DEPARTMENT OF BUILT ENVIRONMENT

Cargo Bikes: Usage & Potential

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Car-goNE City

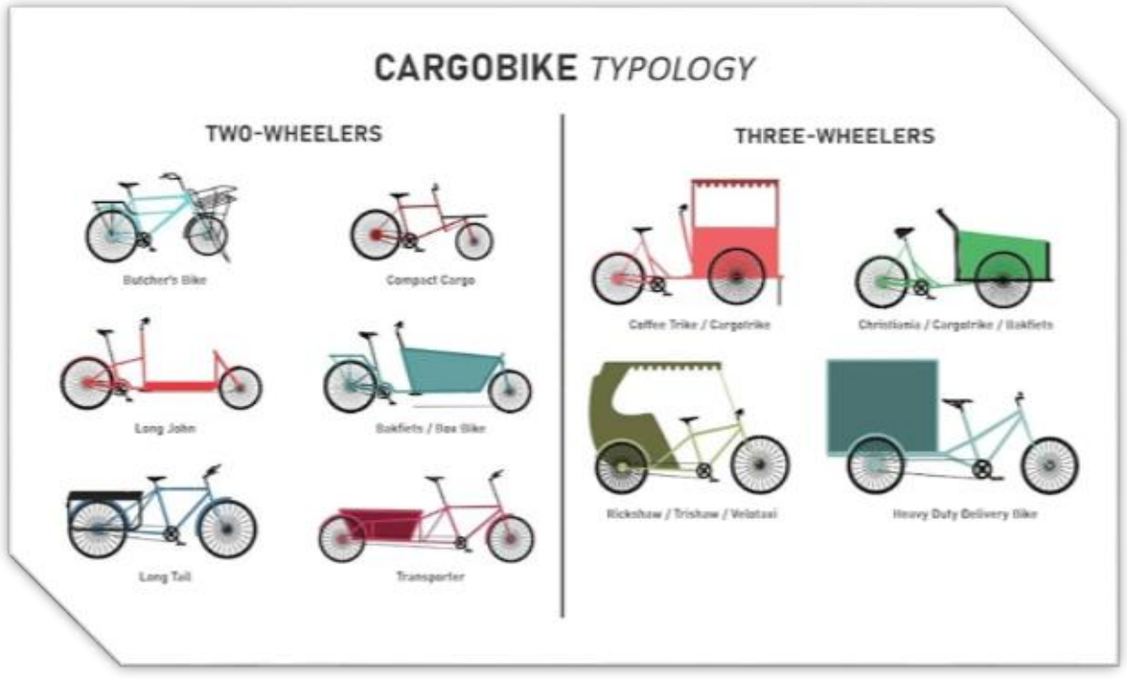
DUT Driving Urban Transitions



Why Cargo bikes?



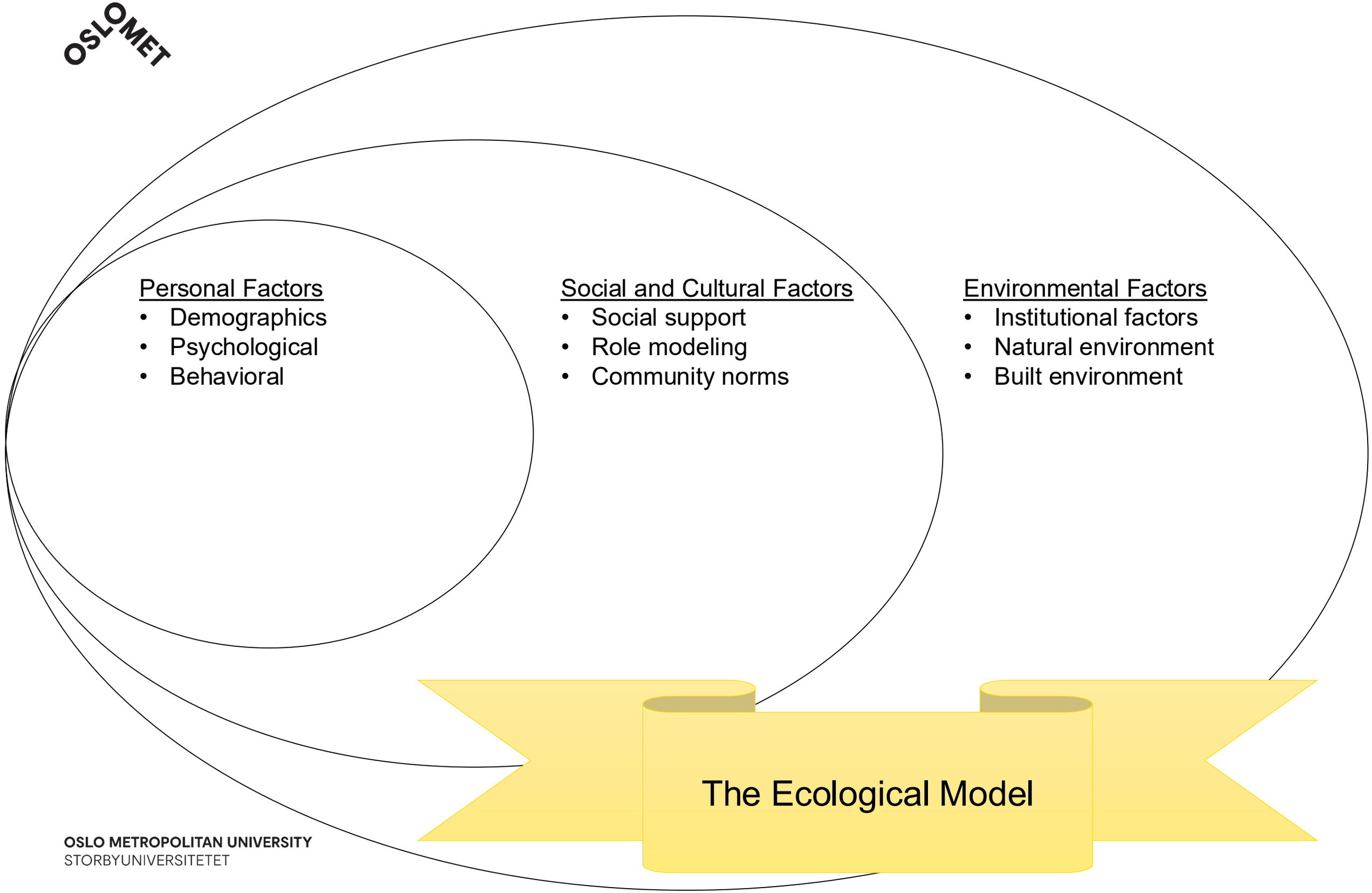
- The sustainability perspective
  - Reduces driving
  - Reduces land use for roads
- The health perspective
  - Increases in cycling connected to public health benefits
- The user perspective
  - Often used by parents – a group prone to increase driving/transition to driving
  - Often used by mid-higher SES – a group prone to pollute more
  - Cycling as an experience – not just the quickest from A→B



Cargo bikes connection with reduced car use

- Literature review
  - 44 peer-reviewed articles about cargo bikes for personal transportation & car-reduction
  - No restrictions on year or place but ended up with only WEIRD countries starting at 2014




Personal Factors
• Demographics
• Psychological
• Behavioral
Social and Cultural Factors
• Social support
• Role modeling
• Community norms
Environmental Factors
• Institutional factors
• Natural environment
• Built environment
The Ecological Model

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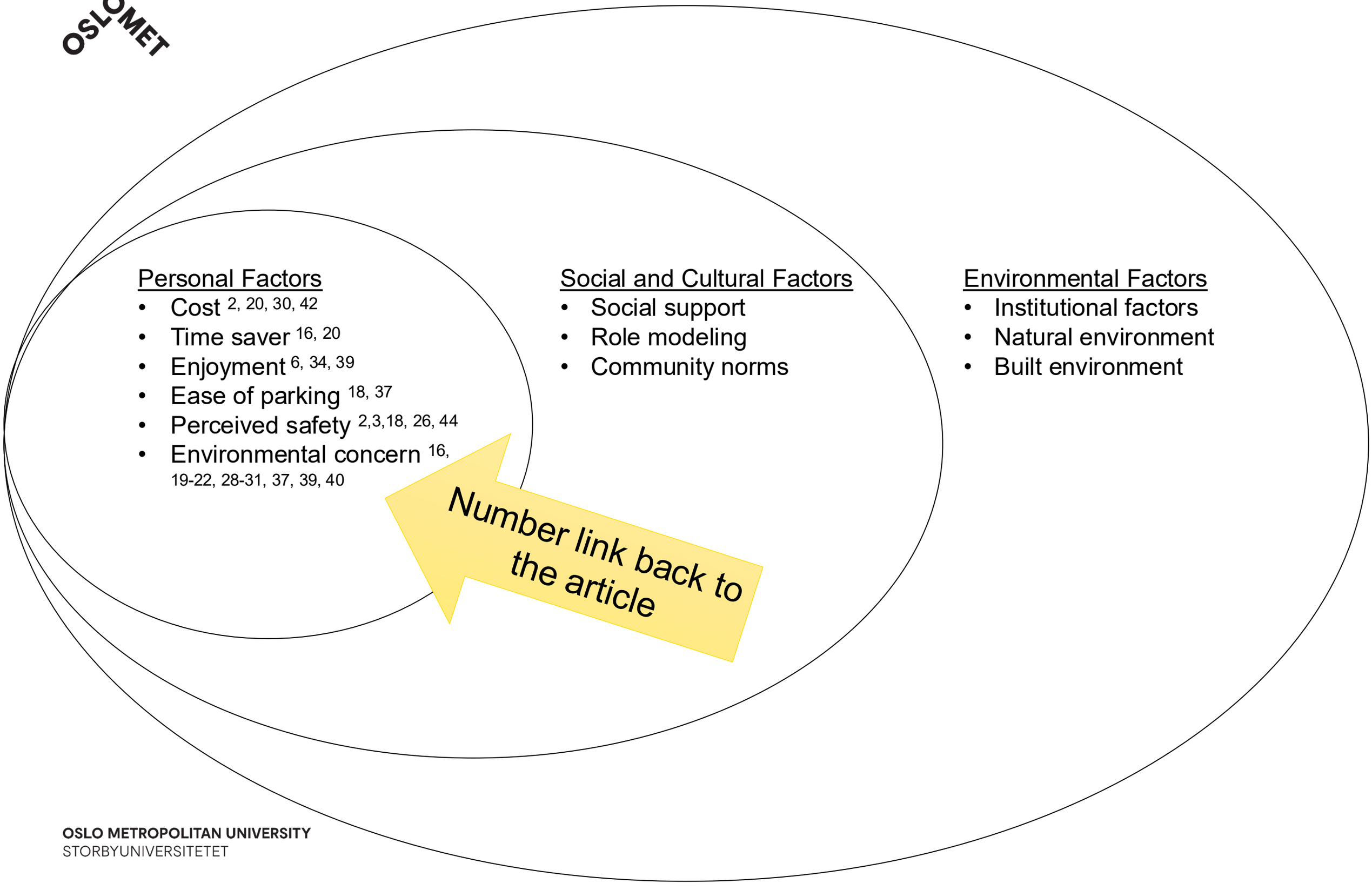
Personal Factors
• Cost 2, 20, 30, 42
• Time saver 16, 20
• Enjoyment 6, 34, 39
• Ease of parking 18, 37
• Perceived safety 2,3,18, 26, 44
• Environmental concern 16, 19-22, 28-31, 37, 39, 40
Social and Cultural Factors
• Social support
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• Built environment
Number link back to the article

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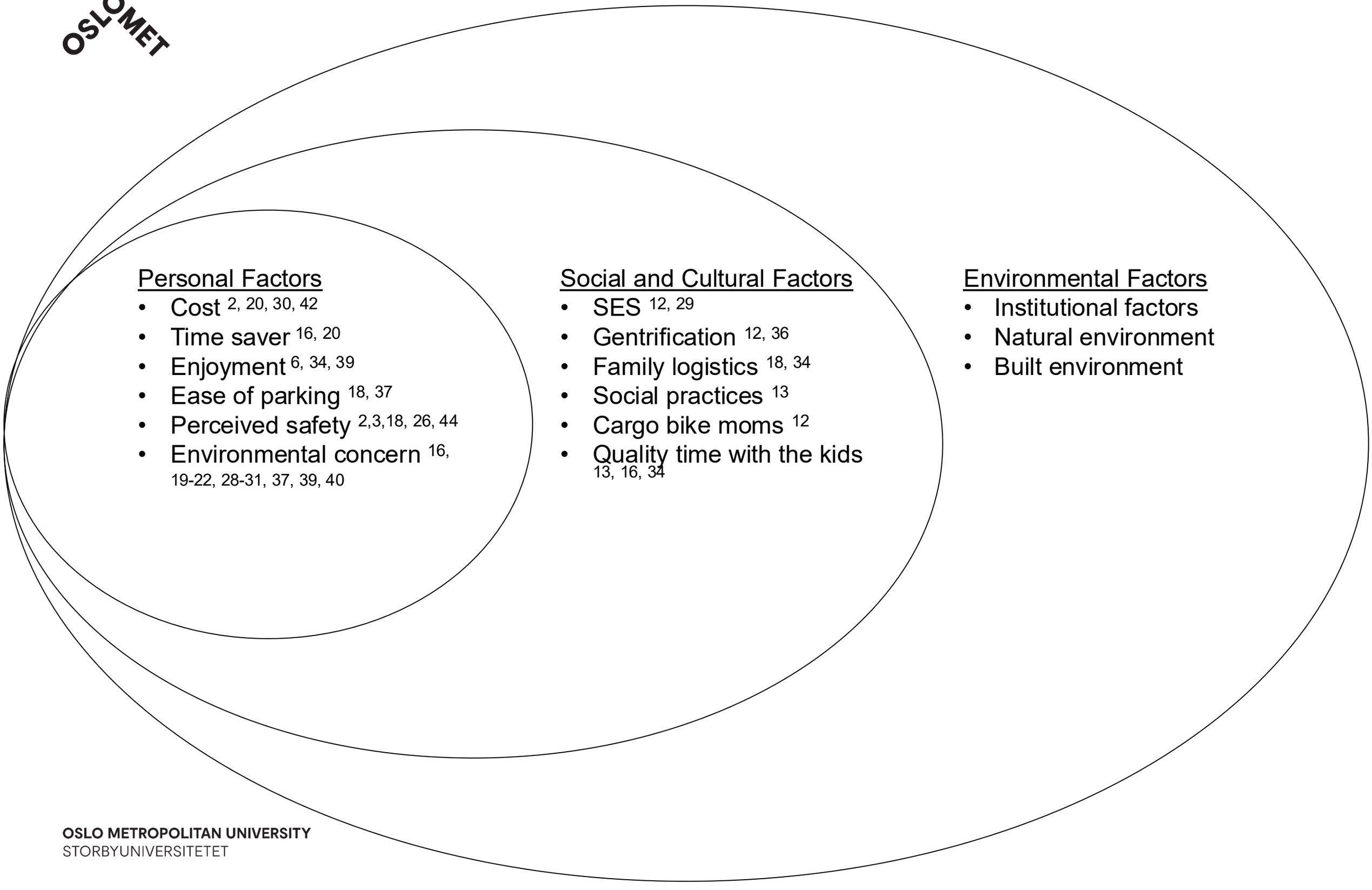

Personal Factors

- Cost [2, 20, 30, 42]
- Time saver [16, 20]
- Enjoyment [6, 34, 39]
- Ease of parking [18, 37]
- Perceived safety [2,3,18, 26, 44]
- Environmental concern [16, 19-22, 28-31, 37, 39, 40]

Social and Cultural Factors

- SES [12, 29]
- Gentrification [12, 36]
- Family logistics [18, 34]
- Social practices [13]
- Cargo bike moms [12]
- Quality time with the kids [13, 16, 34]

Environmental Factors

- Institutional factors
- Natural environment
- Built environment

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Personal Factors

- Cost [2, 20, 30, 42]
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Environmental Factors

- Hills [3, 7, 42]
- Noise [5]
- Parking [2, 10, 15, 29, 31, 35, 37, 38]
- E-assist [18]
- Weather [11, 18, 29, 40]
- Dense city [10]
- Speed limit [3]
- Fear of theft [15, 36, 43]
- Mixed traffic [21, 27, 39, 42]
- Route choice [10, 16, 25, 34, 42]
- Infrastructure [2, 9,10, 16, 21, 25-27, 29, 33, 35, 42-44]

Is there something missing from this? If so, what?

Cargo bikes in an autocentric context

- North American survey with open-and-closed ended questions
  - Focus on the open-ended questions here (template analysis)
  - Asked: reasons for use, satisfaction, social and physical driver/barriers, what they carry by cargo bike, why others don't use them

- RQ1: What are the experiential components of cargo bike use in an autocentric context?
- RQ2: What are the perceived drivers and barriers of cargo bike use?



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Cargo bike cyclist
(N=582)

Motivational factors
(n= 835)

Satisfactions & Upgrading
(n= 142)
- Largely satisfied
- Features and upgrading cargo bike
- Children growing

Health benefits
(n= 177)
- Exercise
- Physical health
- Mental health

Transportation benefits
(n= 576)
- Carrying capacity
- Car-fee/car-lite
- Freedom of movement
- Access and accessibility
- Distance traveled by cargo bike

Barriers to use
(n= 2016)

Perceived barriers
(n= 467)
- Cost, weather, capacity, awareness, test drive

Car culture
(n= 96)
- Comparison with car
- Driving as default

The natural environment
(N=282)

Weather & Seasonality
(n= 124)
- Nice/bad weather
- Perception of weather
- Winter, snowplowing

Topography
(n= 158)
- Hills
- E-bike > distances/ steepness

The human-built environment
(n=1171)

Enabling or disabling use

Infrastructure and urban planning
(n= 806)
- Cycling paths & lanes
- Bike parking & storage
- Dense environment
- Traffic calming/low traffic
- Route choice

Social and perceptual aspects
(n= 365)
- Perceived safety
- Rules & laws
- Drivers' awareness of cyclists

Experiential components
(n= 1045)

Fun & enjoyment
(n= 155)
- Enjoyment
- Social aspects

Connecting to social and natural environment
(n= 181)

Parental roles
(n= 118)
- Child's preferences
- Quality time with children
- Setting an example (role model)

Perception of self, others and the city
(n= 591)

<u>Evangelical to Pragmatic Narratives</u>
Car negativity – One car household
Preaching/recruiting – Nuances
Conviction – Convenience

<u>Perception of cargo bike use</u>
More affluent
More child friendly

Urban experiences

Bike advocacy

Motivational factors

Transportation benefits

- Carrying capacity
- Car-free/car lite
- Freedom of movement
- Access and accessibility
- Distances traveled by cargo bike

44-year-old mother of two: "*The freedom of moving around my community outside of a car and the joy of carrying my kids by bike. Also, the challenge and fulfillment of carrying anything and everything by bike.*"

Upgrading the cargo bike

- Largely satisfied
- Features and upgrading the cargo bike
- Children growing

Health benefits

- Exercise
- Physical health
- Mental health

49-years-old mother of two:"*Feels like flying, often faster than driving, always easier to park than a car, love the exercise*"

Barriers to use

“They are so car brained it simply doesn't occur to them that there might be options”
a 64-year-old male.

Car culture
- Often compared to cars and found better

Perceived barriers
- Cost, weather, capacity, awareness, test-drive

Human built environment
- Infrastructure and urban planning
- Social and perceptual aspects

“It’s fun to ride and makes me feel much safer, since the bike is larger and more visible.”
54-year-old father of two

The natural environment
- Weather, seasonality and topography

Experiential components

A 38-year-old father of one: *"Ability to have special time with my child and show him that we can do things differently than most people around us."*

Parental roles
- Childs preferences
- Quality time with children
- Role model

A 64-year-old male: *"All the joys of cycling with more range and cargo capacity"*

Fun and enjoyment
- Social

Connecting to social and natural environment

"Extremely satisfied, will evangelize at length" as this 38-year-old father of one.

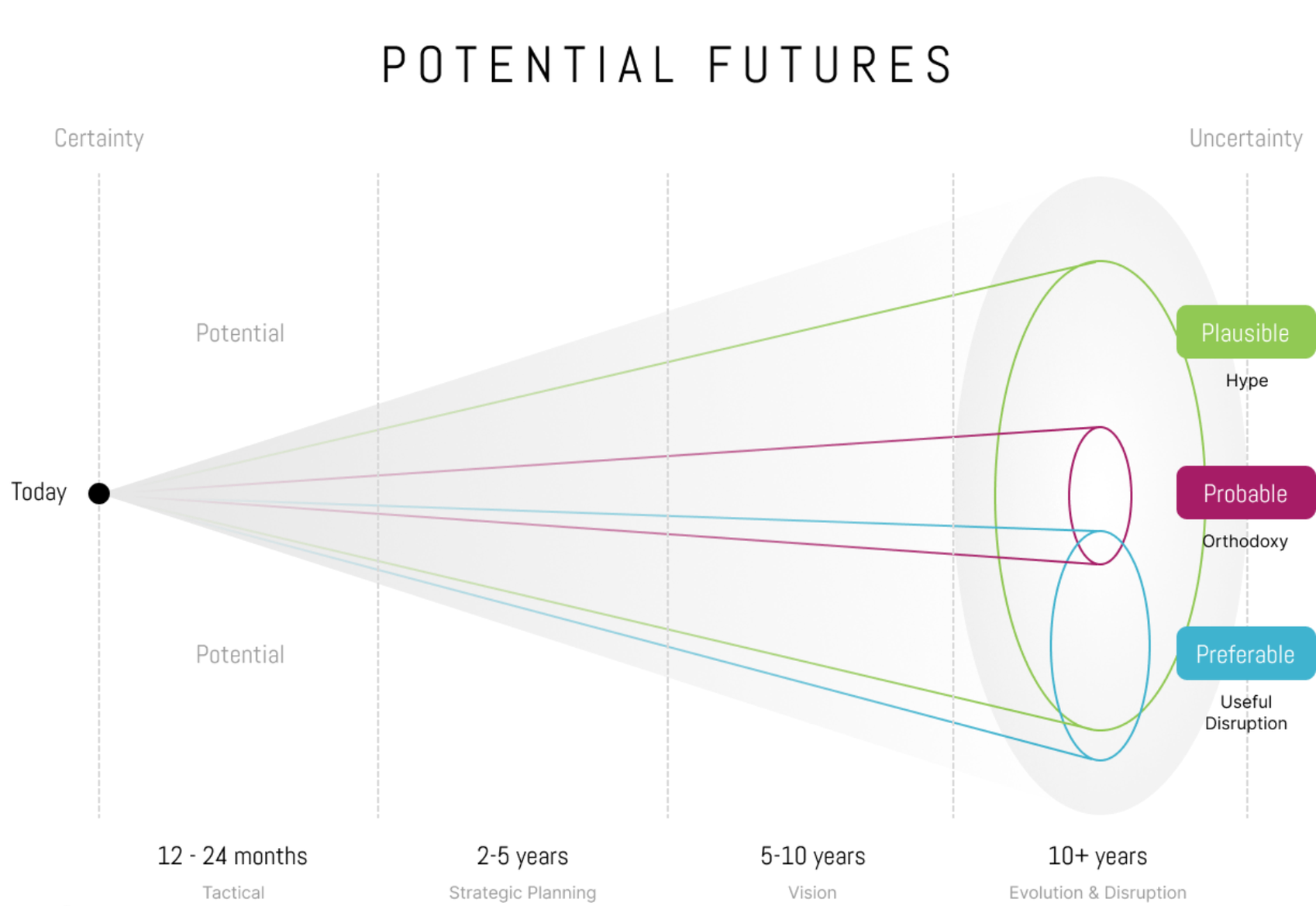
Perception of self, others and the city
- More affluent, more child friendly
- Bike advocacy
- Evangelical to pragmatic narratives
- Urban experiences

A gap analysis

How to close the gap of:

✓Where are we now?

- Where do we want to go?
- And how do we get there?



Take Home Message

Theoretically: 29% of personal car trips can be replaced by cargo bike

Empirically: 20% - 50% of personal car trips were replaced by cargo bikes

Cargo bikes replaces car trips, reduces car ownership, and generates new trips

For many, the cargo bike function as a second car in the household rather than a complete car replacement: car-reduced rather than car-free lifestyle

Experiential components are integrated into the drivers of the using a cargo bike. The barriers are seen more for other, then for the users themself

Thank you!

Questions?

Thoughts?

Ideas?



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