KIC Urban Mobility

UPC - Summary
October 2019

Summary

1. Brief Summary of EIT Urban Mobility

Creation: March 2008 by the European Parliament and Commission (Horizon 2020)

Mission:

- to boost Europe's innovation capacity

- to foster its sustainable economic growth and job creation merging the best innovative nods in Europe

- to be the open innovation hub for a radical change in European innovative capacity
  - from idea to product
  - from laboratory to market
  - from student to entrepreneur
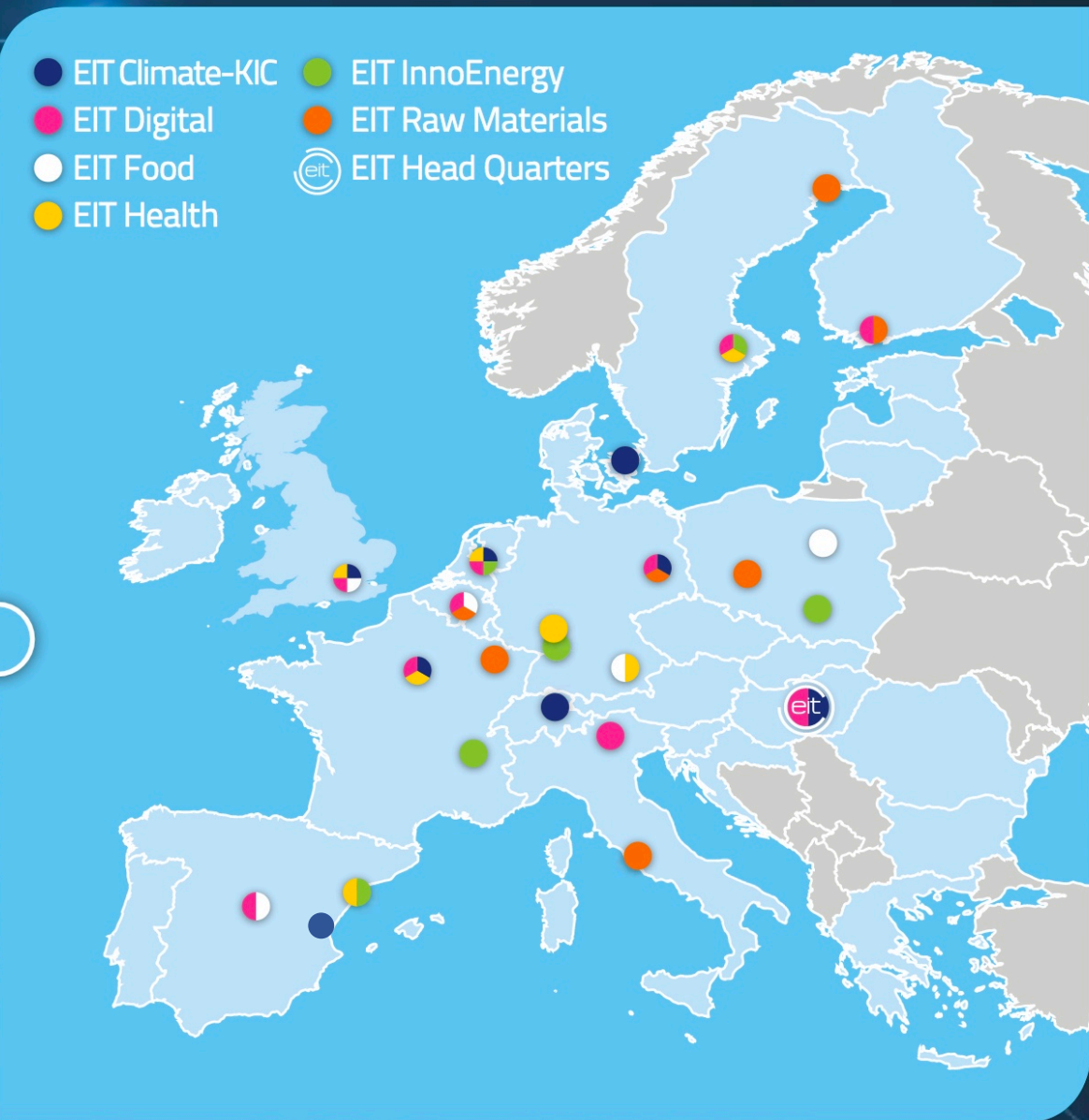
- to be a start-up accelerator

Tool:

The Knowledge Innovation Communities (KICs) bring together the knowledge triangl of business, education and research to form dynamic cross border partnerships

- each KIC is an independent legal entity

- each KIC consists of 5-6 "col-location centers" or Innovation Hubs with max. 50 partners in total

- There is a managing Head Quarter for every KIC

- duration: min. 7 years with annual business plans

business

higher education

Entrepreneurship

research & technology

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BARCELONA**TECH**

Legend:
- EIT Climate-KIC
- EIT Digital
- EIT Food
- EIT Health
- EIT InnoEnergy
- EIT Raw Materials
- EIT Head Quarters

In September 2017, the EIT Community brought together more than 1000 partners, including:

578 companies, including SMEs

199 higher education institutions

152 research centres

83 cities, regions and NGOs

Our results. More than:*

2242 business ideas

305 innovative start-ups

1232 knowledge transfers and adoptions

430 new products and services

1224 graduates completing EIT degree programmes

NEW KICS 2019
- KIC on Urban Mobility
- KIC on Added-Value Manufacturing
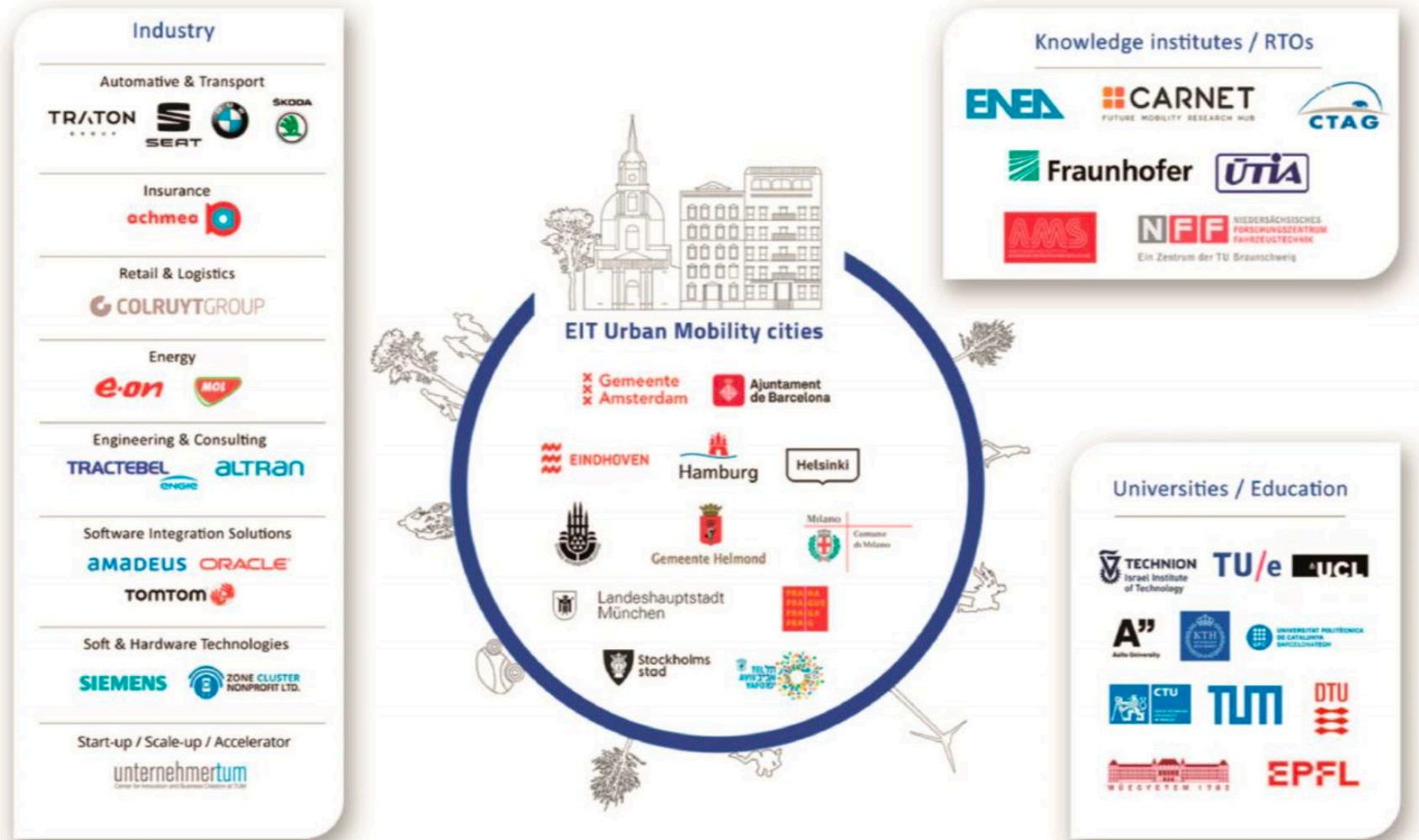
EIT Urban Mobility Partners

Figure C-3: EIT Urban Mobility partnership 2019

Innovation Hubs

- **ICH South Partners CORE Partners T1**
    - UPC, CARNET, Ajuntament BCN, SEAT, CTAG, Amadeus, EPFL
- **New Partners CORE Partners T1?**
    - AMB, UPF, RACC, ETRA
- **Affiliate partners?**
    - I2CAT, BSC, IDIADA

Legend:
- Innovation Hub **North**
- Innovation Hub **Central**
- Innovation Hub **West**
- Innovation Hub **East**
- Innovation Hub **South**

Figure C-6: EIT Urban Mobility Innovation Hubs

2. Early Bird Projects

Early Bird Projects (2019)

- **Education Projects (UPC Involvement)**
  - Innovacity
  - MOOC 5G
  - Master School Activities

- **Innovation Projects**
  - Only 3 projects for the whole consortium. UPC was not involved in these projects

3. Call 2020 Selected Projects

Call 2020

- **Education Projects (UPC Involvement)**
  - Boost I&E Project
  - Research Leadership Project
  - CITYTHON
- **Innovation Projects**
  - PRO-MaaS: Policies and Regulations required for enabling the MaaS concept
  - ANTI-TRASH: Smart trash detection and damage prevention for shared mobility
  - MOBY: Living lab e-micromobility
  - CAROLINA: Real-time pollution City mAp thRough cOLlaborative sensIng aNd Analysis
  - OSCAR: an Off-Street parking floating CARsharing service
  - CityFlows: Decision-support system for pro-active crowd management of crowded urban spaces
  - SMUD: Shared micro depots for urban pickup and delivery
  - ~~Traffic Light Priority System (TLPS) for Public Transport~~
  - ~~Virtual Mobility Lab~~
  - ~~Dynamic Parking Innovation~~
  - ~~MaaS HUBS: Smart Mobility for seamless urban mobility~~
- **Business Creation**
  - UPC leads an Accelerate Program for EITUM South Region (UPC, CiT-UPC, UPF, CTAG and barcelona City)

# of Activities and Budget 2020
top 30 partners
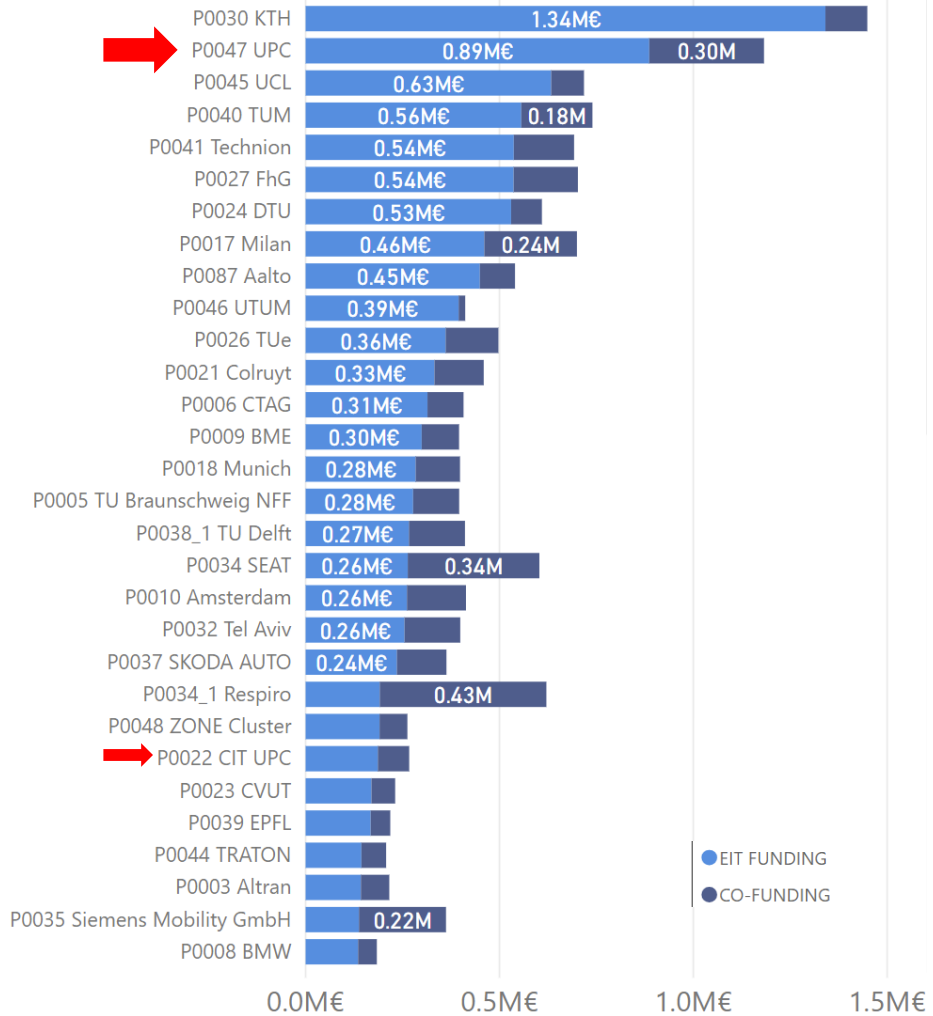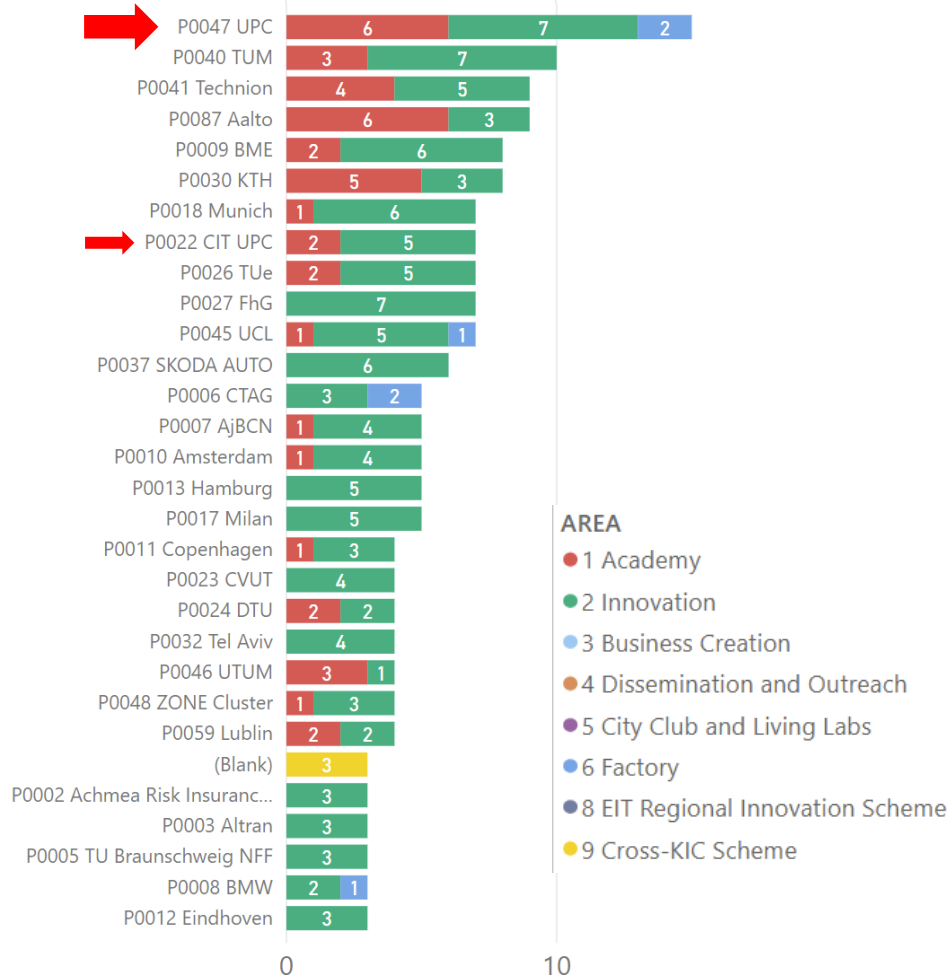
+ Accelerate Program for EITUM South Region:
UPC Budget= 321k€/715k€ (2020: 123k€ - 2021: 153k€ - 2022: 45k€)
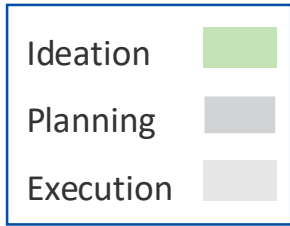
4. Preparation for Call 2021.

Call 2021
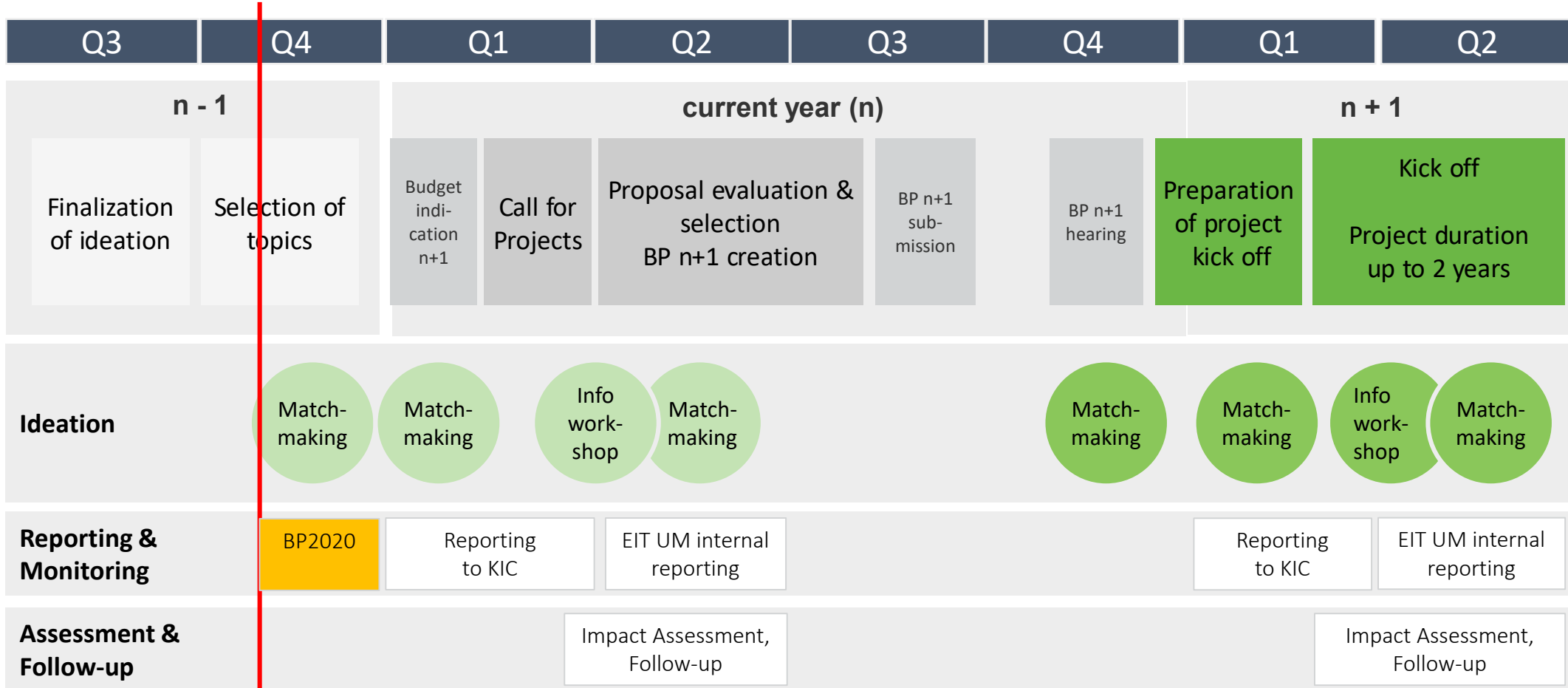
A. Project Cicle (Calendar)
B. Funding Concept
C. KIC Complementary Activities (KCA): How?
D. Types of Partners
E. Elements of the Call 2020 (probably also in Call 2021)
F. First Ideation Projects at UPC (presented in Prague. September 2019)
G. Challenges addressed - City Projects
H. Matchmaking Event in December
I. Lessons learnt. Strategic Partners

A. Project Cicle (Calendar)

EIT Urban Mobility Annual Project Cycle:
Ideation – Planning – Execution

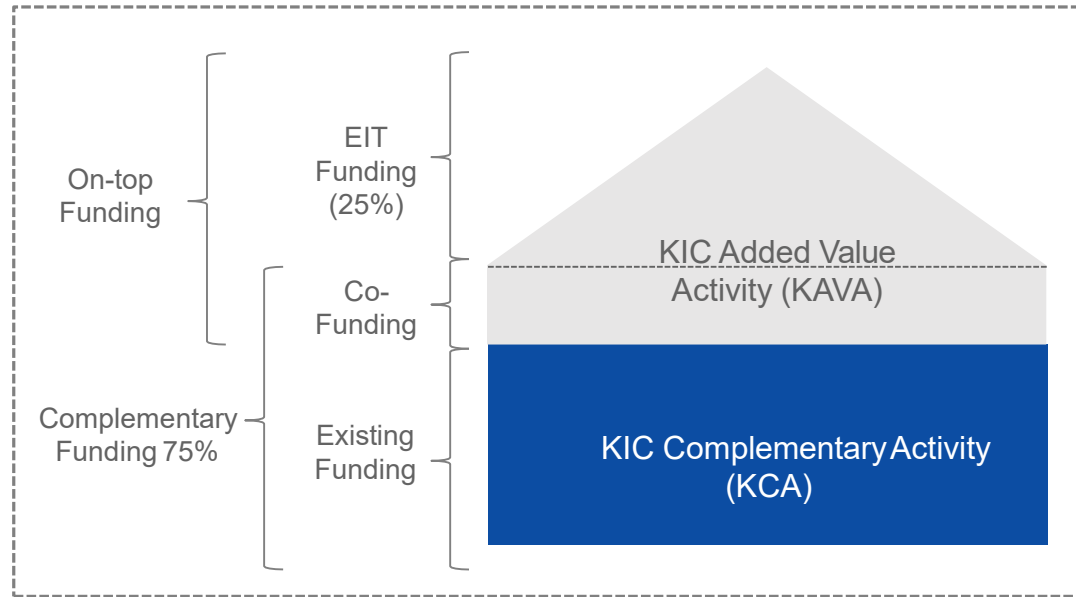| Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
n - 1		**current year (n)**				**n + 1**	

| Finalization of ideation | Selection of topics | Budget indi-cation n+1 | Call for Projects | Proposal evaluation & selection BP n+1 creation | BP n+1 sub-mission | BP n+1 hearing | Preparation of project kick off | Kick off — Project duration up to 2 years |

Ideation

Match-making · Match-making · Info work-shop · Match-making · · · Match-making · Match-making · Info work-shop · Match-making

Reporting & Monitoring

| BP2020 | Reporting to KIC | EIT UM internal reporting | | | | Reporting to KIC | EIT UM internal reporting |

Assessment & Follow-up

| | | Impact Assessment, Follow-up | | | | Impact Assessment, Follow-up |

Legend:
- Ideation
- Planning
- Execution

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B. Funding Concept

C. KIC Complementary Activities (KCA): How?

Call H2020 Urban Mobility

Repte social 4: Smart, green and integrated transport

Opció 1.

- Data limit primera fase: 9/01/2020
- Topics:
  - Cities as climate-resilient, connected multimodal nodes for smart and clean mobility: new approaches towards demonstrating and testing innovative solutions
  - Decarbonising long distance shipping
  - Understanding and mitigating the effects on public health of emerging non-regulated nanoparticle emissions issues and noise
  - Enhancing coordination between Member States' actions in the area of infrastructure research with a particular focus on biodiversity and ameliorating environmental impacts and full automated infrastructure upgrade and maintenance
  - Network and traffic management for future mobility
  - Improving road safety by effectively monitoring working patterns and overall fitness of drivers
- Data limit segona fase: 8/09/2020

Repte social 4: Smart, green and integrated transport

Opció 2.

- Data limit: 21/04/2020
- Topics:
  - Cities as climate-resilient, connected multimodal nodes for smart and clean mobility: new approaches towards demonstrating and testing innovative solutions
  - Enhancing coordination between Member States' actions in the area of infrastructure research with a particular focus on biodiversity and ameliorating environmental impacts and full automated infrastructure upgrade and maintenance
  - Coordination and support for an integrated freight transport and logistics system
  - The effects of automation on the transport labour force, future working conditions and skills requirements
  - Innovative electric network architectures and systems, optimising global energy electrical power, data and communication for aviation

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Call H2020 Urban Mobility

Repte social 4: Smart, green and integrated transport

Opció 2.

- Data limit: 21/04/2020
- Topics:
    - Towards sustainable urban air mobility
    - 'First of a Kind' solutions for sustainable transport and mobility: EU initiative for accelerating EU-wide market access, scale up and derisking
    - Improving impact and broadening stakeholder engagement in support of transport research and innovation
    - Digitalisation of the transport system: data sharing
    - Advanced research methods and tools in support of transport/mobility researchers, planners and policy makers
    - The European mobility culture of tomorrow: Reinventing the wheel?
    - Under water noise mitigation and environmental impact

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Repte social 4: Smart, green and integrated transport

Opció 2.

- Data limit: 21/04/2020
- Topics:
  - Efficient and safe connected and automated heavy-duty vehicles in real logistics operations
  - Large-scale, cross-border demonstration of connected and highly automated driving functions for passenger cars
  - Advanced light materials and their production processes for automotive applications
  - Reducing the environmental impact of hybrid light duty vehicles
  - Next generation electrified vehicles for urban and suburban use
  - Setting up a common European research and innovation strategy for the future of road transport

Repte social 3: Secure, clean and efficient energy

- Electro-mobility: LC-SC3-SCC-1-2018-2019-2020 Smart Cities and Communities

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D. Types of Partners

Types of Partners

	Core partner Tier 1	Core partner Tier 2
Funding	uncapped	max. €300K/y
Fee	€50K/y	€30K/y
Acceptance progress	min. 85% of members (iMT > GA)	max. of 15% of members (iMT > GA)

	Project Partner	Network Partner
FPA accession and signing	yes	no
Funding	max. €150K/y (can differ)	none
Fee	20% of requested EIT project funding	possible fees for event participation
Acceptance progress	via iMT	via iMT
Limitations of duration	status based on SGA (project participation)	on invitation only

E. Elements of the Call 2020

Innovation Projects delivering Products / services / solutions at a Technical Readiness Level (TRL) of 5 and above.

Innovation projects may fall into one of the following categories:
- Research (policies and regulatory)
- Living Lab (TRL 5-6)
- Market (TRL 7-9)

Academy projects may fall into one of the following categories:
- Master School
- Doctoral Training Network
- Competence Hub

All proposals need to support the EIT Urban Mobility's overall vision and mission and substantially contribute to tackling:

- Strategic objectives
- City challenges

Also Key Performance Indicators (**KPI**) from EIT and from the EIT Urban Mobility itself
Examples:

EITNO4: # of Start-ups created as a result of Innovation Projects

SO1: Enhance value of urban spaces for the quality of life by re-shaping mobility
KPI EIT UM: Fraction of EIT Urban Mobility cities that provide evidence on:
- Freeing up road spaces of at least 1% / year (or more depending by their SUMP target) in favour of active mobility, public transport multi-functionality, space for people to meet, green and blue infrastructures (based on EIT Urban Mobility projects).

Innovation projectes (>TRL5) must be impact-oriented to:

- Scale up by the Factory
- Transfer to cities of the City Club and beyond.
- Commercial exploitation in Business Creation
- Provide input on hot topics for the curricula of Academy.

Size	EIT funding		Minimum partner participation requirements		
	Max. budget pa	Partners	Cities	Countries	Hubs
Small	100.000 €	3		3	2
Medium	500.000 €	4	1	3	2
Large	1.000.000 €	6	2	3	2

Evaluation criteria:

1. Project excellence, novelty and strategic fit (30%)
2. Solution readiness, consortium and project plan (20%)
3. Strategy for Implementation (20%)
4. Impact (30%)

F.   First Ideation Projects at UPC

![UPC Universitat Politècnica de Catalunya BarcelonaTech logo]

First Ideation Projects for 2021 at UPC (presented in Prague. September 2019)

Idea Group (*)	Project Name	Project description	Idea Lead
IG1	Idea_Connected Cooperative and Automated Sef-Driving Car	To determine the optimal constrained routes dynamically for driverless vehicles in a urban areas	Prof. Sebastia Sallent
IG3 and IG5	ICT Urban Goods Distribution	Develop ICT systems for good distribution and analyse how urban infrastructure, planning and regulations have to be modified to allow these services.	Prof. Alberto Sanfeliu
IG3	Optimal urban space allocation based on Smart Traffic+transit measurement and management	This project is aimed at developing a new tool to determine the join traffic, transit and pedestrian performance in a city, based on macroscopic fundamental relationships of traffic variables	Miquel Estrada
IG4	The data in the world of logistics	Creating a public access system unified to logistics applications in order to work with standardized and unified transit data for cities and countries.	Josep Lluis Larriba
IG10	Technological Infrastructure for developing and testing ICT Urban Mobility Services	Using scientific and technological infrastructures to improve innovation and development in urban ICT Mobility.	Prof. Alberto Sanfeliu
IG12	Personal ICT Urban Mobility	Develop ICT mobility solutions with features of autonomous platforms and ADAS (advance driver-assistance systems)	Prof. Alberto Sanfeliu

![eit Urban Mobility logo]

* Idea Group (IG):

1 Scaling tools	7. Master School
2 Accelerate Urban Transformation	8. Doctoral School
3 Forster Integrated Mobility	9. Competence Hub
4 Fullfill Mobility Needs	10 RIS
5 Decarbonise and Automate Mobility	11 Business Creation
6 Strategic Innovation	12 Open Topics

First Ideation Projects for 2021 at UPC
(presented in Prague. September 2019)

Idea Group (*)	Project Name	Project description	Idea Lead
IG12	Healthy Urban Mobility	Build a new database management system based on individual mobility focused on measuring how much healthy our mobility habits are according to our urban environment at local level.	Estanislau Roca & Joan Moreno
IG3 and IG5	Transit Integration by speed segregation	Demultiplex current transit (pedestrians, cars, bikes, scooters, public transport, cycles) by segregating different speed traffic flows.	Cecilio Angulo
IG4 and IG5	AIR MOBILITY	Transporting goods and passengers through the air to reduce congestion.	Jordi Pons (**)
IG5	Platooned Autonomous Buses	Identifying the operational planning, potentialities and the technological requirements of platooned modular buses.	Miquel Estrada
IG3 and IG4	Food distribution with the Public Transport Network of Passengers	Distributing dry food through public transport to attract people to travel with PT.	Josep Lluis Larriba
IG3 and IG4	Integration of food bank logistics in the city and in peri-urban areas	Improving the way of logistics for food banks.	Josep Lluis Larriba
IG4	In-Cabin Monitoring	Development of new functions inside the vehicle based on bio-informations.	Lluis Jofre

* Idea Group (IG):

1   Scaling tools
2   Accelerate Urban Transformation
3.   Forster Integrated Mobility
4.   Fullfill Mobility Needs
5.   Decarbonise and Automate Mobility
6.   Strategic Innovation

7.   Master School
8.   Doctoral School
9.   Competence Hub
10   RIS
11   Business Creation
12   Open Topics

G. Challenges addressed

City of Barcelona Challenges for EIT UM BP 2021 (the first 10 with priority)

1. To prioritize traffic lights for public transport to increase public transport average speed and enhance frequency reliability.
2. To improve public transport electrification to fight against climate change.
3. To make limited public space use more flexible, adapting uses to specific needs depending on day/night, working days/weekends, seasons...

4. To optimize logistic travels to reduce the number of vehicles and travels.
5. To increase cars occupancy to reduce the numbers of vehicles and travels.

6. To reduce number of private cars circulating to reduce pollution and fight against climate change.
7. To reduce number of private cars parked on-street to enhance public space quality.

8. To improve most vulnerable modes of transport safety.
9. To develop the multimodality of micro mobility
10. From data to knowledge: technology platform, from sensors to user layer, providing concrete and scalable solutions to enhance interoperable urban mobility.

City of Barcelona Challenges for EIT UM BP 2021

11. To develop measures to minimize health impact of private car mobility.

12. To reduce and limit vehicles speed inside cities to increase citizens safety and reduce pollution.

13. To investigate on innovative technical solutions for urban pavements to reduce air and noise pollution.

14. To investigate on innovative technical solutions for urban pavements to make public space use more flexible.

15. To investigate on innovative technical solutions for urban pavements to mitigate impact of urban heat islands and reflectance index.

16. To minimize visitors impact on public space (group mobility and queues management, early booking systems, signposting, transport stops).

17. To decrease impact of bicycles, motorcycles and PMVs touristic use and promote walking as it is leading coexistence and safety problems.

18. To communicate with visitors in real time to influence their trips, planned visits and mobility patterns (balancing people distribution).

City of Barcelona Challenges for EIT UM BP 2021

19. To assess mobility and air quality health impact (mortality, morbidity, traffic injuries...) focusing on most vulnerable population.

20. To monitor walking and cycling health impact and traffic injuries risk, considering social inequalities perspective.

21. To assess impact of road safety actions on road traffic injuries, considering social inequalities perspective.

22. To assess Low Emission Zones impact on health and well-being, considering social inequalities perspective.

23. To monitor climate change impact on mortality and morbidity, considering social inequalities perspective.

24. To monitor noise pollution impact on mortality, morbidity and quality of life, considering social inequalities perspective.

25. To measure people exposure of mobility on foot and by bicycle.

26. To assess road safety interventions impact on vulnerable users.

27. To establish a surveillance information system on micro-mobility injuries, considering social inequalities perspective.

G. Matchmaking Event

H. Lessons learnt

- Everything goes very fast so contact possible partners with your idea, even if it's not so mature. Call starts in January but by then everybody will be quite oriented.

- Get close to Barcelona City Challenges, it will be closer to market, and cities are more "attractive" than Universities.

- Area Metropolitana de Barcelona (AMB) is also joining next year. Think of them too, they look somehow "agile" in taking decisions

- We do our best in Matchmaking events but everytime they have a different format and It's quite complicate to show all possible projects from UPC. Nevertheless they should be there if opportunity comes and afterwards the projects are available to all partners.

- Think on going to H2020 Calls with your partners. This can improve changes to get these projects and viceversa EIT UM project will have the necessary Co-funding or KCAs.

Management Team UPC

Àrea de Recerca i Transferència (Suport KIC)

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Projectes H2020

- Mònica Altimira monica.altimira@upc.edu

Carnet Contact

- Laia Pagès laia.pages@carnetbarcelona.com

Thank You!

Additional Information

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Improve public transport electrification to fight against climate change.

No. 2

Key problems
- Environmental impact of traditional transport
- CO2 emissions & pollution

Objective
- Electrify public transport
- Reduce environmental impact within the cities

https://www.themachinemaker.com/man ufacture/wri-india-workshop-electrification-of-public-transport

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Optimize logistic travels to reduce the number of vehicles and travels.

No. 4

Key problems
- High amount of logistic
- Congestion

Objective
- Increase efficiency
- Decrease environmental and operational costs

https://www.trendhunter.com/trends/renault-ezpro

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Increase cars occupancy to reduce the numbers of vehicles and travels.

No. 5

Key problems
- Single rides
- Congestion

Objective
- Increase efficiency
- Decrease environmental and operational costs

HIGH OCCUPANCY VEHICLE LANE

2 +

For use by vehicles with 2 or more persons &

No HGVs

http://www.citytransport.info/Roads.htm

Reduce number of private cars parked on-street to enhance public space quality.

No. 7

Key problems
- Blocked public space
- Limited accessibility

Objective
- Free up roads
- Alternatives for parking
- Increase public space quality

https://www.eurocheapo.com/blog/parking-in-barcelona-green-and-blue-zones-and-parking-lots.html

Develop the multimodality of micro mobility.

No. 9

Key problems
- Low efficiency of micro mobility
- Limited availability

Objective
- Increase options
- Improve availability

https://www.enterpriseirregulars.com/133989/seven-implications-to-adopting-multimodal-on-demand-mobility/

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BARCELONATECH

From data to knowledge: technology platform, from sensors to user layer, providing concrete and scalable solutions to enhance interoperable urban mobility.

No. 10

Key problems

- Many sources of data
- Wide range of data providers
- Limited scalability

Objective

- *Interoperability collecting data*
- *Services layer based on knowledge*

https://www.wbcsd.org/Programs/Cities-and-Mobility/Transforming-Mobility/Transforming-Urban-Mobility/Data-Sharing-Principles

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City Challenges

Accessibility and inclusion: provide access to sustainable modes of transport for all population groups

Data exploitation: access, combine, share data via open platforms

Combating pollution: maintain and increase the quality of natural resources – air, soil, vegetation, water

Allocation of space: return urban space to citizens and increase liveability

Managing the transition: improve the processes and define the roles of municipalities in the transition of urban mobility and the use of public space

Accomodating urban growth moderate the battle for the limited amount of available public space

Strategic Objectives (According to the New Strategic Agenda)

SO1 — Create liveable urban spaces

SO2 — Close the knowledge gap

SO3 – Deploy user-centric, integrated mobility solutions

SO4 – Accelerate market opportunities

SO5 – Promote effective policies and behavioural change

Mobilus Education Programs

MOBILUS Master School (EIT Labelling)
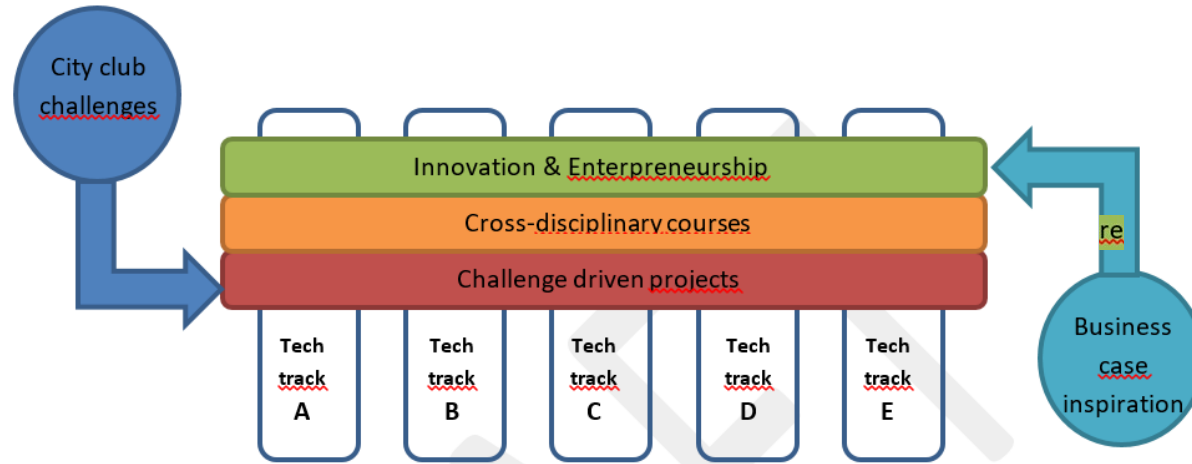
"Quality for learning"
EIT Quality Assurance and Learning
Enhancement Model 2018

https://eit.europa.eu/sites/default/files/eit_label_handbook_2018.pdf

120 ECTS
- 30 ECTS for master thesis
- 30 ECTS Innovation & entrepreneurship (common)
- 30 ECTS urban mobility relevant topics (common)
- 30 ECTS ECTS Specific Tracks

Sep 2020 (?)
- Aalto University
- BME Budapest
- CTU Prague
- Eindhoven University of Technology
- KTH Royal Institute of Technology
- Universitat Politècnica de Catalunya
- Technical University of Denmark

Sep 2021
- Technion – Israel Institute of Technology
- University College London

MOBILUS Master School
(EIT Labelling)

City club
challenges

Innovation & Enterpreneurship

Cross-disciplinary courses

Challenge driven projects

Tech track A | Tech track B | Tech track C | Tech track D | Tech track E

re

Business case inspiration
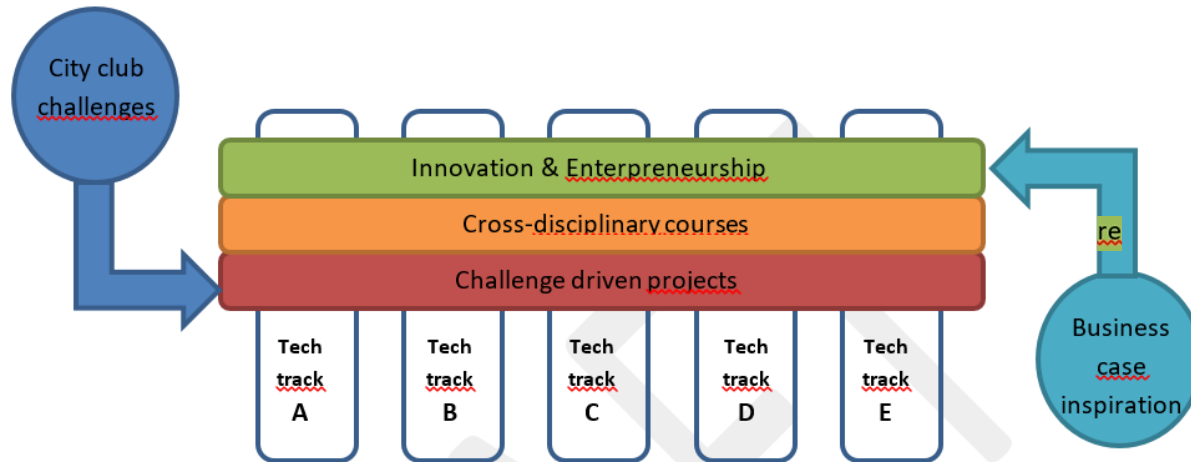
The content of the courses as well as the execution will involve both cities and business partners for providing project challenges, coaching and feedback to student projects addressing real challenges.

30 ECTS Urban Mobility Relevant Topics

Urban Modelling/Travel Demand Analysis (or alike)

Traffic Network Simulation (or alike)

Logistics/Good Transport Planning/Analysis (or alike)

Spatial Analysis (or alike)

Transport Data Analysis (or alike)

Advance data analytic/behavioural modelling (or alike)

30 ECTS Specific Trakcs

* Track 1: Data science and smart mobility
* Track 2: Innovative mobility technology
* Track 3: Future mobility markets and services
* Track 4: Sustainable mobility transitions

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MOBILUS PhD Program

Requirements for MOBILUS PhD Certificate:

- Successfully completed PhD / doctoral thesis ECTS 120
- Report on International (6 months) Research Phase ECTS 30
- Two participations at annual MOBILUS PhD Forum ECTS (?)
- Participation in at least one workshop from the "Entrepreneurial Toolbox"(?)

MOBILUS Professional School

- Focus on lifelong learning in a blended gamified format for both cities and company staff
- Freemium funnel model based on online material (videos etc.) with value added services such as consultancy services
- Leveraging Cross-KIC initiatives
- KPIs such as completed courses/elements and revenues
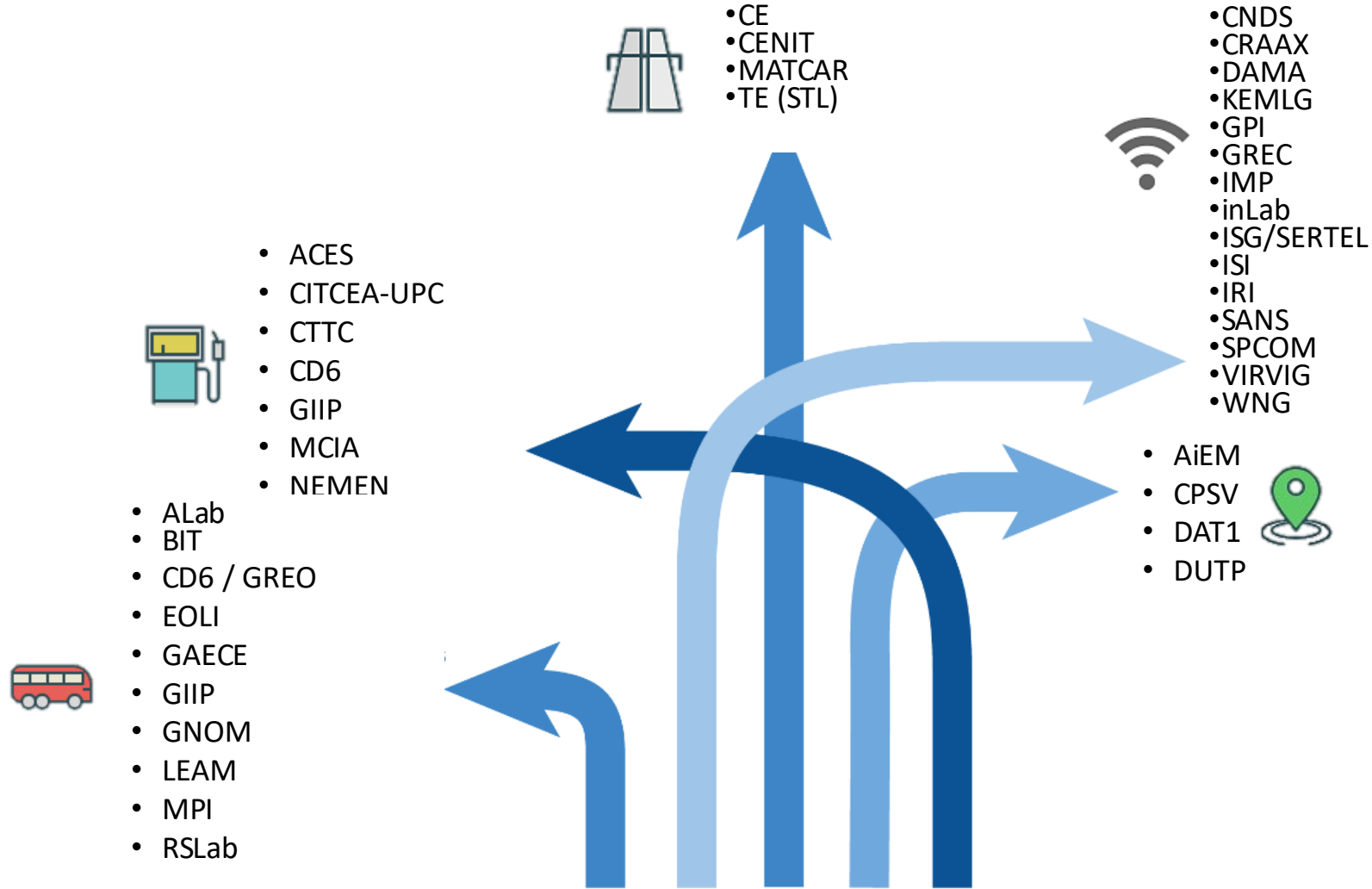- Requires initial startup funding

UPC Capabilities
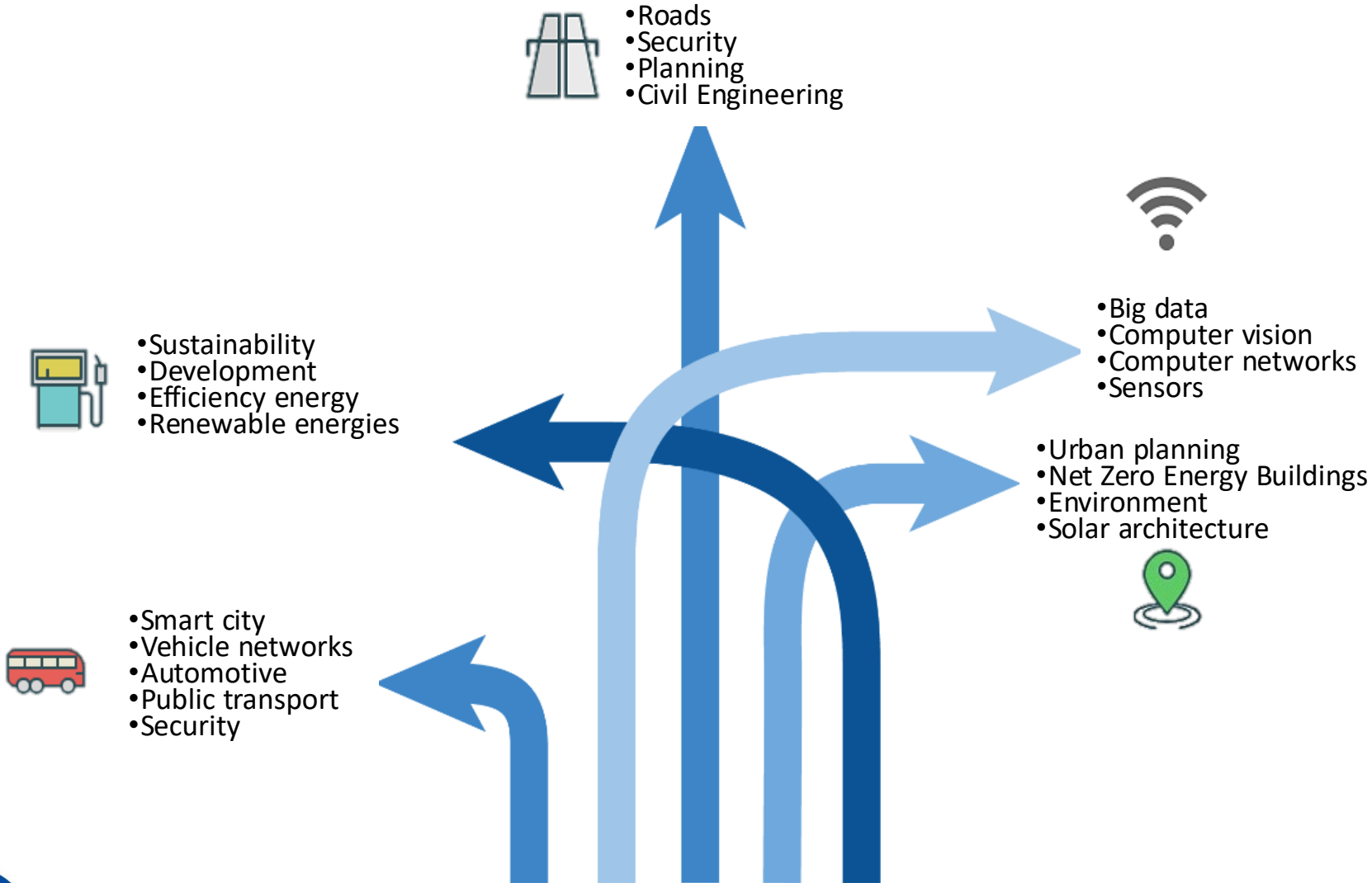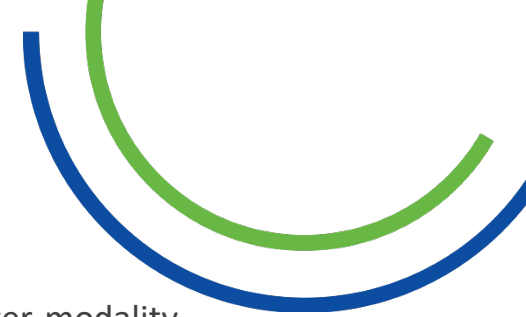
Sustainable vehicle concepts

- Advanced materials: GIIP, NEMEN, AEiM
- Alternative propulsion systems: ACES, IRI, MCIA
- Electric, electronic & wireless: GIIP, ISI, MCIA, CITCEA
- Energy & life-cycle efficiency: GIIP, ACES
- Autonomous & connected mobility solutions: IMP&InLAB, WNG
- Safety & comfort: GPI, ISI
- Robotics, artificial intelligence, interaction/recognition sensor/optical: IRI, GPI, ISI, CD6, WNG, KEMLG, LEAM

Business design for Urban mobility

- Mobility as a Service (MaaS): IMP&InLab, DAMA
- Learning systems & qualitative decision making: IMP&InLab,
- STL, KEMLG
- Technological & social trends
- Predictive user studies: GREC
- Mobility data collection: DAMA
- Investment scenarios / Public Investment: CE

Sustainable Smart City & infrastructure

- Sustainable urban design and accessibility (inter-modality-aware design): IMP&InLAB, IRI, CPSV
- City planning & architecture (acoustics, heat, comfort, light optimization): CD6, DUTP, DAT, ISI, CPSV, AiEM; CTTC
- Urban data simulation (land use, housing, urban mobility plans) & virtual reality: VIRVIG, CPSV, CTTC
- Charging and smart grids: CITCEA
- Sustainable/smart materials/recycling: SANS, GREC, CE, DUTP, DAT, CPSV, MATCAR, AEiM
- Adaptive and dependable interconnectivity
- Big Data and Intelligent Systems: CRAAX, SANS, VIRVIG, DAMA
- Structural Technologies: CE

Urban mobility concepts

- Sustainable urban mobility
- Multimodal mobility strategies
- Dynamic traffic models & management: IMP&InLAB, SANS, CD6, DAMA, IRI, CENIT, BIT
- Flexible road networks: IMP&InLab
- Logistic and routing concepts / multipath routing (AI): IMP&InLab, ISG, EOLI, CENIT, BIT
- Communications/Cooperative Urban Mobility: WNG, CRAAX, ISG, ISI, GNOM, KEMLG

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