DyMoN
Dynamic Mobility Nudge

salzburgresearch

Digitally-enabled behaviour change for sustainable mobility

DyMoN Webinar Series, 07.12.2023

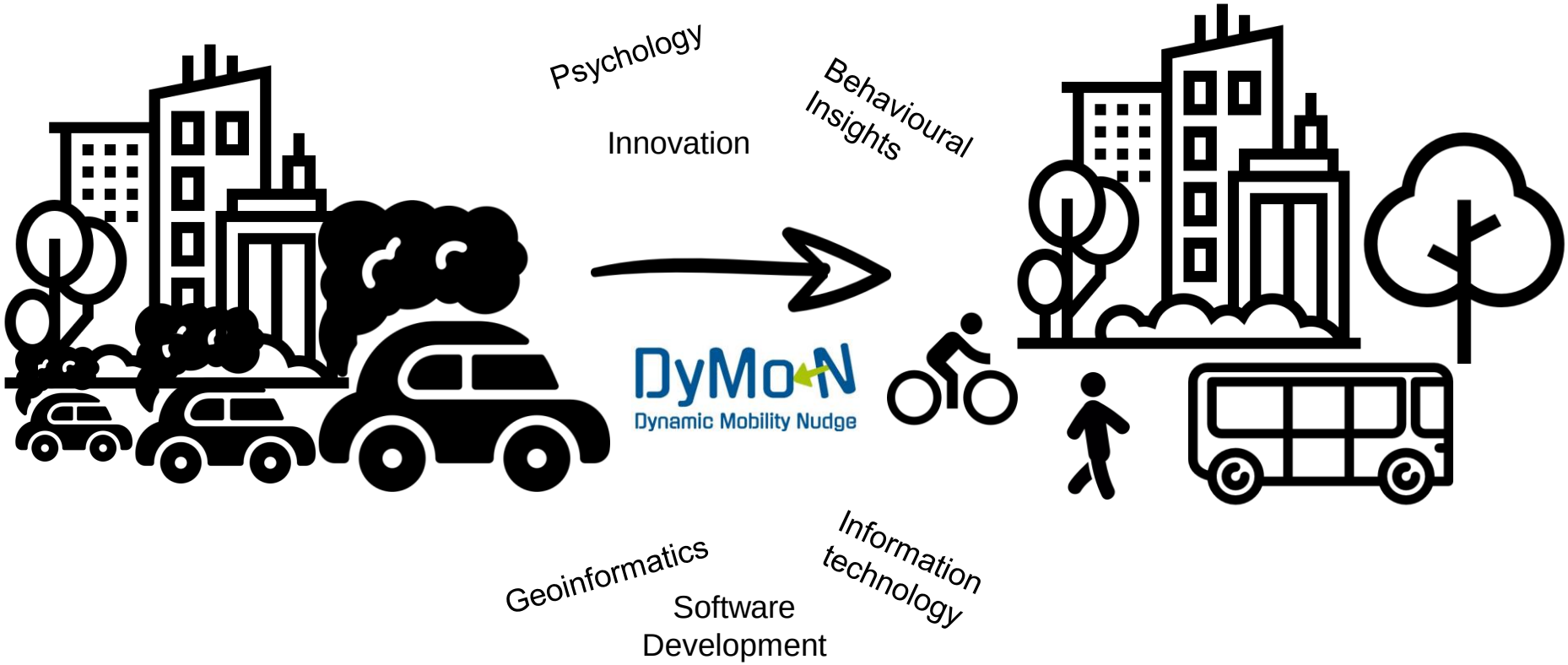
Presenters: Dr. Claudia Luger-Bazinger & David Leistner, BSc
Salzburg Research (Austria)

URBAN EUROPE

European Commission

Content of this webinar

- **Introduction** to the project
- **Enabling behaviour change in the digital environment** by Claudia Luger-Bazinger, project coordinator, Salzburg Research
- **Working with digital nudging for sustainable mobility** by David Leistner, Salzburg Research
- **Q&A**



Images from Flaticon.com

Idea of the DyMoN Project

- **‚Hard' interventions** for sustainable mobility (e.g. laws) only go so far
- **Effective ‚soft' interventions needed for support** (motivation, social norms, etc.)
- **European research project DyMoN** offers **digital, data-based behavioural interventions** (‚nudges') to foster sustainable mobility
- Psychology + geoinformatics + software development = **interdisciplinary approach**
- **Webinar** series about **results, insights, highlights and challenges** of this project

Enabling behaviour change in the digital environment

Even if we want to… change is hard.

Do you remember your last New Year‘s resolution?

What helped you in achieving it – or what would have helped?

Nudging

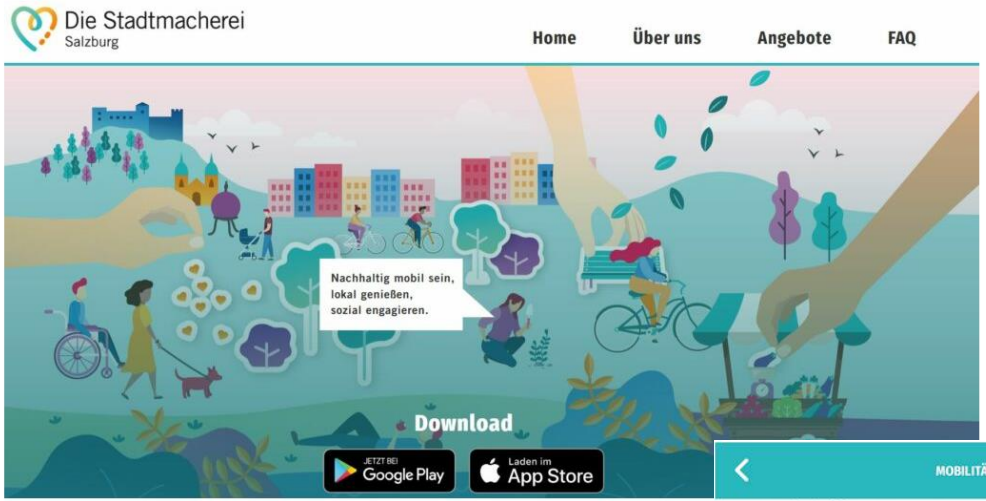
- Nudging is a **method to guide behaviour into a certain direction** (stems from psychology, behavioural economics)
  - Freedom of choice is still preserved, no bans on options
  - One method of **behavioural interventions**
- Decisions and behaviour depend on many factors (habits, routines) and are **not always rational**
- **Change of environment** in which decisions are made („choice architecture“), e.g. new information or presenting options differently
  - **Defaults**
  - **Social comparison**
- **Digital nudging** = using nudging in a digital form to influence decisions in the physical environment

Digital nudging with mobile apps

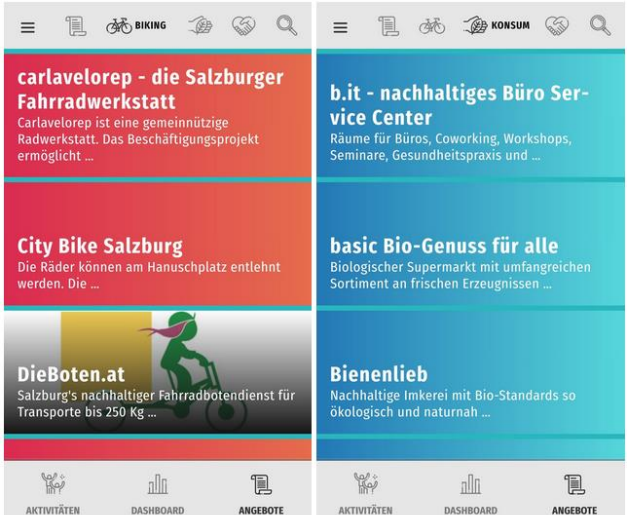
- **Mobile apps / digital tools** to guide behaviour and to **support behaviour change** (e.g. in fitness and sports)
  - Digital behavioural interventions – rewards, reminders, goal setting etc.

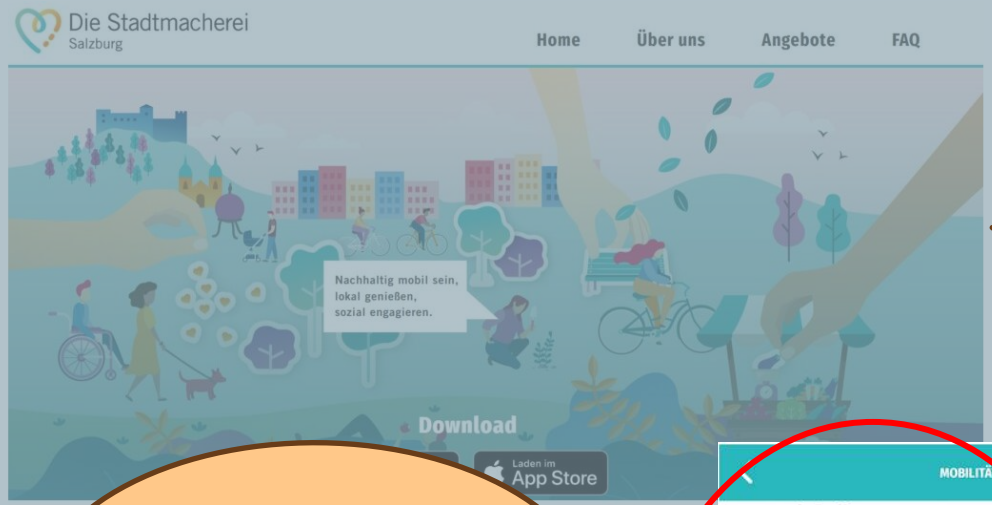
- **Urban mobility apps** → want to motivate switch from individual car use to bicycling, public transport, walking

- **Examples for digital behavioural interventions in urban mobility apps:**
  - Vouchers for kilometers bicycled
  - Gamified elements as incentives
  - Leaderboards



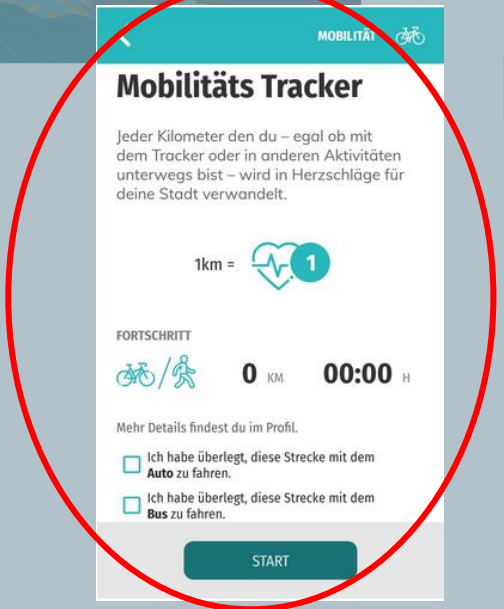
SimpliCITY
https://www.simplicity-project.eu/





Promising results (more bicyclists and kilometers), but not entirely clear. Role of context?

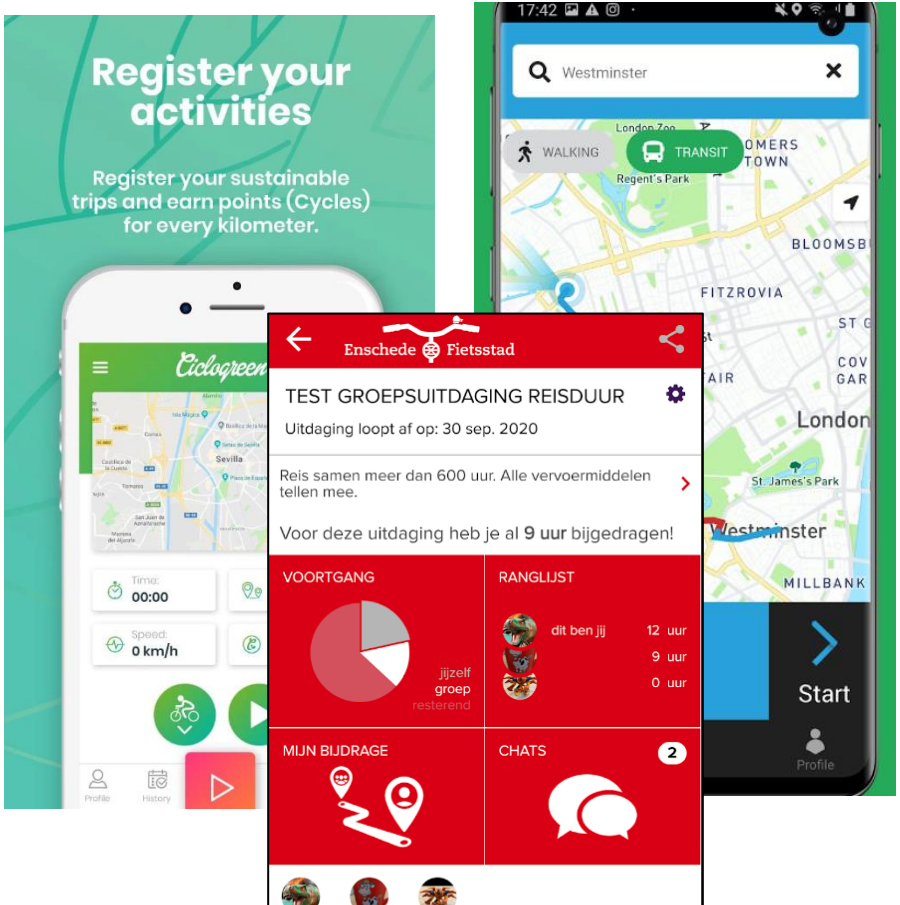
"Your neighbors leaving you behind on their bicycles – let's use the mobility tracker as well!"



Link to publication:
https://austriaca.at/?arp=0x003d2602

Analysis of urban mobility apps

- **Goal:** Overview of **commonly used digital behavioural interventions for sustainable mobility**
- **Mobile applications** that seek to encourage **more sustainable mobility choices** (not just schedules), but
  - promotion of sustainable urban mobility (e.g. GHG emission data, gamification)
- **Search** in Google Play Store and Apple App Store **(July – September 2022)**
- **26 apps** fit search criteria (228 cities and 18 different countries)



Top behavioural interventions used in urban mobility apps

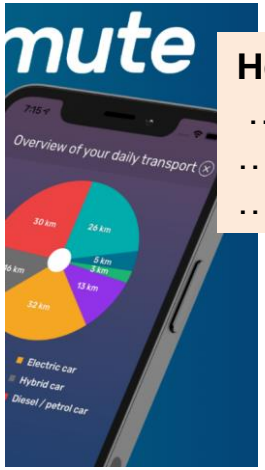
1 Feedback & monitoring

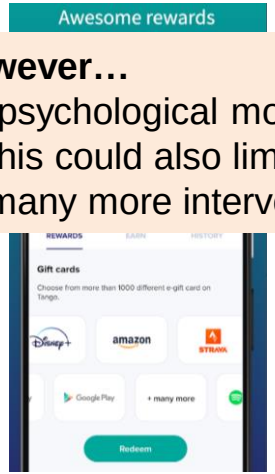
2 Rewards (gamifications)

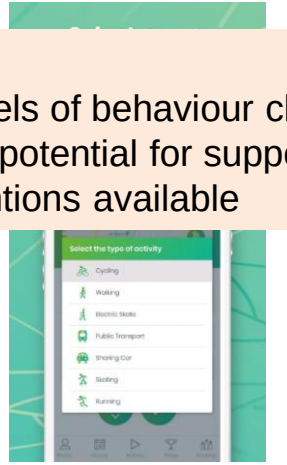
3 Planning

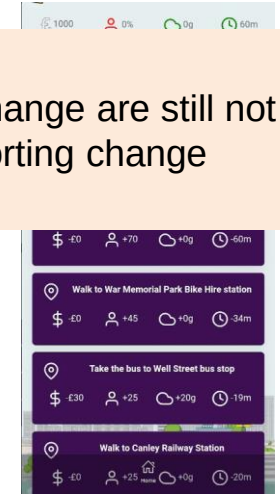
4 Reminders & prompts

5 Knowledge about consequences









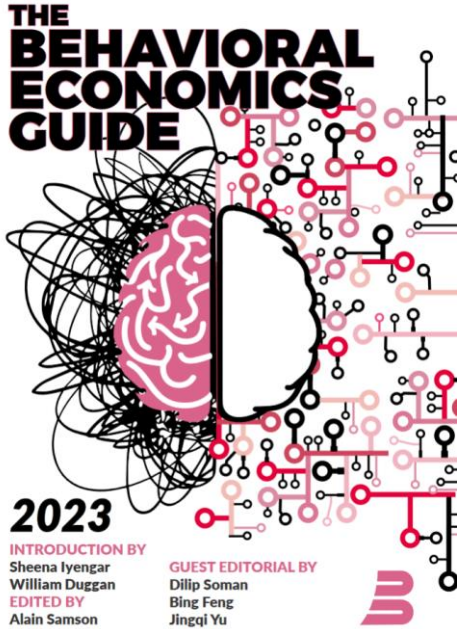
However…

… psychological models of behaviour change are still not commonly used

… this could also limit potential for supporting change

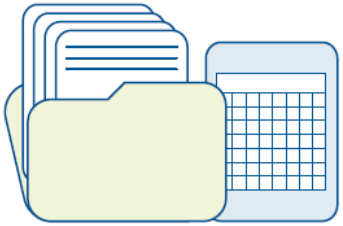
… many more interventions available

Related publication



Luger-Bazinger, C., Geser, G., & Hornung-Prähauser, V. (2023): Digital Behavioural Interventions for Sustainable Mobility. A Review of Behaviour Change Techniques in Mobile Apps. In A. Samson (Ed.), The Behavioral Economics Guide 2023 (p. 68-75). London: Behavioural Science Solutions. https://www.behavioraleconomics.com/download/10527/

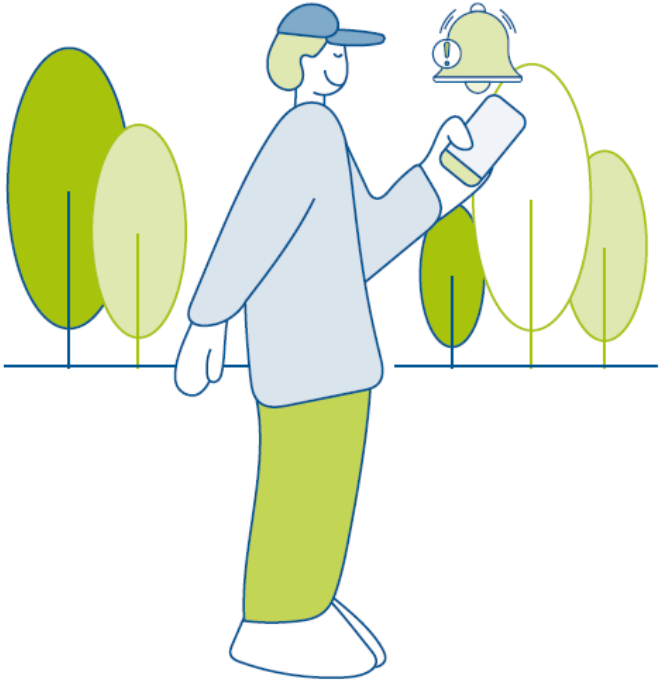
DyMoN Nudging Repository I



- **List of digital nudges to motivate bicycling, walking, public transport**
  - Mainly used as notifications within already existing apps
  - For commuting and leisure
- **Situational factors** as additional, crucial context elements for digital nudges
  - weather forecast, infrastructure, traffic situation, bikeability, walkability, …
  - these factors determine the content and timing of nudges
- **Similar to just-in-time adaptive interventions** from health field
  - **Unique to the mobility field** so far

DyMoN Nudging Repository II

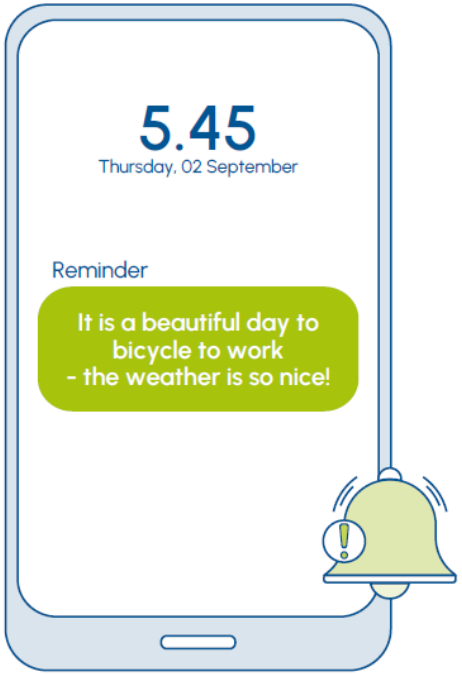
- Based on model of behaviour change (COM-B model), transferred into mobility field
- Nudges from **co-creation** with citizens
  - No concerns about ethics with this repository, but focused on data privacy
- **166 digital nudges**
- **16 groups / clusters** of behaviour change methods (e.g. shaping knowledge, associations)
- **46 different behaviour change techniques / interventions** (e.g. instruction on how to perform a behavior, social comparison)
- Possibility to use **nudges without data** (no situational context, but timed schedule of suitable nudges)



Nudging repository - examples

- Information about emotional consequences
  - Imagine how proud you will be today if you bicycle to work, even if the weather is not perfect!

- Self-reward
  - Here's a suggestion: If you walk to work today in the rain, you have definitely earned a reward! Maybe some nice coffee, a slice of cake - or both?



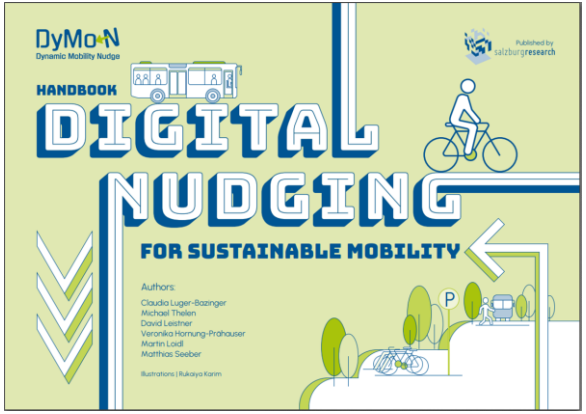
Images: Flaticon.com

How a digital nudge is categorised in the nudging repository:

Nudge text (for push notification)	Imagine how proud you will be today if you bicycle to work, even if the weather is not perfect!
COM-B element	Motivation
Behavioural intervention	Information about emotional consequences
Description	Provide information (e.g., written, verbal, visual) about emotional consequences of performing the behaviour
Mobility Mode	Bicycling
Situation-aware?	Yes
Situational information that determines sending out the nudge	Weather forecast for current day: rainfall. For user location: good bicycle lanes / good bikeability, reasonable bicycling distance to destination.
Trip purpose	Commuting
Timeframe for nudge	Weekday mornings

Download nudging repository: https://zenodo.org/records/7620003

Working with digital nudging for sustainable mobility



Target audience

Local Decision-makers

Providers of Transport Infrastructure and Services

App Developers

Researchers

Purpose of the handbook

- Introduction to (digital) behaviour change and nudging
- Information on how to design behavioural interventions
- Introduction of Nudging Repository and example use case
- Using data for situation aware nudges
- Canvases for Inspiration

Overview of the Content

SECTIONS

01 WHY SUSTAINABLE MOBILITY IN CITIES MATTERS

02 IS THIS HANDBOOK RIGHT FOR ME?

03 CRASH COURSE ON BEHAVIOUR CHANGE

04 BEHAVIOURAL INTERVENTIONS AND NUDGING

05 DIGITALLY ENABLED BEHAVIOUR CHANGE

06 DESIGNING BEHAVIOURAL INTERVENTIONS

07 SITUATION-AWARE NUDGES

08 DIGITAL NUDGING REPOSITORY FOR SUSTAINABLE MOBILITY

09 PUTTING THE NUDGING REPOSITORY INTO PRACTICE

10 USING DATA FOR MULTIPLE PURPOSES

11 DATA REGULATIONS TO KEEP IN MIND

CANVASES AND INSPIRATION

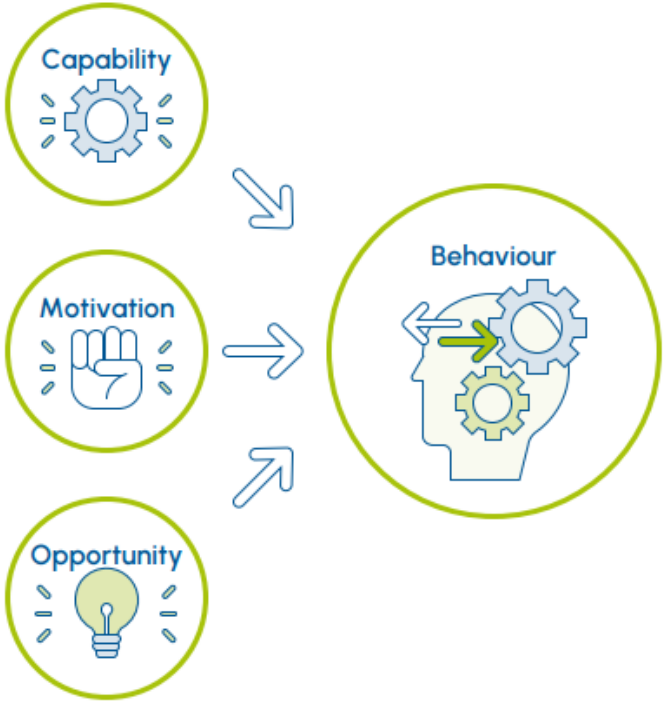
REFERENCES

ABOUT THE PROJECT

COM-B model of behaviour

- C: Psychological and physical **capabilities**
- O: Social and physical **opportunities**
- M: **Motivational** processes

- B: resulting **behaviour**



Michie, van Stralen & West, 2011

Examples of behavioural interventions for sustainable mobility

Target Opportunity:

- Giving out free tickets to public transport
- Offering attractive bicycle infrastructure, such as bicycle storage options

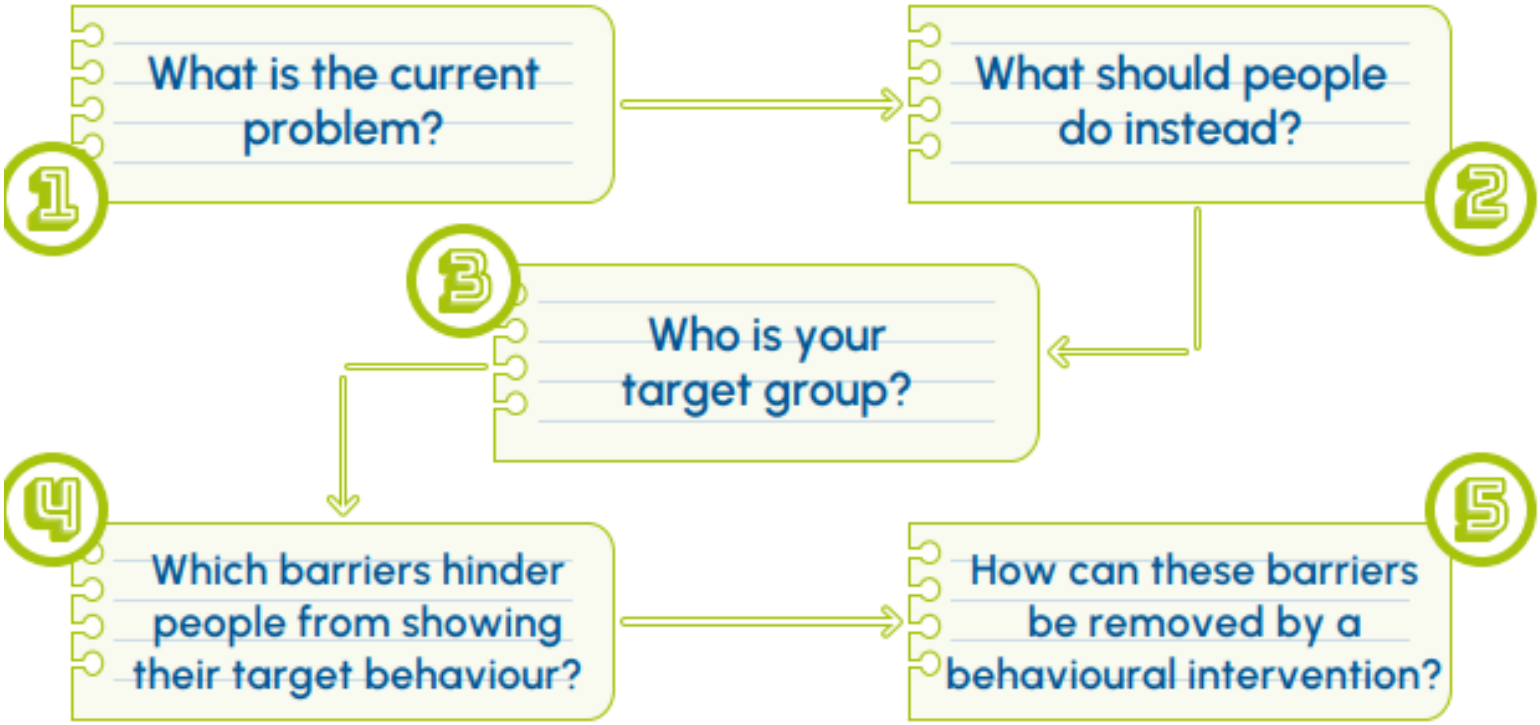
Target Motivation:

- Offering incentives if car is not used (e.g., giving out vouchers)
- Launching a campaign in a neighbourhood to engage families to walk or bicycle together

Target Capability:

- Giving bicycle lessons to people who were not able to do so before
- Making bus schedules easier to understand and more accessible

Step-by-step on intervervention design



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Canvas: Defining target behaviour and barriers

What is the current problem?

What should people do instead?

How can these barriers be removed by a behavioural intervention?

Who is your target group?

Which barriers hinder people from showing their target behaviour?

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Welcome to the mural

DyMoN Webinar Session 2

Collaborate with Eva-Maria Hollauf

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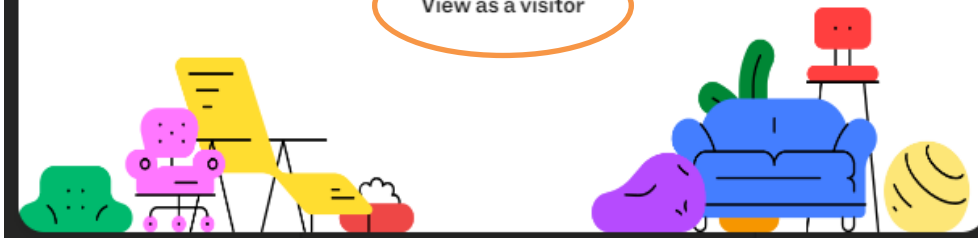

← Back to other options

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Visiting Duck

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Situation-aware digital nudging

- inclusion of relevant context
  - Example: weather, traffic, bikeability/walkability

=> personalized nudges perceived as more relevant

- possible through data hub and Nudging Repository (more detail in next session)

Examples for situation-aware nudges

Persona A: Michaela

- 4km to work, usually driven by car
- Bad public transport connection
- Unpleasant/unsafe neighbourhood
- New bicycling network

„Walk to work. Daily physical activity improves your health“

„Take the bus. There is a connection to your destination“

„Enjoy riding through nature and save time. Take your bike to work!“

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Personas: Who are the target users you wish to reach with your efforts?

NAME:
OCCUPATION:
LOCATION:
AGE:
MARITAL STATUS:
NO. OF CHILDREN:

Current Behaviour:

What they should do instead:

Barriers:

Behavioural interventions:

NAME:
OCCUPATION:
LOCATION:
AGE:
MARITAL STATUS:
NO. OF CHILDREN:

Current Behaviour:

What they should do instead:

Barriers:

Behavioural interventions:

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Canvas: Information for situation-aware nudges

Information needed	Purpose	Importance *(on a scale from 1= not important to 5 = very important)*	Possible data source
Weather forecast for next day	Informing about good weather ahead and suggesting commuting by bicycle	5	Open Data Weather [2023].
Green walkways within cities	Suggesting the most enjoyable walks to users	3	Open Street Map [2022]

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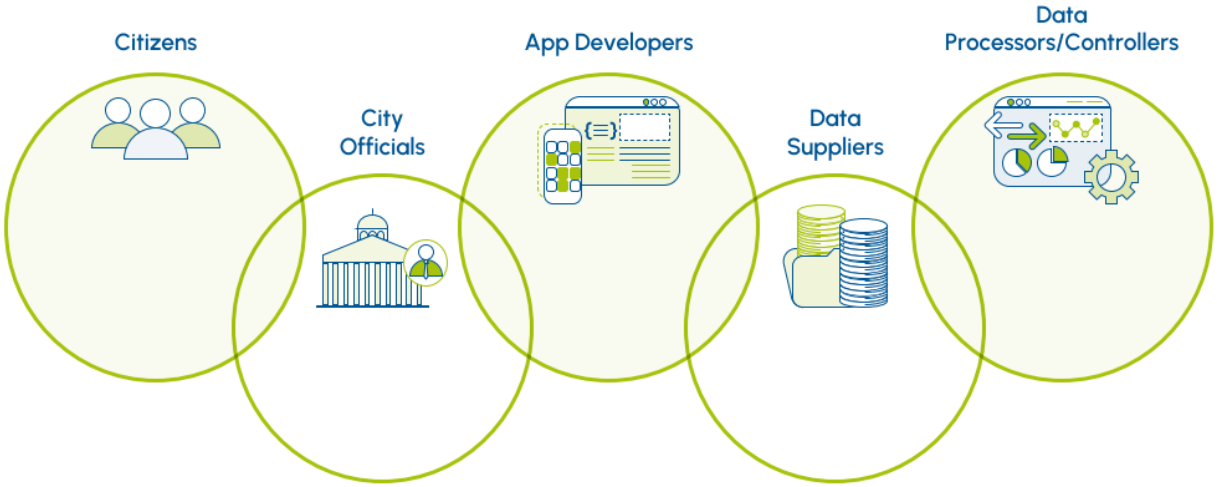
Which stakeholders are needed to realise your sustainable urban mobility campaign?



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Sustainable urban mobility campaigns in your city: What do you face?

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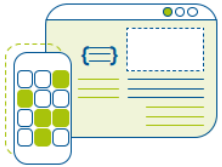
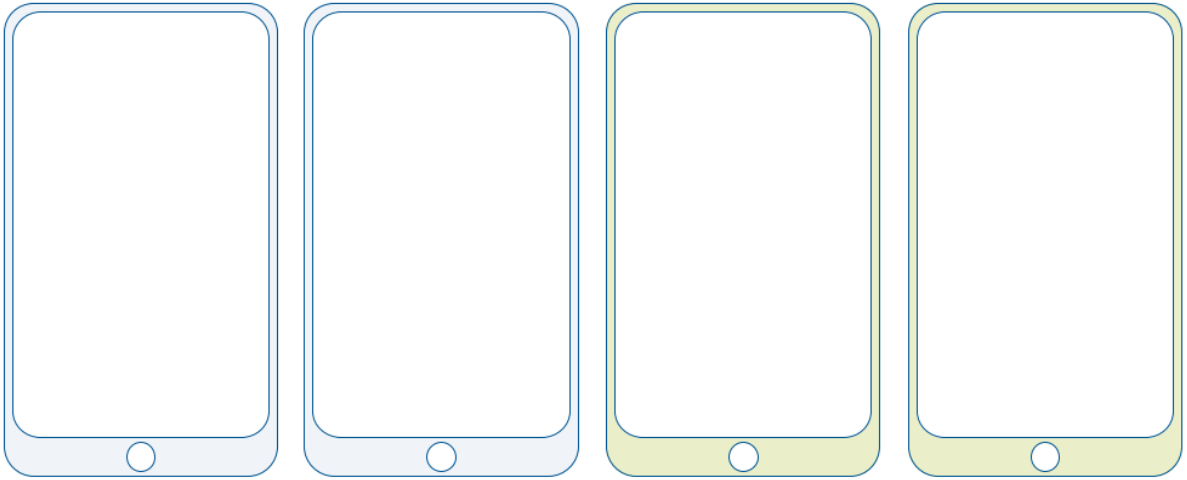


What would the ideal mobility nudging app look like for you?



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HANDBOOK

DIGITAL NUDGING

FOR SUSTAINABLE MOBILITY

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Illustrations | Rukaiya Karim

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Further information: www.dymon.eu
Download handbook: salzburgresearch.at

Next webinar - January 2024

DyMoN

Dynamic Mobility Nudge

Join our webinar series for an interdisciplinary view on sustainable urban mobility:

16/11/2023:	An interdisciplinary view on sustainable urban mobility behaviour
07/12/2023:	Digitally-enabled behaviour change for sustainable mobility
11/01/2024:	Using data to support sustainable mobility behaviour
01/02/2024:	Learnings & recommendations for sustainable mobility from the Dynamic Mobility Nudge project

More info & registration on: https://dymon.eu/news-and-events/

Recordings from webinar 1 available!
https://dymon.eu/2023/11/17/successful-first-webinar/

Q&A