CIPTEC

COLLECTIVE INNOVATION FOR PUBLIC TRANSPORT IN EUROPEAN CITIES

INNOVATIVE FUTURE
PUBLIC TRANSPORT
Utilizing Collective Intelligence

POLICE

POST

www.ciptec.eu

auth@ciptec.eu
@ciptec
www.facebook.com/ciptec

Contents

Challenging an INNOVATIVE FUTURE

for PUBLIC TRANSPORT

It seems that the say of Heraclitus (6th - 5th century b.C.) "everything flows, nothing is left behind" is more true for our era, than ever. New trends and social demands are emerging, requiring new answers concerning the development of new transport services and systems. Economy of sharing applications, Internet of Things (IoT), Mobility as a Service (MaaS), Infomobility, Autonomous vehicles, Drone vehicles, Hyperloop, are shaping a new visible Future of Transport.

Public Transport services are a vital component of a City's well-being. In an ever changing world, cities are changing, also Public Transport services are changing. CIPTEC has identified, by means of an extensive questionnaire survey, which are the main contemporary Market and Societal trends influencing Public Transport (PT), as well as the required main measures and policy actions in relation to each one of them.

The production of innovations to face various existing and new emerging needs is a non-stop, ongoing process. CIPTEC has conducted a review to identify main existing innovations in the public sector, in other transport sectors (e.g. air transport, logistics, ridesharing, etc.) and in other business sectors (e.g. banking, tourism, etc.). Next, the innovations were evaluated quantitatively against certain criteria and the most promising ones with the higher scores were further analysed in more depth. The results are publicly available to all those interested to consider further, the applicability of existing innovations in their own city/country context.

On the quest of new innovative concepts and ideas for Public Transport, CIPTEC assumed to utilise "collective intelligence" i.e. intelligence of the crowd. The relevant actions included:
- The organization of co-creation workshops in certain places, with different settings and mixture of the participants.
- The organization of crowdsourcing campaigns (via the CIPTEC crowdsourcing platform) in certain local languages, as well as in English on a pan-European scale.

The aforementioned actions produced results, namely innovative ideas and concepts and certain selected ones, appear in this booklet. Are the results satisfactory? Will they find their application route? Who will further push them for application?: these are questions for which answers will be sought in next steps of CIPTEC and after its conclusion by the PT industry itself.

Using advanced marketing techniques, such as conjoint analysis, CIPTEC has attempted to reveal hidden groups profiles and associated existing innovations appealing to them. Certain main results are presented here.

How CIPTEC results can be better utilized benefiting European Citizens and Public Transport stakeholders? The development of a "CIPTEC Toolbox" aims in answering the previous question. In the toolbox all main project results and outcomes, such as trends, needs, existing, new innovations etc. will be presented, in an easy to access and use format and will be available to all interested stakeholders. In addition the tools used in co-creation workshops, as well as the CIPTEC crowdsourcing platform developed will be available for free to Public Transport stakeholders interested in order to further facilitate the continuous, probably in-house, development of Public Transport Innovations.

This is a first edition of the CIPTEC booklet aiming to summarize and visualise project results. In the final version, towards the conclusion of the project, more project results such as, Public Transport Marketing Experimentation results, Social Innovation, main Policy Recommendations etc. will appear.

CIPTEC attempts to make the future happen, concerning the identification, generation, adoption of Public Transport Innovations, aiming to face relevant global and local problems, thus making Public Transport more attractive to the users and effective in fighting congestion problems.

Main contemporary Market and Societal Trends influencing PUBLIC TRANSPORT, actions required

CIPTEC has examined the question how globally observed market and societal trends such as, the shared economy, the emergence of sustainable lifestyles, technological ubiquity and individual empowerment, will affect the demand for Public Transport services over the next 10 years in European cities.

A survey has been conducted that was addressed to transport experts and non-experts and was carried out in April 2016 to validate CIPTEC project findings. 441 respondents from 7 countries participated in the survey which yielded 153 fully completed questionnaires.

Each Box, presented in the following pages contains, the following information: the name of the trend, a brief explanation of the trend and why it matters to transport, which policy instruments should be used by European Public Transport Authorities and Operators to respond effectively to the trend in a ranked order (Gold, Silver and Bronze badges), and other interesting information that may have resulted from the survey.

'Innovative and affordable technologies', 'Sustainable lifestyles', 'Population ageing', and 'Shared Economy, Individual Empowerment, Social innovation' are the trends that are expected both to increase significantly in themselves and yield high demand for Public Transport services within the forthcoming decade. 'Urbanisation and urban sprawl', as well as 'Enhancement of urban governance',

although not expected to increase very significantly in themselves, will have a high impact in Public Transport demand. On the other hand, 'Harmonisation of Legislation at EU level' and 'Globalisation', although expected to increase as standalone trends, will not have a very significant impact on the demand for Public Transport services in European cities. Finally, the trends 'Transforming families and household sizes', 'Environmental degradation' will both increase less in themselves and generate less demand for Public Transport services.

Overall, it seems that the innovation/technological aspects of new developments will play a pivotal role in Public Transport Futures; the diffusion of new technologies, urban and social innovation and the lifestyles that will emerge as their result will have the most significant impact on how travellers view and use Public Transport services. Population ageing is also a phenomenon to be taken very seriously; the proportion of elderly people in need of tailored mobility services will increase and Public Transport Operators (PTOs) and Authorities (PTAs) will have to plan effectively for this increasing share of the population.

Trends influencing PUBLIC TRANSPORT, actions required

Flexible Economy

An expanding number of companies offer flexible work schedules and remote working options to their employees. Travel patterns are changing.

31%

say that transport stakeholders should react to this trend very actively by means of:

- Business models
- Marketing and Mobility Management
- Digital Services

Social Innovation

Individuals, the public and private sector and the civil society develop new products and services to meet social needs. New ways of thinking about urban mobility emerge.
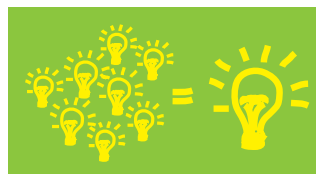
34%

say that transport stakeholders should react to this trend very actively by means of:

- Marketing and Mobility Management
- Business models
- Digital Services
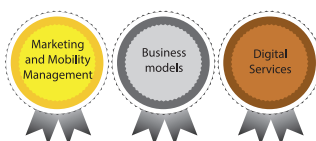
Population Ageing

Life expectancy increases, while birth rates decrease. Cities and Transport are called to accommodate a higher proportion of elderly people with distinct requirements.

35%

say that transport stakeholders should react to this trend very actively by means of:

- Business models
- Network Infrastructure
- Organizational changes
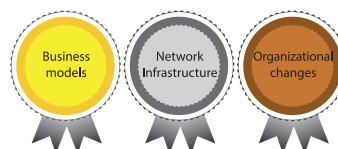
Innovative Technologies

Technological advancements render the travelling experience more efficient and enjoyable. Transport users plan their trips more effectively. Vehicles are cleaner and safer.

58%

say that transport stakeholders should react to this trend very actively by means of:

- Vehicle Technologies and Design
- Digital Services
- Marketing and Mobility Management
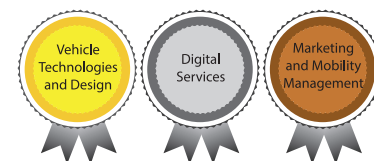
Trends influencing PUBLIC TRANSPORT, actions required

Transforming households

A growing share of the population remains childless or has children at a later age, while divorce rates increase. The sizes of households diminish. Contemporary families have different transportation needs.

22%

say that transport stakeholders should react to this trend very actively by means of:

- Marketing and Mobility Management
- Network Infrastructure
- Vehicle Technologies and Design
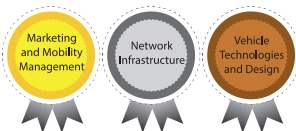
EU Legislation

The European Commission puts forward regulations for building a competitive transport system that will increase mobility, remove major barriers in key areas and fuel growth and employment. National governments are called to comply.

38%

say that transport stakeholders should react to this trend very actively by means of:

- Business models
- Organizational changes
- Network Infrastructure

Globalisation

Social, economic and physical boundaries fade. The mobility of goods and people increases. Travelling becomes easier and more affordable for Europeans.

19%

say that transport stakeholders should react to this trend very actively by means of:

- Business models
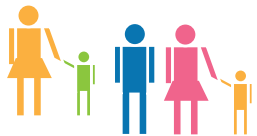- Network Infrastructure
- Organizational changes
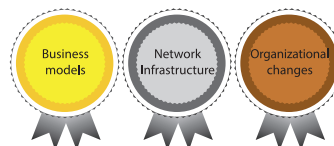
Sustainable Lifestyles

People become aware of their energy consumption and their carbon footprint. More of them consciously opt for healthy, sustainable and 'alternative' lifestyles and travel options.

47%

say that transport stakeholders should react to this trend very actively by means of:

- Vehicle Technologies and Design
- Marketing and Mobility Management
- Digital Services supporting Public Transport

Urbanisation

Towns and cities become larger as more and more people move to city centers. The inhabitants of those areas demand shorter and more frequent journeys.

47%

say that transport stakeholders should react to this trend very actively by means of:

- Marketing and Mobility Management
- Vehicle Technologies and Design
- Digital Services

Trends influencing PUBLIC TRANSPORT, actions required

Shared Economy

People increasingly share human, physical and intellectual resources. Travelers can now share vehicles using social networking platforms for car-pooling and car-sharing.

28%

say that transport stakeholders should react to this trend very actively by means of:

- Business models
- Marketing and Mobility Management
- Organizational changes

Urban Governance

More decisions are taken on the city level. Regional and local authorities strive to come forth as innovative and develop a distinguished brand, promoting 'sustainable' and 'smart' transportation.

37%

say that transport stakeholders should react to this trend very actively by means of:

- Organizational changes
- Business models
- Network Infrastructure

Environmental Degradation

Natural resources become depleted, ecosystems are destructed and the climate changes. Oil prices increase. Environmental policies of all scales include measures affecting transport.

63%

say that transport stakeholders should react to this trend very actively by means of:

- Vehicle Technologies and Design
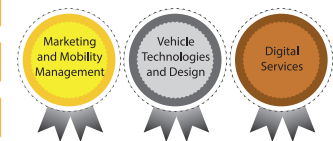- Business models
- Network Infrastructure

Corporate social responsibility

Businesses, including Public Transport Operators, voluntarily commit themselves to behaving ethically and promoting end users' health and quality of life.

35%

say that transport stakeholders should react to this trend very actively by means of:

- Marketing and Mobility Management
- Digital Services
- Business models

Urban Sprawl

Parts of the population move away from central urban areas into low-density, monofunctional and car-dependent communities. The 'last mile' issue becomes more critical than ever.

42%

say that transport stakeholders should react to this trend very actively by means of:

- Network Infrastructure
- Vehicle Technologies and Design
- Marketing and Mobility Management

Individual Empowerment

People are better educated, entrepreneurial and tech-savvy. They claim their rights and pressure transport authorities to accommodate their needs and demands.

22%

say that transport stakeholders should react to this trend very actively by means of:

- Business models
- Marketing and Mobility Management
- Organizational changes

SELECTED EXISTING INNOVATIONS identified by the CIPTEC review

CIPTEC has identified and mapped existing innovations in Public Transport sector, in other Transport sectors, as well as in other Business sectors, aiming to assess their applicability potential to Public Transport towards its modal share increase.

For this purpose, we adopted the following definition of innovation: *all new or modified (existing) ideas, methods, products, services, technologies that were (or still are being) developed consciously using the latest insights with the aim of improving the status quo and that can be applied to Public Transport with the main goal to attract more customers (preferably at lower costs).*

The innovations identified were next quantitatively evaluated for identifying the most promising ones, with respect to main criteria: feasibility; transferability; correspondence to users' needs; correspondence to the needs of supplying organisations (PTAs and PTOs); innovativeness. After weighting the criteria to be applied, partners scored all of the innovations using a 1-5 scale (5 being the highest), considering the attributed score as the weighted result of the expert opinion judgement.

Based on this evaluation, innovations were ranked and partners conducted desk research for the most promising ones filling a template form, particularly designed for this aim.

In addition to the evaluation by the project partners, selected innovations were further investigated and discussed by conducting interviews with external experts and stakeholders 'responsible' for them and organising a special workshop in May of 2016 with the participation of EMTA's General Assembly delegates. The combination of the methods enabled the extraction of useful insights coming from both the literature review and the real business practice experience.

Selected existing innovations (around 10 from each of the aforementioned sectors), together with the new innovative ideas that emerged from the CIPTEC application of collective intelligence and the insights being produced by the on-going marketing research (preferential surveys and consumer experimentation) feed the "CIPTEC Toolbox for Public Transport Innovation".

The findings of this work are presented in the relevant project deliverables that are available through the CIPTEC's website.

SELECTED EXISTING INNOVATIONS identified by the CIPTEC review

Public Transport

Passenger counting

A system which utilizes wireless devices to collect real-time transit data and uses a web framework to analyze them

Passenger distribution

Information concerning different carriages in a train can be sent to passengers that are waiting at the next station(s) allowing them to stand at the right place on the platform when the train arrives thus will be better spread across the train.

Rewarding Public Transport users

This initiative offers travellers the opportunity to earn great discounts and extras for free by using their Public Transport cards.

Personal Rapid Transit

PRT is a Public Transport mode that uses small, automated electric 'podcars' to provide a taxi-like service for individuals or small groups of travelers running in a segregated guide way.

Virtual Ticket Vendor

The idea of Virtual Ticket Vendor is to allow operators to locate ticketing staff in one place, interacting with customers through high-definition screens and high speed connection networks at any other connected station.

Internet of Things

IoT applications in Public Transport concentrate around vehicle dynamics monitoring, fleet management and value-added services, providing an unprecedented opportunity for improving passenger experience, increasing service reliability and security and reducing operational costs.

Integrating Public Transport use in Entrance Tickets of Events

This innovation combines event entrance and Public Transport use in one ticket for specified groups of visitors and attendants at major events, as the result of negotiations with hosts.

Improving Waiting Time Perception

According to scientific research waiting is perceived to last three times longer than it really does; Time perception can be reduced using combinations of various stimuli i.e. fragrances, sound music, decoration.

Mobility as a Service (MaaS)

MaaS systems intent to provide a seamless journey by the use of an online platform for accessing (planning, booking and paying for) a tailored package of public and private transport services.

Driving monitoring and training tool

Systems monitoring driver performance through software linked to vehicle CAN bus system i.e. breaking, deceleration, acceleration, G-Forces, along with fuel consumption. Driving instructors can act as a benchmarking to provide "best practice example" for any given vehicle being used on any given line.

Innovative "light" system for fleet monitoring and provision of user information

Low-cost Automatic Vehicle Monitoring solution, for bus transport market, based on the use of smart technologies. This solution does not require any on-board installation enabling a "drastic" cut of costs of PTAs, PTOs

Shared Mobility Agency and related ICT

The Agency is based on a single co-ordination centre enabling the planning and management of different mobility services, including new shared mobility services integrated with conventional Public Transport.

SELECTED EXISTING INNOVATIONS identified by the CIPTEC review

Other Transport

Ridesourcing

A ridesourcing platform or transportation network company connects potential passengers with drivers who provide the travel on their own non-commercial vehicles and for profit e.g Lyft, Uber etc. Ridesourcing features such as the tracking of vehicles and the mobile pricing application could be applied to Public Transport.

Cross-sectorial partnership (integration of Public Transport and shared services)

Practical experience in Brussels shows that the key factor for success is the effective collaboration of Public Transport and the Car-sharing operator with the political support of the local authorities, which makes car-sharing a good example of Cross-sectoral Partnership.

Intermodal Journey Planner

An intermodal journey planner supports intermodal journeys, i.e. using more than one mode of transport.

Paperless transport

Paperless solutions cover a wide range of implementations with the common objective to improve service accessibility by extending selling channels for transport services e.g. SMS/App/QR code, and/or incorporating non PT payment tools e.g. bank cards, simplifying tickets' management and validation.

Fuel Efficiency (Opticlimb solution)

OptiClimb is an innovative solution focusing solely on the aircraft performances and optimisation. In Public Transport this innovation can be used to save energy and maybe to improve comfort of travelling.

Computer and Human Interaction Improvement

The FANCI system is a newly developing platform, still at research level. It focuses on developing better interaction between human senses and natural computer interfaces in order to improve safety, security and economic efficiency.

Sustainable Travelling Application e.g. Mobis

Mobis facilitates MaaS by offering assistance in travelling from door-to-door in the most energy-efficient and sustainable way possible.

Greenway battery swap

When the battery is getting low on energy, at a number of locations the electric battery can be changed for a fresh one. The concept could be applied for the PT buses, particularly the small ones.

Easy Transfers/wayfinding with robots

This innovation is a robot helping passengers to find their way at airports. These robots seem to be employable at Public Transport stations too.

Cycling Allowance Scheme

This allowance scheme encourages employees to cycle to and from work. It can also be applied to Public Transport.

SELECTED EXISTING INNOVATIONS identified by the CIPTEC review

Other Business Sectors

Crowdsourcing

In Public Transport, Crowdsourcing can contribute to real-time social media messages with information regarding the state of the transport service and can allow the people who use Public Transport to feel that their voice is heard and their opinion matters.

Gamification

In Public Transport, game elements can be used to support user engagement and enhance positive patterns in service. Because of the high numbers of people who enjoy playing games, using Gamification will result in positive feedback from users and will attract more customers in Public Transport.

Integral Public Transport, museums and/or other attractions card

This Card is a tourist card offering combined admission to city's museums and/or other attractions and Public Transport at a competitive price.

New Creative Uses of Public Transport Hubs (Seats2Meet)

Hubs as well as the Public Transport system itself could be utilized as meeting and co-work spaces, places creating unexpected but relevant encounters, resulting in more pleasant and work effective mobility chain time.

Local Ambassadors (e.g. Momaboard)

Public Transport customers, being better informed about the use and the capabilities of the Public service by recruited appropriate "ambassadors", will be more willing to try out and be confident in using the Public service.

Superpromoter for attracting new customers in Public Transport

A number of PTO/PTA employees can be appointed as Superpromoters to foster the PTO/PTA cultural change towards the marketability of Public Transport services.

QR-Shopping at Public Transport stations

Public Transport can be used to house virtual retail stores offering customers a satisfying experience of easy to use technology.

Crowdfunding

Crowdfunding is a method of raising money through the collective effort of customers, supporters or investors in order for a project to be funded and be completed.

Citizens' Initiative for supporting specific community projects e.g. DORV Zentrum in Germany

Due to funding refusal by banks etc., multifunctional shops located in small villages in Germany, were established with the village's own finance, through a public share mechanism. The concept could be applied to specific PT projects or initiatives.

Facility applications optimizing operational processes

Facility Apps optimise operational processes. In Public Transport, these apps can be used to optimise cleaning schedules, whereby delays in Public Transport will be avoided and their quality will be improved.

COLLECTIVE INTELLIGENCE UTILIZATION in the frame of CIPTEC

Collective intelligence is defined as groups of individuals doing things collectively that seem intelligent. In fact, all groups of people, such as families, companies and countries are constituted of individuals who act collectively and these actions seem, in some cases, intelligent. However, the increased Internet penetration in European countries as well as the growing number of smartphone users has enabled the need of creating new concepts and aplications of collective intelligence.

In order to support innovation and increase attractiveness of public transport, CIPTEC utilises two forms of collective intelligence methods: **crowdsourcing** and **co-creation**.

Crowdsourcing (collecting sources from the crowd) within CIPTEC is a participative online activity in which individuals, of varying knowledge and background are asked via an open call and campaign to generate, record, comment/evaluate and improve on a voluntary basis ideas for making Public Transport more attractive, through an appropriate web-platform. The main objective of the crowdsourcing campaign is to bring new thinking and innovative solutions (service concepts and business models) for Public Transport, in order to create a favourable environment for Public Transport growth.

Co-creation is a process which is based on the creativity of two or more people (collective creativity) aiming at the production of new, innovative ideas. In more details, co-creation is a revolutionary user-centered, participatory and collaborative approach where a multitude of stakeholders (users, professionals, firms etc.) is involved in the design process of a product or a service aiming to jointly create value.

COLLECTIVE INTELLIGENCE UTILIZATION in the frame of CIPTEC
Co-Creation workshops

Eight co-creation workshops were implemented within CIPTEC project at four specific urban areas, namely Thessaloniki, Frankfurt, Southern Tuscany and Rotterdam/The Hague. Especially, two co-creation workshops took place in each one of the four aforementioned urban areas, in order innovative ideas and concepts for Public Transport sector to be collected.

Main objective of the first co-creation workshop in Thessaloniki: *The improvement of Public Transport services within the city of Thessaloniki.*

Main objective of the second co-creation workshop in Thessaloniki: *The search of innovative ideas answering to some of the crucial market and societal trends as well as to some major Public Transport challenges.*

Main objective of the first co-creation workshop in Southern Tuscany: *The identification of the accessibility problems in several type of areas (tourist areas, city center, points of interest, peri – urban areas etc.) and the investigation of innovative solutions for these issues.*

Main objective of the second co-creation workshop in Southern Tuscany: *The shift from problems' and needs' identified in the first workshop to further analysis and solutions investigation.*

Main objective of the first co-creation workshop in Frankfurt: *Building a common understanding for the creation of a single 'umbrella' Public Transport brand concept replacing local and regional PT brands, as well as on identifying barriers and innovative solutions for its adoption.*

Main objective of the second co-creation workshop in Frankfurt: *The identification of innovative concepts for Public Transport, tailored to the local needs and specifications, by considering the portfolio of existing Public Transport innovations (as they were reviewed in previous project's research activities) and the suggestions of the members of the Public Transport council.*

Main objective of the first co-creation workshop in Rotterdam/The Hague: *The generation of concrete and innovative ideas or concepts (services and products) that will enhance the quality, attractiveness, market share and experience of Public Transport use within the region.*

Main objective of the second co-creation workshop in Rotterdam/The Hague: *Elaboration of the results of the first event, by identifying related new innovative concepts that are in line with the scope of the first workshop's results.*

In total, 209 participants, both citizens (PT users and non-users) and experts with diverse backgrounds and expertise, attended the eight co-creation workshops from various groups (e.g. citizens and community groups, mobility providers and PT operators, experts in the field of PT, local authorities and transport policy makers).

Co-creation and evaluation methods used: Brainstorming, World Café, Role playing, Conceptual mapping, Dot Voting, Two dimension axis, Appreciative Inquiry, Problem Tree, Brand Constellation, Storytelling, Dilemma Thinking.

Introduction Phase

Marshmallow Challenge

Participants try to build the tallest free-standing structure, out of spaghetti sticks and a marshmallow on the top.

Standard Personal Introduction

Participants have the opportunity to know each other.

Co-creation Phase

Brainstorming

Participants express usually absolutely freely their ideas creating an inventory.

Conceptual mapping

Participants visually demonstrate the brainstorming discussion that stimulates the generation of new ideas.
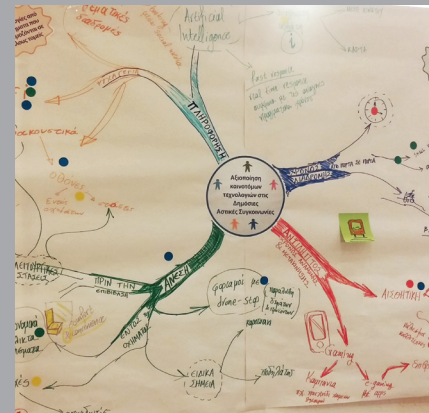
Role playing

Participants play roles discussing more easily complex social issues in a non-threatening environment.

Appreciative inquiry method

Participants envision the ideal situation, e.g. the ideal trip by Public Transport and think of innovative solutions.
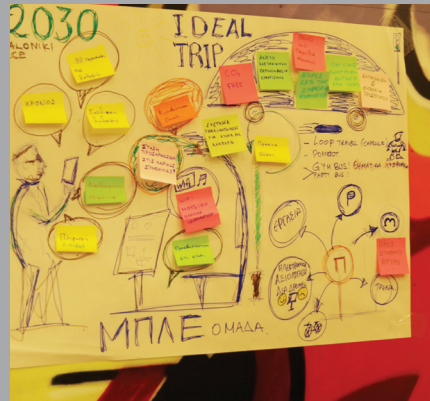
World Café

Participants discuss a question or issue in small groups around the café tables. At regular intervals the participants may move to a new table.

Evaluation Phase

Two dimension axis

Participants place the co-created concepts on a two-dimensional axis being assessed against two criteria, e.g. feasibility and potential for PT growth.

Dot voting

Participants allocate a number of stickers or dots, which are used to prioritize and converge upon an agreed solution.

Crowdsourcing campaigns

In the frame of the project an online "crowdsourcing platform" was developed in order to mobilise and activate city residents to demonstrate, propose and design new innovative ideas, practices, business models, etc. - preferably at the lowest possible cost – for public transport.

The crowdsourcing action aimed at the interaction of the citizens and the enhancement of cooperation and communication with each other to achieve the objective of improving Public Transport. It was an "experiment" about the activation of the people and the inclusion of them in the pl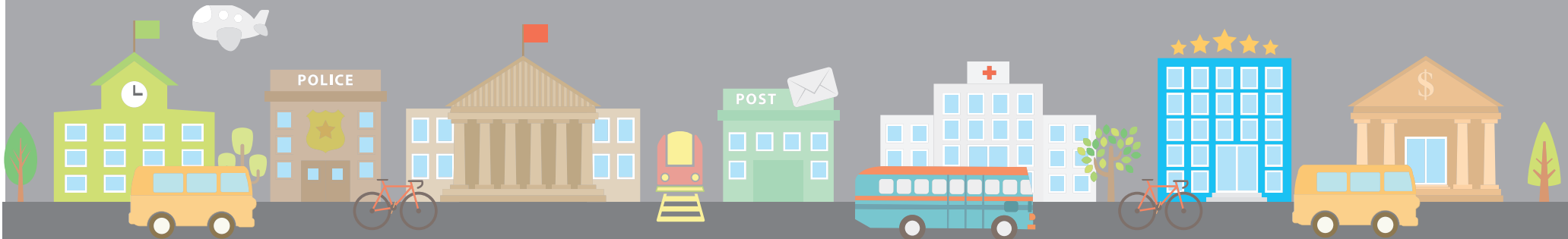anning that allowed drawing general conclusions on the effectiveness of the crowdsourcing method concerning urban and transport management issues. Therefore, the platform was encouraged to be used as an open dialogue forum. In general, CIPTEC used crowdsourcing for generating innovative ideas from different groups of individuals and stimulating dialogue and discussion among all parties involved in the Public Transport sector.

Beyond the motivation derived from the participation, dialogue and joy of collaborative creation themselves, it was expected that some attractive gifts could encourage citizens to participate. However, the potential reward for some ideas/users had a moral and symbolic character in order to strengthen participation incentives, rather than strengthening the competitiveness between them.

Crowdsourcing platform

collective
intelligence

power
of the crowd

collaboration

"out of the box"
thinking

bottom-up
innovation

broader
acceptance

*The crowd submits and designates innovative
concepts and incentives for increasing the share
of public transport through a digital platform*

Crowdsourcing campaigns
On-line web platform

The homepage of the CIPTEC crowdsourcing platforms was designed and structured with the dual objective to be easy and friendly for the users and to provide adequate information about the campaigns.

The crowdsourcing campaign was addressed to all citizens interested in the improvement of Public Transport of their city. Every user and non-user of Public Transport systems were encouraged to share an innovative idea, regardless his/her gender, age, educational level, occupation etc.

Steps for winning
Register: In order to submit a new innovative idea for Public Transport, users should register in the platform by filling some personal details or by using their social media accounts.

Share: After their registration, users could submit their idea. In order for a submitted idea to be as more complete and comprehensible, some specific details were requested (e.g. the title, a short and a more detailed description, the thematic category and the transport system in which the idea is referred).

Get feedback: All registered users had the opportunity to evaluate other users' ideas and comment on them in order to improve them.

Win: Depending on the crowdsourcing campaign the most promising ideas arisen from users' evaluation, experts' committee in the field of transport evaluation or both of them. In some cases the most promising ideas won interesting gifts such as tablet, unlimited travel cards for Public Transport systems, PT City Trip from Netherlands to Stockholm.

Register	→	Share	→	Get feedback	→	Win!
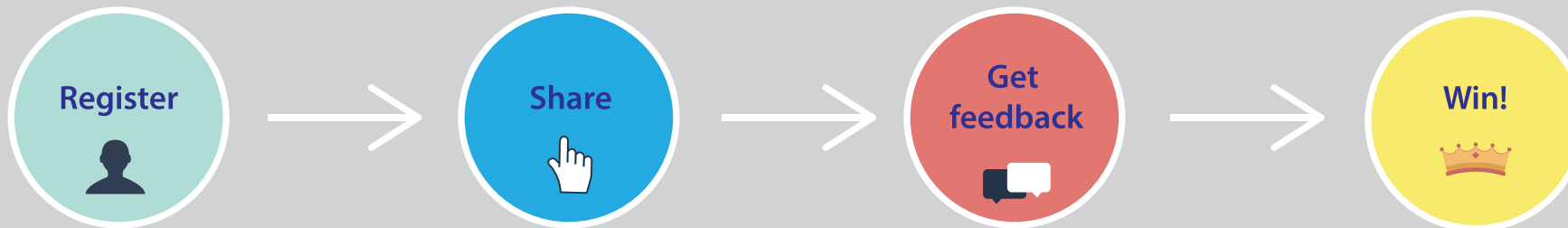
Crowdsourcing campaigns
Implementation areas

Within CIPTEC project, five different crowdsourcing campaigns ran in five different contexts, with the objective of receiving innovative ideas for Public Transport systems. In more detail, the five different campaigns were:

A **European-wide crowdsourcing campaign** where European citizens were able to submit generic innovative Public Transport ideas in English.

A **local campaign in the city of Thessaloniki,** Greece, in Greek language.

A **local campaign in the metropolitan area of Rotterdam/The Hague,** Netherlands, in Dutch language.

A **local campaign in the city of Frankfurt,** Germany, in German language.

A **local campaign in the metropolitan area of Southern Tuscany,** Italy, in Italian language.

The decision for five different campaigns was taken from the CIPTEC project partners in order to better test, evaluate and exploit the crowdsourcing platform developed in the frame of CIPTEC project and the crowdsourcing concept in general.

The ways of dissemination that any organiser decides to adopt for advertising the campaign in the most effective way is one of the most significant issues in order for such a crowdsourcing initiative to be successful. For that reason, easily understandable and mnemonic slogan, posters and flyers were created, for the visual identification and promotion of the campaigns. In addition, informative Press Releases were circulated, and social media were exploited for reaching more subscribers and innovative ideas at the platforms. Finally, the campaigns were promoted in various events and conferences and via an e-mail invitation to potential users worldwide.

It is worth mentioning that the CIPTEC coordinator, AUTh, being responsible for designing and running the CIPTEC crowdsourcing campaign at Thessaloniki won the thematic "ECOPOLIS 2017 Environmental Awareness Campaign Award" for the successful implementation of the local action. The ECOPOLIS Awards ceremony is annually organized by ECOCITY, a Greek environmental oriented, volunteering NGO, active in the promotion of environmental protection, sustainable development and environmental awareness raising of citizens, with emphasis on the urban context.

Southern Tuscany

Frankfurt

Thessaloniki

Rotterdam

Rest of Europe

SELECTED IDEAS
resulted from CIPTEC using Collective Intelligence

8 Co-creation workshops

Thessaloniki
69 Ideas

Development of a mobile application indicating how overcrowded the vehicles are

By using this application, the users could be informed about the vehicle occupation so that they are given the opportunity to choose a less crowed vehicle/line and improve the conditions and the experience of their trip.

Development of the "social-bus" application

Application that allows Public Transport users to interact with other people travelling with the same mode of transport at the same time, e.g. using the same train, bus, etc.

Rotterdam
28 Ideas

City marketing from a Public Transport perspective

Combination of city marketing with Public Transport so as to address the needs of city visitors and promote city branding.

Flexible pricing options

Provision of customized pricing options for people with different transportation needs - e.g. individual travellers, business travellers, tourists, international guests, etc.

Frankfurt
37 Ideas

Single PT brand for all operators in an area

The concept of an umbrella brand concerns the development of one strong Public Transport brand that integrates all the other smaller local Public Transport brands that might exist in the region in order to reduce the confusion of Public Transport users.

Public Transport financing by the beneficiaries of the system

Public Transport financing could be organized in a way that every beneficiary -e.g. businesses, commuters, inhabitants, etc.- takes up its share to finance the Public Transport system.

Southern Tuscany
31 Ideas

Increase of accountability and transparency of decision taking process

Definition and sharing of a clear and verifiable set of indicators used to explain how decisions in PT are taken by Authorities and Operators

Innovative solutions for on-board passengers counting

Technologies such as the use of biometric data are quite promising for counting passengers on-board.

SELECTED IDEAS
resulted from CIPTEC using Collective Intelligence

5 Crowdsourcing campaings

Register

Share

Get feedback

Win!

European campaign

28 Ideas
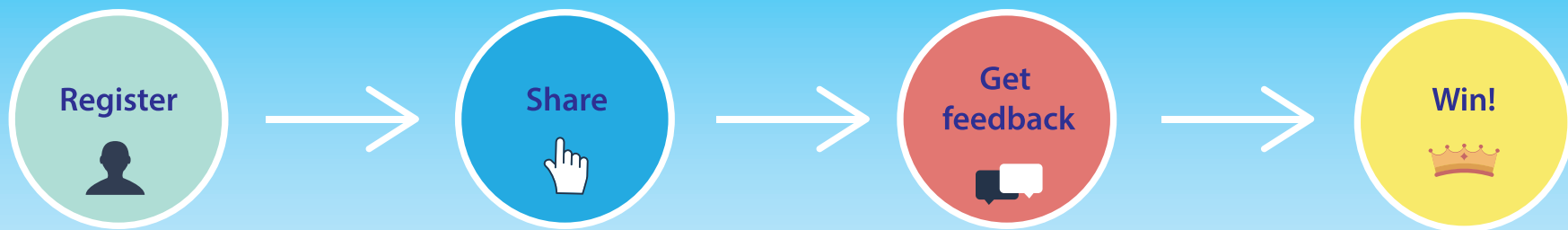
Dynamic Bus Lane with Intermittent Priority (BLIMP)

The BLIMP Bus Lane is a dynamic one, operating only when a bus is going to cross the street in which the operation is to be applied.

Boosting passengers' experience at public transport hubs

By using wide screens with funny images or interesting and attracting places of the city, pleasant music, public pianos etc. the Public Transport passengers' experience can be boosted.

Making on board public transportation a tool for social learning, sharing of experiences, knowledge and activities

Make Public Transportation a tool for social learning, create opportunities for citizens to share experiences, knowledge and activities while travelling by Public Transportation.

SELECTED IDEAS
resulted from CIPTEC using Collective Intelligence

5 Crowdsourcing campaigns

Thessaloniki
🇬🇷
164 Ideas

Collecting Points by each ticket validation

Rewarding of the passengers who choose Public Transport with small gifts through weekly/monthly draws or through the points' collection system by validating their tickets.

"On demand" feeder transport services using minibuses

Through these services, travellers can submit a travel request (origin, destination, time frame). Subsequently, all submitted requests are grouped spatially and temporally and minibuses are routed to serve these requests.

Rotterdam
🇳🇱
232 Ideas

Development of "Public Transport seats finder" application

"Public Transport seats finder" is an application that passengers can use to find out which parts of a vehicle are less crowded and are more likely to have seats available.

Development of an application which informs about the arrival time of a passenger at a destination

This app informs the people at a destination if they should start with a meeting, a training, a dinner, or if they can wait for the people that are still on their way.

Bus stops powered by solar energy, providing digital facilities

The idea is to install green technologies systems such as solar or photovoltaic panels on the stops, for electricity production, contributing to the creation of a place where it is pleasant to wait.

Frankfurt
🇩🇪
44 Ideas

'Accessibility' / Mobility information system before you go/enter

The passengers can be informed at the entrances and on the platforms if the elevator works in order to choose this station or another one. In addition, this information can be given for the whole part of a multimodal trip.

Customer information for bike and luggage transport

Passengers can be informed about the parts of vehicles, where users with wheelchairs, luggage/large suitcases, baby prams and bikes have priority.

Dynamic operations related to demands

The Public Transport timetable can be changed dynamically depending on passengers' waiting time, peak and off-peak hours, special events etc.

Southern Tuscany
🇮🇹
18 Ideas

Development of an application for the management of customer requests

Through the use of social media the application will be the main communication channel between the PT Operator and the users/citizens about problems during the services (i.e. delays at bus stops, modification of service .

Fully equipped Public Transport making travel time exploitable time

High quality service (equipped with WiFi, suitable seat, recharge plugs, etc.) targeted to serve commuters connections and enabling work during the trip.

HIDDEN GROUPS revealed profiles and associated existing innovations using Conjoint Analysis

In CIPTEC, advanced marketing research and consumer experimentation is used to draw conclusions on what people prefer in relation to Public Transport. Preferential questionnaire surveys were performed with the aim of analysing preferences on innovative solutions and identifying hidden groups. These were followed by online lab experiments and the ongoing field experiments in Rotterdam and Siena (Southern Tuscany), in which it is tested whether social labelling can be used to increase people's intended / hypothetical Public Transport use.

Under the objective of collecting and analyzing user preferences on innovations and revealing hidden groups with similar preferences, Conjoint Analysis (CA) was applied. CA is an advanced marketing research technique which attempts to explore what people really value in products and services, revealing the drivers behind users' choices. In CIPTEC, CA was used to analyse preferences concerning eleven (11) selected existing innovative concepts. Evidence was found supporting that preferences were driven by factors including - among others - gender, social group, country, reason for using PT, payment method. Findings reinforce the underlying work hypothesis that EU users have different preferences when it comes to PT innovations.

As our segmentation analysis reveals, there are homogenous groups with different priorities and therefore different needs and driving factors. These groups don't follow the dominant demographics patterns (e.g. age, gender) and remain hidden to the common analytics and stereotypical approaches. Mapping and appreciating these finer structures can open u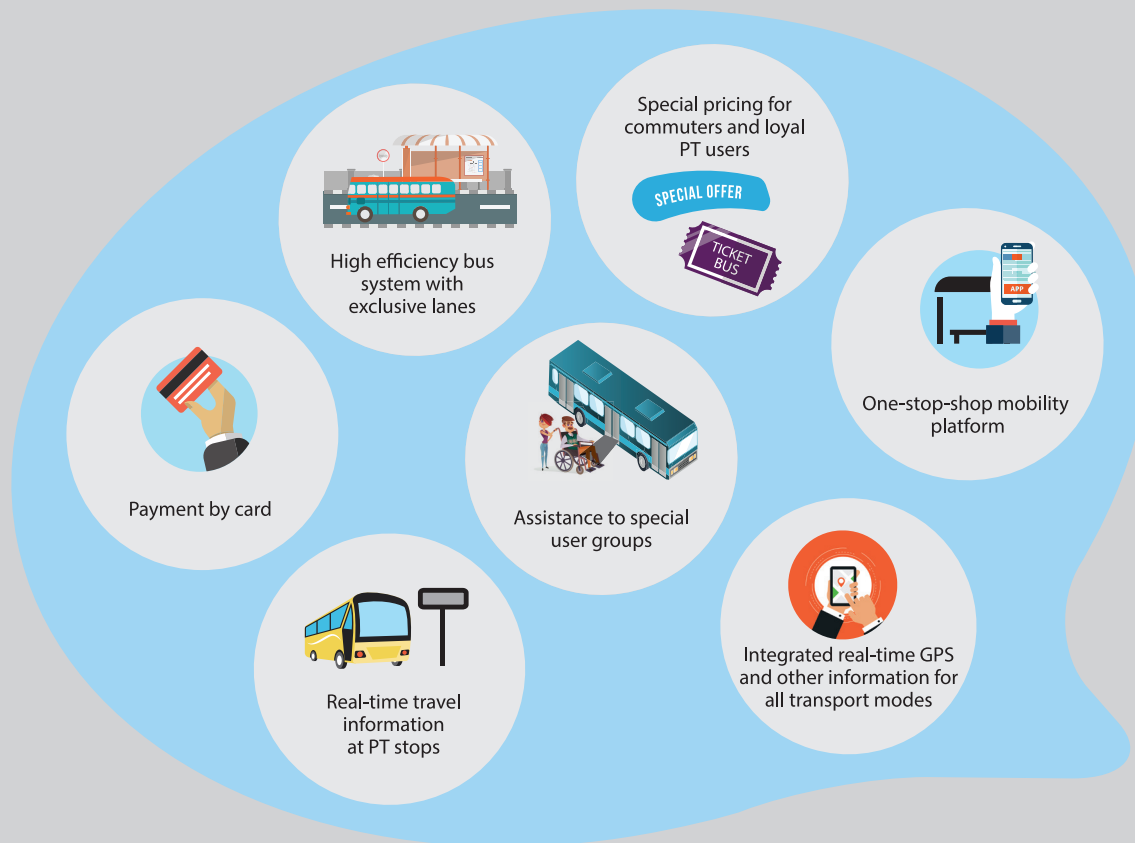p the way for improved customer-oriented service design, better tailored innovation strategies and roll-up to target these segments.

One key insight is that introducing more than one innovation can have a significantly larger effect than introducing these innovations alone. While more evidence is necessary, this preliminary finding points to the fact that there is synergetic value (beyond mere adding of values) in combining certain innovations in a service. This finding also suggests that one-shot innovation introductions might be less impacteous in increasing choice share than a combination of two or more. However, according to our data, it should be noted that this effect does not appear to work for any combination – introducing the wrong innovations could result in marginal effects. Innovations should be strategically viewed, selected and rolled out in order to take advantage of the positive synergetic effects.

Our empirical results are expected to inform the CIPTEC toolbox directly but also to inspire transport authorities to employ these marketing research methods in their new service offering development.

Seven (7) distinct groups/segments with similar preferences were identified. The main attributes of each group and the associated preferred innovations are presented hereafter. From a practical standpoint, both differences and similarities among the present seven groups could be utilized by the practitioners in order to effectively place their services to the appropriate target groups.

High efficiency bus system with exclusive lanes

Special pricing for commuters and loyal PT users

SPECIAL OFFER

TICKET BUS

Payment by card

Assistance to special user groups

One-stop-shop mobility platform

Real-time travel information at PT stops

Integrated real-time GPS and other information for all transport modes

" **Group 1**
• Urban dweller
• Weekly trips: Pedestrian or by private car
• PT only out of necessity
• 0-10% of monthly budget spent for mobility issues
• Ready to change mobility habits "

HIDDEN GROUPS revealed profiles and associated existing innovations using Conjoint Analysis

Group 2

" • Lives in urban or suburban area
• Weekly trips mostly by private car
• Not frequent PT user
• 0-10% of monthly budget spent
for mobility issues
• Sensitive to price increase
• Not willing to change travel behaviour
• Most likely to never have had
a traffic accident "

Special pricing for commuters and loyal PT users

SPECIAL OFFER

TICKET BUS

Assistance to special user groups

Group 3

" • Urban dweller
• Weekly trips mostly on foot
• PT user mostly out of necessity
• 11-20% of monthly budget spent
for mobility issues
• Moderately ready to change travel
behaviour
• Most likely to never have had
a traffic accident "

Real-time information applications

APP

Smart cards for all mobility needs

HIDDEN GROUPS revealed profiles and associated existing innovations using Conjoint Analysis

Group 4
- Urban dweller
- Weekly trips mostly by private car
- PT user mostly out of necessity
- 0-10% of monthly budget spent for mobility issues
- Not ready to change travel behaviour
- Never have had a traffic accident

Real-time travel information at PT stops

Group 5
- Urban dweller
- Weekly trips mostly on foot or by private car
- PT user mostly out of necessity
- 0-10% of monthly budget spent for mobility issues
- Ready to change travel behaviour
- Most likely to never have had a traffic accident

High efficiency bus system with exclusive lanes

HIDDEN GROUPS revealed profiles and associated existing innovations using Conjoint Analysis

Group 6
• Urban dweller
• Weekly trips mostly on foot
• PT user mostly out of necessity
• 0-10% of monthly budget spent for mobility issues
• Moderately ready to change travel behaviour
• Most likely to never have had a traffic accident

Integrated real-time GPS and other information for all transport modes

Group 7
• Urban dweller
• Weekly trips mostly on foot
• Not frequent PT users
• 0-10% of monthly budget spent for mobility issues
• Not ready to change travel behaviour
• Either never have had a traffic accident or one with only minor damages
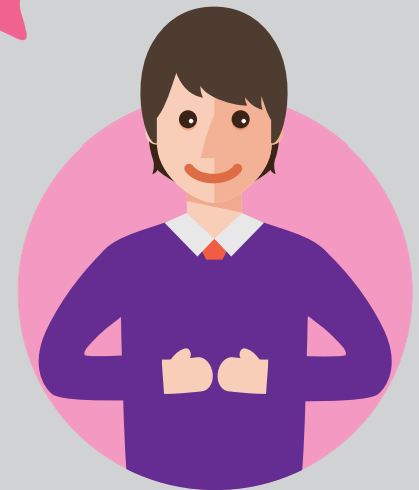
Customized travel information for specific groups

Assistance to special user groups

A toolbox to capture the generated knowledge and provide strategy advice on innovation introduction to Public Transport stakeholders

CIPTEC TOOLBOX FOR PUBLIC TRANSPORT INNOVATION

Toolbox for Public Transport Innovation: A toolbox to capture the generated knowledge and provide strategy advice on innovation introduction to Public Transport stakeholders.

The "Toolbox for Public Transport innovation" will be delivered under three different versions:
• Printed "full version" Deliverable
• Printed dissemination version (booklet)
• On-line tool

The target audiences of the Toolbox are Public Transport stakeholders (e.g. Public Transport Operators and Authorities, Policy makers, Decision makers, Citizens/End-users Associations).

Two levels (type) of contents have been defined for the Toolbox:
• General purpose contents: open and suitable for all the target groups
• Targeted contents: specifically addressed to Public Transport Authorities/Operators and Decision Makers as they mainly refer to the selection, the design and the implementation of innovative concepts in Public Transport.

The Toolbox provides Public Transport stakeholders with:
• Insights on how operational procedures, organization structure, cultural background, personal attitude towards changes in the daily workflow, etc. can affect the operation of new concepts/solutions in Public Transport.

• Recommendations on the design and implementation of innovative concepts/measures in accordance with the reference context, current conditions of Public Transport operation, local needs, operational requirements, planned targets.
• A set of innovative concepts/measures selected by CIPTEC project, which can be:
   - Accessed as a whole list covering all the different areas of Public Transport and service cycle (planning, programming, operation, control/monitoring/assessment, reporting, evaluation, etc.).
   - Filtered on the basis of suitable reference context and transport mode, objectives/needs to be achieved.

These innovative concepts/measures are generated within CIPTEC project by the survey of existing/emerging innovative concepts in Public Transport, the adaptation of new concepts coming from other Transport mode services and businesses, the adoption of collective intelligence methods aiming to cover the distance between Transport specialist/professional expertise and end-users/citizens.

Thanks to the on-line version of the Toolbox this repository is open to receive the contribution of Public Transport stakeholders in terms of new contents, feedbacks on the relevance of each concept/measure, submission of new concept. This approach guarantees an on-going interaction between the on-line Toolbox and its target audience and the maintenance of the contents over time (even after the project end).

THE FUTURE CITY PUBLIC TRANSPORT SERVICES

How Future City and its Public Transport services will look like?

Technological and organizational initiatives of the present day become mainstream application systems of tomorrow. New global and local issues, trends, demands arise continuously.

But cities have unique characteristics, local problems, challenges and priorities resulting to the development and predominance of a particular mix of transport services, as an answer to global and local needs.

Thus any attempt to describe an ideal mix of Public Transport services and innovations in a Future City will be very subjective and abstract. Our attempt, to select promising Public Transport innovations and present them as a possible application mix in an idealized future city, should be considered under the light of the aforementioned elements, subjectivity and abstraction.

We selected certain innovative concepts resulted from our review and evaluation of existing ones and also from the ones resulted from the CIPTEC co-creation workshops and crowdsourcing campaigns.

The concepts selected have been classified in certain fields of application concerning Public Transport: i.e.

Public Transport Efficiency
• Personal Rapid Transit
• Internet of Things
• Use of autonomous vehicles
• Fully electric buses
• On demand services
• PT financing by the system's beneficiaries

Promotion of Intermodality
• Intermodal Journey Planner
• Shared Mobility Agency and related ICT platform
• MaaS oriented apps
• Cross-sectoral partnership

Enhancing Users Experience
• Improving Waiting Time Perception
• Rewarding
• Gamification
• Easy Transfers & wayfinding
• Fully equipped PT making travel time exploitable time
• Social-bus app for networking and socializing
• PT widget indicating the accessibility of places of interest by PT

Providing Incentives and Motivation to use Public Transport
• Use of "ambassadors" in the entire service provision to overcome barriers (Momaboards)
• Use of Superpromoters to foster Public Transport's cultural change
• Incentives to share data
• Integrating PT use in Entrance Tickets of Events
• All-Inclusive Card for integral PT
• City marketing from a PT perspective
• New Creative Uses of Hubs: the Seats2Meet concept of co-working spaces

Public Transport Efficiency

Personal Rapid Transit

Internet of Things

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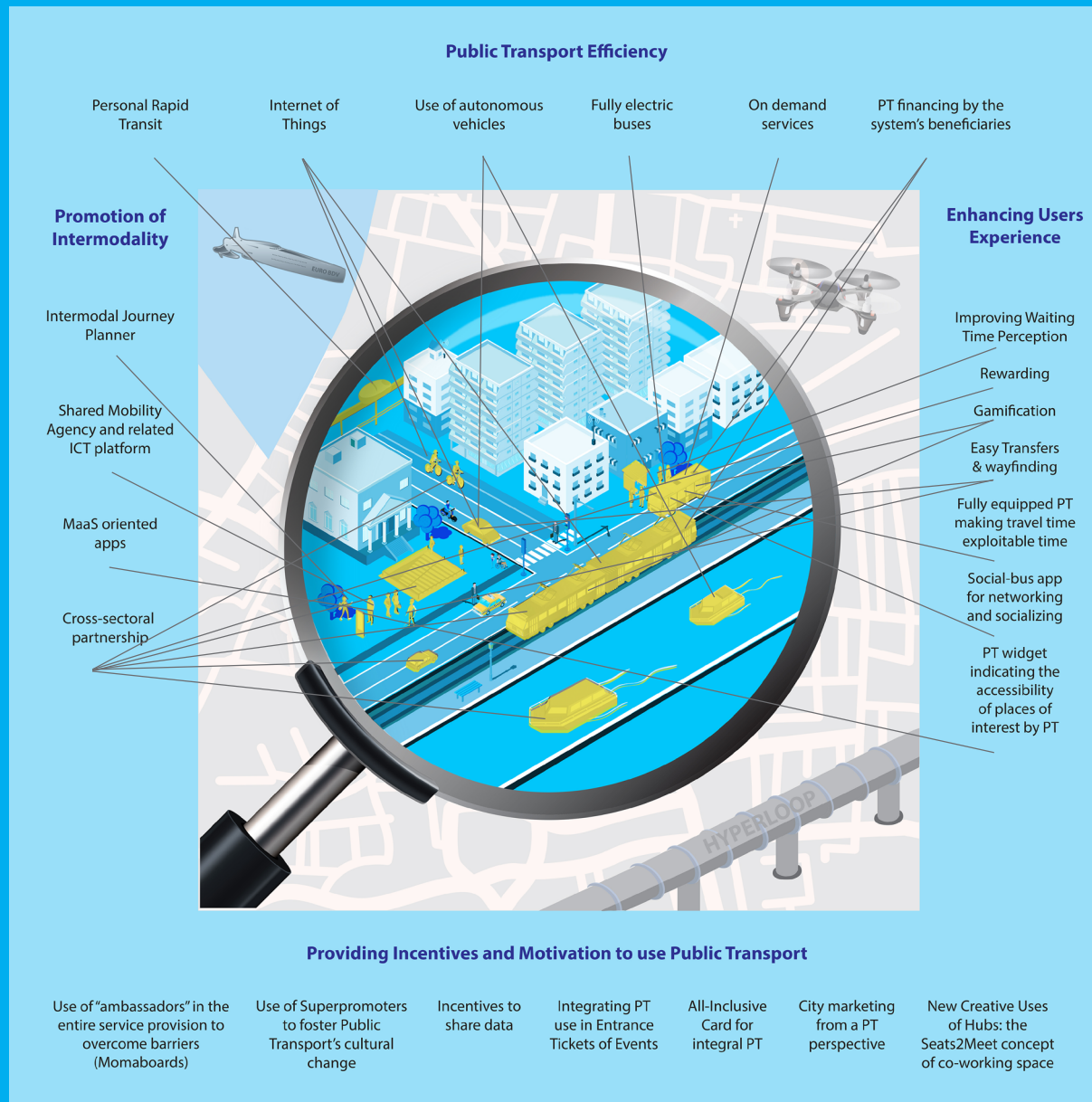**Enhancing Users Experience**

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City marketing from a PT perspective

New Creative Uses of Hubs: the Seats2Meet concept of co-working space

CIPTEC CONSORTIUM

Logo	Organization
	Aristotle University of Thessaloniki-Transport Systems Research Group, Greece
KU LEUVEN	KU Leuven - The Research Centre for Marketing and Consumer Science, Belgium
MOBYCON	Mobycon Concordis Groep, Research Consultancy, The Netherlands
Tero Consulting	Tero Ltd., Research Consultancy, Greece
MemEX	MemEX, Public Transport and ITS Consultancy, Italy
WhiteResearch	White Research, Research Consultancy, Belgium
ortelio	Ortelio Ltd., Research Consultancy, United Kingdom
MRDH	Metropolitan Region Rotterdam The Hague, Public Transport Authority, The Netherlands
tiemme TOSCANA mobilità	TIEMME, Public Transport Operator, Southern Tuscany, Italy
traffiQ Frankfurt am Main	Local Public Transport Authority of the City of Frankfurt am Main, Germany
EPF	European Passengers' Federation, Belgium
EMTA	European Metropolitan Transport Authorities, France

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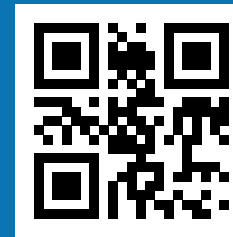
📧 auth@ciptec.eu
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For more information, please contact the Project Coordinator:

Prof. Aristotelis Naniopoulos
Transport Systems Research Group (www.tsrg.gr)
Aristotle University of Thessaloniki,
Faculty of Engineering,
"Ktirio Edron", 6th fl. P.C. 54124, Thessaloniki, Greece
Tel: +30 2310 995796
e-mail: naniopou@civil.auth.gr

This is an interim edition of a CIPTEC booklet produced in view of CIVITAS FORUM 2017