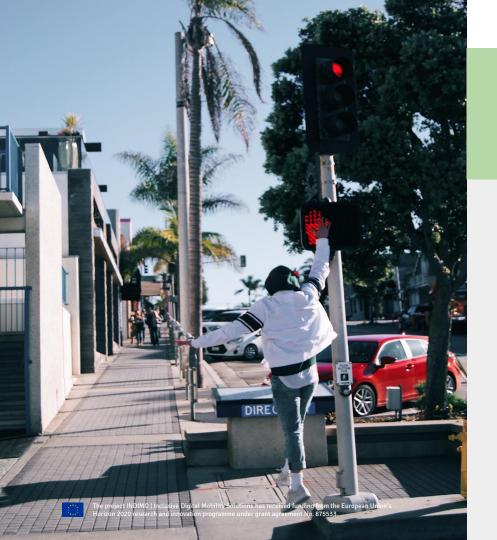








Universal Design Manual for digital mobility and delivery services







Universal Design Manual for digital mobility and delivery services

The Universal Design Manual provides guidelines to improve the accessibility of the user interface of digital mobility and delivery services taking into account the principles of Universal Design targeting the needs of all kinds of end users.

The INDIMO Toolbox is intended for a practical use, providing direct access to interactive evaluation tools, templates and documentation.







The Universal Design Manual for digital mobility and delivery services

- How to navigate the tool?
- 1. What is the **UDM**?
- 2. Why do I need the **UDM**?
- 3. How can I use the **UDM**?
- 4. What is the science behind the **UDM**?
- 5. UDM recommendations: examples and best practices
- 6. Useful links and references
- **7.** <u>Project information</u>





How to navigate the tool?

Tips and tricks

Dynamic navigation index



Full screen mode

and forth















How to navigate the tool?

Navigation style



DEEP-DIVE

 click on the links provided in each slide to open contents contextually



READ-ON

 read thoroughly the slides and download all templates in a compressed file at the end



SPEED-UP

 fast-read and skip slides or jump to the final slide whenever you want



The UDM ambition and challenge

The focus of the Universal Design manual is on the interaction between users and the digital transport systems through user interfaces on multiple devices (e.g., mobile, desktop, interactive equipment or information display).

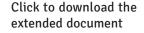
The UDM provides answers to the following **key questions**:

- How to assess and analyze user needs inclusively?
- How to identify user requirements for accessible digital mobility services?
- How to apply recommended changes across the different service design phases?













Key features of the UDM

The **key features** of the UDM supporting the inclusive design of user interfaces are:

- 1. The inclusive approach to the development of adaptive user interfaces.
- 2. The design of accessible content organisation and visual layouts.
- The conceptualization of navigation flows, combined with multi-modal cues (e.g. visual aids, captions, icons labelling, etc..).
- 4. The coherence across service communication channels.
- 5. The support the integration with **assistive device technologies** (e.g. text-to-speech, voice readers, etc..).











From co-creation to recommendations

The INDIMO Toolbox provides a **user-centric design approach** and a set of **recommendations** based on the empirical research carried out in the Communities of Practice (CoPs) and the Co-creation community (CCC), also drawing from literature review and desk research.

In the following sections you can read more about the UDM methodological process, the results and find the other downloadable templates and documents.

Click on one of the links to visit the online interactive repository of recommendations













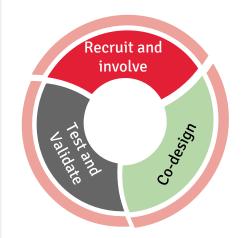


The development of the UDM



The INDIMO Toolbox was created by following a simple process:

- Recruiting and involving end users, service operators, developers, policy makers, researchers, and experts in the collaborative identification of user needs and requirements.
- Applying iterative design to the co-development and assessment of the UDM contents in five pilot sites, through periodic meetings with the local Communities of Practice (CoP).
- 1. Proceeding with the **collective validation** of each pilot site's service applying the final UDM recommendations.









2. Why do I need the UDM?

Find yourself!



NGO or association representing people with special needs and/or impairments



Mobility/delivery service providers

You know the needs of the people you represent, but you face difficulties in expressing this expectation to other professionals.

The UDM will help you substantiate your ideas and provide recommendations to increase service inclusivity.



Developers, UX/UI and graphic designers

While developing a digital mobility or delivery system (DMS/DDS) you try to do it for the widest audience as possible and you want to be able to adapt it to emerging needs.

The UDM will help you **identify users' needs and and suggest you practical tips** on how to tackle them.

You want to be sure your service can be used by everyone and be as inclusive as possible to increase your customer base.

The UDM will contribute to generating awareness in your team and guide the decision-making process through inclusive principles and approaches.



Policymakers

As you are in charge of promoting accessibility, you either elaborate, deploy or execute policies, or you shape laws and regulations that directly affect mobility and delivery services.

The UDM allows you including essential requirements to bring more inclusive services on the market.









The UDM objectives

You can use the UDM to achieve one of the following objectives:

- To assess accessibility and inclusiveness of existing digital mobility and delivery services and the related user interfaces;
- To design accessible and inclusive new digital mobility and delivery services' and the related user interfaces.

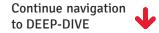
You can use the UDM to analyse, develop or redesign a service in two ways:



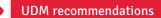
DEEP-DIVE | Discover and apply the UDM methodology to evaluate and improve the accessibility and inclusiveness of new or existing services;



SPEED-UP | Identify and apply the appropriate UDM recommendations to adopt an inclusive approach in new or existing service design.















A step-by step digital Universal Design methodology

In the following slides you will find all materials needed to apply the UDM methodology:

STEP 1

The Checklist for service assessment, to identify your target audience, weak points and to create a preliminary roadmap for development.

STEP 2

The Capabilities-limitations spectrum, to identify typical users and intervention areas for implementation.

The Requirement ranking template to assess the demands and effects of your possible interventions.

STEP 4

The Personas concept to build context-specific user types and their user experience (UX).

STEP 5

The **User journey** concept to identify the difficulties users may experience while using your service.

STEP 6

STEP 3

The **UDM Guidelines** include a general guidance for the design and development process.









Step 1 - Checklist for service assessment



As first step, use the INDIMO checklist for service assessment to obtain a performance score of the inclusivity of the service inclusivity and familiarize yourself with the specific needs and requirements of end users with the most diverse characteristics.

For the overall service the checklist helps to:

- Determine the performance of your overall service on the different axes of users' capabilities and limitations.
- Identify and address accessibility and inclusivity issues of the service based on its performance.
- Create a roadmap of the main areas of possible improvement.

At the physical and digital interfaces level the checklist helps to:

- 1. Trigger the design/redesign process by focusing on the available resources.
- Characterize users' capabilities and limitations to access and use the service.
- Prioritize actions required to improve the service and/or related subsystems.



Checklist for service assessment









Step 2 - Capabilities-limitations spectrum

After service performance assessment, a capabilities-limitation spectrum can be defined. This exercise may be implemented by any developer, operator or service provider to assess the capabilities/limitations of their potential users and think of how to make their services universal (or, at least, with a higher degree of universality). An example is the assessment of the end users' degree of capabilities-limitations in daily activities such as walking, paying for a service, etc.



- **1.** First **identify a spectrum of capability*-limitations** where people can be characterized using the graph template.
- 2. Secondly visualise the scope of the spectrum that is covered by the characteristics of the service.

*capability: what people can do – their capabilities and their current state with respect to the options available to them









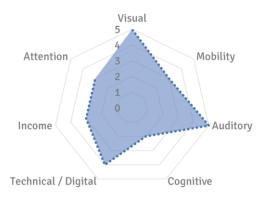




Step 2 - Capabilities-limitations spectrum



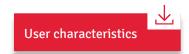
Instead of elaborating guidelines for fixed target groups of users, the UDM proposes to approach Universal Design through a spectrum of users' capabilities-limitations: there exist no social minorities separated from the majority tagged with "normality", but there are rather different dimensions of capabilities-limitations and overlapping characteristics. Each person, according to their self-perception, can be at any point on this spectrum.



The spider-graph axes with degrees of capability-limitation

Scale from 0 (no capability) to 5 (complete capability).

Ideally, both the service provided and the related digital interface should have satisfying ratings on every axe of the capabilities-limitations spectrum.



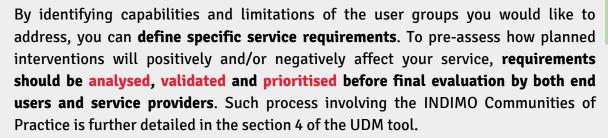








Step 3 - Requirement ranking





UDM requirement ranking table template

UDM requirement ranking - example

UDM_DUI_91
Add a photo of the rider/driver that
will serve the user for better
identification. Notes: Needs further
discussion

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Use the dynamic navigation menu to move across sections



Step 3 - Requirement ranking example

Below there are three examples of the requirements derived the target groups of a food delivery service in the INDIMO pilot in Madrid:

PEOPLE WITH REDUCED VISION

- Some degree of autonomy;
- Enjoyment of going to the store and selecting products;

PEOPLE WITH REDUCED MOBILITY

- Purchase of large amounts of food;
- 2. No focus on physical condition to justify choices;

NON-CONNECTED PEOPLE

Disconnection as a lifestyle choice;

LIMITATIONS

CAPABILITIES

- 1. Tend to avoid screens;
- 2. Get lost in icons;
- 3. Sensitive to contrast, shapes and colors;
- 1. Limited by low accessibility of stores
- Prefer small stores, associate delivery with big chains
- 1. Concerns about privacy, security;
- 2. Negative perception: association of delivery with sickness or impairment;

REQUIREMENTS

- Anticipation and control over graphic interface (e.g. customizable fonts...).
- 1. Human assistance:
- 2. Direct contact with rider to arrange delivery details.
- 1. Terms and conditions in checkboxes;
- 2. Include the possibility of viewing user ratings.









Step 4 - Build personas

Potential users can be represented by **personas**. *Personas* are fictional characters representing user profiles through behaviours, attitudes, beliefs and goals they want to reach through a certain service. Personas enable designers to think of the user as a real person with a name, face, and life routines. These creations capture the most relevant user profiles and characteristics.

In INDIMO, each pilot's Communities of practice created one or more *personas* to **transform the users' goals, needs, challenges, limitations into a human portrayal** to inspire developers towards service redesign. For each *persona*, a user journey map was designed in order to portray the actual user experience with the service.







Age: 30 y/o
Marital status:
Married
Children:
2 children (1 infant)
Occupation:
Maternity leave
Location: Peri-urban
area in Berlin

Income: Medium

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Go to next slide to see examples







Step 4 - Personas examples

PERSONA LUISA

Emilia Romagna pilot

PERSONA JOHANNA

Antwerp pilot

PERSONA

MARIAM

Galilee pilot

MARIA

CARMEN

Madrid pilot

PERSONA



SARA Madrid pilot

PERSONA



Age: 76 y/o Marital status:

Widowed Children:

One daughter (+ one grandchild)

Occupation: Retired

Location: Centre of Monghidoro Income: Medium

Age: 40 v/o **Marital status:**

Single Children:

No children **Occupation:**

Public service officer

Location: Antwerp **Income:** Medium

Age: 25 v/o Marital status:

Single

Children: No children **Occupation:** Part-time

saleswoman at grocery store; Parttime university

student

Location: Rural area/village Income: Medium Age: 60 y/o Marital status: Widowed

Children: Two

children, lives on outskirts of

city

Occupation:

Unemployed; support from government and family

Location: Madrid Income: Low

Age: 26 y/o Marital status:

Single Children: No children

Occupation:

Works at sheltered workshop

Location: Madrid Income: Low

CLUSIVE DIGITAL MOBILITY SOLU







Step 4 - Personas examples

MARIE Berlin pilot



Age: 30 y/o
Marital status:

Married Children:

2 children (1 infant)

Occupation: Maternity leave

Location: Peri-urban area in Berlin

Income: Medium



Marie lives in a peri-urban location of Berlin with her husband, who needs the car to get to work. Her husband is very busy, and her parents live an hour away, so **she has little support from others to take care of her child** and the husband.

There are only **limited public transport options** in her neighbourhood, so it is more convenient to use the ridesharing option as she wants to bring her children along. **She is already a user of the ride sharing service** as it helps her get everyday tasks done more swiftly and with less frustrations as the public transport is inadequate. **She is now able to plan her trips** to the grocery store, doctor, school etc. without too much hassle.

She is an open-minded woman who does not mind sharing with people she does not know, and **she is not afraid to try out new technologies**. However, she is not an explorative person and will not actively look for new things as she is quite busy, **she relies on information from others**.









Step 5 - From personas to user journeys

A journey map is a visualization of the intellectual and physical actions that a person performs in order to accomplish a goal. With the persona's profile in mind, a user journey can help to **identify the difficulties** users may experience in a realistic scenario.

- different capabilities and limitations together with the design team to run this exercise.
- 1. Involve end users with 2. Define a realistic scenario for each persona/user, before she/he is using your service, possibly before even knowing it exists at all.
- 3. Specify actions and add thoughts related with each step of user-experience, including the post-journey stage.



User journeys

Marie's scenario

AWARENESS (3)

Marie needs to order a ride with ridesharing service from her home to the doctor and then to the pharmacy and finally back home with her children, including an infant.







POST-USAGE







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Step 5 - User journey example



AWARENESS 🚳	CONSIDERATION	USAGE	SERVICE	POST-USAGE
Doing:	Doing:	Doing:	Doing:	Doing:
Mouth-to-mouth recommendation from relative.	Downloads the app/reads information on the app.	Books 1st ride in the mobile app: register + destination & 3 passengers.	Receives notification of arrival car and goes to the pick up point.	Starts rating and commenting at the end of the ride and gets notified in the app.
Uses a service (route planner) that integrates the offer.	Tries to book a ride as a test but does not confirm it at the end of the process.	(Pre-)book 2nd ride after completing booking and payment of ride 1.	Goes out and checks Confirmation of pre-booking for 2nd ride and starts waiting for it.	
Thinking:	Thinking:	Thinking:	Thinking:	Thinking:
It looks like the service is not developed for me.	Checks potential benefits, e.g. combined price for mother and child(ren).	Checks if it is possible to see connections with public transport.	/	Considers sending an e-mail or call if unhappy about the service.









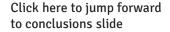
Step 6 - Generalisation of requirements into recommendations and guidelines

The final step of the UDM methodology is to translate requirements into recommendations and guidelines. This can only be effective if done after the previous steps.

In the next slide we provide as an example a table in which requirements and recommendations from the INDIMO Communities of practice have been collected in all pilot sites. All recommendations derived are now a part of the full set included in the INDIMO Toolbox.



Continue navigation
to see an example and
read more about the
science behind the UDM















Type of Requirement

Step 6 - Example table - From requirements to recommendations

Detail of

development



As done in	j.
INDIMO, you can	
build a large table	
to collect	
examples,	
evaluation,	
implementation	
roadmap and the	
generalisation of	
each requirement	
into one or more	
recommendations	
that can be applied	
to all other similar	
services or sub-	
features of your	
service.	
33.7.33.	

Registration i. Requested information Adding to favorites their home or work address (MR) (P5:B) Service should require as little personal data as possible to function properly The first 2 examples ii. Steps for registration An easy one-time registration Include introductory tutorials and FAQ section Allow registering

through social networks

(such as Facebook)

Organize some sort of

target audience (e.g.

educational session)

teaching method for the

Requirement

Showing at the beginning of the registration process very visible the options to access: a) video tutorial: b) FAO: c) direct contact with care to the user. (for all apps).

correspond to point a) video tutorial b) FAQ c) Direct contact. A button present in the home of the app, which goes to a screen with all types of contact with the operator.

Also, a WhatsAppicon for people to communicate may be added. That is always at the discretion of each programmer.

Recommendation(s)

UDM DUI 74: Simplify/ Reduce the requested Video-tutorial information to register for Do you want to know how to use the App. e.g., adding to favorites user's home or work address, requiring as fewer personal data as possible to function properly.

Top restaurants

Design

examples

UDM DUI 75: Provide easy one-time registration requiring as few personal data as possible (e.g. predefined work/home addresses, register/login through existing platforms/social networks)

was implemented jointly by the CoopCycle developer team allowing users to directly register on the digital service platform with a Facebook, Google and Apple account and for providing the changes on all channels: for the Android, iOS mobile app and for the web application.

Pilot's

implementation

P4 - Madrid: This change

The recommendation is meant to increase

the user base of La

Páiara in order to

Fvaluation

feedback

include new users from INDIMO target groups, either those who already use social networks like Facebook and for those who do not but still are registered in widespread platforms like Google or Apple since they own mobile devices, as emerged from nonusers interviews carried out in

INDIMO.

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Click here to download the table



Requirements to recommendations table



The Universal Design principles in the digital world

Universal Design is the design of products and services that may be employed by people with a wide array of characteristics, abilities and disabilities. It implies a type of use that does not require adaptation or specialized design.

Service operators and involved design teams aiming for a higher degree of accessibility shall familiarise themselves with the seven principles of Universal Design, plus the two additional principles proposed by INDIMO for the digital mobility and delivery services: accessible security protection of data and social, spatial and economic inclusiveness.

Equitable Size and space for use approach and use Tolerance **Flexibility** for error in use Simple and intuitive use Perceptible Low physical and information intellectual effort Social, spatial Security and and economic protection of data inclusiveness









Universal Design principles adopted by INDIMO



Security and protection of data

Social, spatial and economic inclusiveness

Security and protection of data

All features and procedures related with end users' agreement to personal data treatment, sharing and storage, be it sensitive or not, shall be more accessible and inclusive both in the physical and digital domain of any service. Safety-by-design, Human Factors and usercentred approaches should be used to ensure the involvement of end users in the design process.



Social, spatial and economic inclusiveness

All services both in the physical and digital domain should explore and consider the social, spatial and economic dimensions of accessibility and their interrelationships. This way we can ensure the highest degree of inclusivity, considering socio-technical systems as a whole, instead of seeing them as separate silos.









The INDIMO Communities of practice

In INDIMO user requirements for digital mobility services have been identified through a structured step-by-step methodology. Such process took place through a series of meetings of the **Communities** of practice (CoP) sessions in each pilot. The main tasks of the CoPs were:

- **1. Active recruitment of target groups** of participants for each pilot who committed to participate on a regular basis.
- 2. Collaborative **identification of requirements,** further analysed through collective fieldwork in online and in person workshops.
- 3. Specific meetings across the pilots to run requirement validation and prioritization exercises.

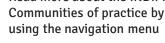
Visit the INDIMO Communities of practice webpage





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Read more about the INDIMO



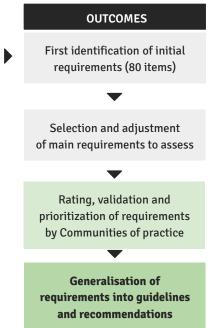


From needs to requirements: the work behind Communities of practice

The identification and prioritisation of users' requirements towards the Digital Mobility and Delivery Services was defined, tested and validated through Communities of practice by following the same process in each pilot site.















4. Conclusions

Engage, empathise, redesign, repeat

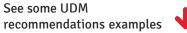


Main UDM question: How can digital and physical interfaces of mobility and delivery services be designed to be satisfying for users with different capabilities and limitations?

Key recommendation: explore and address all users' group requirements by properly applying Universal Design principles as suggested by the Universal Design manual and commit to creating the preconditions for empathy, engagement and mutual understanding between end users and decision makers at all levels!









5. UDM Recommendations and best practices

Three examples



Source UDM

All service employees should be trained about inclusivity

Theme/Aspect: Assistance offered / Physical user interface





Provide first-use tutorials for users on multiple channels

Theme/Aspect: Assistance offered / Digital user interface





Increase safety and security perception through human contact

Theme/Aspect: UD principles / Organisational measures



Read all

Read all

Read all



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5. UDM Recommendations and best practices

Implementation examples in the pilot sites

The UDM provides a framework for the assessment and design of digital mobility and delivery services. The same process can be applied to all users' groups and types of services that are not currently covered in the manual.

To offer practical guidance, INDIMO developed an infographic report with examples showing how pilot sites translated recommendations into concrete actions: changes in service user interface, physical features and organisational measures.











Practical examples from the pilot sites













5. UDM Recommendations and best practices

Best practices to transfer

Best practices in Universal Design are defined as building practices and procedures that comply with Universal Design principles and provide affordable design practices that meet the needs of the widest possible range of people who using digital mobility and delivery services.

INDIMO collected a set of best practices to foster a broader understanding of accessibility, inclusivity, gender and cybersecurity issues and, if relevant, how these best practices may be used as resources in the development of further European, national or local standards.



Download



Best practices



Continue navigation







5. UDM Files and templates

All in one click

Congratulations! You've come to the final part of the UDM tool. Continue navigation to find useful links, references and project information.

Alternatively you can:

- Download in one click all the documents and templates provided in this UIL tool
- 2. Use the Service Evaluation Tool (SET) to evaluate your service accessibility performance and get a specific selection of recommendations
- Explore all other tools from the main INDIMO Toolbox page

Download all UDM files as compressed folder

SET tool

INDIMO Toolbox

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Continue navigation







6. Useful links and references

- European Commission (2011) Buying social, A guide to taking account of social considerations in public procurement. https://op.europa.eu/en/publication-detail/-/publication/cb70c481-0e29-4040-9be2-c408cddf081f
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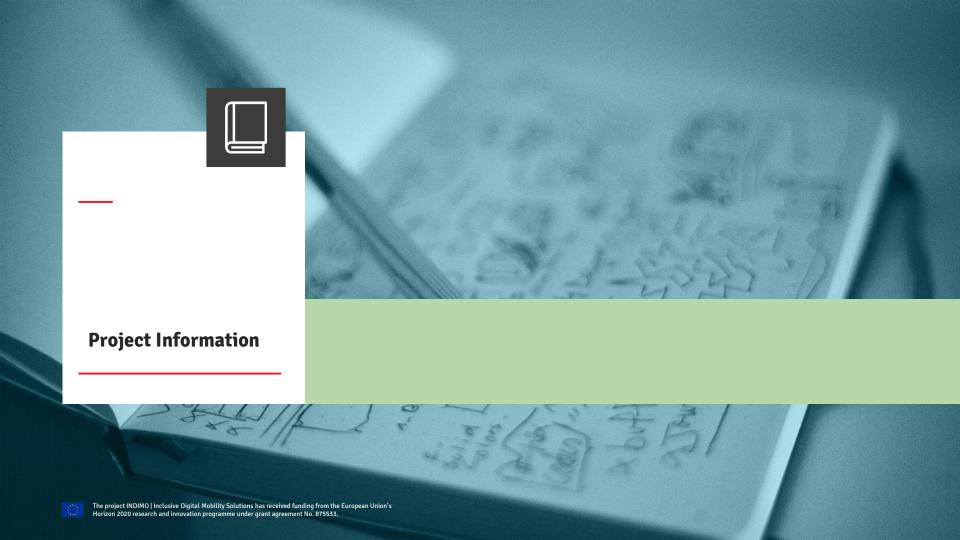












End users categories

End users targeted in the research









People living in peri-urban or rural areas



Ethnic minorities



Foreigners



Lower-educated citizens



Caregivers



Women



People lacking digital skills



Non-connected people



Older people



People with mental health impairments



People with reduced vision or mobility



Socially isolated people



Covid-19 confined people



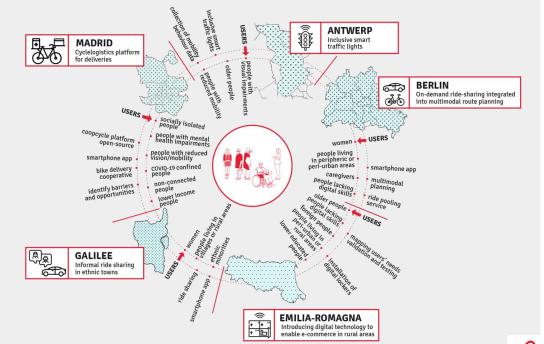






Pilot Projects

The five European pilot sites, their goals and target groups













Pilot implementation

Strategic phases





Preparation

Assess the state of the art and define high level guidelines to design, prepare and implement pilots' activities. Phase1

Assess users' needs and requirements towards digital mobility solution, by investigating general population as well as specific groups living some kind of barriers to access services. Phase2

Redesign of
existing services
or set up of new
services based on
the assessment
and use of the first
version of the
INDIMO Digital
Mobility Toolbox
in co-creation
workshops.

Phase3

Implement (re)designed services, based on final testing and transferability assessment.



Disseminate and exploit the Toolbox across all potentially interested actors in the digital mobility services domain







Co-creation Community

Involving stakeholders in the redesign of services



The **co-creation community has been strongly involved** in the development of the **INDIMO Toolbox** through **workshops, consultations** and **interviews**. The co-creation process was based on the establishment of a Co-creation Community in each pilot, composed of **transport user representatives, policymakers, operators, and developers.**

Several meetings took place both in the individual pilot site cities and in online plenary sessions, supported by the European Transport and Mobility Forum discussion platform.









Communities of practice

Involving end users to create common knowledge



The INDIMO **Communities of practice** established in each pilot included **end users**, mobility service providers and developers, in order to **create common knowledge on travel behaviour and barriers** in the use of digital mobility services.

They built on the knowledge and experience of their members to propose solutions adapted to local users' needs and interest, in a peer-to-peer learning context.





Develop productive services



Empower end-users depending on their skills



Create common knowledge











THANK YOU FOR YOUR ATTENTION!

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Website and Social Media:



www.indimoproject.eu



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