This project received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 649397

FUTURE SCENARIOS ISTANBUL 2050

Appendix C to D2.2 Report - Desired Future Scenarios

15 June 2016

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ROADMAPS FOR ENERGY®

This appendix is part of the D2.2 Report - Desired future scenarios - and contains all results of the vision development activities held in the city of Istanbul.

The R4E project received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 649397.

Versions of this report:

15 May 2016	Concept for internal check in the city (limited distribution)
15 June 2016	Final version for public distribution

ISTANBUL METROPOLITAN MUNICIPALITY

Contents Appendix C

ROADMAPS FOR ENERGY®

SMART MOBILITY

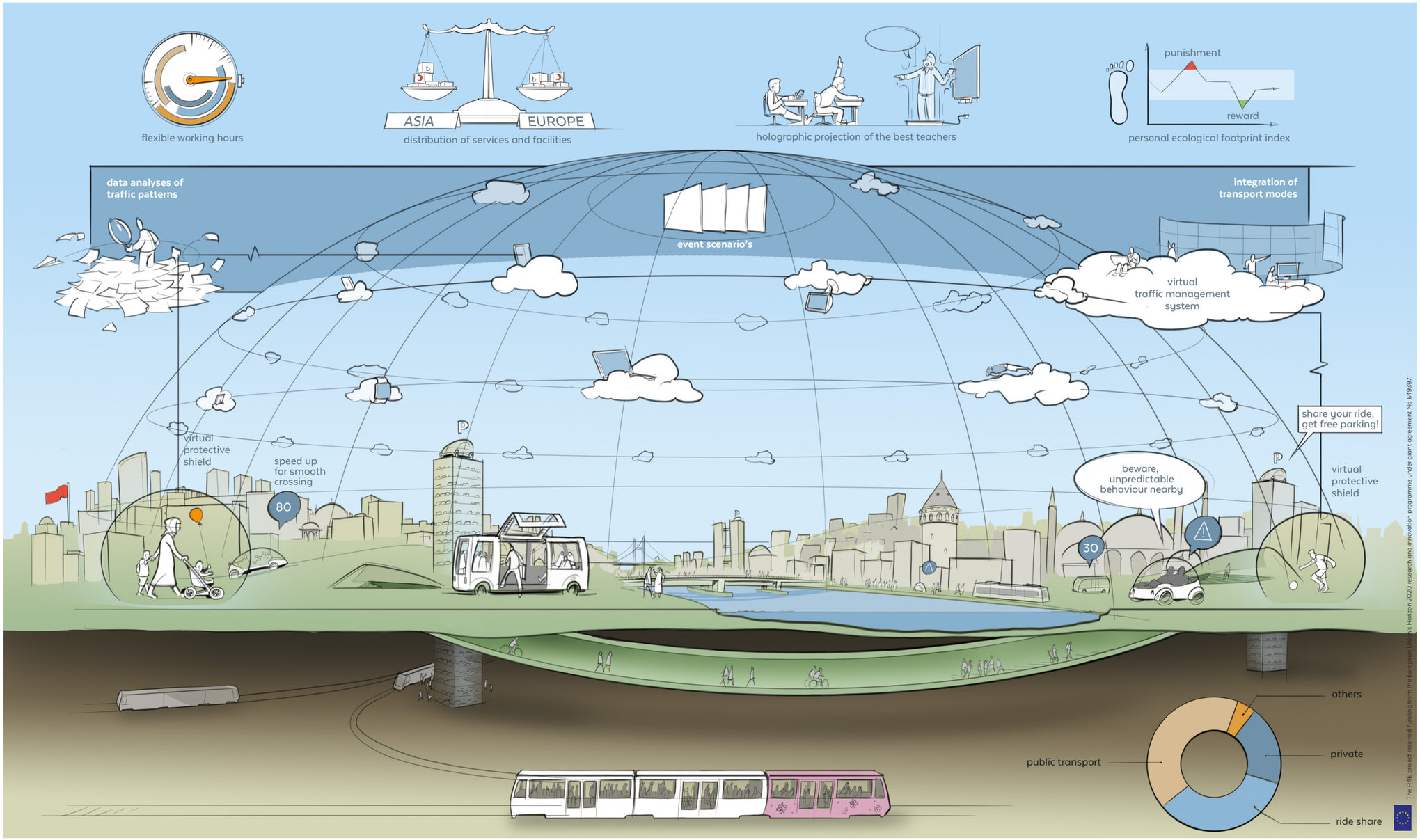
ISTANBUL METROPOLITAN MUNICIPALITY

PERSONALISED, SMOOTH, SAFE TRAFFIC IN ISTANBUL 2050

In 2050, individual travellers in Istanbul are valued and facilitated by personalised travel advise. Smart technologies and apps enable personalised route planning. Communication between vehicles, drivers and infrastructure allows smart signalling. Green behaviour is encouraged by a range of personalised, sustainable options.

People value fast, smoothly flowing traffic, free from congestion. Automated systems support smooth traffic flows through the city. Mass transport solutions are attractive thanks to flexible charging and working hours. Alternative routes and transport modes are conveniently available. People value better air quality and choose healthier options such as walking and cycling.

Traffic is safe. Smart safety measures help to avoid accidents and traffic violations. Vehicles are equipped with smart solutions and options to communicate, both with other road users and with the infrastructure.



The R4E project received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 649397.

Elements of the desired future scenario are:

Smart traffic management system

All traffic in Istanbul is managed through a single, safe, reliable and efficient system. The system connects all public and private vehicles, devices and road users and is accessible from anywhere. Data is collected to analyse the traffic movements and provide real-time (event-driven) smart traffic management.

Compact smart e-vehicles:

People make use of personalised services based on compact smart vehicles. Vehicles are sustainable (using recycled materials and with zero-emissions) and are charged at widely available charging stations using renewable energy sources. The service allows easy reservation, flexible payment and pick-up/drop-off at any point. Personal profiles (e.g. including a network of friends) and connection to the smart system provide routes and options to share rides with friends.

Strategic demand management

People travel less because high-quality services are available remotely. Remote health monitoring and preventive health services reduce the need to visit distant hospitals. High-quality training and education are available in all districts, for example through holograms of excellent teachers. Flexible school and working hours and relocation of offices spread the demand for travel. Ride-sharing and air-cargo drones reduce road traffic. Ride-sharing is safe and efficient thanks to easy reservation and accessibility (e.g. special, cheaper parking for shared cars).

Sustainable, healthy behaviour

Citizens have adopted healthy lifestyles. Activity levels are measured by wearable devices, and more walking is rewarded by privileged services. The use of private cars has been reduced. The new generation of people care about sustainability and use the system to make optimal choices (balancing costs, emissions, time, social aspects etc.).

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R4E ROADMAPS FOR ENERGY®

SMART MOBILITY

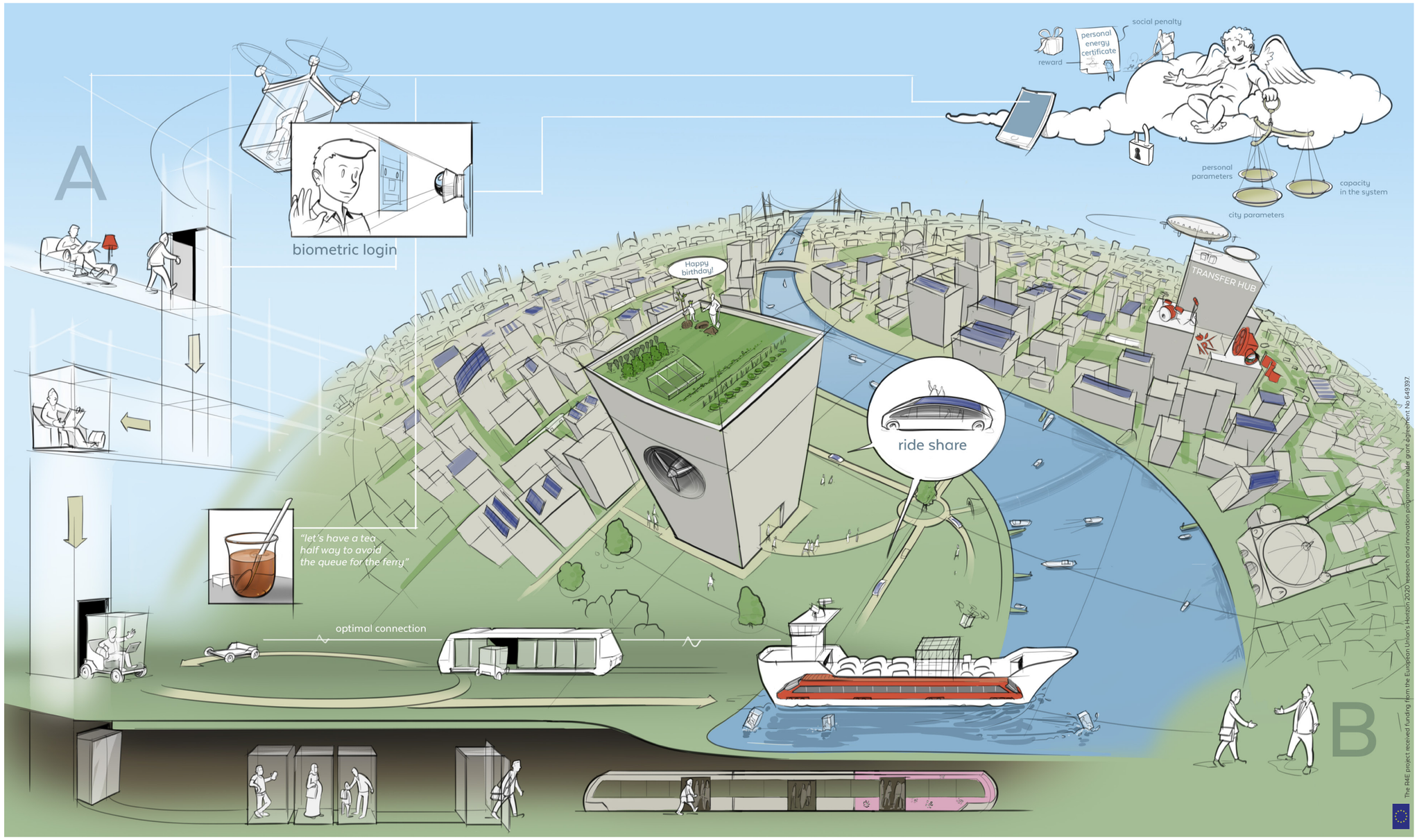
ISTANBUL METROPOLITAN MUNICIPALITY

FULLY INTEGRATED, ACCESSIBLE & SUSTAINABLE MOBILITY IN ISTANBUL 2050

In 2050, a clean, green and healthy environment is valued by the citizens of Istanbul. Travellers appreciate the wide range of alternative routes and forms of transport. Public transport benefits everyone by providing good accessibility to all modes of transport. These are seamlessly integrated, providing a closely-knit network that reaches every part of the city while respecting its historical heritage.

Travellers choose sustainable and healthy options. Public transport provides a single route to people's destinations, without disruptions caused by changes between modes. Travellers value the availability of accurate, up-to-date and cross-modal information. This enables them to choose the best options as and when they need them, taking into account changing situations and transport availability.

The public transport systems use renewable energy resources.



Elements of the desired future scenario are:

A clean and green city

In 2050, Istanbul is a clean and green city. A whole new city conceptthas been created around emission-free and ecological buildings with green roofs and waste recycling. In green areas all over the city residents enjoy walking, cycling and (hobby and urban) gardening. Pedestrian tunnels and floating gardens connect the areas. Citizens are energy-aware; a tree is planted for each child's birthday. Energy efficiency and sustainability are monitored for continuous improvement.

Seamless transport and pleasureable travel experience

Istanbul has an integrated transport system that provides door-to-door service. Buses, trams, automated vehicles, taxis, shared cars and bikes are all integrated into one, easily accessible service. New modes of transport and innovative vehicles are also integrated, like autonomous vehicles in the air and on water. The integration of smaller units (personal or larger) into larger ones (ferries or trains) avoids transfers. Management is by an autonomous system.

'Public' transport provides a pleasurable and comfortable travel experience. The PRT (personal rapid transit) system allows people to travel in their own units, which are transformed into DRTs (demand response transit) with VIP services.

People can easily transfer between all vehicles at hubs. These are real experience centres, with shopping, cinemas, and theatres.

Personal travel assistant

Everyone has a virtual 'guardian angel' for personal travel advice wherever they are, free of charge. All the 'angels' are connected to the cloud for accurate, up-to-date, cross-modal information. They give warnings of storms or snowfall, help to cancel or postpone trips when needed, help in case of emergencies or prevent accidents by warnings. They balance capacity in the system, important city parameters (energy, air quality, etc.) and personal health parameters.

Privacy & security

People feel comfortable and safe, because only the 'angels' have access to personal data. In 2050, the transport systems in Istanbul are also perceived as secure. For example, the biometric information used to identify people at entry points is also used to identify suspicious persons and activities. Personal data banks have a virtual shield to ensure confidentiality and privacy, and guard against hacking.

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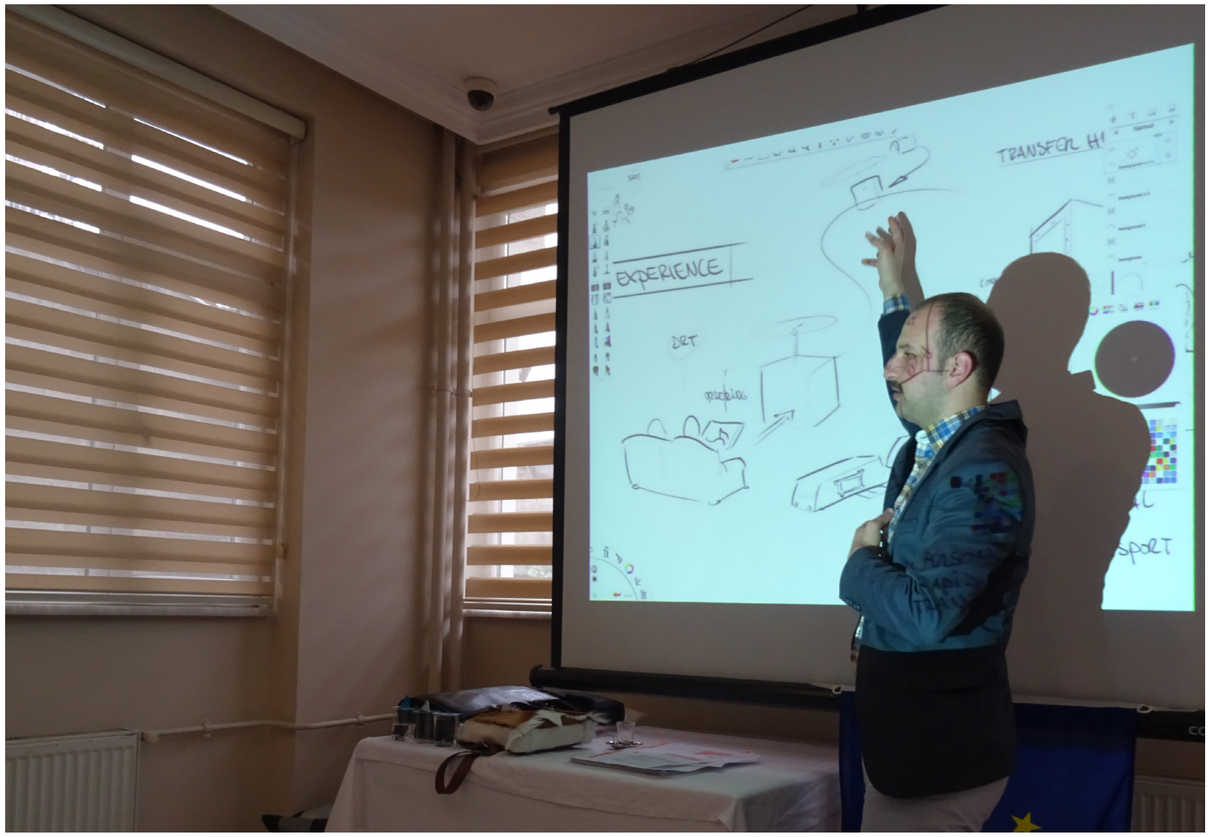


Creating the visual of the desired future scenarios

The making of the desired future scenario

The approach

In the Roadmaps for Energy (R4E) project, the partners work together to develop a new energy strategy: their Energy Roadmap. The difference between the regular energy strategies and action plans and these new Energy Roadmaps is the much earlier, better developed involvement of local stakeholders. These include not only those who will benefit from the new strategy, such as the citizens themselves, but also relevant research and industry partners. They offer a much clearer view of the future potential of the city in terms of measures and technologies, as well as of the challenges presented by today's situations in the cities. The aim is to create a shared vision containing the desired, city-specific scenarios and the dedicated roadmaps to be embedded in the context of each city.

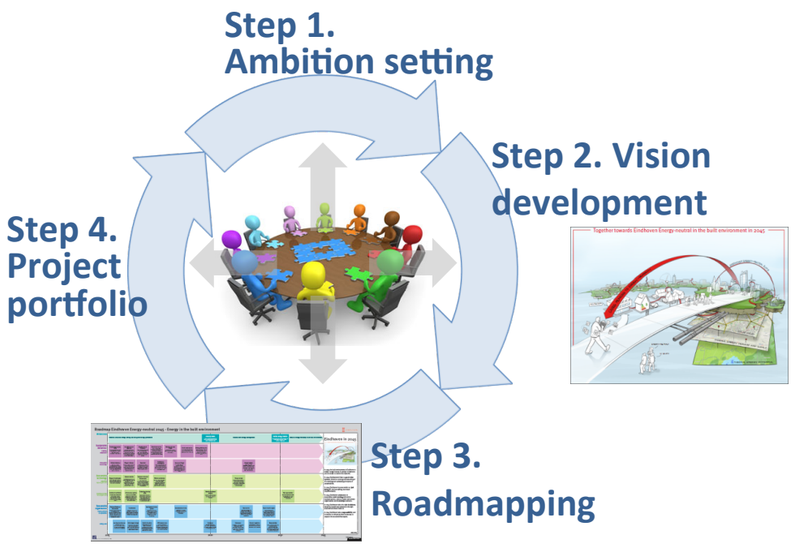
The R4E project follows a four step approach:

1. Set the ambitions of the participating cities on sustainable energy and Smart Cities, as well as their choice of three Smart Energy Saving focus areas: 1. Smart Buildings; 2. Smart Mobility; and 3. Smart Urban Spaces.

2. Develop scenarios for the selected focus areas.

3. Create the roadmap. Identify existing and future technologies and other developments – these will enable the desired future scenarios. Plot the opportunities and developments on a timeline, showing the route and milestones towards the desired scenarios. The roadmaps contain common parts for all the partner cities, as well as specific parts for the individual cities.

4. Create a portfolio of new projects and initiatives to achieve the ambitions, visions and roadmaps of the cities. This portfolio shows the shared and individual projects, and includes a cross-city learning plan and a financial plan.



Four step approach of R4E

Step Two: Vision development

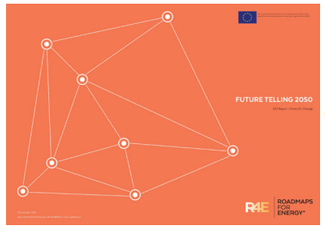
The aim of Step 2 is to develop visions for the cities in the selected focus areas. A vision is based on a long-term perspective on the world — in this case we are focusing on 2050. Two main activities are taking place in this step: Future Telling research and the development of desired future scenarios.

Future Telling

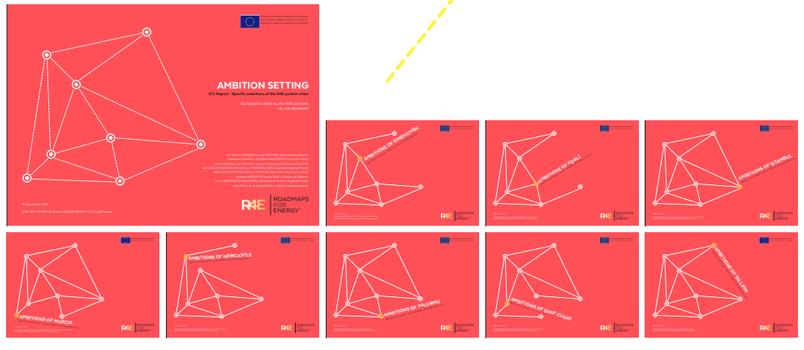
The first part of the vision development activity is to identify Drivers for Change that influence the future of Smart Cities in general, as well as Smart Buildings, Smart Mobility and Smart Urban Spaces in particular. The Future Telling research method is an approach to create context-related possible future scenarios in a creative, imaginative way. Future Telling research consist of a structured method to map expertise and ideas of thought leaders from the Smart Cities domain. Through interviews and analysis leading to the Drivers for Change for liveable and smart cities in 2050. This research and the 18 Drivers for Change are described in the report Future Telling 2050 D2.1 Report — Drivers for Change.

Developing desired future scenario's

Out of the 18 Drivers for Change for smart and sustainable cities, the cities have chosen the most important Drivers for Change to be included in their further vision development. Together with the Ambitions, which the cities set in Step 1, the desired future scenarios for the focus areas will be developed in city scenario workshops. The ambitions are described in the Ambition Setting D1.1 Report — Specific ambitions of the R4E partner cities.



Future Telling 2050 - D2.1 report - Drivers for Change



Ambition Setting - D1.1 report - Specific ambitions of the R4E partner cities

City scenario workshops

The desired future scenarios for the selected focus areas in the cities are created in a series of workshops held in each of the partner cities. These Scenario Workshops consist of a 3-day programme in each city, and include sessions with policy-makers and stakeholders to develop a rich, contextual scenario for the city. Local stakeholders (companies, citizens, public and private organisations and knowledge institutes) are invited to take part in the workshops through the networks in the cities. The results of the Scenario Workshops are reported in the same format for each of the city, facilitating cross-learning between the cities.

Two sessions are held for each focus area. In the morning session the outline for the vision and the desired future scenario is developed. The main stakeholders work with the set ambition for the focus area and the selected Drivers for Change to understand their impact on the city in 2050. Together, the participants define the main elements of the vision. Then, in the afternoon session a broad spectrum of stakeholders are invited to enrich the desired future scenario with specific additions. Based on the outlined vision they carry out a further in-depth exploration of the main elements of the vision in-depth.

In all the sessions, the participants will interactively build a visualisation of the desired future scenario. See also the pictures of the workshops.

Day 1 - Focus area 1	Day 2 - Focus area 2	Day 3 - Reporting
Outlining the vision • Exploring the Drivers for Change in relation to the future of the city • Selecting the main elements of the vision	**Outlining the vision** • Exploring the Drivers for Change in relation to the future of the city • Selecting the main elements of the vision	Project team working session to prepare the report of the Scenario Workshop
Enriching the desired future scenario • Exploring the future of the city and the main elements of the vision • Enriching the vision with specific additions	**Enriching the desired future scenario** • Exploring the future of the city and the main elements of the vision • Enriching the vision with specific additions	

Program of the ambition workshops

The result of the vision development step is a visualisation of the desired future scenario. The visual is explained in this report and the main elements of the vision are described. The following pages also provide the background of the scenario: the ambition of the focus area, copied from the Ambition Setting D1.1 Report — Specific ambitions of the R4E partner cities and the selected Drivers for Change for each focus area, copied from the Future Telling 2050 D2.1 Report — Drivers for Change.

Ambition: Fully integrated, accessible & sustainable mobility in Istanbul 2050

SMART MOBILITY

1 Clean, green and healthy mobility

In 2050, a clean, green and healthy environment is valued by the citizens of Istanbul. Travellers appreciate the wide range of alternative routes and forms of transport. Travellers choose sustainable options: they use fewer cars and more public transport, and they frequently choose to travel by bike or to walk.

Public transport systems use renewable energy resources.

Strategic ambitions

- In 2050 we have energy-efficient, sustainable and green transportation.
- In 2050 we use less cars and more public transport and bikes.
- In 2050 we have increased the share of rail systems to beyond 50%.
- In 2050 we have attractive pedestrian and bicycle areas.
- In 2050 we use renewable resources for energy in public transport.

2 Fully accessible, seamless transport

In 2050, public transport benefits everyone by providing good accessibility of all modes of transport. These are seamlessly integrated, providing a finely meshed network that reaches every part of the city, while respecting its historical heritage. Public transport provides a single route to people's destinations, without disruptions caused by changes between modes.

Strategic ambitions

- In 2050 we have accessibility of all modes of transportation through integration.
- In 2050 we achieved a 100% social inclusion in terms of mobility.

3 Well-informed travellers

In 2050, travellers value the availability of accurate, up-to-date and cross-modal information. This enables them to choose from the best option as and when they need them, taking into account changing situations and transport availability.

The information provided includes available routes, fares and car parking facilities.

Strategic ambitions

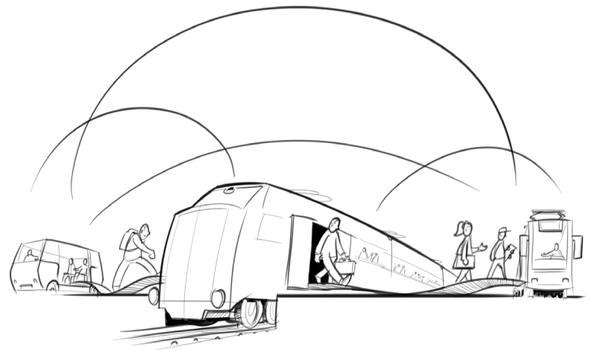
- In 2050 all mobility elements will be smart, using all effective Intelligent Transportation Systems (ITS) solutions.
- In 2050 we have better information in information systems.

Drivers for change for the future of Smart Mobility (public transport) in Istanbul 2050

SMART MOBILITY

Valuing public transport

In 2050, cities offer attractive, seamless mobility options: these give everyone access to everywhere. New investment structures and revenue models ensure that the city values (such as inclusiveness) are ingrained in system design. Cities actively influence operators to ensure high levels of customer satisfaction and service quality.



Experience, experience, experience

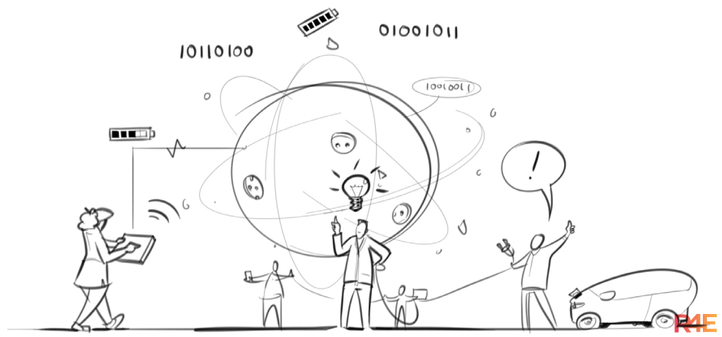
In 2050, city residents travel because they like the experience. For short (hyper-local) distances by walking or cycling, to reach places on a daily human scale. And for longer (hyper global) distances, the whole planet can be reached within a few hours. Even space travel could be an option! There's a range of convenient, clean mobility options, making use of abundant renewable energy. Travel has never been easier – it provides seamless connections from where you are to where you want to go. Services focus on what people need, and not on the available systems.

Connecting to 'green' and 'nature'

In 2050, people's need for 'green' and 'nature' is met by well-connected green spaces and landscapes all over the city. Soft birdsong and other nature sounds add an intangible quality and sense of well-being. Urban farming increases regeneration of resources, creating fresh, healthy foods, reconnecting with nature and mobilising local communities. People are aware of the effect of their living environment on health and well-being, and push for cleaner technologies. Advanced systems allow control of micro-climates, contributing to more resilient cities.

Democratised energy systems based on open data

In 2050, energy systems are open, bidirectional, multi-purpose platforms on which (renewable) energy and energy management services are open to all. Entrepreneurs have developed business models that provide value for them, for their users and for society at large. Citizens can choose freely from a range of available options. The system ensures privacy and security of users, who are always in control. Ambient energy networks provide connectivity for (wireless) access to data and energy. Increased computing power and artificial intelligence make system resilient: self-organising, self-sustaining and self-learning.



Ambition: Personalised, smooth, safe traffic in Istanbul 2050

SMART MOBILITY

1 Personalised travel advise

In 2050, individual travellers are valued and facilitated by personalised travel advise. Smart technologies and apps enable personalised route planning. Communication between vehicles, drivers and infrastructure allows individual signalling.

Green behaviour is encouraged by a range of personalised, sustainable options.

Strategic ambitions

- In 2050 everyone has it's own route-planner using smart apps and technologies provided. There is no need to ask anyone else for your own discretion.
- In 2050 we have individual signalisation so that communication with vehicles and drivers is possible.
- In 2050 green behaviour is stimulated

2 Fast, smooth traffic flows

In 2050, people value fast, smoothly flowing traffic, free from congestion. Automated systems support smooth traffic flows through the city. Mass transport solutions are attractive thanks to flexible charging and working hours. Alternative routes and transport modes are conveniently available.

People value better air quality and choose healthier options such as walking and cycling.

Strategic ambitions

- In 2050 traffic congestion is not among the primary 10 problems in Istanbul.
- In 2050 people move faster and fluently through the city, experiencing no congestion and using new transport modes (walking, cycling etc.). There is better air quality to stimulate healthier living and more walking and cycling.
- In 2050 there is no congestion due to the use of automation and automated solutions
- In 2050 we have low emissions and a healthy environment.

3 Traffic safety

In 2050, people in Istanbul value traffic safety. Smart safety measures help to avoid accidents and traffic violations. Vehicles are equipped with smart solutions and options to communicate, both with other road users and with the infrastructure.

Strategic ambitions

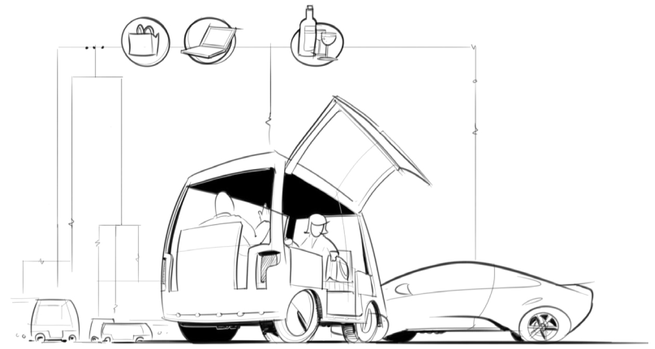
- In 2050 we have safe traffic management by communication between vehicles and infrastructure. Vehicles are equipped with smart safety measures to avoid accidents.
- In 2050 Istanbul will be in world top 5 regarding traffic safety statistics.

Drivers for change for the future of Smart Mobility (traffic management) in Istanbul 2050

SMART MOBILITY

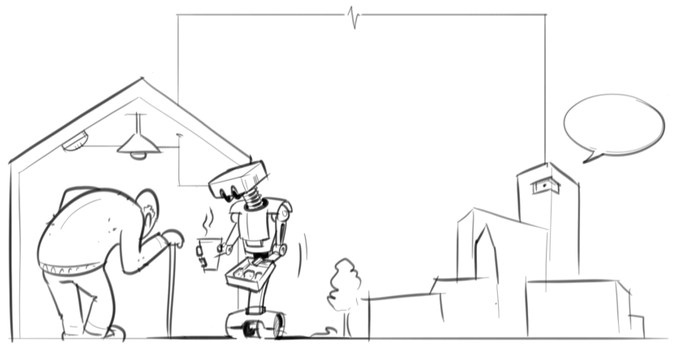
Personal mobility as a service

In 2050, technology enables autonomous vehicles. These take affordable personal mobility to a whole new level. Technology makes sharing easy, so everyone has access to a vehicle whenever they need it. It also facilitates the transition to a circular economy, gradually replacing legacy systems with cleaner, safer options. Stakeholder resistance is overcome by the availability of complete, resilient system that meet the needs of city dwellers in full.



Technology with a human focus

In 2050, we've mastered the challenge of ever more complex, multifunctional systems and the need to make them easier to use. Those systems are user-focused: that means users can understand how the systems work, and how their own behaviour affects sustainability and energy use. Robotics and smart (home care) systems support living at home, helping people to live healthier lives and to stay in their homes longer as they get older. There's a range of available solutions that plug-in directly to the city's open energy platform.



Valuing public transport

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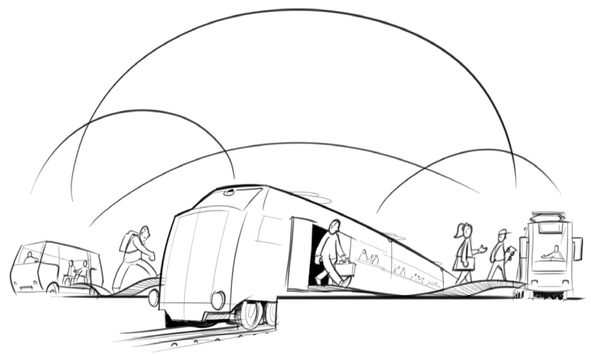
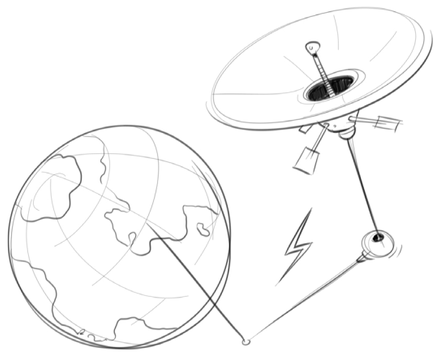


Applying new technologies

In 2050, a range of new technologies are available and affordable. Some of them are already in development, others are still unknown. Cities apply those technologies in new solutions that contribute to the quality of life, and in particular to the creation of smart buildings, smart mobility and smart urban spaces.




İSTANBUL BÜYÜKŞEHİR BELEDİYESİ
SOSYAL TESİSLERİ

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We would like to thank the participants for their contribution to the scenario workshops:

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