Standing e-scooters, what to expect:

micro-mobility, but also micro effects?

Explorative research into the expected effects and policy implications of the introduction of e-scooters in the Dutch traffic system

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13 September 2021
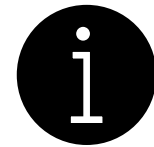MSc Transportation, Infrastructure & Logistics

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2021 EUROPEAN TRANSPORT CONFERENCE ONLINE

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Content

Introduction   Methodology   Results   Conclusions   Recommendations

Source: Trouw (2019)

Dear city,

Let us introduce you to a world made for people - with less pollution and traffic jams.
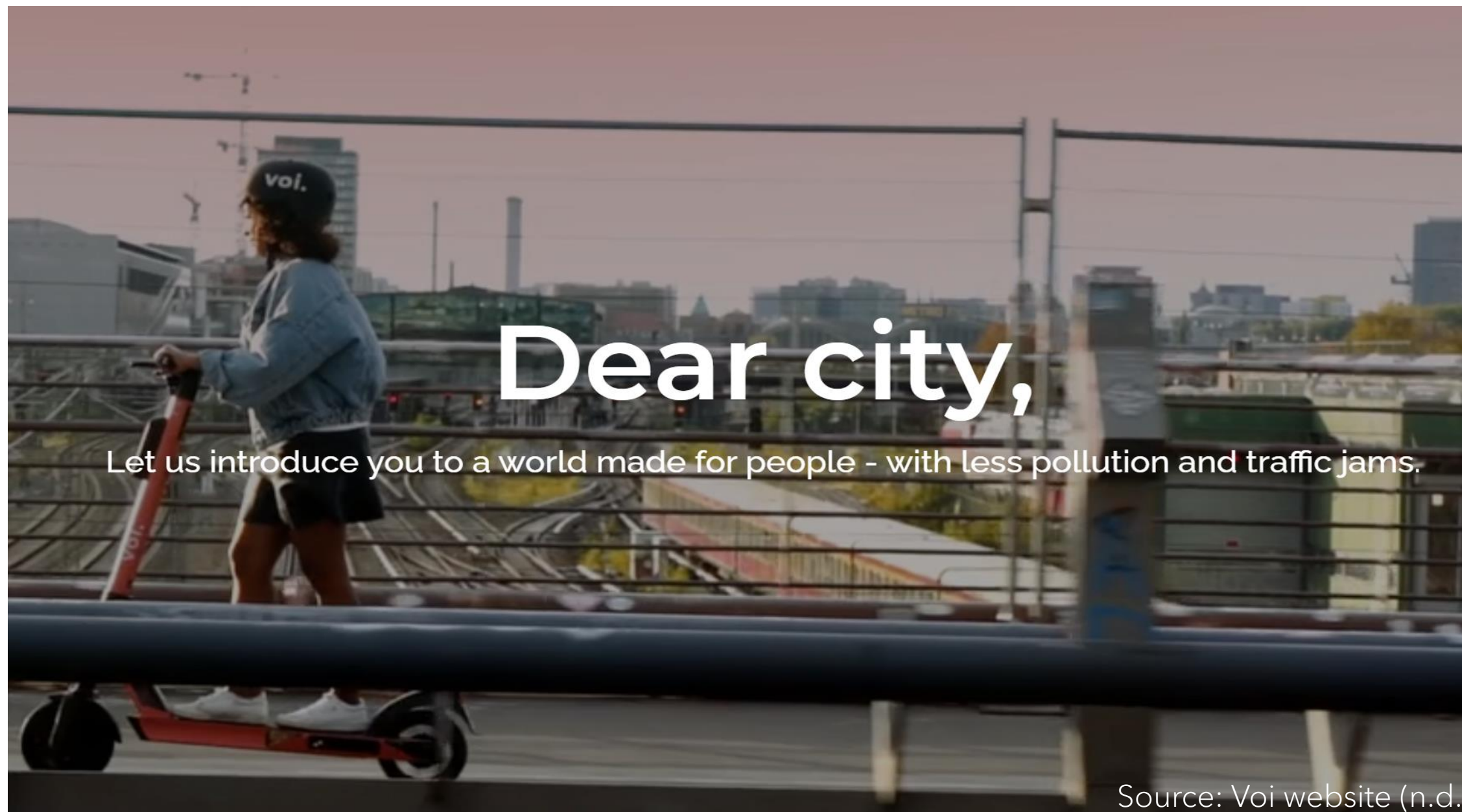
Source: Voi website (n.d.)
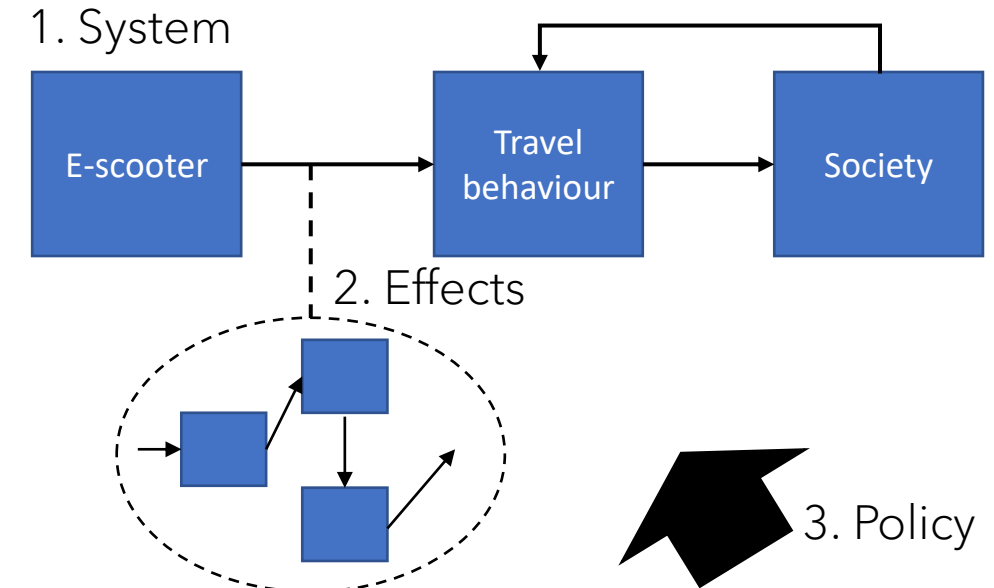
Research question

*What relevant **effects** can be expected when e-scooters are (legally) introduced in the Netherlands and what are the potential **policy implications** of these effects?*
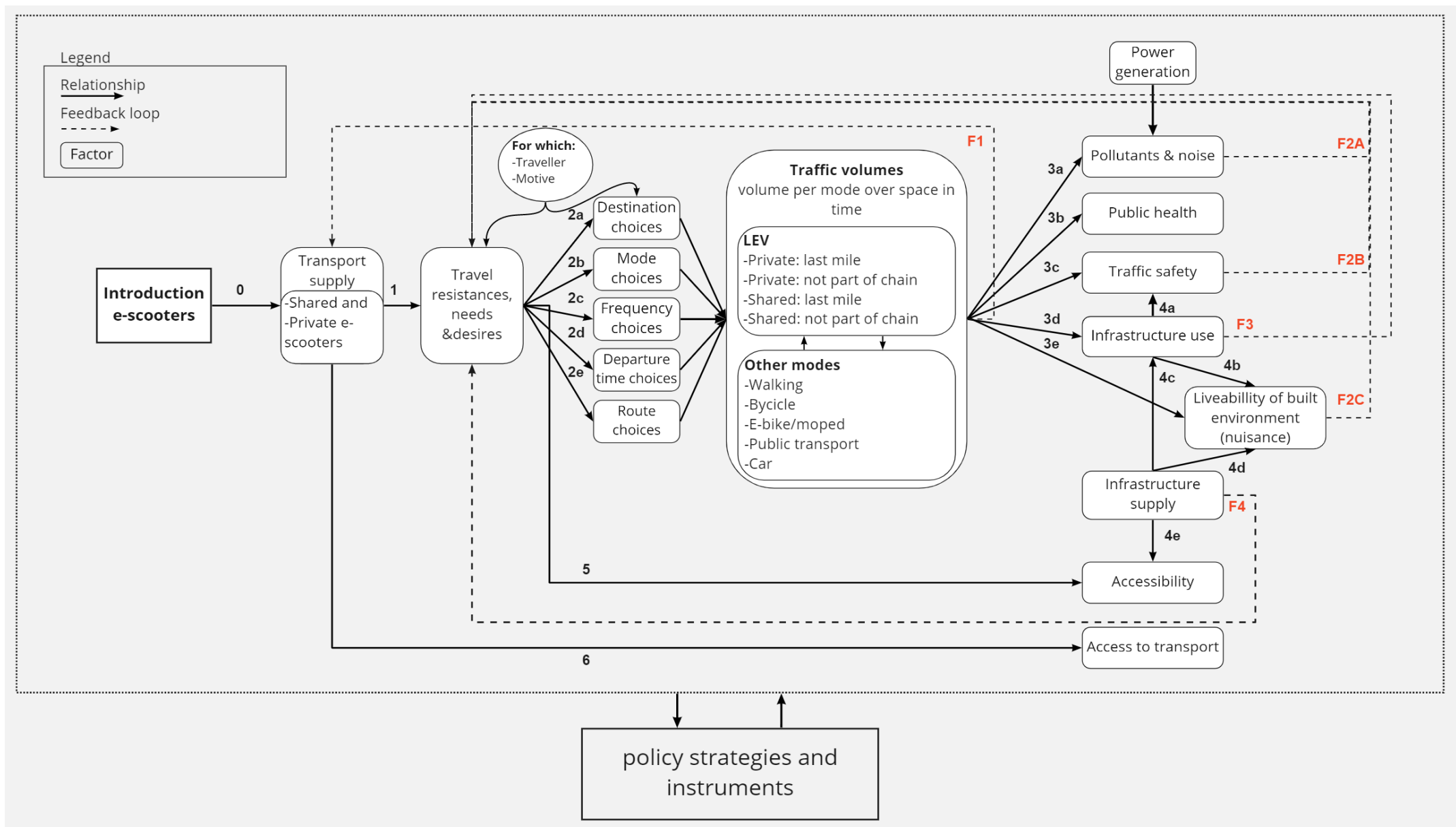
- Effects on: a) travel behaviour
                                          b) society: environment, public health, traffic safety, liveabillity, accessibility

- Policy implications: policy strategies and instruments

Methodology

Research methods

Conceptual diagram	Literature study: urban transportation systems	1. System
	Mobility expert interviews	2. Effects
	Literature study: effects abroad	
	Policymaker interviews	3. Policy
	Focus group	

1. System

E-scooter → Travel behaviour → Society

2. Effects

3. Policy

Legend

Validated system diagram

Not yet a sufficiently founded basis for the expectation

There is a reasonable basis for the expectation

There is a sufficient basis for this expectation

Feedback loop

Policy strategies and instruments

Policy strategies and instruments

Set requirements for infrastructure
-Only allow on bycicle
-Seperate traffic flows

Set requirements for users
-Minimum age
-Helmet
-Driving license

Set requirements for
Safety design
Safety campaing

Focus on shift from car
Connect e-scooters to PT
Connect e-scooters to car
Avoid dumping
-With locks or geofencing
Don't allow if shift from car is not achieved

Set environmental requirements
-For the production process in national
-For the production process in tender
-For recharging in the tender

Dont allow (shared) e-scooters if shift is from active modes

System diagram

Introduction e-scooters
-Shared LEVs
-Private LEVs

Transport supply
-Shared LEVs
-Private LEVs

Copying behaviour

Familiarity

Availabillity of shared LEVs

Set-up of shared system

Convenience/comfort aspects

Price

Operating speed

Lifestyle

poratble in PT

Dutch bycicle culture

Novelty

Hygiene situation

Travel resistances, needs & desires

If less options for cars, other modes more attractive

-Leisure purpose
-Commuting purpose

-Younger people

-Non-cyclists
-Increasing age trend
-Lower educated
-Higher educated
-Visitors

Mode choices

In gen no large effect

Increase leisure frequency

Route choices

Most effects on activity side

Traffic volumes
volume per mode over space in time

LEV usage
-Highest share shared system
-Small share of private users
-Usage in unimodal trips
-Usage in multimodal trips
-Most users on activity side
-First hype, the small amount of remaining users

Modal shift:
-Largest: Bicycle & walk
-Smaller: public transportation
-(very) small shift from car
-Virtually no shift from car

LEV life cycle emissions

Redistribution shared e-scooters

Power generation

Pollutants & noise

Negative effect

Positive effect, in time

Potential for positive effect

Public Health

Negative effect

Feedback from effects

E-scooters are new

Pricing promotes speeding

Traffic Safety

Decreases

No influence

Perception of safety decreases

Busy on bycicle lanes

Dangerous objects on footpaths

Diversity of vehicles on bycicle lanes

Infrastructure use

Infrastructure supply

Way of parking

Limited space required

Cluttering

Take up space in PT

Liveability of built environment (nuisance)

Negative impact not well regulated

Not a large impact if well regulated

Regulations

Quality and quantity

More congestion, more attractive other modes

Accessibility

Access to transport

Not a large impact

Increase for small group of peope

Increase of accessibility PT networks

potential to increase for transport poverty places

Price

Not accessible by disabled

Digital access relevant

Connect to other transportation options
-Hubs at PT
-Hubs at park & rides

Ensure enough parking options
-Allow everywhere
-Enough hubs

Focus on accessibility of suburbs
-Service requirements

Requirements for cost of use

Focus on parking
-Designated parking zones
-Or hubs
-Enforce with geofencing or ticketing

Focus on driving
-Assign designated driving zones

Focus on cluttering
-Fold an stack while not in use

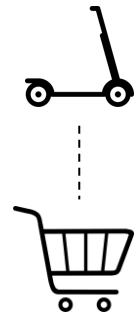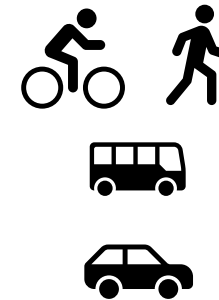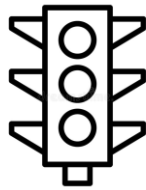TUDelft   AT OSBORNE   EUROPEAN TRANSPORT CONFERENCE

Conclusions

*What relevant **effects** can be expected when e-scooters are (legally) introduced in the Netherlands and what are the potential policy implications of these effects?*

Travel behaviour
- Besides vehicle choice, not substantially influenced
- Increase in leisure trips frequency

Vehicles replaced
- Bike and walking most replaced
- Bus, tram and metro
- (very) small amount of car trips

Conclusions

*What relevant **effects** can be expected when e-scooters are (legally) introduced in the Netherlands and what are the potential policy implications of these effects?*

Environment
- Negative
- Potential for improvement

Traffic safety
- Negative
- No influence

Public health
- Negative

Liveability
- Negative
- Potential for moderate impact

Accessibility
- Positive for specific groups
- Potential for larger group

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Conclusions

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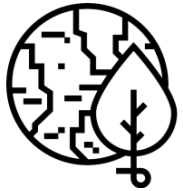
Environment
- Focus on shift from car, production process and servicing
- Don't allow
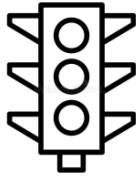
Traffic safety
Set requirements for:
- Users
- Vehicles
- Infrastructure

Public health
- Don't allow

Liveability
- Focus on parking
- Focus on driving

Accessibility
- Focus on connection to other transportation options
- Focus on connection to suburbs and activity locations

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Recommendations: policy

National
- Standards in admission framework
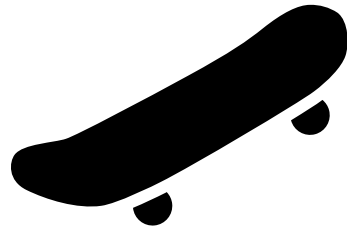- Only allow on bicycle paths
- Require a license plate

Local
- Requirements in tenders
  - Coverage certain areas
  - Recharge & service
- Create hubs
  - At other transportation modes
  - At suburbs & activity zones

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Recommendations: research

Stated preference survey → Transportation models

Pilots + User survey

Policy effectiveness
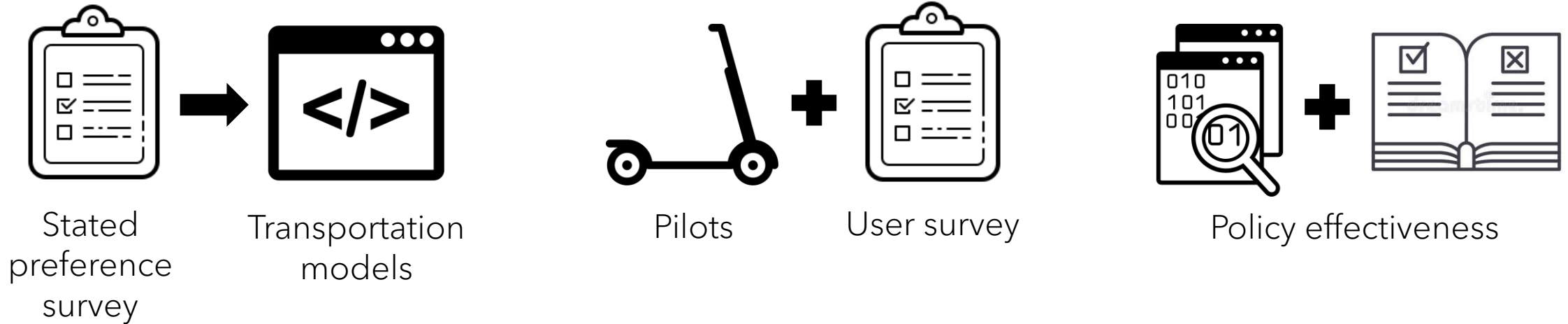
Generalizability of research results

- Other micro mobility vehicles with similair characteristics

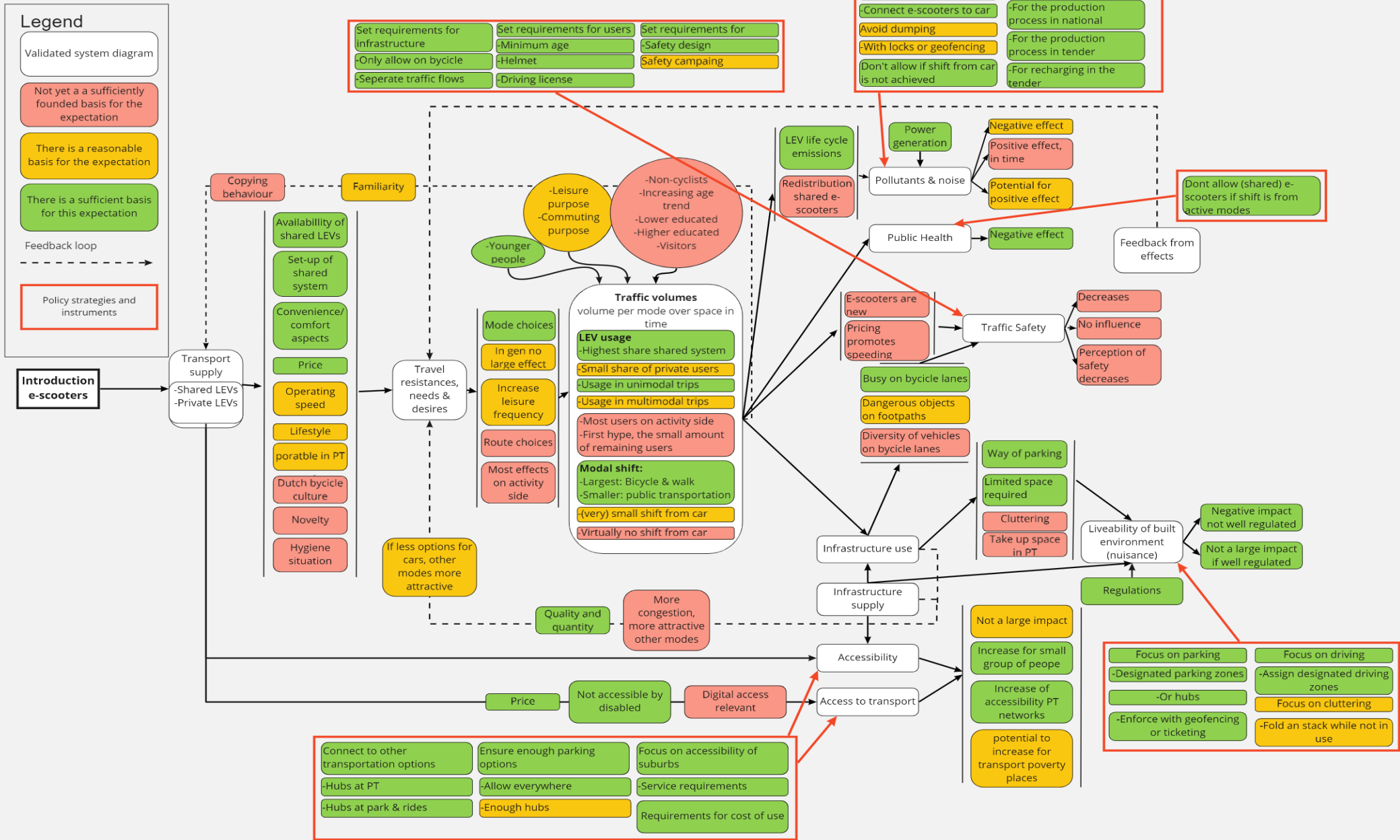- Other countries where e-scooters are not yet introduced

Questions?

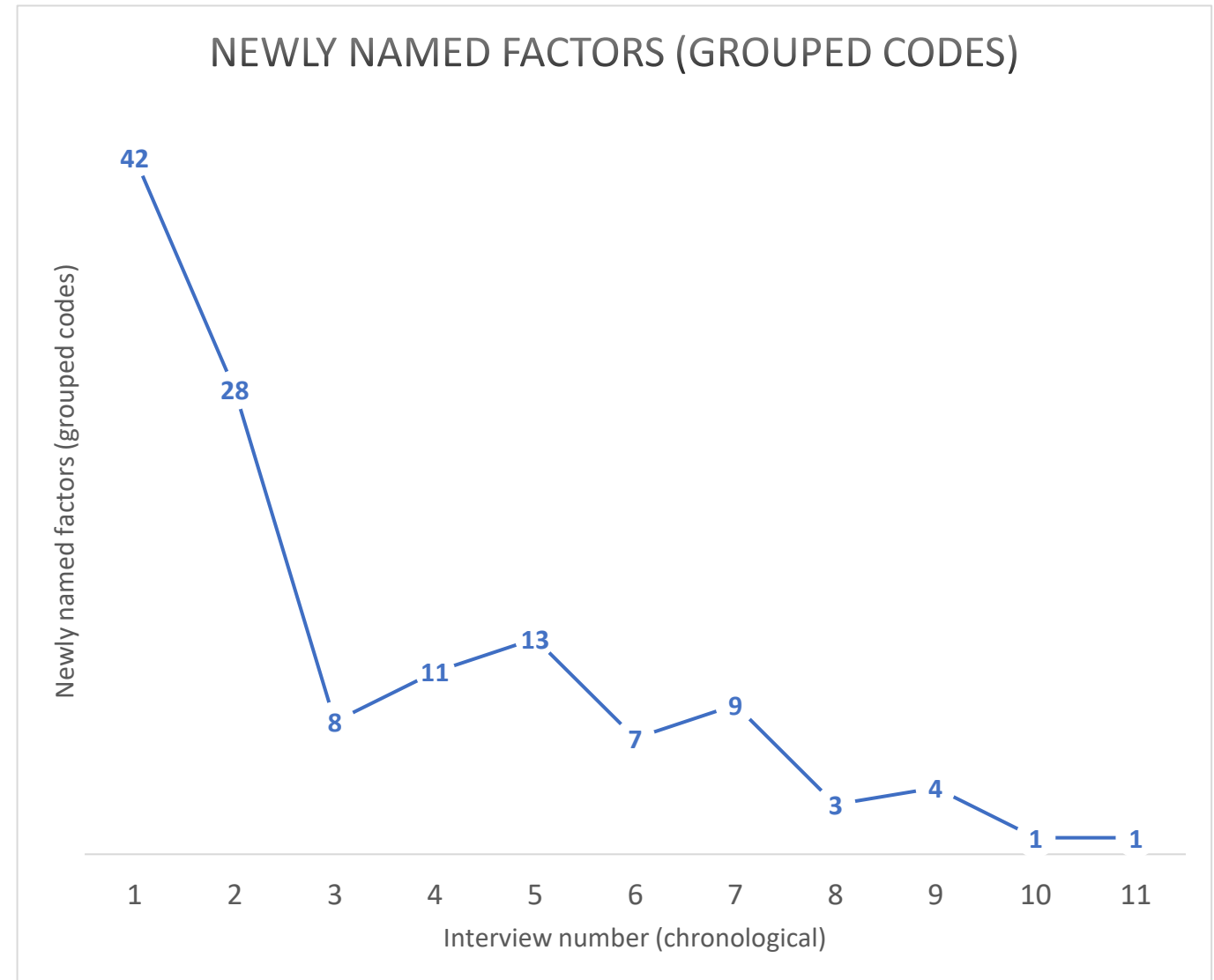Contact details
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Thesis report: http://resolver.tudelft.nl/uuid:5ddf756d-60b7-4cc9-acb3-668cb62b7689

Results

Academia (TU Delft, International Transport Forum)
Policy Makers (Ministery , Municipalities)
Consultancys (Studio Bereikbaar, AT Osborne)
Others (TNO, PBL, Dutch Cycling Embassy)

NEWLY NAMED FACTORS (GROUPED CODES)

Newly named factors (grouped codes)

42, 28, 8, 11, 13, 7, 9, 3, 4, 1, 1

Interview number (chronological)
1 2 3 4 5 6 7 8 9 10 11

Type	Strategy or instrument	Contributing to societal effects
Setting requirements in the tender for shared e-scooter suppliers (local) or the admission framework (nationally)	Requirements for recharging (with green energy)	Environment
	Requirements for the production process of e-scooters	Environment
	Requirements for safety design of e-scooters: reflectors, lights, maximum speed, license plate	Traffic safety
	Requirements for the production process of e-scooters	Environment
	Requirements for the number of vehicles using smart scaling	Liveability
	Service requirements for certain areas	Accessibility and inclusivity
	Requirements for the maximum cost of use	Accessibility and inclusivity
Organise the transportation system	Connect e-scooters to public transportation and the car by means of hubs	Environment, accessibility
	Place enough charging points and make sure charging points can be used by all electric modalities	Environment, liveability
	Allow e-scooters to be parked everywhere or ensure enough parking places	Accessibility
	Use geofencing to avoid dumping, driving in restricted areas and parking in restricted areas	Environment, liveability, traffic safety
Set requirements for e-scooter users	Minimum age, (car) driving license, helmet use	Safety
Driving rules (local or national)	Only allow usage on bicycle infrastructure	Traffic Safety
	Don't allow riding next to each other	Traffic safety
Other	Organise an information campaign	Liveability, traffic safety, public health
	Skip certain bus tram or metro stops to make them faster and connect e-scooters to serve the skipped stops	Accessibility
	Don't allow e-scooters if the major shift is from active modes	Environment, public health