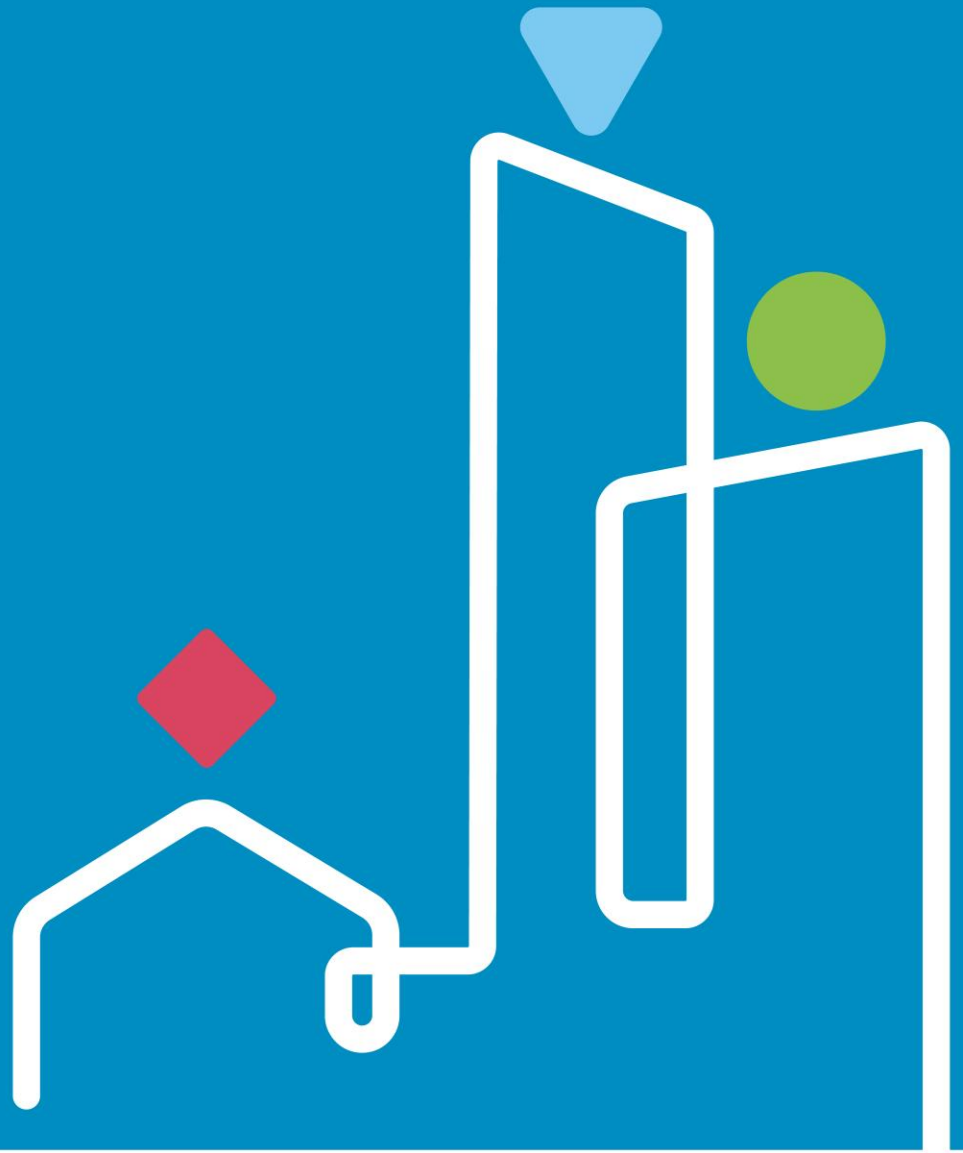


Diversify-CCAM

Funded by
the European Union

Dr Anna Anund

Vision and aim

Diversify-CCAM envisions to develop **methods and tools** that support CCAM developers, transportation planners and policy makers (European, national, regional) in integrating social diversities in the design and implementation of future shared autonomous mobility in all European landscapes.

Diversify-CCAM aims to expand the existing knowledge on CCAM social acceptance and willingness to use, by integrating **cultural**, **geographical** and **policy** aspects collected in 6 European countries, covering **12 diversified local contexts** as well as best practice strategies in CCAM design, development and implementation to pioneer their fair deployment and advance mobility equity Europewide.

Ambition

- Diversify-CCAM project goal is to deepen our understanding of the diverse social contexts affecting the acceptance, adoption, and utilisation of CCAM within the European mobility ecosystem.

- Additionally, the project aims to identify solutions for overcoming challenges and barriers that impede the effectiveness of shared services, particularly in areas with unique geographical and cultural demands.

Objectives

- Study the cultural, geographical and policy aspects that affect the social acceptance, usage and deployment of CCAM solutions.
- Create and evaluate iteration-driven methodological tools and apply them for data collection, disaggregation and correlation with real end-users at 6 European countries and 12 local contexts.
- Study the influence of diversification factors on CCAM impact areas.
- Develop a live knowledge transferability mechanism on recurring diversification patterns affecting CCAM deployment in specific local contexts.
- Sustainable short and mid-term valorisation and governance models for mobility equity

Diversification model

CCAM Diversification Tool (CCAM D-Tool) that will support planners in designing inclusive and equitable mobility solutions for urban, peri-urban and rural landscapes.

Diversification Factors

Cultural Factors

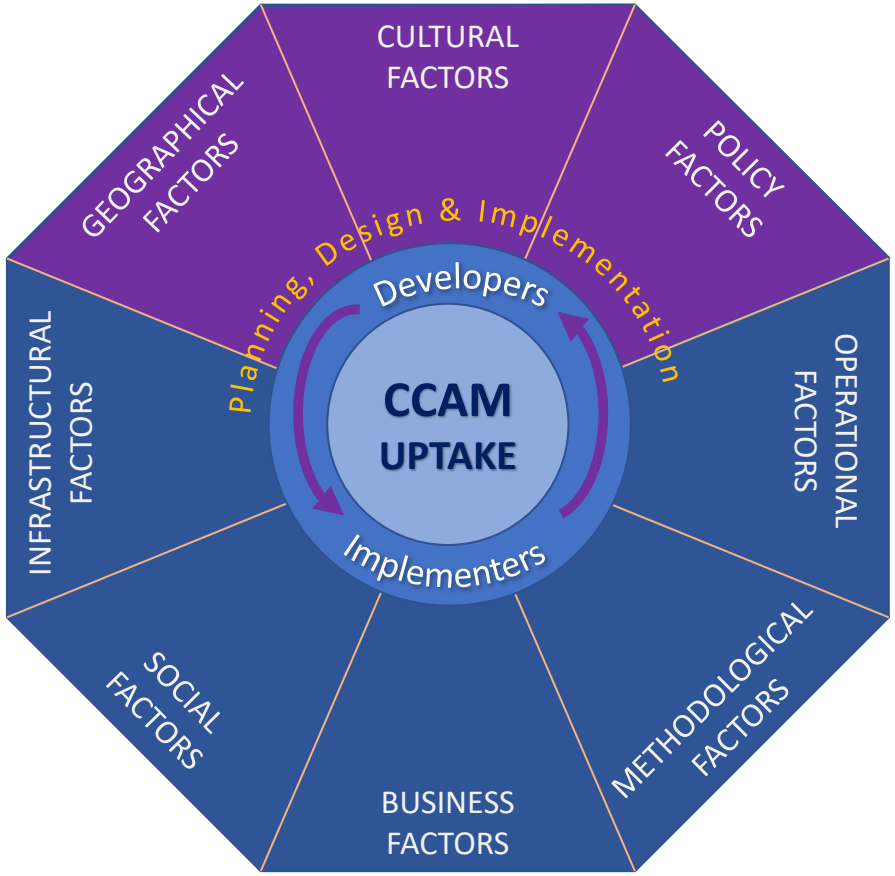
- Language
- Mobility cultures (travel behaviours, needs)
- Innovation cultures
- Work cultures
- Governance cultures
- Sustainability cultures
- Social norms

Geographical Factors

- Diversity in topography (e.g. landforms such as mountains, hills, and waterbodies, context-specific physical barriers)
- Built environment (e.g. urban, rural, and regional morphology, land use, road and transport infrastructures)
- Climate and weather conditions

Policy Factors

- Heterogeneity of policy instruments
- Political, legal, regulatory, and governance frameworks across the studied contexts.
- Policy priorities
- Decision-making processes
- Stakeholders' engagement and collaboration
- Local laws and regulations.



Related Factors

Social Factors

- Demographics (gender, age, social origin, education, income level)
- User experience and behaviour
- Migration
- Accessibility and Inclusivity
- Community engagement
- Digital Equity

Infrastructural Factors

- Bike lane infrastructures
- Mobility coverage
- Incentives
- Funding

Operational Factors

- Fixed, on-demand, door-to-door
- Operation hours (day, night, etc.)
- Digital ticketing
- Information provision
- Mixed transport (cargo & passenger)

Business Factors

- Business models
- Sustainability
- Value proposition

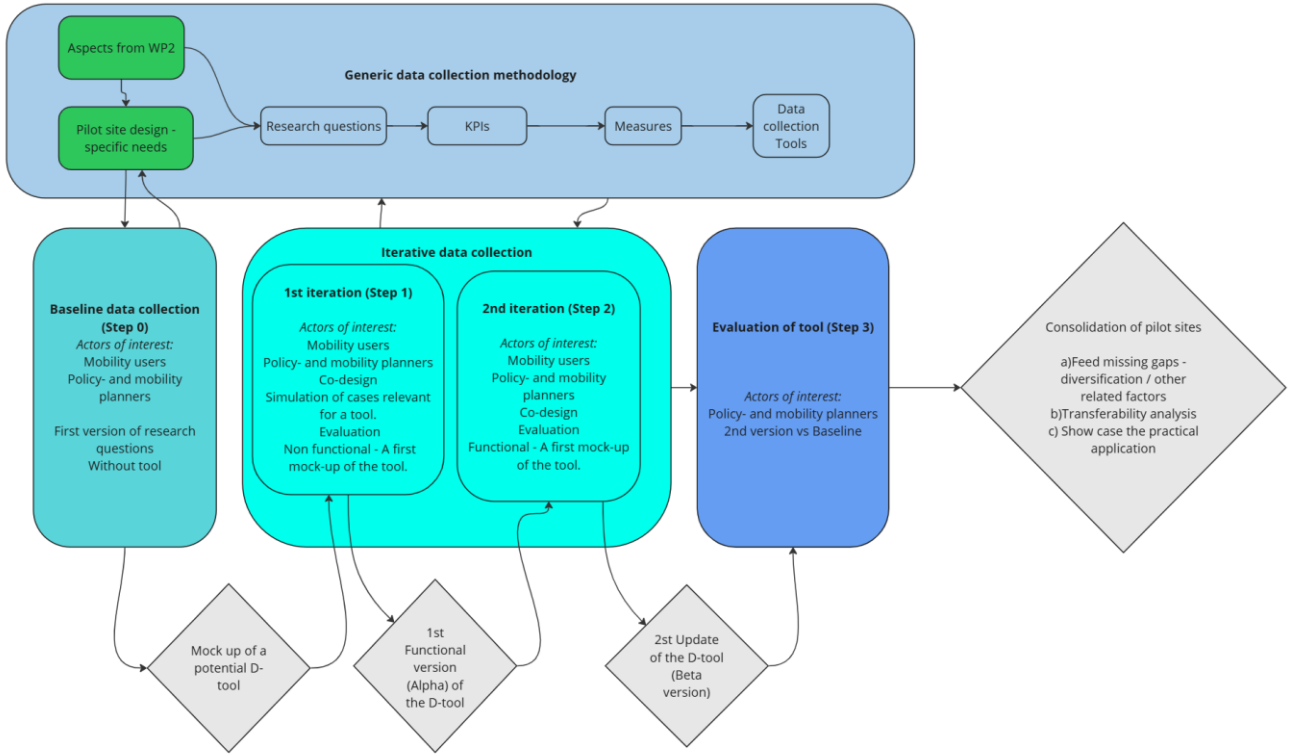
Methodological Factors

- Data disaggregation
- Patterns identification
- Correlation and operationalisation
- Composite metrics

The contributions from Diversify-CCAM are several:

1. **Perception indexes** based on the most important factors according to the literature and the identified needs for people captured from 12 pilot sites.
2. **Alignment indexes** to be used to select the most promising CCAM services in each area
3. A Diversification transport planning tool (**D-tool**) that integrates both Perception and Alignment indexes
4. An **Observatory** to share experience and knowledge with planners and policy makers
5. **Handbooks** for planners and policy makers to support a fair and equal implementation of CCAM solutions.

Co-creation involving citizens and users



Diversify-CCAM are inspired by the **EU-CEM handbook** and aligned with FESTA approach for data collections.

Three steps in engaging citizens and users:

Baseline: general understanding the needs of the people at the 12 sites: survey + feedback of results to Stakeholders). Survey: out in March.

Iteration I & II: A: deeper understanding of traveller needs B:Iterative development of the D-tool with stakeholder involvement. (Start in August 2025)

Final Evaluation: Evaluation of the tool with people working on policy, planning and development with a need for or use of CCAM. (Start in 2026)

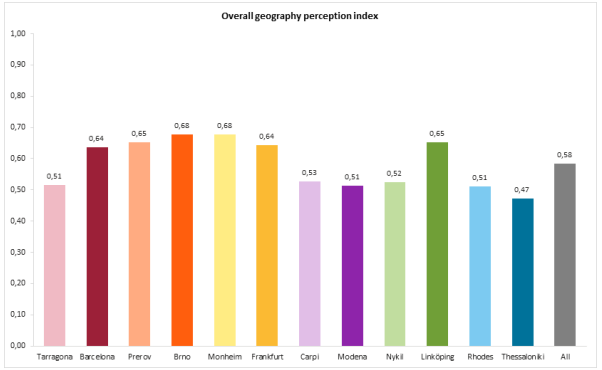
Target travelers and Stakeholders

- Diversify-CCAM reaches out to **traveler groups** (residents, commuters, visitors and tourists) with a **diversified profile**, to understand their needs and barriers in mobility, but also to stakeholders in policy, planning or development in relation to mobility.
- Data collections are done in an **iterative way**, starting with Baseline data collection guided through a theoretical framework to better understand local conditions.
- A CCAM **Alignment Framework** is developed based on a model designed to assess how different CCAM mobility services fit specific local contexts. The work relies on expert ratings of seven AV services.

Perception indexs

The goal is to provide planners and decision-makers with a structured picture of how the local context is perceived by potential users.

Perception Indexes support the understanding that **mobility systems are far from being just technical systems**. They are instead embedded in social, spatial, and institutional environments, as well as in people's experiences of them, all of which need to be taken into account when designing mobility innovations.



The perception indexs

The **Culture Perception index** captures how individuals perceive the cultural readiness and inclusivity of their mobility environment. The central factors are:

- Tech-savviness: How comfortable people feel using digital tools and new technologies
- Community engagement: Whether people want to be involved in mobility planning
- Mobility equity: Whether the system is seen as fair and accessible to everyone
- Mobility transition readiness: How ready people are to move toward more sustainable transport options

The perception indexs

The **Geography Perception index** captured how people experience the physical conditions around them. The central factors are:

- Climate challenges: How much weather affects daily travel
- Public transport accessibility and affordability
- Infrastructure quality across modes such as public transport, cycling, and walking

The perception indexs

The **Policy Perception Index** reflects how people view local transport governance. The central factors are:

- Innovation: Whether governments support new technologies
- Infrastructure investment: Whether enough is being invested in transport
- Public inclusion and communication: Whether people feel informed and involved

Alignment index

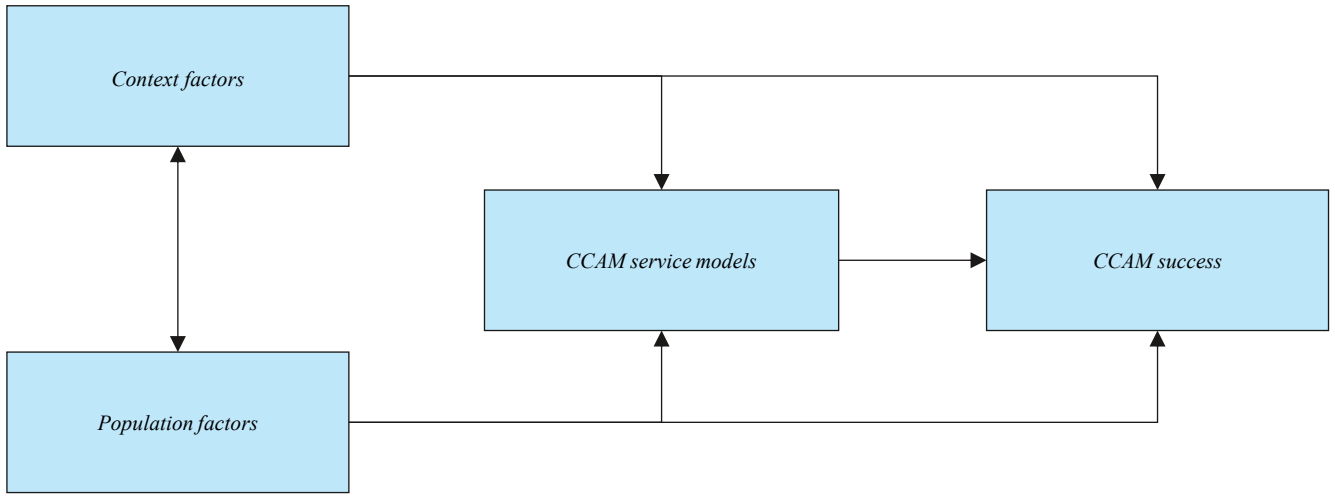
Á model designed to assess how well different CCAM mobility services fit specific local contexts.

Rather than asking whether a location is “ready,” the framework examines the alignment between contextual conditions (culture, geography, policy), population characteristics, and service design.

The results show that different services depend on different factors and are therefore suited to different environments. By making these relationships explicit, the framework shifts the focus from technology deployment to context-sensitive service design, providing a practical tool to guide more targeted and effective CCAM implementation.

The model

- **Context** (culture, geography, policy)
- **Population** (population characteristics)
- **CCAM service design** (how a CCAM system is configured)



Alignment to services

CCAM Services

The seven CCAM service types assessed across pilot sites for deployment readiness and public acceptance

1 AV Bus/Shuttle with fixed route

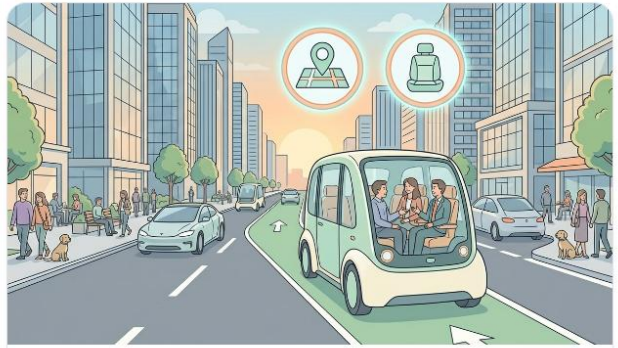
Autonomous buses and shuttles operating on predetermined fixed routes, typically in urban or suburban environments.

2 Feeder/Last-Mile Shuttle with fixed route

Autonomous shuttles providing connectivity between transit hubs and final destinations along fixed routes.

3 On-demand AV Shuttle

Flexible autonomous shuttle services that respond to real-time passenger requests without fixed routes.

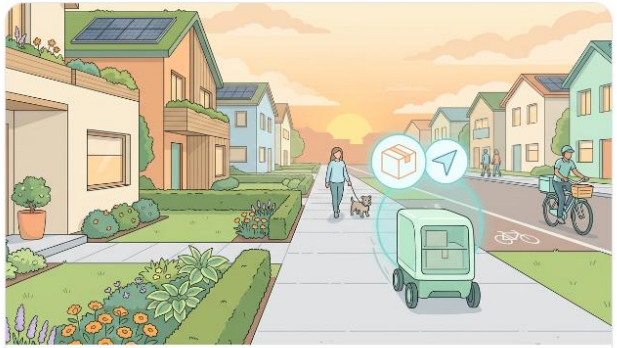


4 Robotaxi

Fully autonomous taxi services providing door-to-door transportation without human drivers.

5 Shared Micro-mobility Services

Shared services for small electric vehicles like e-scooters, e-bikes, and similar personal mobility devices.



6 Small Goods Delivery Service

Autonomous delivery services for small packages and goods using ground-based robots or drones.

7 **MaaS Integration Platforms**

Mobility-as-a-Service platforms that integrate multiple transport modes into a unified booking and payment system.

D-tool Demonstration

https://ccam.brainweb.gr/d-tool/about?level=PILOT_SITE&pilots=linkoping%2Cnykil

DIVERSIFY CCAM

D-Tool Analytics

- Platform Overview — About the D-Tool
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- KPI Analysis — Metrics & distributions
- Segments — By user groups
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Export Current View

Filter Data to customize your view — Select level, location, and segments to filter the data

Level: Pilot Site | Countries: Select... | Pilot Sites: 2 selected | Linköping × | Nykil × | Segments: All segments

Source: Diversify CCAM... | Reset

Diversify CCAM D-Tool > Platform Overview

Platform Overview

Learn about the Diversify CCAM D-Tool, its features, and pilot sites

Project Context

The D-Tool is developed within the framework of the Diversify-CCAM project. It integrates data from:

- **Diversify-CCAM Baseline Survey** — Foundational quantitative perception data from the project's twelve pilot sites
- **Diversify-CCAM Iterations 1 & 2** — Qualitative data collections enriching the baseline findings
- **SHOW Living Lab Project** — CCAM pre-acceptance survey data, integrated at country level, where methodologically comparable with the Diversify-CCAM baseline survey and upon user request
- **SINFONICA Project** — Complementary CCAM acceptance-related data, integrated at country level, where methodologically comparable with the Diversify-CCAM baseline survey and upon user request

> *It should be noted that the SHOW and SINFONICA surveys were not designed with the same objectives as Diversify-CCAM, did not explicitly address cultural, geographical, and policy diversification factors affecting CCAM, and do not fully share the same pilot sites, although some location contexts overlap.*

Participating Pilot Sites

12 pilot sites across 6 European countries

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Level: Pilot Site | Countries: Select... | Pilot Sites: 2 selected | Linköping × | Nykil × | Segments: All segments

Source: Diversify CCAM... | Reset

Diversify CCAM D-Tool > Dashboard

Dashboard

At-a-glance overview of key metrics and trends

Welcome to the Diversify CCAM D-Tool

This dashboard provides insights into Diversify CCAM (Connected, Cooperative and Automated Mobility) across European pilot sites. Here's how to get started:

1. Filter Data
Use the panel above to select level, countries, pilot sites and segments

2. Explore Perception
Check Perception Indexes for policy, geography & culture insights

3. Analyze KPIs and Segments
Dive into detailed metrics via KPI Analysis and Segments

4. Compare Sites
Use Map, Compare, or Diversify CCAM Services Alignment for cross-site analysis

Level: Pilot Site Level | Selected: Linköping, Nykil | Segments: All | Source: Diversify CCAM Baseline

Perception Indexes

Overall perception scores across Policy, Geography and Culture, plus the Diversified Mobility Equity Index (DMEI).

What do status levels mean?

Overall policy perception index	Overall geography perception index	Overall culture perception index	Diversified Mobility Equity Index (DMEI)
Room for Improvement	– Medium	– Medium	Room for Improvement
31	59	64	51

DIVERSIFY CCAM
D-Tool Analytics

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Export Current View

KPI Analysis

Explore metrics and distributions by category

Category: All Categories

Pilot site data for 2 sites | Source: CCAM BASELINE

Showing 15 KPIs

Understanding This Page

What are KPIs? Key Performance Indicators (KPIs) are measurable values that demonstrate how effectively Diversify CCAM (Connected, Cooperative, and Automated Mobility) initiatives are achieving their objectives.

How to read the charts: Higher values generally indicate better performance. The baseline comparison shows changes from initial measurements, with positive deltas (green) showing improvement and negative deltas (red) indicating areas needing attention.

Filters impact: The data shown is filtered by your current selection (level, countries, pilot sites, segments, and data source). Change filters in the top bar to analyze different subsets.

KPI Breakdown | Radar View | Baseline Delta | KPI Glossary

KPI Breakdown by Selected Level

All KPIs sorted by value for the current selection. Each bar represents the aggregated score across your selected filters.

User Segments

Measures sentiment on policy, geography, and culture across different user types

Showing values for **Linköping, Nykil** (pilot site level)

User Types | Age Groups | Gender | Vulnerability Groups

User Types

Classification based on how individuals use mobility services in the area.

Methodology: Derived from survey responses about frequency and purpose of travel in the pilot site area.

Residents

People living permanently in the area.

Overall policy perception index	30%
Min 15% · Max 45% · Spread 30%	
Overall geography perception in...	60%
Min 53% · Max 68% · Spread 15%	
Overall culture perception index	63%
Min 59% · Max 67% · Spread 8%	
Average Score	51%

Commuters

People travelling regularly for work/education.

Overall policy perception index	42%
Overall geography perception in...	62%
Min 56% · Max 68% · Spread 12%	
Overall culture perception index	64%
Min 64% · Max 65% · Spread 1%	
Average Score	56%

Tourists

Temporary visitors using mobility services for leisure.

Overall policy perception index	55%
Overall geography perception in...	53%
Overall culture perception index	63%
Average Score	57%

Occasional Visitors

Irregular visitors (friends/family, occasional trips).

Overall policy perception index	51%
Min 42% · Max 61% · Spread 19%	
Overall geography perception in...	51%
Min 47% · Max 55% · Spread 9%	
Overall culture perception index	62%
Min 58% · Max 67% · Spread 9%	
Average Score	55%

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Showing data for: **Linköping, Nykil** · Source: CCAM_BASELINE

Policy | **Geography** | Culture

Overall Geography Perception Index

Reflects individuals' subjective evaluation of how local geographical conditions shape their transport experience. It synthesizes perceived climate-related barriers, the accessibility and affordability of public transport, and the quality of local transport infrastructure. Together, these factors represent how "geographically enabling" or "challenging" a location feels for everyday mobility.

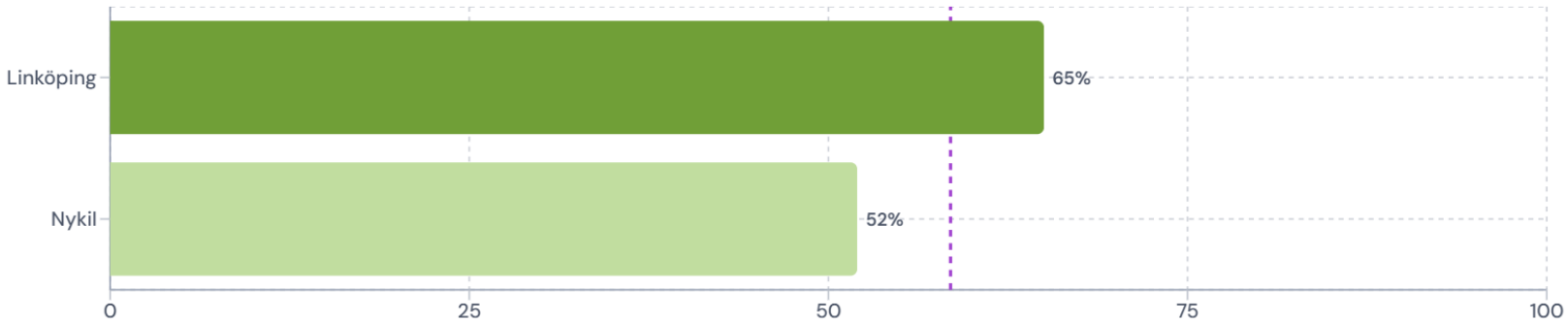
HIGH SCORE MEANS
Individuals perceive the local environment as highly supportive of mobility: weather rarely impedes travel, infrastructure is well-maintained, and public transport is both accessible and affordable.

LOWER SCORE INDICATES
The environment is seen as a frequent obstacle to mobility: severe climate effects, poor infrastructure, and limited access to affordable public transport combine to create structural disadvantages.

Scores by Pilot Site

Each bar represents the perception score from **CCAM_BASELINE**. The dataset average is 59.

Min: 52 · Max: 65 · Spread: 13



DIVERSIFY CCAM

D-Tool Analytics

Export Current View

Understanding This Page

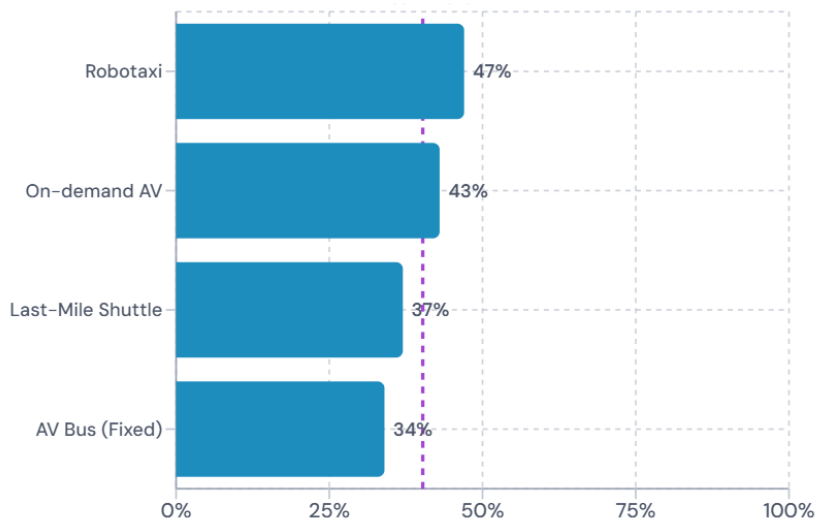
What is Service Alignment? The alignment score shows how suitable a site currently is in comparison to the other sites of the study for each service based on local context (geography, culture, policy) and population characteristics.

How to read the charts: Higher alignment scores indicate better fit. These are relative indicators of suitability, not absolute percentages. The scores are most meaningful when compared to each other, reflecting relative differences in how suitable a site is for CCAM services.

Segment breakdown: Different user groups (Residents, Commuters, Tourists, Visitors) have different mobility needs. The segment analysis reveals which groups would benefit most from each service.

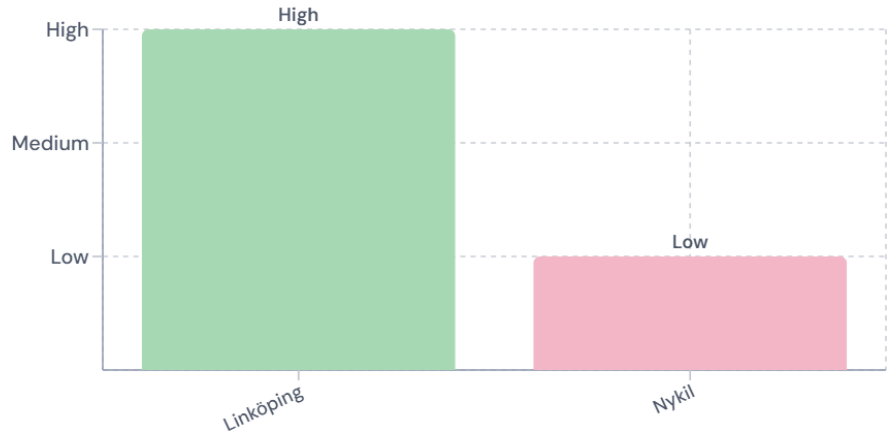
Diversify CCAM Services Integration

Average alignment score across the selected pilot sites for the four Automated People Mover services.



Smart Mobility Services

Aggregate Low/Medium/High rating per pilot site for the remaining three services: Shared Micro-mobility, Goods Delivery and MaaS Platforms.



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Linköping
Sweden

Nykil
Sweden

Perception Indexes

Overall perception scores across Policy, Geography and Culture, plus the Diversified Mobility Equity Index (DMEI).

What do status levels mean?

Overall policy perception index

Room for Improvement

31

%

Min: 16 · Max: 45 · Spread: 29

Computed for current selection

Highest contributor: **Linköping**

Lowest contributor: **Nykil**

Overall geography perception index

– Medium

59

%

Min: 52 · Max: 65 · Spread: 13

Computed for current selection

Highest contributor: **Linköping**

Lowest contributor: **Nykil**

Overall culture perception index

– Medium

64

%

Min: 60 · Max: 67 · Spread: 7

Computed for current selection

Highest contributor: **Linköping**

Lowest contributor: **Nykil**

Diversified Mobility Equity Index (DMEI)

Room for Improvement

51

points

Min: 43 · Max: 59 · Spread: 16

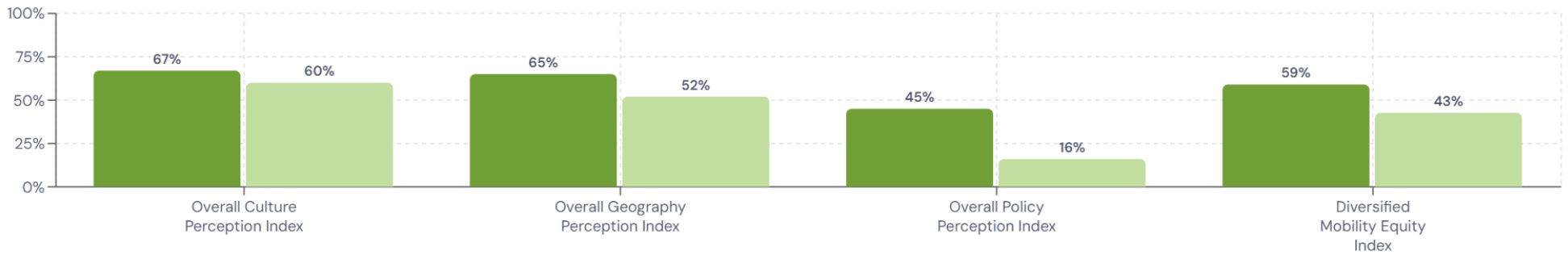
Computed for current selection

Highest contributor: **Linköping**

Lowest contributor: **Nykil**

Diversify Impact KPIs by Pilot Site

Compare key performance indicators across each selected pilot site individually. Each bar represents a single pilot's score for that KPI.



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Level: Pilot Site | Countries: Select... | Pilot Sites: 2 selected | Linköping × | Nykil × | Segments: All segments

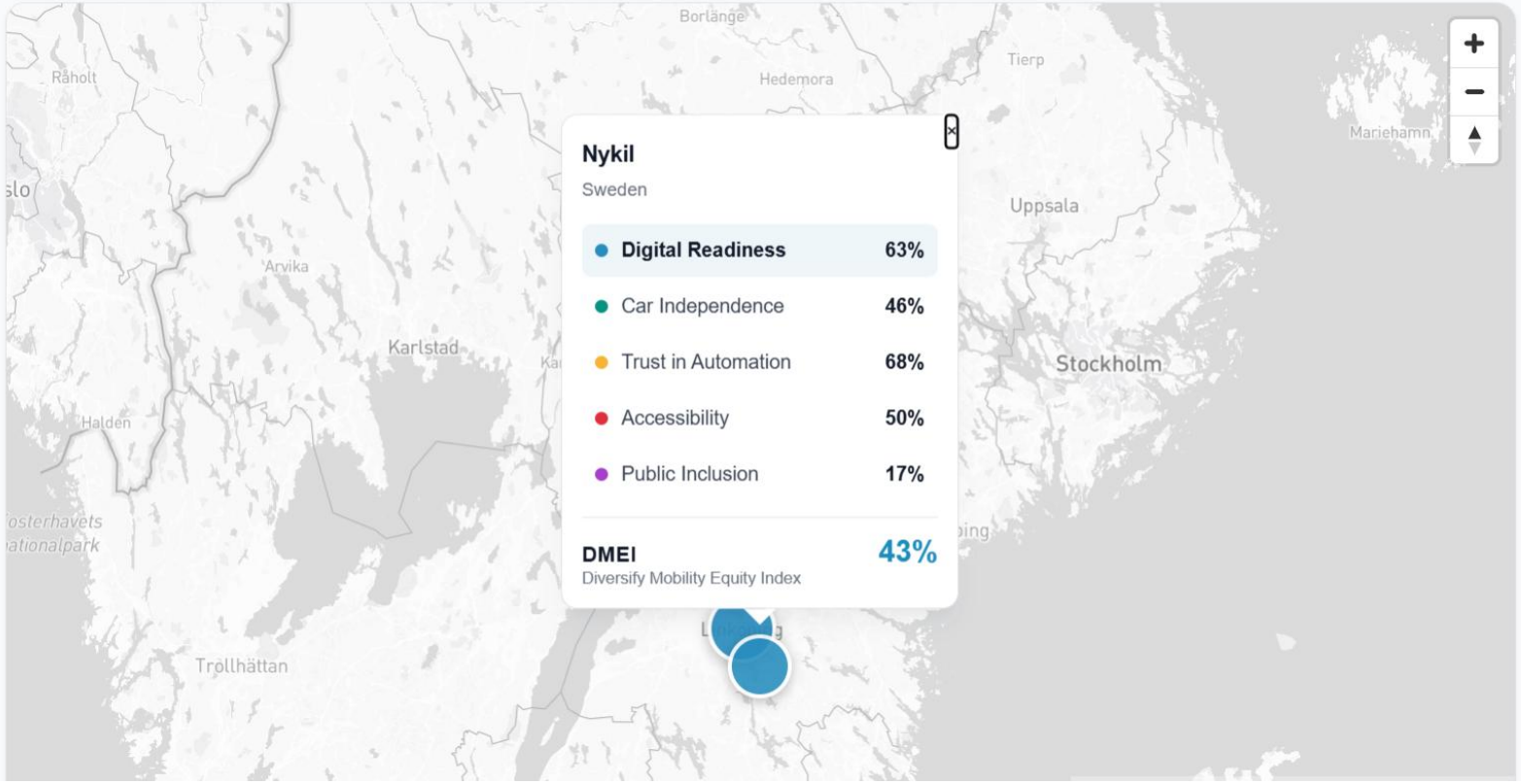
Source: Diversify CCAM... | Reset

Diversify CCAM D-Tool > Map

Geographic Map

Visualize pilot sites and regional factors across Europe

Layer: Digital Readiness



Map List View

Accessible list of all pilot sites with their values. Use "Zoom to site" for quick navigation.

Sort by: Factor Value

Linköping — Sweden — Zoom to site
Digital Readiness: 72%

Nykil — Sweden — Zoom to site
Digital Readiness: 63%

FACTOR LEGEND

- Digital Readiness

To think about…

From a user point of view: Looking the same does not mean it is the same….and it might be the same even if they do not look the same.

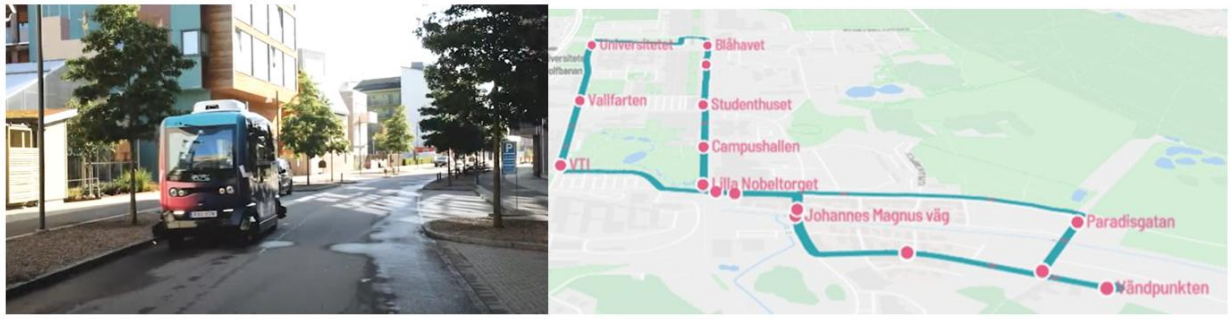


Figure 2. *Linköping pilot site (Source: SHOW website - https://show-project.eu/ (retrieved 26.02.2026)*

Figure 3. *Monheim pilot site (Source: SHOW website - https://show-project.eu/ (retrieved 26.02.2026)*

The **KIRA vehicles** are modified NIO ES8 electric SUVs, equipped with the Mobileye Drive autonomous driving system. They operate as level 4 on-demand services with a safety driver and can currently carry up to three passengers. Though shared shuttles, as SUVs, the riding experience is potentially more akin to robotaxis than public buses.

Typology of CCAM passenger transport services characteristics

Service characteristics	Expressions of service characteristic					
Vehicle type	M3 Large Bus – Class 1	M3 Large Bus – Class 2	M3 Large Bus – Class 3	M2 Small Bus – Class A (L, M)	M2 Small Bus – Class B	M1 Passenger Car (K)
Speed	Low speed (L, M)		Medium speed		Traffic speed (K)	
Automation level	SAE L0–L2		SAE L3 (L, M)		SAE L4 (K)	SAE L5
Operational supervision	Not applicable	On-board human supervision (L, M, K)		Remote supervision – proximate	Remote supervision – distant	No human supervision
Route structure	Fixed route (M)		Stop-based flexible route (L, K)		Zone-based flexible route	
Schedule structure	Fixed schedule (M)			Flexible / dynamic schedule (L, K)		
Stop structure	Fixed stops (M)			Flexible stops (L, K)		
Time of service	24/7			Limited (L, M, K)		
Booking structure	Booking in advance (L)		Direct booking (K)		No booking (M)	
Sharing logic	Public shared ride (L, M)		Bounded shared ride (K)		Conditionally shared ride	Exclusive ride
System integration	Integrated into public transport system / MaaS (M, K)			Standalone system (L)		
Access	Internal user group	Closed user group (K)	Registration based – after approval	Registration based – direct	Public access (L, M)	
Maturity	Demonstration / test operation	Pilot operation (K)	Transition phase (L)	Full operation (M)	Commercial operation	

In preparation

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