"*

4

Ticketing – TESC - DAT4m

INTELLIGENT TRANSPORT SYSTEM
ITS ESPAÑA

El objetivo de TESC es facilitar la interoperabilidad generando un elemento de acceso al Sistema de Transporte de fácil uso para los viajeros esporádicos y simplificando la gestión a la autoridad u operador de transporte al evitar tener que atender las necesidades especiales de los usuarios no habituales.

El Sistema TESC-DTA4m está compuesto por una solución Administrativo Comercial y un Soporte Tecnológico.

## TESC (Tarjeta Española sin Contacto) y en su nueva versión DAT4m

(Token Digital de Acceso para movilidad)

SOLUCIÓN ADMINISTRATIVO COMERCIAL

- La solución Administrativo Comercial consiste en que una entidad comercializadora (que atiende directamente a clientes no necesariamente procedente del mundo de la movilidad) pueda proporcionar a sus clientes algún Token o elemento que le permita acceder con facilidad al servicio de transporte o movilidad deseado.

- Para ello una o varias entidades coordinadoras se encargarán de hacer de intermediario entre las autoridades y operadores de movilidad, y los comercializadores, realizando contratos que establezcan sus relaciones con ambas partes.

- La entidad coordinadora, recabará el importe de las transacciones de los comercializadores que para abonárselo según se acuerde en los contratos a las autoridades y operadores de movilidad correspondientes.

Red de autoridades y operadores de transporte asociados
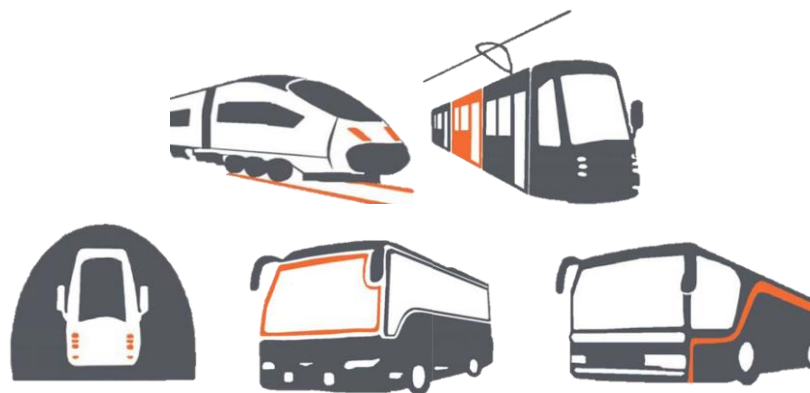
AGENTES PARTICIPANTES

CONTRATOS

Entidad Gestora

Red de tarjetas y entidades comercializadoras asociadas
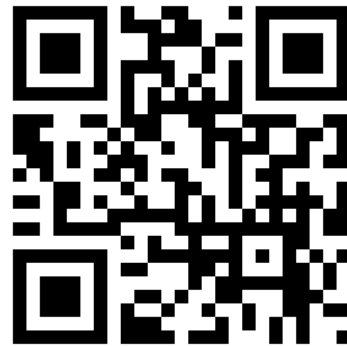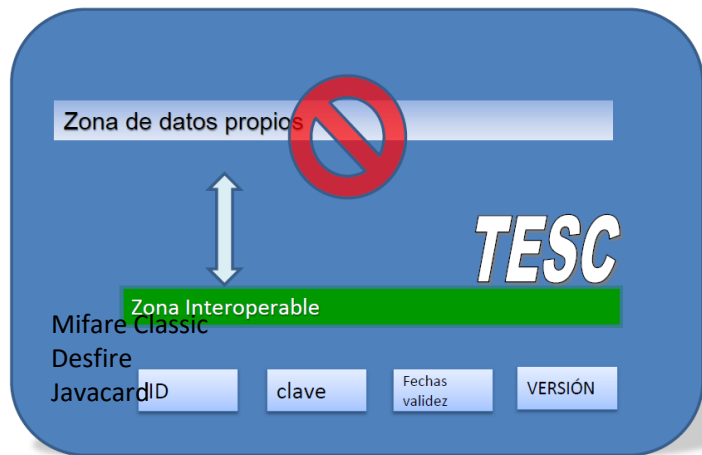
CONTRATOS

SOPORTE TECNOLÓGICO

- Por otra parte el soporte tecnológico se basa en un código de 24 Bytes (16 Bytes de información + 8 Bytes de firma de seguridad) asociado al usuario y/o a su entidad comercializadora.

- Si el código cumple las normas acordadas, el operador tendrá garantías de cobro y ello le permite proporcionar el acceso al servicio al usuario.

- Los código pueden suministrarse en formato código QR, sobre soportes NFC (nxp y Java Card). En ambos casos e recomienda la utilización de teléfonos móviles para permitir el acceso sencillo por parte de los usuarios a los títulos de transporte.

- Mediante sistemas de listas blancas, se establece una nueva opción simplificando el código de 24   dígitos para permitir el uso de elementos digitales   sencillos que suele portar el usuario como son: DNI contactless, tarjeta sin contacto de cualquier tipo, Localizadores alfanumérico (Como los utilizados en la emisión de billetes de largo recorrido, combinado cercanías de RENFE), e incluso tarjetas EMV Contactless sin la gestión a través de la red EMV.

Zona de datos propios

Zona Interoperable

TESC

Mifare Classic
Desfire
Javacard ID   clave   Fechas validez   VERSIÓN

Código QR correspondiente al texto inferior

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	2
C	o	n	t	e	n	i	d	o	T	E	S	C	1	6	B	F	i	r	m	a	8	B	

Nº Socio 57,881
DAVID GARCÍA MARTÍN
2º ANFITEATRO FONDO NORTE
Sector 516 Fila 0001 Asiento 0013

5 Conclusiones

5 Conclusiones

- MaaS: Nuevo paradigma en la Movilidad

- Relacionado con la Interoperabilidad, intermodalidad y experiencia de usuario

- Papel clave del transporte Público

- Necesidad de adaptación e integración de los nuevos actores

MaaS
Mobility as a Service

MUCHAS GRACIAS

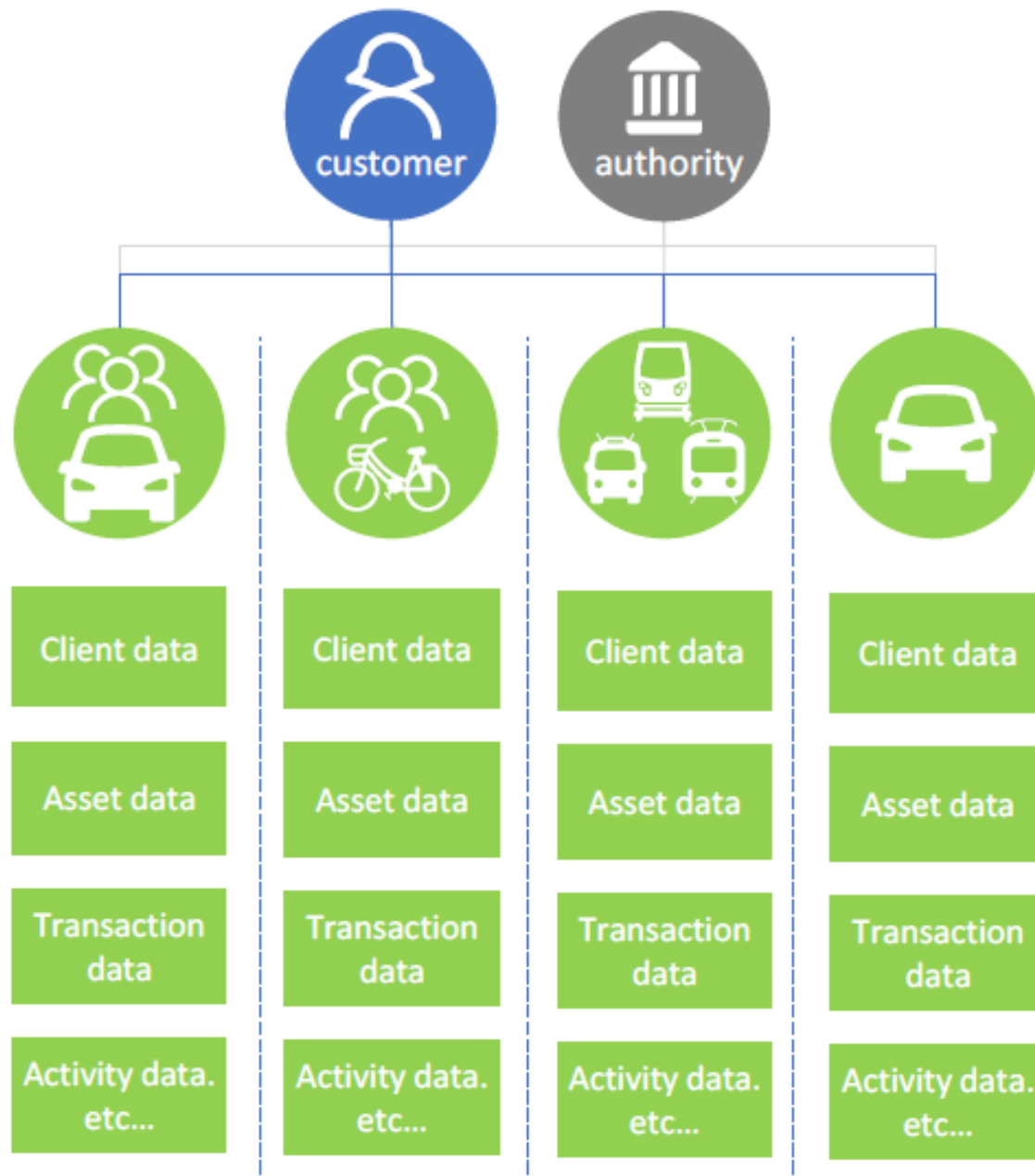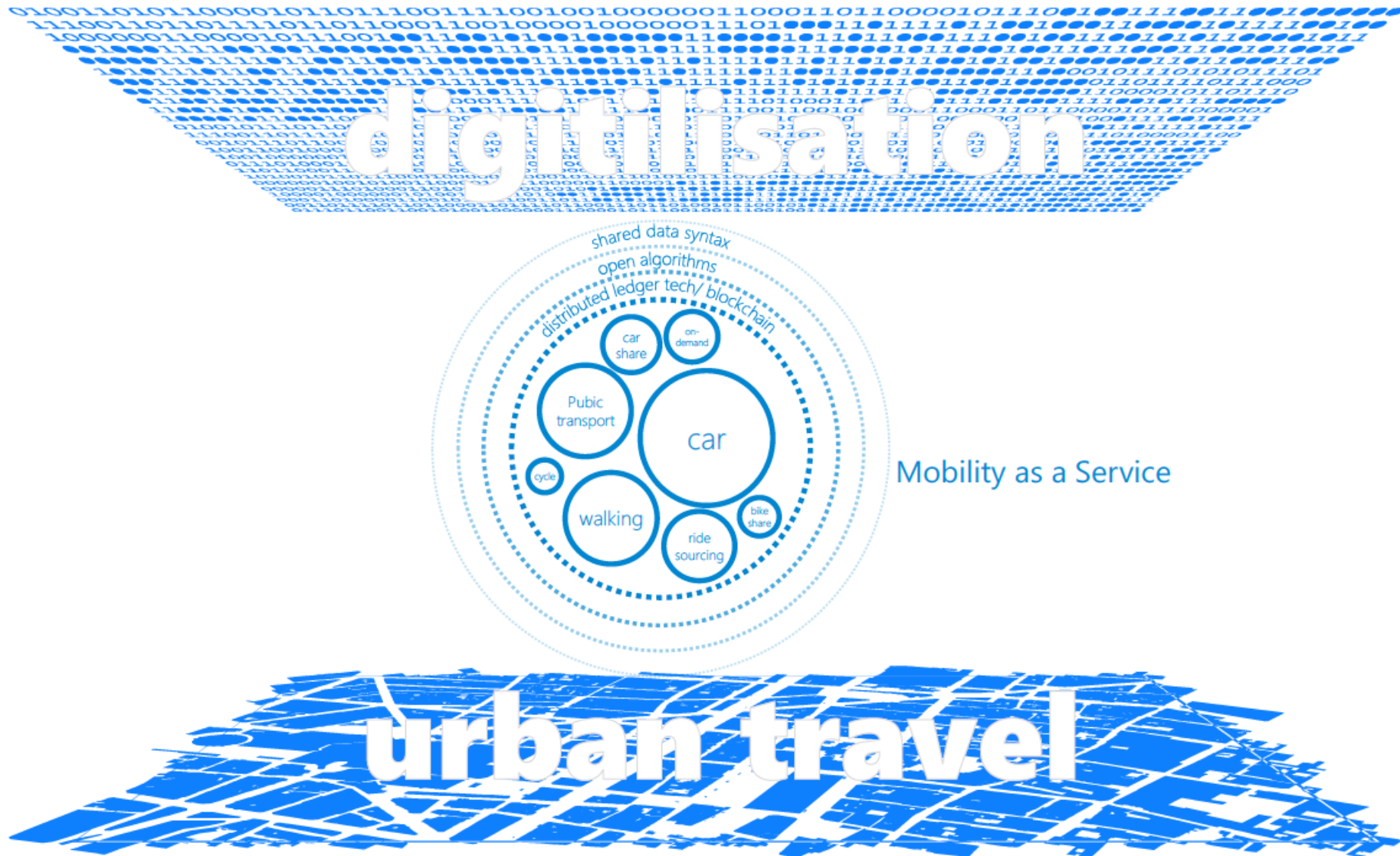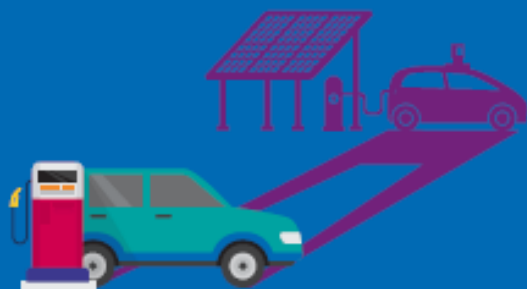Jaime Huerta
Secretario General
jhuerta@itsspain.com

ITS ESPAÑA
INTELLIGENT TRANSPORT SYSTEM

Figure 3: **Mobility as a Service leverages digitalisation for customer-centric transport services**

digitilisation

shared data syntax
open algorithms
distributed ledger tech/ blockchain

car share
on-demand
Pubic transport
car
cycle
walking
ride sourcing
bike share

Mobility as a Service

urban travel

KPMG

Reimagine Places: Mobility as a Service

The Mobility as a Service (MaaS) Requirements Index: A guide for determining the required regulatory, governance, commercial, and technological environment to facilitate policy and customer-optimised mobility services.
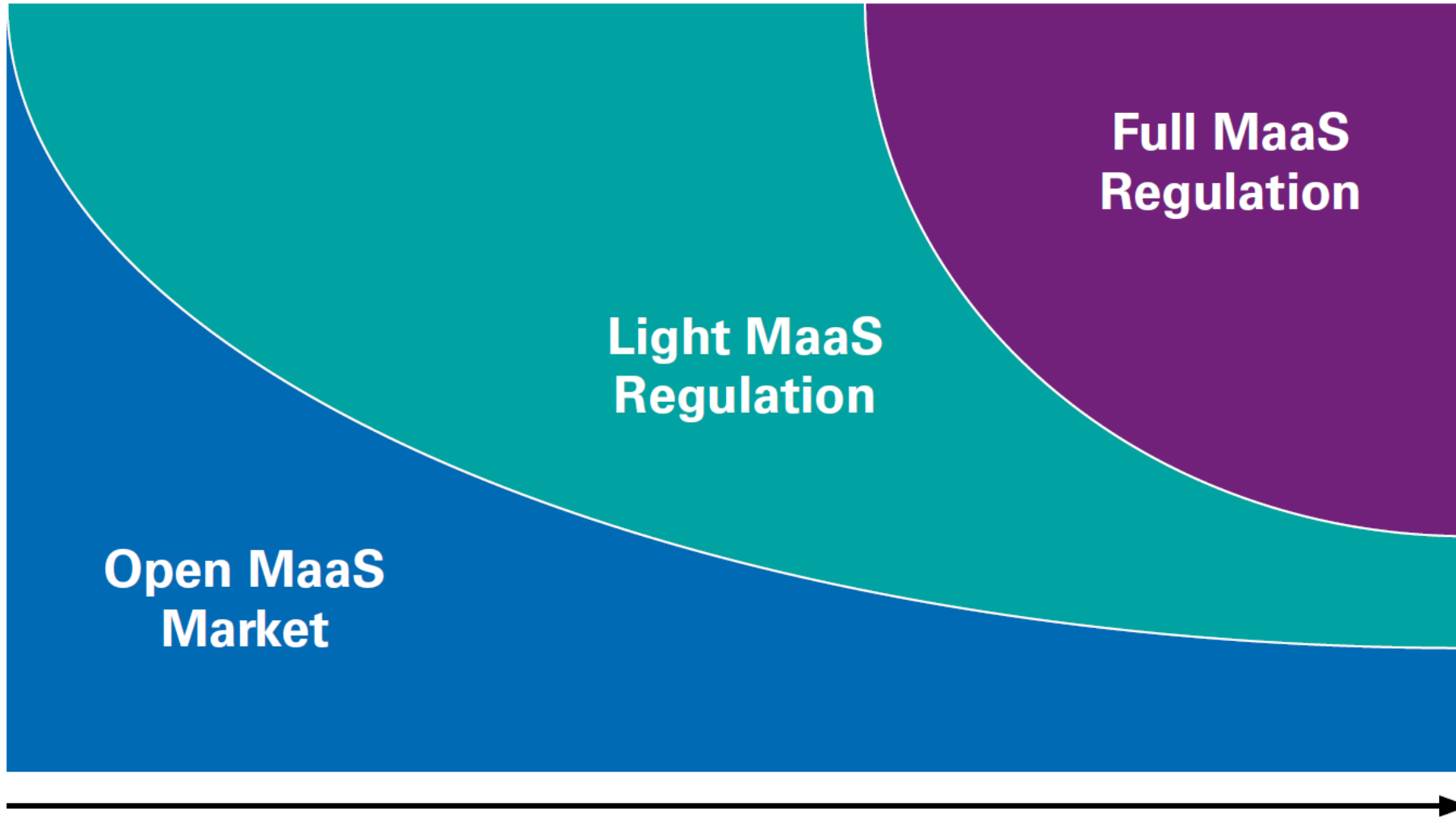
August 2017

www.kpmg.com/uk/reimagine-maas

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Scenario four

Urban, high modal choice, full regulation

MaaS Requirements Index

Full MaaS Regulation

Light MaaS Regulation

Market

Open MaaS Market
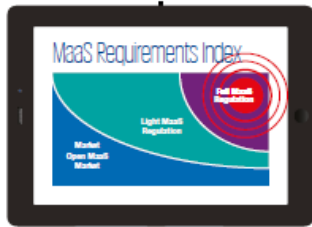
1

Miss Delta has always wanted to live in a big city. She loves the bustle, the noise, the sheer opportunity that is right on her doorstep.

2

Accessing that opportunity involves interacting with a bewildering array of travel modes. Within two minutes of her front door are a bus stop, an underground station, and a bikeshare hub. Then there's Uber, local private hire, and cabs, all jostling for her attention and filling up the city with their presence. One day, she expects to see autonomous vehicles on the city's roads, though she's not sure what they'll bring beyond yet more traffic and congestion when pedestrian behaviour changes and people start walking out in front of cars.

3

Miss Delta needs a way of working out the best mode of transport for her journey, given dynamic factors like congestion, delays, crowding and travel time. She can use a handful of apps to book her chosen means of getting around. But none of them offer guidance about the most efficient mode at that moment, and she has to flick between screens to compare prices.

4

A committed environmentalist, she's also concerned about air quality in the city, and voted in the local elections for a candidate promising to clean up the transport network. But she can't make an informed choice that perpetuates her principles, because the relevant information isn't readily to hand.

Let's reimagine what an authority could do

Take control. It already regulates fairly heavily in order to optimise road-space capacity, incentivise use of public transport, ensure passenger safety, and to ameliorate the potential disruption in such a busy marketplace. But the high degree of mobility services and options in this context could be built upon significantly to improve the user experience. And the arrival of disrupting private operators like Uber has moved the regulatory context on,

necessitating careful consideration of governance models, taking care not to stifle the market.

A good start would be to develop a single, Whim-style, app and associated MaaS scheme, through which all transport modes available to a traveller are made available. This should include real-time information on travel times and prices, making it easy to reroute mid-journey. As a neat feature aimed specifically at

travellers like Miss Delta, it could also rate each option's green credentials, helping them make informed choices about their mobility. Allied to a "nudge"[3] communications strategy that engages the environmental sensibilities of all travellers, this would make a tangible difference to air quality, congestion and crowding.

From a regulatory perspective, the authority in Miss Delta's city will probably need to aggregate all

mobility, governing demand and supply across public- and private-sector operators and using regulation to influence customer behaviour where possible (e.g. using levers such as dynamic pricing, dynamic traffic management, and dynamic licensing of private hire vehicles). That necessitates close relationships with providers, including those developing autonomous vehicles, to develop infrastructure and governance models that are fit for

purpose. Strong partnership working across the supply chain is therefore essential, as is a commitment to keeping the market vibrant and open.

From Miss Delta's perspective, the task facing the authority is simple: bring the joy into city living, by optimising the transport ecosystem to deliver efficiency, ease of use, and modal choice, while heightening resilience, minimising disruption and improving quality of life for all the

city's residents. For the authority and operators, however, this will necessitate a complex and carefully balanced MaaS scheme.

MaaS

Moovel (Como integrador de Transporte Público)

App marca blanca a disposición de soluciones MaaS