

# Vision 2X - Research and Development Platform

DVN workshop exterior displays



# The evolution of signal lighting

From animated functions...



...via segmented surface illumination...



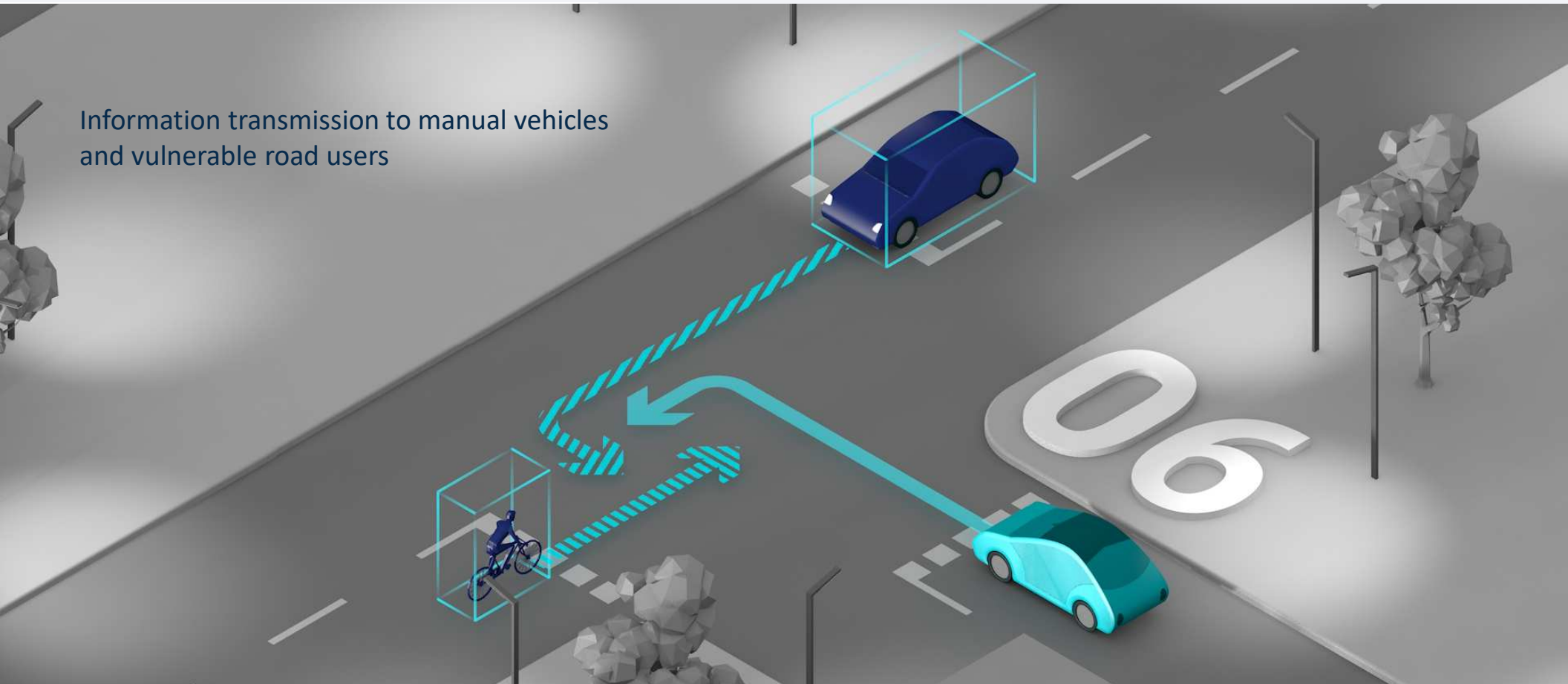
...to pixelated displays



**Exterior Displays will be the main differentiator for vehicle lighting**

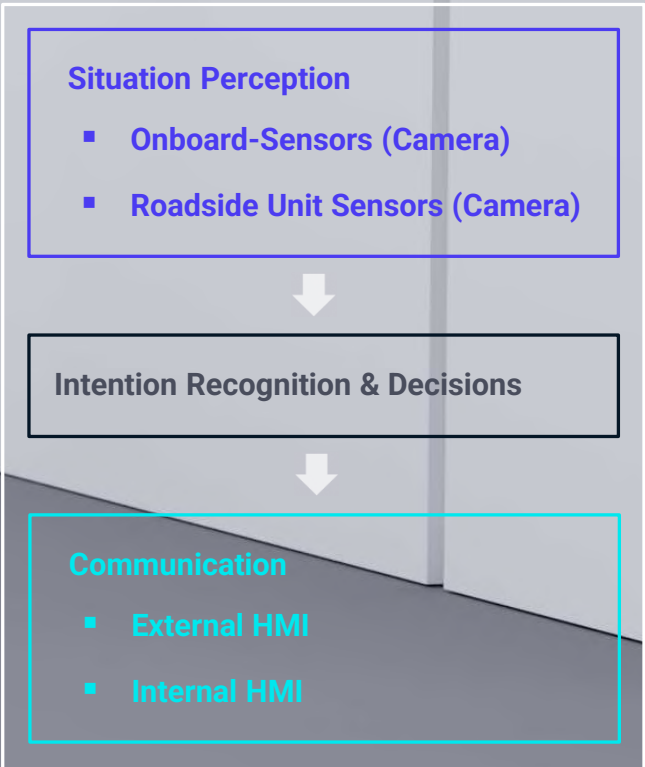
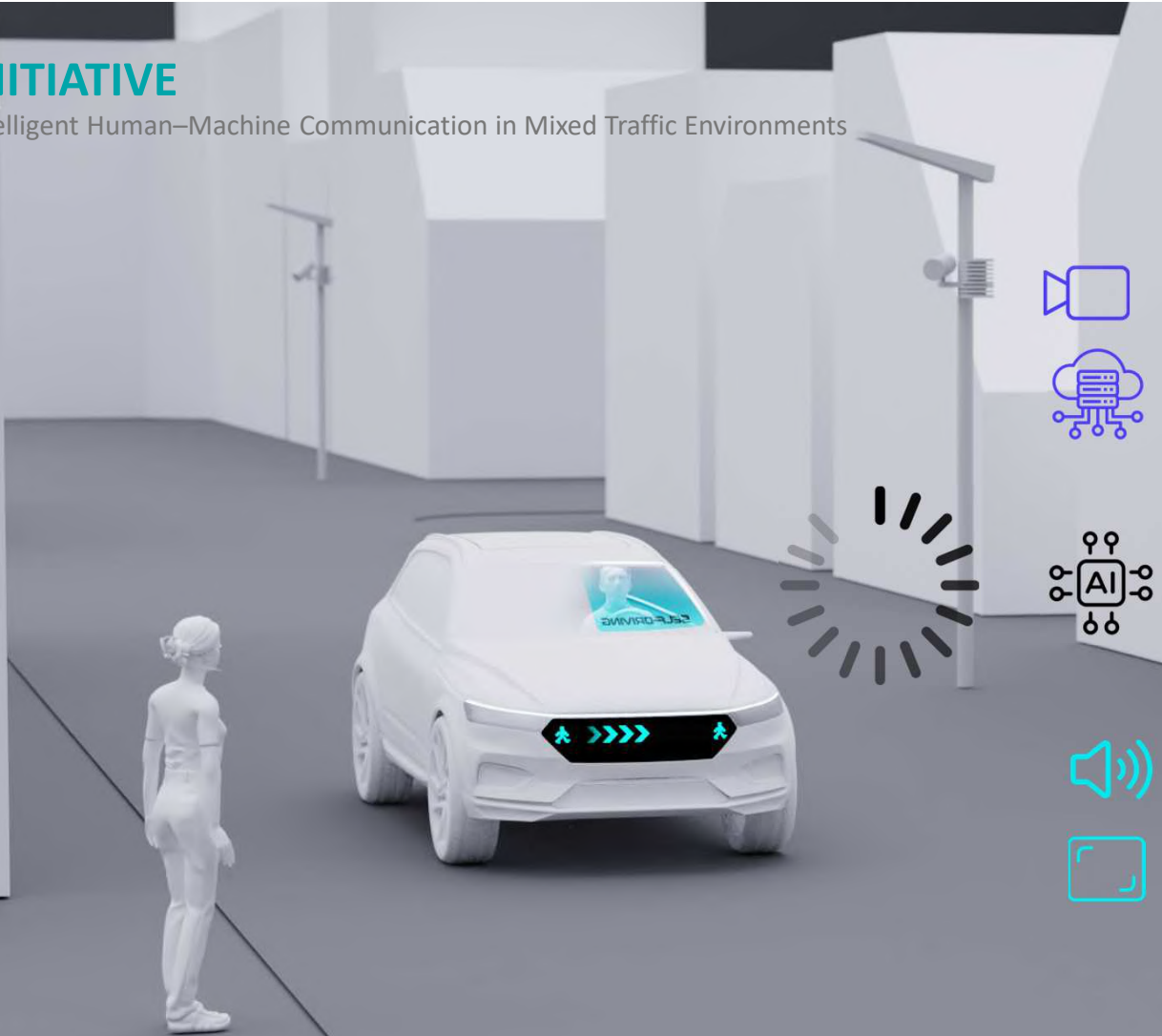
## Pixelated displays enable cars to communicate

Information transmission to manual vehicles and vulnerable road users



# INITIATIVE

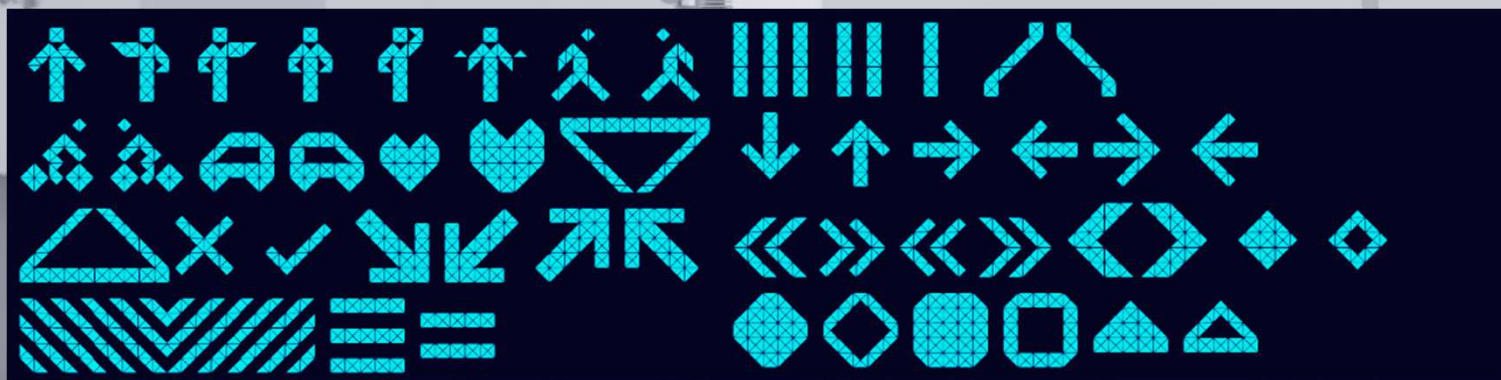
Intelligent Human–Machine Communication in Mixed Traffic Environments



Legal Framework

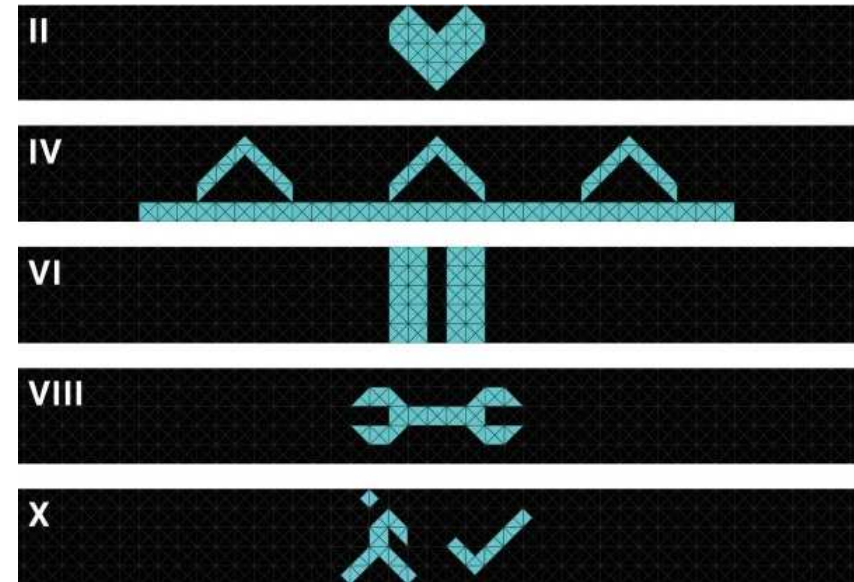
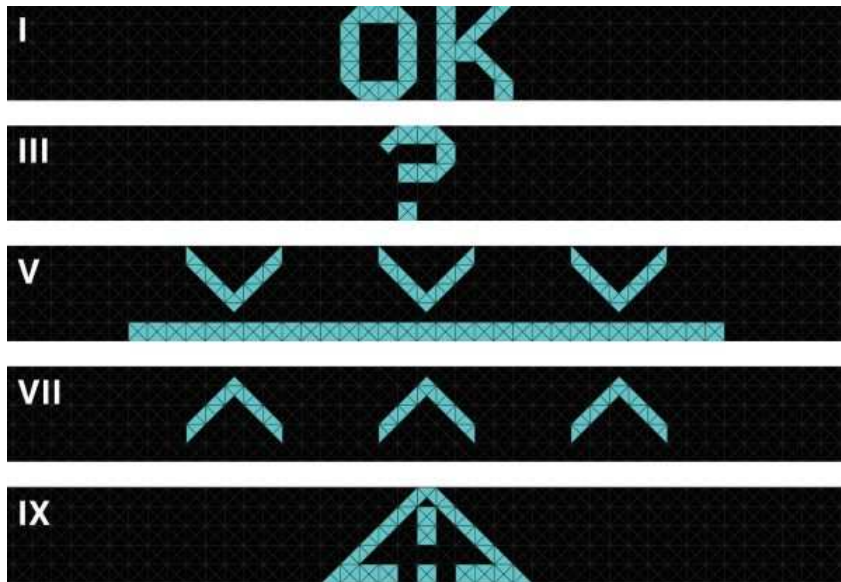
# INITIATIVE

## Symbols and Pictograms



## Message catalog INITIATIVE

### Communication front



(I) I understand you (II) Thank you, (III) Whats's going on? (IV) I start driving (V) I am stopping  
(VI) I am waiting (VII) I continue driving (VIII) Fail safe, (IX) Caution (X) I recognize you

## STADT:up

Experienceable driving functions for fully automated driving in urban traffic

To be developed:

- AI methods and data-driven models along the entire signal-processing chain
- Forward-looking interaction concepts
- Experienceable driving functions that are demonstrated in challenging traffic situations

Concepts for sustainable, multimodal urban mobility

- Expert interviews / dialogue forum with cities and technology partners
- Development of a digital twin for urban mobility
- Analysis and evaluation of mobility scenarios





Vision 2X

Research and Development Platform

## Vision 2X

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## Vision 2X

### Research and Development Platform

#### ■ Front of car

- AV marker lights in headlamps
- Horizontal communication matrix (CMX)
  - 860 individual triangular pixels
  - Cyan and white



#### ■ Rear combination lamp

- EdgeLight lighting functionality
- Vertical communication matrix
  - 200 individual triangular pixels
  - Cyan and red | white when combined



## User study – Communication of automated vehicles for following traffic

Investigation of acceptance-related factors in different stopping scenarios

Rear eHMIs for informing following drivers

Pedestrian crossing



Virtual Stop



Minimal Risk Maneuver (MRM)



Studiendurchführung läuft aktuell in Lippstadt

# THE POSSIBILITIES ARE ENDLESS

What is the right way to manage the options?



*ISD – Intelligent Social Display*  
*ISD+ – Daytime visible Social Display*  
*PO – Position Light*  
*DRL – Daytime Running Light*



Thank you for your attention.



INTERNAL & PARTNERS



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