cross-border Mobility App (MaaS)

Use Case #1

The regiomove app is not a classic local transport app, but a mobility app. In addition to the classic means of transport such as buses, trams, regional and city trains, you can also use car and bike sharing with regiomove. Taxis, shuttles and e-scooters will be added in the future. Because charging and parking facilities are also important for a sustainable transport mix, you will also find these in the regiomove app.

You decide which means of transport you want to combine. Or you can conveniently let the app decide. It couldn't be simpler.

Not everyone will be able to do without their own car. Especially outside the cities and in the surrounding areas. With the regiomove app, you can therefore integrate your own car into the route. For example, to the next regiomove port. You can also see which option is the most CO2-saving.

The app is productive in the region of Karlsruhe, an area of approx. 1.300.000 inhabitants.

Source: regiomove by KVV

Responsible RECIPROCITY project partner: BIZUP/RTECH

External partners involved: inola

City/village/region & country: Regensburg, DE

x	urban	x	peri-urban	x	rural
x	tourism	x	everyday	x	commuter

technological readiness (TRL) [1-9]	9
simplicity to replicate [1=hard,... 5=easy]	3

Facts & figures

- Started as a research project in Nov 2017 with 11 partners
- Consortium lead was Karlsruher Verkehrsverbund
- Live in the app stores since Nov 2020 for the area of Karlsruhe
- Website: https://www.regiomove.de/
- Funded by

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°101006576

document not confidential

Domino – Maas

Use Case #2

Providing mobility for all users in a simple, convenient and networked manner - this is the vision we are working on at DOMINO, the "hub for intermodal mobility services and technologies". Avoiding traffic jams is one of our biggest goals. To achieve this, we have developed the app DOMINO OÖ.

The main objective of the DOMINO research project is to develop an integrated, publicly accessible mobility offer. It can be used by all users with as little barriers as possible and at the same time supports the mobility and climate goals of the public sector.

In three pilot regions, new offers will be created based on user needs and existing services to be integrated into a "MaaS made in Austria" system. The pilot operation will start in Upper Austria in the LINZ area in October

Mobility-as-a-Service (MaaS) is defined as a user-orientated, multi- and intermodal service that largely combines the offers of existing and new mobility service providers in the three core components of "multimodal travel information", "booking/ reservation/ payment/ billing" and "sharing mobility". Ultimately, the various mobility offers will be conveniently available for its users from a single source.

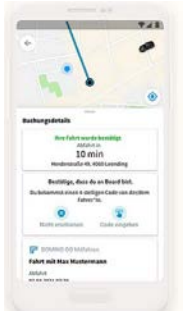


Figure 1, 2: Domino – App, Figure 3: MaaS made in Austria, Source: www.domino-ooe.at

Responsible RECIPROCITY project partner: BIZUP

External partners involved:

City/village/region & country: Linz, Upper Austria

x	urban	x	peri-urban	x	rural
x	tourism	x	everyday	x	commuter

technological readiness (TRL) [1-9]	3
simplicity to replicate [1=hard,... 5=easy]	4

Facts & figures

- Duration of implementation
  (from concept to finished project): 36 Months (planned)
- Website: https://www.domino-maas.at/en/projekt-domino

RECIPROCITY

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°101006576

Autonomous shuttle for passengers

Use Case #3

Responsible RECIPROCITY project partner: BIZUP

City/village/region & country: Leonding, AT

City of Leonding evaluates implementation of autonomous shuttle for passengers.

Digibus®Austria: https://www.digibus.at/ergebnisse-und-erfahrungen/

Autonomous bus – Seestadt: https://www.wienerlinien.at/web/wiener-linien/auto-bus-seestadt

x	urban	x	peri-urban		rural
	tourism	x	everyday	x	commuter
technological readiness (TRL) [1-9]					7
simplicity to replicate [1=hard,... 5=easy]					1

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°101006576

Autonomous shuttle for goods

Use Case #4

Gunskirchen (AT) / Hub-to-hub autonomous logistics shuttle service on public road in harsh weather conditions (BRP Rotax, DB Schenker, Digitrans)
-> see H2020 project "AWARD"

Demonstration of an autonomous swap body truck between the Engine Factory of BRP-Rotax and the Logistics Hub of DB Schenker (Gunskirchen, Austria), which are connected via factory areas, public side and main roads and public crossing areas.

The goal is to replace the so far installed conventional truck by a driverless electric transporter with test permission by 2023 – at all weather conditions.

For this purpose, various new infrastructure is planned (5G network, C-ITS, etc.) and preliminary tests will be performed at the Digitrans proving ground in St. Valentin with a unique outdoor rain plant.

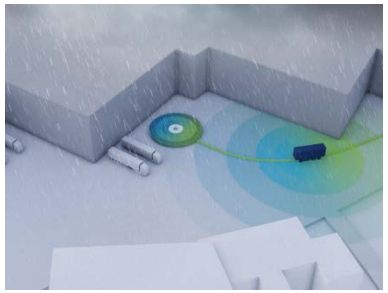
Responsible RECIPROCITY project partner: BIZUP

External partners involved: Digitrans, BRP Rotax, DB Schenker

City/village/region & country: Gunskirchen, AT

	urban	x	peri-urban		rural
	tourism	x	everyday		commuter

technological readiness (TRL) [1-9]	7-8
simplicity to replicate [1=hard,... 5=easy]	3-4



Source (picture): AWARD H2020 and Digitrans Webpage

Facts & figures of AWARD

- 29 partners
- 12 countries
- Duration: 36 Months
- Overall budget: 26M+
- Website: https://award-h2020.eu

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°101006576

airtaxi for passengers and/or goods

Use Case #5

City of Linz evaluates implementation of airtaxis for passengers.

Urban Air Mobility comprises air mobility concepts within and between cities: passenger flights or freight transport with autonomous aircraft are at the center of the concepts.

The goal of the agreed collaboration between EHang, FACC and LINZ AG is to simulate real passenger flights and freight transports with autonomous airtaxis in urban environments.

Responsible RECIPROCITY project partner: BIZUP

External partners involved: Linz AG, FACC, eHang

City/village/region & country: Linz, AT / Regensburg, DE

x	urban	x	peri-urban	x	rural
	tourism	x	everyday		commuter

technological readiness (TRL) [1-9]	3
simplicity to replicate [1=hard,... 5=easy]	1

Facts & figures

- Website: https://www.linzag.at/portal/de/ueber_die_linzag/projekte/airtaxi

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°101006576

Softly Mobile Tourism Mobility

Use Case #6

Softly-mobile holidays: Our motto is “All-inclusive-mobility”, and as a member of the network of Alpine Pearls (www.alpine-pearls.com) we take it seriously: Guests arriving by train or not using their car during their stay in Werfenweng are eligible to obtain the “SaMo-Card”. This is a special bonus card including all mobility services free of charge. E.g. transfer service to the lodging is offered for all train travellers arriving in Bischofshofen. Additionally, we provide a local e-taxi, a fleet of climate-friendly vehicles such as e-bicycles, e-mountain-bikes, e-cars and electric fun-vehicles - all powered by photovoltaic. A wide variety of mobility services such as guided hiking tours, excursions by bus, winter-sports equipment, etc. are offered all year long. The SaMo-Card is the key to all our mobility services! The regional “W3 shuttle” covers the villages of Werfenweng, Werfen, Bischofshofen and Pfarrwerfen.

Usage data:
shutte > 35000 users / year
e-bikes > 1500 users / year
e-cars > 4000 users / year

Source (picture): Tourismusverband Werfenweng (TVB Werfenweng)

Responsible RECIPROCITY project partner: BIZUP

External partners involved: Alpine Pearls, Municipality Werfenweng, Tourism association Werfenweng,

City/village/region & country: Werfenweng, AUT

	urban		peri-urban	x	rural
x	tourism		everyday		commuter
technological readiness (TRL) [1-9]					9
simplicity to replicate [1=hard,... 5=easy]					4

Facts & figures

- Costs for implementation & for operation (yearly): € 300.000 for all services ofthe SaMo-Card, financed byhosts/municipality/state
- External expertise needed: Trafficplanner, tourism consultants
- Duration of implementation: Developmentstarted 1995, continous improvements and newprojects eversince
- Website: https://www.werfenweng.eu/EN/SAMO/Card/ https://www.alpine-pearls.com/en/holiday-destinations/austria/werfenweng/

RECIPROCITY

This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement N°101006576

river taxi "Donaubus"

Use Case #7

The Danube Bus is a taxi-boat system on the Danube in Linz. It has been connecting Linz, Puchenau and Ottensheim by means of a catamaran speedboat since July 2019. The catamaran speedboat used travels at up to 45 km/h and covers the 9km route in 14 minutes. It does not require a jetty, but can dock at existing slip facilities. The boat has room for 12 passengers including bicycles.

Facts:
~13.100 passengers / season
Season: 1st May – 30th September
operation:10h per day / 7 days a week
price for 1 boat: 150.000 – 200.000€
costs per ride: single = 7,50€, round trip = 11,-€, 10-tickets = 50,-€

Source picture © https://www.donaubus.at/donaubus-1/ottensheim-linz/

Responsible RECIPROCITY project partner: BIZUP

External partners involved: Luger OG

City/village/region & country: Linz, Puchenau, Ottensheim / AT

x	urban	x	peri-urban	x	rural
x	tourism	x	everyday	X	commuter

technological readiness (TRL) [1-9]	9
simplicity to replicate [1=hard,... 5=easy]	4

Facts & figures

- Costs for implementation & for operation (yearly): 1 person/day (~70h/week)
- Duration of implementation (from concept to finished project): depends, ~12 months
- External input needed: yes – implementation and operation knowhow provided by Donaubus
- Website: https://www.donaubus.at/

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°101006576

Urban Airport for drones

Use Case #08

It is the first Airport used for electric vertical take-off and landing aircraft, including cargo drones and air taxis. Drones are the transport of the future. Anyway, there are no infrastructures for drones to land and take off. If you can operate these drones in an urban environment, this would be a more environmentally friendly transport solution.

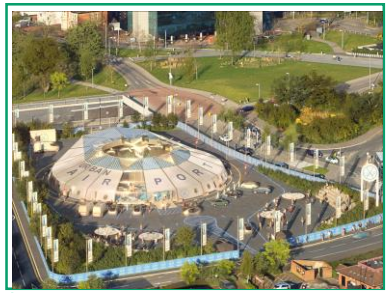
The hub design is said to be easy to replicate at other sites in the future.

Responsible RECIPROCITY project partner: ERRIN

External partners involved: Connected Kerbs

City/village/region & country: Coventry UK

	urban		1		
			everyday		commuter
technological readiness					2
simplicity to replicate					5



RECIPROCITY

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°101006576

Charging for electric cars

Use Case #10

Coventry have secured £1.42m government funding and successfully installed 403 slow and fast electric vehicle charging points in the City to help make having an electric car more accessible and to reduce emissions resulting in poor air quality.

Coventry has the largest rollout of charging for electric cars in the UK, outside London.

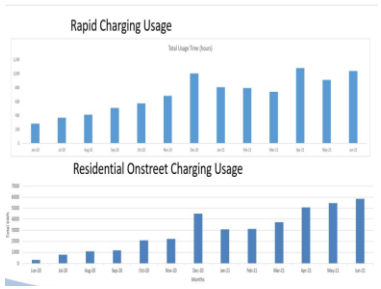
There are also incentives to scrap the high polluting cars and receive 3000 pounds that can only be used for alternative public transport (rent e-scooters, e-bikes, take trains, buses, etc.).

Responsible RECIPROCITY project partner: ERRIN

External partners involved: Connected Kerbs

City/village/region & country: Coventry

	urban		200		56
	256		everyday		commuter
technological readiness					5
simplicity to replicate					5



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°101006576

Very Light Rail

Use Case #11

Very Light Rail (VLR) is a research and development project, using the latest automotive expertise developed in the region to deliver an innovative and affordable light rail system. Traditional light rail schemes cost upwards of £25 million per km, in some city centre locations they can cost as much as £100 million per km. This project aims to deliver all of the benefits of trams but at a fraction of the cost – providing a real alternative to the car and helping to improve air quality and reduce congestion.

Coventry City Council is collaborating with WMG, Transport for West Midlands and Dudley Council to apply innovative research and development to the urban light rail sector. The aim is to create a reliable, frequent, environmentally friendly, battery-driven hop on hop off transport system that will work in small to medium-sized towns and cities at a fraction of the cost of a traditional tram.

Coventry Very Light Rail will be run on a lightweight innovative new track specifically designed for the Coventry system which is not laid as deep as conventional light rail lines. As the Coventry VLR is self-propelled, costly overhead electrification is not needed and operation will be pollution-free. Coventry VLR is not designed to run on mainline railways, however, a parallel VLR project is underway to build a lightweight vehicle suitable for heavy rail use . A test track of the new track form will be delivered at the Very Light Rail National Innovation Centre (VLRNIC) in Dudley – operated by BCIMO – for testing the integrated system.

- The VLRNIC will allow for testing and development of VLR vehicles in the West Midlands. This will include a test track and workshop space for Research and Development activities.

Responsible RECIPROCITY project partner: ERRIN

External partners involved: Dudley Council, WMG, TfWM, BCIMO

City/village/region & country: Coventry

	urban	1			
			everyday		commuter
technological readiness (TRL) [1-9]					5
simplicity to replicate [1=hard,... 5=easy]					4

Facts & figures

- Costs for implementation & for operation (yearly): First route costs plus R&D are circa £140m
- Programme is late 2025 for operational section within the highway

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°101006576

ITS system in transport vehicles

Use Case #12

• SRG-6000 autocomputers: They make it possible at any time to determine the location of the vehicle or the task it is currently performing with a time deviation from the timetable.
• internal displays (ceiling and side) in all public transport vehicles that inform about the time and route of the journey (names of upcoming stops, streets, districts, map of the stop area). Passengers can also find there information about possible transfers to other communication lines or possibly messages about a changed route;
• Passenger Information System (www.sip.zdzit.olsztyn.eu) and the "MyBUS" mobile application
• city surveillance cameras and internal cameras in all vehicles
• a modern ticket system enabling payments with the Olsztyn City Card and using mobile applications, as well as the sale of tickets in mobile (206) and stationary (51) ticket machines, including the sale of tickets in vehicles with pre-paid cards (without printing the ticket);
• passenger counting gates

Source (picture): Olsztyn City Hall

Responsible RECIPROCITY project partner: ERRIN

External partners involved: No external partners

City/village/region & country: Olsztyn

	urban				
			everyday		commuter

technological readiness (TRL) [1-9]	9
simplicity to replicate [1=hard,... 5=easy]	4

Facts & figures

Costs for implementation & for operation (yearly): the system is still being developed, for example in 2019: 25 information panels at the bus stops, 125 remote control devices for visually impaired persons, 27 video cameras at bus/tram stops and 11 ticket vending machines at public places; moreover: 6 trams and 24 buses were equipped with passenger counting system; all those elements costed 8,8 million PLN (ca. 2 million EUR); there is no possibility to present operation costs as for now.

- Duration of implementation (from concept to finished project): the stage mentioned above: ca. 30 months
- Website: no website for the project; the passenger module: www.sip.zdzit.olsztyn.eu

RECIPROCITY

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°101006576

Trento and Rovereto Play & Go

Use Case #24

Trento and Rovereto viaggio Play & Go

Responsible RECIPROCITY project partner: G!E

External partners involved: City of Rovereto

City/village/region & country: City of Rovereto

"Moving in Trento & Rovereto is a children's game"

The app available on Android and iOS.

An initiative that rewards ecologically sustainable behavior in the context of urban travel -> people choose among travel possibilities and the system encourage the most sustainable combinations by assigning points that allow to occupy a position in global and weekly rankings

The most sustainable travellers can win real prizes

It is an initiative that encourages people to move in a sustainable and healthy way.

It is an application that includes all the mobility platforms and services of the province.

Intermodal management and travel planning via an app.

Information on available parking spaces is included and updated in real-time.

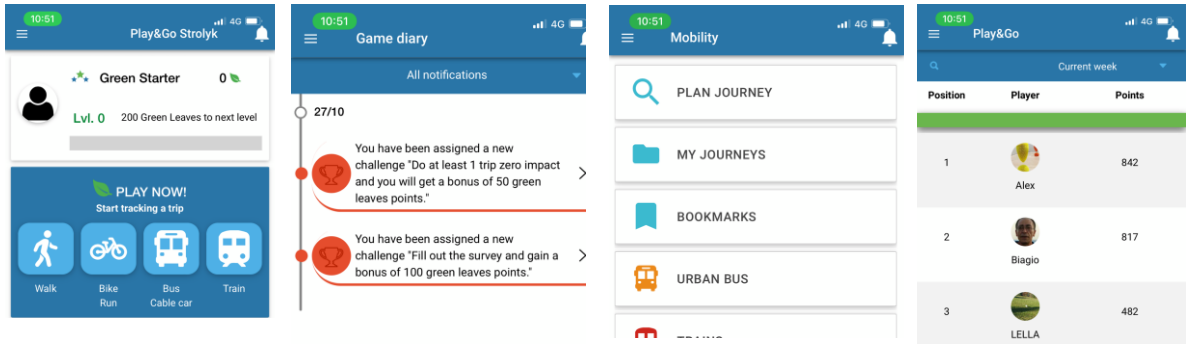
The Application was developed thanks to the involvement of experts (both in transport and in the social field).

x	urban	x	peri-urban		rural
x	tourism	x	everyday	x	commuter
technological readiness (TRL) [1-9]					9
simplicity to replicate [1=hard,... 5=easy]					4

Facts & figures *(if available and not confidential; add more if useful), e.g.*

- Website: https://www.smartcommunitylab.it/playgo-high-school-challenge/ ; https://play.google.com/store/apps/details?id=it.smartcommunitylab.viaggiatrento.playgo&hl=fr&gl=US ; https://apps.apple.com/fr/app/viaggia-play-go/id1151014023

Pictures, diagrams etc. *(if available and useful)*



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°101006576

TORNADO MOBILITY

Use Case #15

The purpose of the TORNADO project is to define and test technologies and conditions enabling rollout of autonomous mobility services in lightly populated areas.

It has explored different use cases to address local requirements from september 2017 to November 2020

This research project was jointly led by Groupe Renault and Rambouillet Territoires, with 10 industrial and academic partners.It conducted two experiments involving autonomous and electric mobility services, including full-scale validation tests in real-life environments:

An on-demand and shared car service using Renault ZOE to provide a direct link between Gazeran rural train station and Bel Air - La Forêt business park in Rambouillet (southwest of Paris);

A shuttle service calling at predefined stops within Bel Air business park.

Responsible RECIPROCITY project partner: NextMove

External partners involved: Renault

City/village/region & country: Rambouillet Territoires

	urban		x		x
			everyday		commuter
technological readiness (TRL) [1-9]					9
simplicity to replicate [1=hard,... 5=easy]					2

Facts & figures

- External number of partners needed
- Has to answer a real need for the territory

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°101006576

Parkunload

Use Case #16

Mobile App with Digital and Dynamic Parking Rules to increase parking turnover and free up spaces for Sustainable Mobility experimented in the 4th district of Paris (Le Marais)

Responsible RECIPROCITY project partner: NextMove

External partners involved: -

City/village/region & country: City of Paris (France)

	urban		x		x
			everyday		commuter
technological readiness (TRL) [1-9]					9
simplicity to replicate [1=hard,... 5=easy]					5

Facts & figures

- Has to answer a real need for the territory

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°101006576

Smart Navigo

Use Case #17

Smart Navigo allows the user to pass through the validation gates even if their smartphone is switched off. Quite simply because it works thanks to contactless technology: a Near Field Communication (NFC) chip, which allows 2 devices to communicate automatically when they are close to each other.

The tickets and the user's specific information are stored in the smartphone's SIM card, which acts as an anonymous safe. Each user can thus easily consult the number of his remaining tickets or the days of validity of his package.

This manipulation is carried out today on the Vianavigo application, then soon via the applications of the operators RATP, Transdev and SNCF.

Responsible RECIPROCITY project partner: NextMove

External partners involved: -

City/village/region & country: Ile-de-France

	urban		x		x
			everyday		commuter
technological readiness (TRL) [1-9]					9
simplicity to replicate [1=hard,... 5=easy]					3

- Need for a unique mobility authority (or close cooperation)
- Need for a great percentage of the population to have a smartphone

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°101006576

My Anatol

Use Case #18

Issy-les-Moulineaux is testing the My Anatol application, a French mobility assistant that uses geolocated data to facilitate mobility.

Concretely, the app analyzes the data associated with congestion points and proposes possible diversion points to limit and reduce these traffic jams.

The principle is comparable to applications such as Waze, but My Anatol wants to allow local authorities to promote alternative routes that avoid residential areas or near schools.

At this stage, the experiment will focus on Boulevard Gallieni, in both directions, and could then extend to other crossings in the territory.

Responsible RECIPROCITY project partner: NextMove

External partners involved: My Anatol

City/village/region & country: Issy-les-Moulineaux

	urban		x		x
			everyday		commuter
technological readiness (TRL) [1-9]					7
simplicity to replicate [1=hard,... 5=easy]					3

- Urban use (no need for rural areas)

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°101006576

Electric city bus „EMIL„

Use Case #19

EMIL are the 5 fully electric city buses in Regensburg.

They are 7.72 meters long, 2.20 meters wide and come through almost every alley - the new electric buses from Stadtwerk.Mobilität. This leaves room for new route planning in the old town. The biggest advantage of the midi buses: They run quietly, free of pollutants and environmentally friendly with 100 percent green and locally produced electricity from REWAG – the local energy and water supplier. You can't have a better ecological balance in public transport. das Stadtwerk.Mobilität is investing around three million euros in vehicles and charging technology. Local companies also benefit from this commitment.

Incidentally, the "electric buses" project has an impact on the entire das Stadtwerk.Regensburg/REWAG Group. The experts at REWAG provide the know-how in terms of charging stations and, of course, the green electricity. The colleagues in the workshop operations of das Stadtwerk.Fahrzeuge und Technik have undergone special training in the maintenance and repair of electric vehicles and drives and have already provided valuable evaluations in the test operation of the rental electric buses. And the bus drivers of das Stadtwerk.Mobilität are being made fit for driving with electric drives and charging at bus stops.

Source: https://www.das-stadtwerk-regensburg.de/mobilitaet/busverkehr/das-stadtwerkemil/

Responsible RECIPROCITY project partner: RTECH

External partners involved: das Stadtwerk Regensburg.Mobilität GmbH

City/village/region & country: Regensburg/ DE

x	urban		peri-urban		rural
x	tourism	x	everyday	x	commuter
technological readiness (TRL) [1-9]					9
simplicity to replicate [1=hard,... 5=easy]					2

Facts & figures:

- External expertise needed: Yes, partners from industry and science
- Duration of implementation (from concept to finished project): 12 Months
- Website: https://www.das-stadtwerk-regensburg.de/mobilitaet/busverkehr/das-stadtwerkemil/

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°101006576

Autonomous people mover (shuttle)

Use Case #20

As part of a two-year pilot project, *das Stadtwerk.Mobilität* is sending two autonomous vehicles on a ring route with seven stops in the Regensburg industrial park. On weekdays between 11 a.m. and 3 p.m., passengers are able to use the shuttle service there free of charge at 10 minute intervals. At the beginning of 2021, the routes were measured with test drives in cooperation with the vehicle manufacturer Navya and TÜV Nord. On September 1st 2021 the autonomous shuttles started operating. During the journey, a trained escort is on board who can intervene if necessary and control two otherwise driverless buses during this development phase.

In the pilot project the *das Stadtwerk.Mobilität* is gathering a wealth of experience, knowledge and data and is in close contact with the French vehicle manufacturer Navya, which is supplying not only the actual vehicles but also the necessary software and project support. The project is also primarily concerned with identifying and addressing important issues and problems relating to operation with autonomous buses.

Source: https://www.das-stadtwerk-regensburg.de/mobilitaet/autonomer-shuttle/

Responsible RECIPROCITY project partner: RTECH

External partners involved: das Stadtwerk Regensburg.Mobilität GmbH

City/village/region & country: Regensburg/ DE

x	urban		peri-urban		rural
x	tourism	x	everyday	x	commuter

technological readiness (TRL) [1-9]	7
simplicity to replicate [1=hard,... 5=easy]	1

Facts & figures:

- External expertise needed: Yes, partners from industry and science
- Duration of implementation (from concept to finished project): 36 Months
- Website: https://www.das-stadtwerk-regensburg.de/mobilitaet/autonomer-shuttle/

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°101006576

Micromobility (DUCKT)

Use Case #21

DUCKT is a smart mobility startup that develops and operates docking, locking and charging infrastructure solutions for micromobility in urban environment. They help organize public space, lower operation costs and create a better experience for MaaS with their plug&play universal adaptor and IoT charging solutions, and that is not all!… DUCKT is also an award-winning company holding several international recognitions around the globe.

Responsible RECIPROCITY project partner: OKAN

External partners involved:

City/village/region & country: Istanbul, New York City, Paris

	urban				
			everyday		commuter
technological readiness (TRL) [1-9]					9
simplicity to replicate [1=hard,... 5=easy]					5

- Website: https://duckt.app/#Mainpage

Source (pictures): https://farklabs.com

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°101006576

Hydrogen fuel cell bus line in Huesca

Use Case #22

The implementation of a hydrogen-fuelled bus line to provide sustainable public transport and connect the centre of the city of Huesca with its main technological and commercial centres, as well as public education centres.

The project is structured in several phases:

Comparative analysis of possible scenarios or routes, sizing of the vehicle type and choice of the number of vehicles. Analysis of options for hydrogen supply, storage and distribution system analysis as well as auxiliary equipment and maintenance and costs of buses, personnel, services and hydrogen production.

This proyect is linked to H2PiyR Project, which aims to develop a cross-border corridor of refuelling stations for hydrogen vehicles connecting Spain, France and Andorra.

Responsible RECIPROCITY project partner: IAF

External partners involved: Aragon Hydrogen Foundation

City/village/region & country: Huesca / ES

x	urban	x	peri-urban		rural
	tourism	x	everyday		commuter

technological readiness (TRL) [1-9]	7
simplicity to replicate [1=hard,... 5=easy]	1

Facts & figures

- The cost of the Feasibility Study study is 100 m euros, and the total investment is about 2.4 M euros.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°101006576

Hera Drone Hub

Use Case #23

Hera Drone Hub was created as an urban space in Europe where drones testing, experimentation and training will be carried out: research and development, training, certification and demonstration flights. A space created in response to the need for testing in a real environment in view of the imminent integration of drones in urban airspace (UAM) and the forthcoming transformation of the Single European Sky.

It is a holistic project with industries such as energy, automotive and logistics and in which Zaragoza City Council will also carry out the flight tests of the European H2020 project FLYING FORWARD "Towards sustainable urban air mobility".

Responsible RECIPROCITY project partner: IAF

External partners involved: Tecnalia, Ferrovial, Enaire, Telefónica, Everis and Enerland

City/village/region & country: Zaragoza / ES

x	urban	x	peri-urban	x	rural
x	tourism	x	everyday		commuter

technological readiness (TRL) [1-9]	3
simplicity to replicate [1=hard,... 5=easy]	2

Facts & figures

- Started in march 2021
- 130,000 square metres of space
- 150 million investment and the creation of 1,200 jobs indirectly.
- Website: http://www.heradronehub.com/

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°101006576

IE Tram buses

Use Case #25

Project for the electrification of Zaragoza's urban bus fleet with the aim of approaching the objective of making the city climate neutral by 2030.

68 electric buses have been purchased, 51 of which are 12-metre and the remaining 17 are 18-metre (articulated) IE Tram buses.

The Irizar ie tram is a 100% electric, zero-emission bus with the aesthetic attributes of a tram that combines the large capacity, ease of access and interior circulation of a tram with the flexibility of a city bus. This model is available in versions from 12 m to 18 m articulated, with a maximum capacity of 145 people. Its batteries are developed and manufactured by Irizar Lithium-Ion.

Responsible RECIPROCITY project partner: IAF

External partners involved: Irizar e-mobility

City/village/region & country: Zaragoza / ES

x	urban	x	peri-urban		rural
x	tourism	x	everyday	x	commuter

technological readiness (TRL) [1-9]	8
simplicity to replicate [1=hard,... 5=easy]	3

Facts & figures

- Testing has started in 2021 for full implementation in the second half of 2022.
- Fleet of 68 electric buses
- 48 Mill. Euros of investment

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°101006576

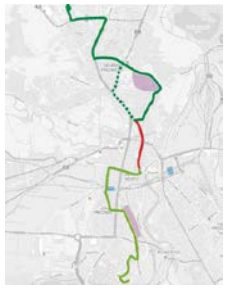
Electromobility – battery trolleybuses

Use Case #26

Development of electromobility - battery technology in trolleybuses in the City of Pilsen: Due to the extensive trolleybus network in Pilsen, this technology is very advantageous - it allows the extension of trolleybus lines to the outskirts of the city without the need to build expensive infrastructure and without the need for additional interchange for passenger to the connecting bus connection. The development of battery technology in trolleybuses is part of the SUMP of the City of Pilsen, the technology assumes a higher share of electric traction in public transport and the replacement of part of the performance of conventional diesel buses. Trolleybuses use dynamic in-motion charging with high efficiency, small lightweight batteries with battery-friendly charging resulting into lowest power consumption. The technology also allows the choice of a variant route of the line, especially in the case of closures and emergencies in operation.

Usage data:
32 trolleybuses in the City of Pilsen
new trolley-bus line No 11 - savings of:
30 000 diesel-bus km/a & 100 000 liters of diesel/a,
1 diesel-bus & 2 drivers and 296 t CO2/a

Pictures, diagrams etc. *(if available and useful)*



Source (picture): Jiří Kohout, Plzeňské městské dopravní podniky PmdP

Responsible RECIPROCITY project partner: RDAP

External partners involved: City of Pilsen

City/village/region & country: Pilsen, CZ

x	urban	x	peri-urban		rural
	tourism	x	everyday	x	commuter
technological readiness (TRL) [1-9]					9
simplicity to replicate [1=hard,... 5=easy]					5

Facts & figures

- Costs for implementation & for operation (yearly): acquisition costs EUR 0.5 million (12 m battery trolleybus) – EUR 0.7 million EUR (18 m battery trolleybus)
- External expertise needed: no
- Duration of implementation (from concept to finished project): 24 Months
- Website: https://www.plzen.eu/o-meste/aktuality/aktuality-z-mesta/plzen-ziska-nove-bateriove-trolejbusy-skoda.aspx

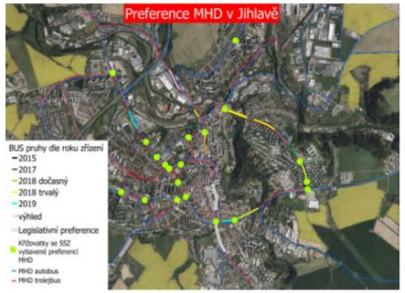
This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°101006576

Public transport preference

Use Case #27

Preference measures in the public transport in the city of Jihlava - the city of Jihlava uses the legislative preference, the preference at light-controlled intersections and reserved lanes for the preference of public transport. The preference at light-controlled intersections is provided through a complex system of transport telematics. The city has more than 2 km of reserved lanes for trolleybuses and 23 light-controlled intersections with a preference with a view to further expansion. Public transport preferences make it possible to reduce the intervals (headways) between connections without the need for additional vehicles, increase the travel speed, more efficient vehicle rostering and use data for transport planning.

Usage data:
23 light-controlled intersections with a preference of public transport, 12 sections of total length 2 080 m of the reserved lanes for (trolley-)buses, consequences: an increase in the number of passengers by 12% in the period 2009-2019, increase in the number of trips by public transport per capita by 15% with the current increase in transport performance (vehicle km) by only 3%




Source (picture): Karel Trojan, Department of Transport, City of Jihlava

Responsible RECIPROCITY project partner: RDAP

External partners involved: City of Jihlava

City/village/region & country: Jihlava, CZ

x	urban		peri-urban		rural
	tourism	x	everyday	x	commuter
technological readiness (TRL) [1-9]					9
simplicity to replicate [1=hard,... 5=easy]					5

Facts & figures.

- External expertise needed: no
- Duration of implementation (from concept to finished project): 48 Months

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°101006576

Smart Parking Systems

Use Case #28

Responsible RECIPROCITY project partner: RDAP

External partners involved: City of Pardubice

City/village/region & country: Pardubice, CZ

Smart parking systems in the city of Pardubice - smart parking (control of entrances with cameras), equipped with parking sensors, overview of residential parking, analyses of the camera system, an effort for regulated parking throughout the city due to condition of concurrence of vehicle ownership and permanent residence, which implies a high need for places for residential parking.

x	urban		peri-urban		rural
	tourism	x	everyday	x	commuter

technological readiness (TRL) [1-9]	2
simplicity to replicate [1=hard,... 5=easy]	4

Facts & figures

- External expertise needed: yes
- Duration of implementation (from concept to finished project): 48 Months

Source (picture): City of Pardubice

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°101006576

On-demand Public Transport

Use Case #29

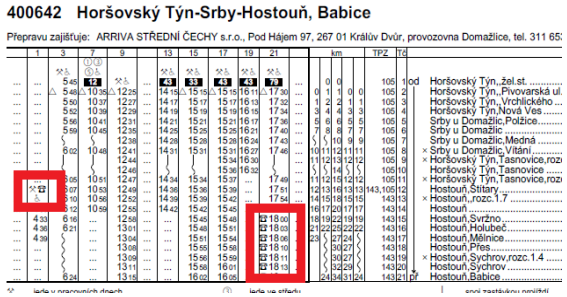
Development of an application for on-demand public transport in rural areas in the Pilsen Region - The Pilsen Region currently uses a system of on-call buses in sparsely populated areas and on the outskirts of the day. The objective of the Pilsen Region, respectively regional coordinator POVED is to develop the application of the on-demand systems, e. g. development of applications in which a requirement is entered in the evening before the transport process and which optimizes the route and timetable as needed (parantransit with minibus). There is a need for an agreement with municipalities in rural areas - school connections with a fixed timetable, other variables and optimized.

Responsible RECIPROCITY project partner: RDAP

External partners involved: City of Pilsen

City/village/region & country: Pilsen, CZ

	urban		peri-urban	x	rural
	tourism	x	everyday	x	commuter
technological readiness (TRL) [1-9]					2
simplicity to replicate [1=hard,... 5=easy]					4



Source (picture): POVED

Facts & figures

- External expertise needed: yes
- Duration of implementation (from concept to finished project): 24 Months
- Website: https://www.idpk.cz/cz/spoje-na-zavolani/

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°101006576

Traffic Calming in the City Centers

Use Case #30

Traffic calming in the centre of the City of Pilsen - Americká street with exclusion of individual car traffic (14 400 vehicles/day until August 2021). Americká street is intensively served by public transport (1 200 T-buses/day and 24 000 passengers/day). Before the traffic calming there were significant delays in public transport (7 - 16 min in peak hour, total 141 hours per 1 peak), public transport transited a section of 500 m for 12 minutes at a speed of 2,5 km/h. From 23.8.2021 can the street be accessed only by pedestrians, cyclists, public transport, supplies and taxis. The city of Pilsen is trying to turn the street into a city boulevard, widen sidewalks and city greenery.

Usage data:
Before traffic calming the traffic density of 14 400 vehicles per day, public transit 1 200 T-buses/day used by 24 000 passengers/day, Before the traffic calming significant delays in public transport 7 - 16 min in peak hour, total 141 hours per 1 peak, public transport transited a section of 500 m for 12 minutes at a speed of 2,5 km/h

Source (picture): City of Pilsen,

Responsible RECIPROCITY project partner: RDAP

External partners involved: City of Pilsen

City/village/region & country: Pilsen, CZ

x	urban		peri-urban		rural
x	tourism	x	everyday		commuter
technological readiness (TRL) [1-9]					9
simplicity to replicate [1=hard,... 5=easy]					5

Facts & figures

- External expertise needed: no
- Duration of implementation
  (from concept to finished project): 96 Months

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°101006576

Tuzla Bike Path

Use Case #31

Aims:

•Reducing CO2 emmissions

•Reducing traffic load by providing an alternative path

•Providing secure environment for sports activities

•Enhancing awareness of and possibilities for sustainable mobility

Providing efficient access to higher education institutions South of the E-5 Starting from Tuzla Marmaray (metropolitan train) station, reaching İçmeler Marmaray station via a 10355 m path illuminated with renewable energy, the bike path project has been approved for financing through a grant and long term credit by Ilbank (https://www.ilbank.gov.tr/), and the tendering process has started. Construction is expected to start at the end of 2021, to be completed in 2022.

Responsible RECIPROCITY project partner: OKAN

External partners involved:

City/village/region & country: Tuzla, Istanbul

	urban		peri-urban		
			everyday		commuter
technological readiness (TRL) [1-9]					2
simplicity to replicate [1=hard,... 5=easy]					5

Source for Picture: https://www.tuzla.bel.tr/icerik/993/7119/bisiklet-yolu-.aspx

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°101006576

Istanbul BRT

Use Case #32

Reducing general road traffic; carrying high volume passenger traffic on reserved/dedicated BRT routes; reducing waiting time and trip duration variance by intelligent and autonomous BRT management - highly reduced inter-vehicle gap; reducing CO2 emmission by intelligent and autonomous BRT management.

Operating since 2007. The present use-case aims at enhancing operation through autonomous control.

Total route length: 52 km, 45 stations
PAX: 950,000/day

Responsible RECIPROCITY project partner: OKAN

External partners involved:

City/village/region & country: Istanbul Metropolitan

	urban				
			everyday		commuter
technological readiness (TRL) [1-9]					7
simplicity to replicate [1=hard,... 5=easy]					3

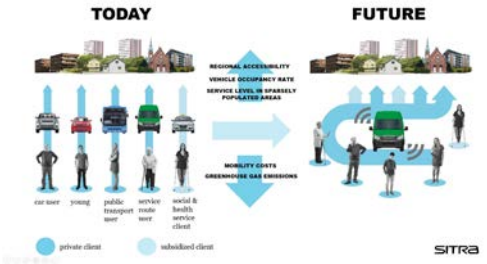
Source (picture): https://www.teknolojidenbirhaber.com/metrobus-toplu-ulasim-trafik-istanbul/

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°101006576

Integrated Operation of Regional Mobility Services, Kyläkyyti-pilot

Use Case #33

Testing new ways of organizing regional mobility services. In Southern Savonia, Eastern Uusimaa and Pirkanmaa, call-driven traffic was tested and it was investigated how a company-driven digital service platform can help to combine transport supported by society and serve the mobility needs of private individuals. The project carried out impact assessments and identified good practices based on experiments and recommendations for the procurement of mobility services. In eastern Uusimaa, the specific aim was to trial demand-responsive connecting transport along the trunk routes in public transport and to combine service transports in towns and cities.



Responsible RECIPROCITY project partner: HURC

External partners involved: City of Porvoo

City/village/region & country: City of Porvoo, Finland

	urban	X	peri-urban	X	rural
	tourism	X	Everyday	X	commuter

technological readiness (TRL) [1-9]	7
simplicity to replicate [1=hard,... 5=easy]	3

Facts & figures

- Duration of implementation (from concept to finished project): 16 Months
- Website: https://www.sitra.fi/en/projects/public-private-mobility-services-offered-side-side/

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°101006576

Last Mile Autonomous Delivery (LMAD), Jätkäsaari-pilot

Use Case #34

The LMAD project is piloting an autonomous delivery robot in Jätkäsaari district in City of Helsinki. The goal is to learn about the potential of delivery robots in open environments.

The LMAD project includes building a robot, a fleet management system that enables autonomous mobility and an order system that allows the robot to communicate with customers. In addition to the technical implementation, a service concept is created by means of co-creation and service design and tested in a genuine urban environment with genuine customers.

Responsible RECIPROCITY project partner: HURC

External partners involved: City of Helsinki

City/village/region & country: City of Helsinki, Finland

x	urban		Peri-urban		rural
	tourism	x	Everyday		commuter

technological readiness (TRL) [1-9]	7
simplicity to replicate [1=hard,... 5=easy]	3

Facts & figures

- Website: https://mobilitylab.hel.fi/projects/

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°101006576

Parking hub (pysäköinti hub)

Use Case #35

Ongoing digital parking hub pilot project; testing and developing traffic and mobility digital permit services, mobile payment services, mobile parking disc, smart camera solutions, resident parking codes, car-sharing, parking fee reduction for low-emission vehicles and dynamic pricing. Piloting in Turku includes a solution for reducing car-traffic in commuting by using car parks as an incentive (location, price).

Responsible RECIPROCITY project partner: HURC

External partners involved: City of Turku, Coreorient

City/village/region & country: City of Turku, Finland

x	Urban		Peri-urban		rural
x	tourism		Everyday		commuter

technological readiness (TRL) [1-9]	7
simplicity to replicate [1=hard,... 5=easy]	3

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°101006576

Drone delivery system

Use Case #36

The goal of the pilot project is to test the usefulness of drone deliveries.

Drone-based delivery services are piloted in the district of Jätkäsaari in Helsinki. The pilot tests both the feasibility and usefulness as well as citizens' views about using drones as a means for delivering items.

Responsible RECIPROCITY project partner: HURC

External partners involved: City of Helsinki

City/village/region & country: City of Helsinki, Finland

x	urban		Peri-urban		rural
	tourism	x	Everyday		commuter
technological readiness (TRL) [1-9]					7
simplicity to replicate [1=hard,... 5=easy]					3

Facts & figures

- Website: https://mobilitylab.hel.fi/projects/

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°101006576

LAZO CARD

Use Case #37

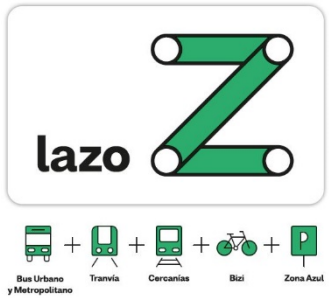
The metropolis of Zaragoza is composed by the capital city and 33 municipalities, belonging to Zaragoza Province. The CTAZ's creation was triggered by difficulties to move across and around the metropolis. In this way, this organism helps citizens to move easily, offering different transport lines with a scope of 2.950,40 km2 and approaching 260,5 citizens per km2.

To obtain these objectives a mobility-communication network is created based on 6 interurban operators, 25 transport line (connecting 25 municipalities), 28 lines of long-medium distance, 580 stations-stops and 21.402 interbus cards.

To connect all citizens and municipalities to each other, the LAZO card arises. It allows to pay and access different services through a balance accumulated on the card and it is not necessary to be a registered citizen of Zaragoza. This card has a cost of 12€ (including 9€ of pre-charged balance) and you can load it in every stop or station and other 429 points of sale. LAZO card encompasses tram, urban and interurban bus, Renfe Cercanias, BIZI and parking meter.

Its functions are divided into different areas:

- Transport: manage 11 regular public transport lines by road, through subscribed agreement
- Integration: functional coordination, tarrif integration and system coordination
- Mobility: promoting economic, social and environment sustainability of the mobility system.
- Citizens: working to be a meeting point between citizens and public sector.



Responsible RECIPROCITY project partner: IAF

External partners involved:

City/village/region & country: Zaragoza / ES

x	urban	x	peri-urban	x	rural
x	tourism	x	everyday	x	commuter

technological readiness (TRL) [1-9]	8
simplicity to replicate [1=hard,... 5=easy]	3

Facts & figures

- Started in 2nd semester 2018
- 5,406,285 trips per year in the group of collective public transport modes for passengers operating in the suburban and interurban areas.
- 120,686,561 trips per year in the group of collective public transport modes of passengers operating in the Zaragoza area (urban+interurban).
- In June 2018, CTAZ issued 10.000 LAZO cards and not needing to be from Zaragoza allowed its use by many uiversity students, most of them from foreign regions..
- Website: https://marketplace.libelium.com/smart-parking?gclid=CjwKCAjw4qCKBhAVEiwAkTYsPKNfyXX9EHsLLmXKljy3tAddyUY1zxn6I-NSdH_qj7Y7pqdR6BpPiBoCvp8QAvD_BwE

RECIPROCITY

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°101006576

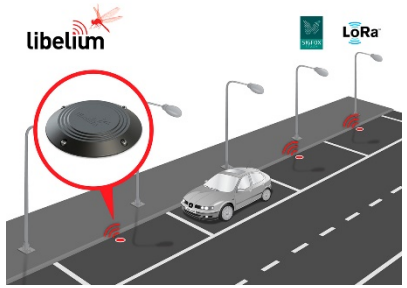
Parking management network for people with reduced mobility

Use Case #38

System that registers incidents of use and facilitates parking for users with reduced mobility. It is an intelligent management system for parking spaces reserved for people with reduced mobility. Through an application, the user can find out where these spaces are located and which are free. It also prevents misuse of these parking spaces by identifying whether the vehicle is authorised or not.

The sensor is a new model called "Smart Parking" designed by the multinational technology company Libelium. Its main function is magnetic detection based on a sensor that works on 3 axes and reads the variations in the magnetic field around it. Thus, when a large mass of metal such as a car passes over the node, it changes the magnetic field and thus detects that a car is parked on top of it.

It is extremely difficult to confuse this device, as the software installed in the node has advanced algorithms implemented to dynamically compensate for temperature variations around it and also to sense the magnetic influence of nearby vehicles.



Responsible RECIPROCITY project partner: IAF

External partners involved: Libelium

City/village/region & country: Huesca / ES

x	urban	x	peri-urban	x	rural
x	tourism	x	everyday		commuter

technological readiness (TRL) [1-9]	8
simplicity to replicate [1=hard,... 5=easy]	4

Facts & figures

- Started in 2nd semester 2018
- 185 parkings
- to broadcast frequencies on 2 radios for 2 wireless protocols: Sigfox and LoRaWAN.
- Website: https://marketplace.libelium.com/smart-parking?gclid=CjwKCAjw4qCKBhAVEiwAkTYsPKNfyXX9EHsLLmXKljy3tAddyUY1zxn6I-NSdH_qj7Y7pqdR6BpPiBoCvp8QAvD_BwE

RECIPROCITY

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°101006576

Tramway Dynamic traffic light priority

Use Case #39

At 12.8 kilometres long, Line 1 of the Zaragoza Tram crosses the city from the southernmost point to the northernmost, going through the centre and the Old City, linking populous neighbourhoods and young districts.

The football stadium and hospitals are connected for thousands of people who benefit from rapid, comfortable and environmentally sustainable access to points of interest like the Parque Grande, the Auditorium, the Plaza del Pilar, the Main Theatre and the Chamber of Commerce.

In addition, the Zaragoza Tram links together all the Zaragoza University campuses providing a service to thousands of students every day.

One of the great technological advances for Line 1 of the Tram is the dynamic traffic light priority system. Developed by technicians from the Zaragoza Council Mobility service, this allows the trams to run without the need to stop at junctions. This is possible thanks to balise technology that detects the passing tram. When this happens, traffic light phases are altered to allow the Tram to continue whenever possible.

This advance, which applies throughout Line 1 - even in the centre where the number of junctions is much greater - allows the user to gain in terms of speed and regularity, as it is possible to know the exact journey time whatever the state of the traffic.

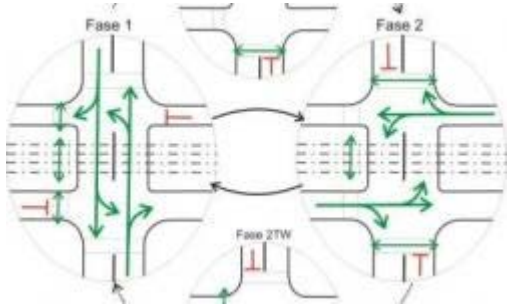
Responsible RECIPROCITY project partner: IAF

External partners involved: Irizar e-mobility

City/village/region & country: Zaragoza / ES

x	urban		peri-urban		rural
x	tourism	x	everyday	x	commuter

technological readiness (TRL) [1-9]	9
simplicity to replicate [1=hard,... 5=easy]	3



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°101006576

5G as an enabler of autonomous mobility in City of Pilsen

Use Case #40

5G technology is going to be implemented and extensively tested in recent time in city of Pilsen whereas autonomous mobility is one of 6 future fields, in which 5G technology should bring new features and services (e.g. health, energy, safety, education etc.). 5G is considered as a base stone and future condition for functioning autonomous mobility. Piloting of early phase is starting by definition of existing tram-railroad track owned and operated by City of Pilsen public transportation provider terminating on the edge of University of West Bohemia (this should create a test lab or living lab for future testing and exploration). Project plan is composed of design and deployment of central system components, infrastructure equipment, smart vehicles technology and user devices. The project (in its early stages) connects owner and operator of mobility service – city of Pilsen, substantial tram producer, strong national GSM operator and University of West Bohemia. Project ambition is during next seven years develop and implement functional technical and digital infrastructure, legal background, operational guidelines, safety procedures and cyber security elements all together creating complex environment for future mobility and 5G center of competence. Close cooperation between all partners is essential for successful project delivery. Project team is open for partnership and cooperation with relevant institutions across Europe to create knowledge-transfer network.

Responsible RECIPROCITY project partner: RDAP

External partners involved: INTENS

City/village/region & country: Pilsen, CZ

x	urban		peri-urban		rural
	tourism	x	everyday		commuter

technological readiness (TRL) [1-9]	2
simplicity to replicate [1=hard,... 5=easy]	3

Facts & figures

- External expertise needed: yes
- Duration of implementation (from concept to finished project): 36 Months
- Website: INTENS Corporation - Drive future now

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°101006576

Hydrogen as future of urban and interurban transportation

Use Case #41

The use of hydrogen for propulsion of vehicles is in the beginning and creates unique opportunities for those who start early. Hydrogen is expected as an alternative to battery driven electromobility mainly for bigger vehicles as buses of cargo transport requesting longer operational range comparable to conventional combustion engine. ŠKODA Electric in Pilsen has developed and successfully operates prototype of hydrogen bus ready for implementation to the public transportation systems. This centre recently introduced the idea of comprehensive solution for public transportation operators using hydrogen production on site, storage, and distribution. The energy for hydrogen production will be provided by FTE located on roofs of public transportation depot. This infrastructure can be complemented by the existing concept of hydrogen bus to be a delivery of a complete "turnkey" solution for urban and interurban transport.

Responsible RECIPROCITY project partner: RDAP

External partners involved: Škoda Electric

City/village/region & country: to be specified, CZ

x	urban	x	peri-urban	x	rural
	tourism	x	everyday	x	commuter
technological readiness (TRL) [1-9]					7
simplicity to replicate [1=hard,... 5=easy]					3

Facts & figures

- External expertise needed: no
- Duration of implementation (from concept to finished project): 36 Months

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°101006576

BKK FUTÁR

Use Case #42

The BKK FUTÁR system has two user groups: users of public transport and those who maintain it.

An interface available to users on the Internet, with virtually any online connection, consisting of a map and a trip planner. This allows public transit users to get up-to-date travel information.

In addition, the Centre for Budapest Transport, which maintains the public transport of Budapest, can monitor various vehicles and intervene in the operation of the system and network when necessary.

Responsible RECIPROCITY project partner: ZONE Cluster

External partners involved: Centre for Budapest Transport

X	urban	X	peri-urban		rural
X	tourism	X	everyday	X	commuter
technological readiness (TRL) [1-9]					9
simplicity to replicate [1=hard,... 5=easy]					3

Facts &

- Duration of implementation
  (from concept to finished project): 12 Months
- Website: https://futar.bkk.hu/

Source (picture): bkk.hu

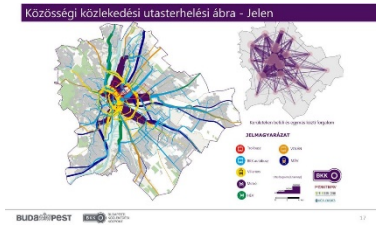
This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°101006576

Single Trafic Model

Use Case #43

This is a model that includes public and continuously maintained data on total transport in the capital. These up-to-date traffic count information and statistics help the transport development projects taking place in Budapest and provide uniform, representative data for them. This Single Traffic Model is now a great help in preparing investments, during preliminary feasibility studies.

The Single Trafic Model is based on the all-transport model concept and provides a unified modeling basis for transport development planning: thanks to the software-independent design of the model, it can be accessed and used by any design company, continuously developed and improved through new developments related to various design tasks.



Source (picture): bkk.hu

Responsible RECIPROCITY project partner: ZONE Cluster

External partners involved: Centre for Budapest Transport

X	urban	X	peri-urban	X	rural
	tourism	X	everyday		commuter
technological readiness (TRL) [1-9]					9
simplicity to replicate [1=hard,... 5=easy]					3

Facts & figures

- Duration of implementation (from concept to finished project): 18 Months
- Website (only in hungarian): https://bkk.hu/downloads/747/9PA0CvHFqmgjdE8NJDAPVQ==

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°101006576

Rollet Parking

Use Case #44

The domestically developed Rollet application allows automated, parking ticket free entry into parking garages operated by the municipality. The mobile app registers the duration of parking and automatically pays the fees.

Following a one-time registration, parking is made available without the use of cash or paper-form parking tickets. The user's payment card is automatically charged with the parking fees, saving them from any nuisance associated with parking.

Responsible RECIPROCITY project partner: ZONE Cluster

External partners involved:

City/village/region & country: City of Debrecen

X	urban	X	peri-urban		rural
	tourism	X	everyday	X	commuter
technological readiness (TRL) [1-9]					8
simplicity to replicate [1=hard,... 5=easy]					3

Facts & figures

- Website: https://www.rollet.hu/?lang=en

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°101006576

DKV E-Ticket

Use Case #45

The project's main goal is cash and paper-less travel, with the use of student identification or regular ID card. Instead of waiting in queues, tickets can be purchased online.

The price of a transport mobile ticket is the same as the pre-purchase price of a paper-based line ticket. The purchase and validation of a transport mobile ticket is also done through an application.

Responsible RECIPROCITY project partner: ZONE Cluster

External partners involved:

City/village/region & country: City of Debrecen

X	urban	X	peri-urban		rural
X	tourism	X	everyday	X	commuter
technological readiness (TRL) [1-9]					8
simplicity to replicate [1=hard,... 5=easy]					3

Facts & figures

- Website: https://dkvejegy.hu/

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°101006576

Smart Zebra Crossing

Use Case #46

The aim of the Project was to improve safety measures around pedestrian crossings that are quite busy, but have no traffic lights. This was done to minimalize the chances of any accidents and improve the citizens' sense of security. Sensors had been installed on both sides of the crossing, which send signals to LED lights installed right next to the zebra crossing. The LEDs blink with white lights, signaling to the motorists that they need to slow down, since the pedestrian has priority to cross.

The system require the Pearl Enterprises' products, which consist of sensors and LED lights, the connection between the two and a reliable power source.

Responsible RECIPROCITY project partner: ZONE Cluster

External partners involved:

City/village/region & country: City of Debrecen

X	urban	X	peri-urban	X	rural
	tourism	X	everyday		commuter
technological readiness (TRL) [1-9]					7
simplicity to replicate [1=hard,... 5=easy]					4

Facts & figures

- Duration of implementation (from concept to finished project): 6 Months
- Website: http://smartcity.debrecen.hu/en/projects/debrecens-first-smart-zebra-crossing

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°101006576

E-car sharing concept „EARL„

Use Case #47

EARL is an all-electric and station based car sharing system in Regensburg. das Stadtwerk.Mobilität offers a completely new service for everyone who needs a car at short notice and want to protect the environment as well. As location-based car sharing offer with several locations it is designed to complement the public transport system. The principle is simple: people who rarely have a car need to share a vehicle. It's cheaper for everyone and also relieves the environment.

Start of the project was in November 2016 with two cars; actually there are 20 e-cars available in the system, which are shared by almost 3.000 users. EARL is powered with 100 percent green and locally produced electricity from REWAG – the local energy and water supplier.

Responsible RECIPROCITY project partner: RTECH

External partners involved: das Stadtwerk Regensburg.Mobilität GmbH

City/village/region & country: Regensburg/ DE

x	urban	x	peri-urban	x	rural
	tourism	x	everyday		commuter

technological readiness (TRL) [1-9]	9
simplicity to replicate [1=hard,... 5=easy]	3

Source: https://www.heyearl.de/; https://www.rewag.de/e-mobilitaet-in-regensburg

Facts & figures:

- External expertise needed: Hard- and Software for Sharing Mobility
- Duration of implementation
  (from concept to finished project): 12 Months
- Website: *https://www.regensburg.de/leben/verkehr-u-mobilitaet/elektromobilitaet/e-car-sharing*

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°101006576