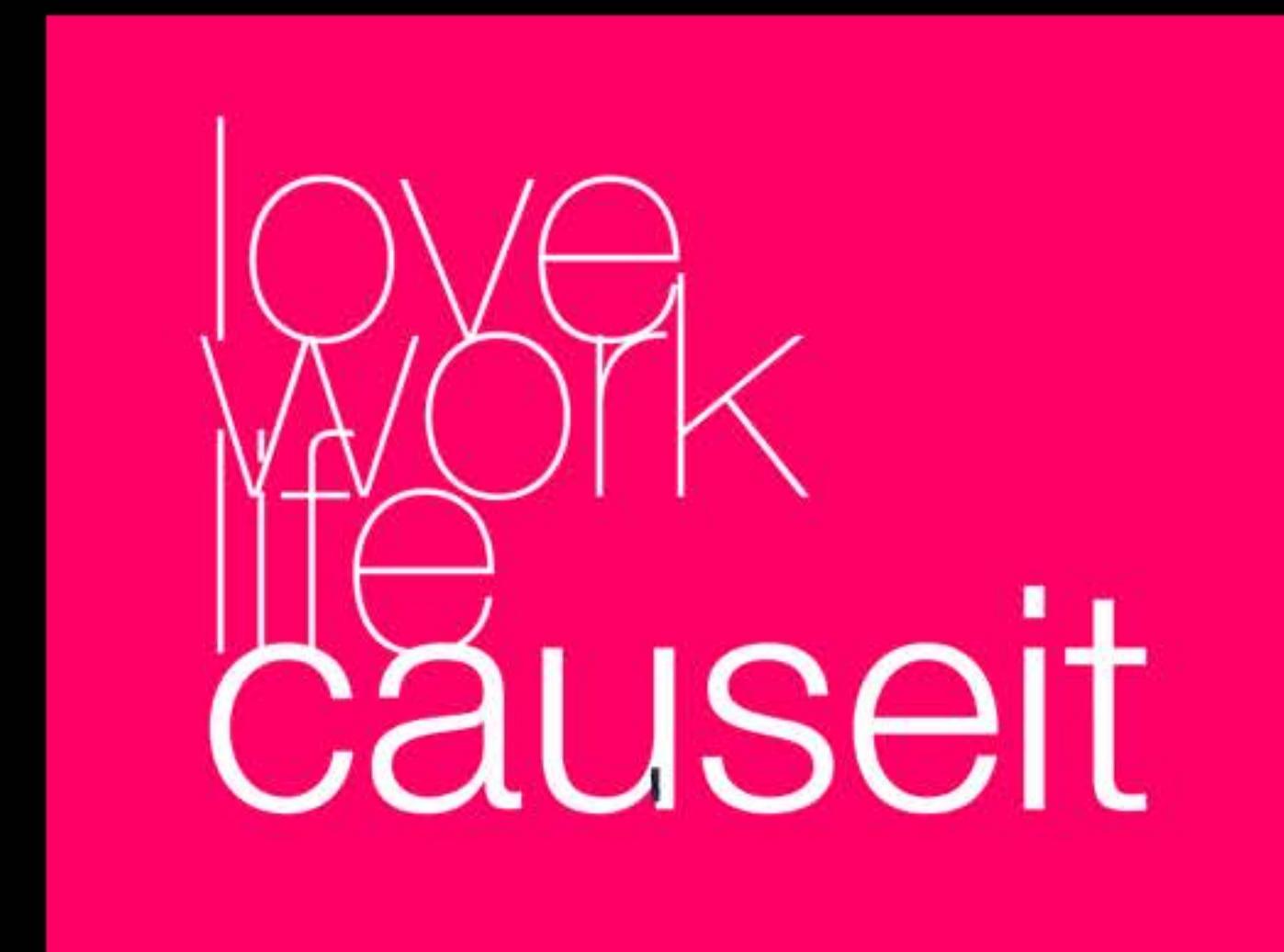


# AUTOMOBILITY AS A PLATFORM



[causeit.org/snt](http://causeit.org/snt)

@causeit

**“IF I HAD ASKED PEOPLE WHAT THEY  
WANTED, THEY WOULD HAVE SAID  
FASTER HORSES.”**

**-HENRY FORD**



**"PEOPLE MAY OUTLAW DRIVING CARS  
BECAUSE IT'S TOO DANGEROUS... YOU  
CAN'T HAVE A PERSON DRIVING A TWO-  
TON DEATH MACHINE."**

**-ELON MUSK**







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**HISTORY**



**POSSIBILITY**



**FUNCTIONALITY**



**SAFETY**

# Industrial



# IoT



# 1.0/now

• Information •



• SNT •

1.5

2.0/ten years

• Cyborg •

Deep  
Cyborg



• Singularity

• Posthuman

3.0

4.0

**MACHINES HAVE  
RELATIONSHIPS TOO**

# THE AUTOMOBILITY SPECTRUM



# AUTOMOBILITY: FEET, HORSES

- Range: double-digit kilometres
- Autonomy: high to very high
- Challenges: distance, efficiency
- Risks: theft, disease, weather



# AUTOMOBILITY: BICYCLES

- Range: double-digit or kilometres
- Fuel: food and water
- Agency and autonomy: high
- Infrastructure: low
- Challenges: long distances, access, cargo, weather
- Risks: theft



# AUTOMOBILITY: CARS

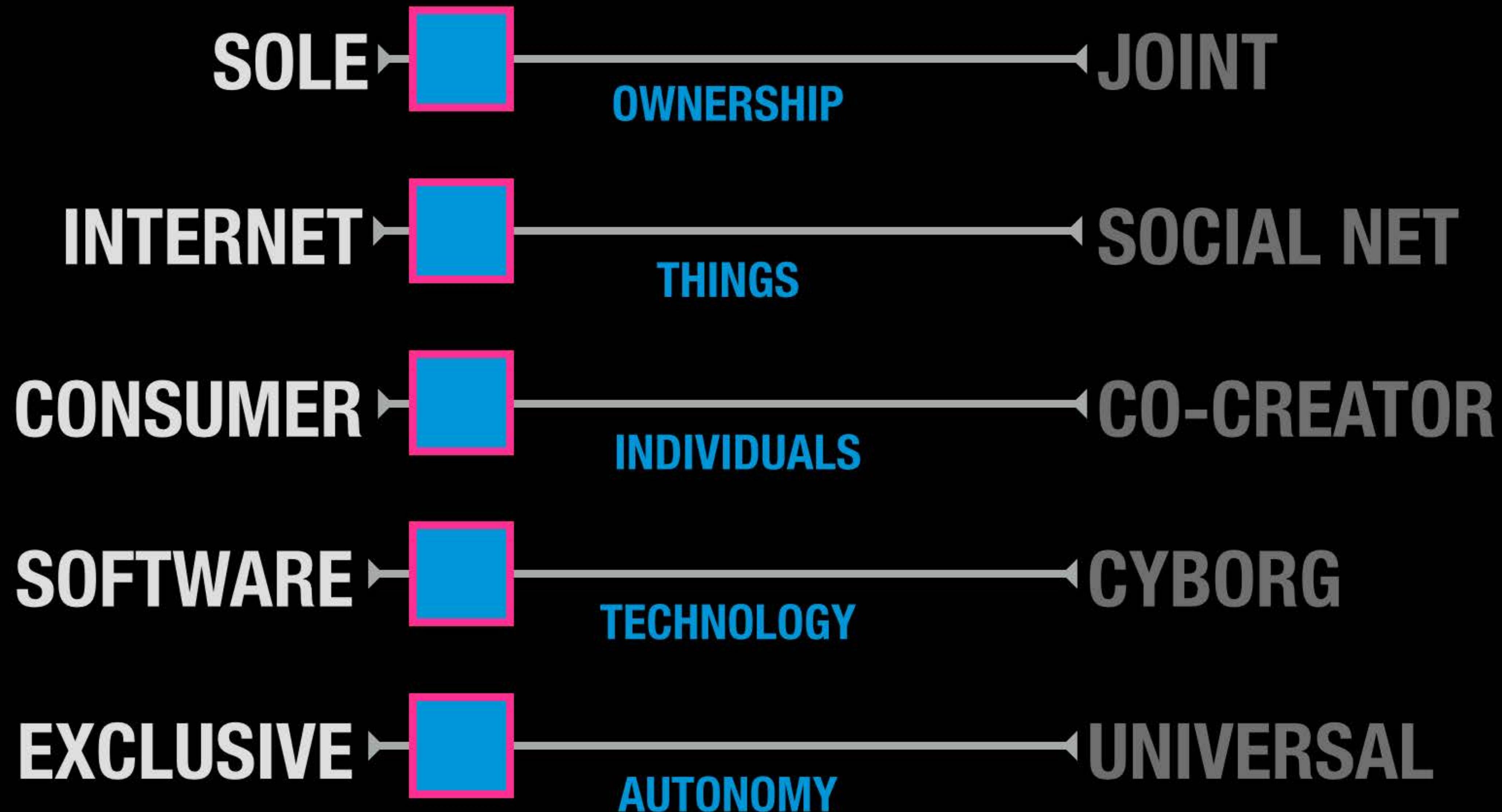
- Range: several hundred kilometres
- Fuel: petrol
- Ownership: individual vehicles, shared infrastructure
- Utilization of resource: 95%+ idle
- Degree of agency: high, but arduous
- Degree of conscious planning: moderate
- Cost: mostly disproportionate to use
- Challenges: pollution, cost of the commons, inefficiency, impact on city structures, liability, deadly crashes, ecological breakdown, domination of communal space



# 1.0: CONNECTED CAR, CONNECTED TRANSIT

- Range: triple digit kilometers
- Autonomy and agency: moderate—easier to navigate systems, but still largely constrained by their existing schedules
- Makes integrating car and mass transit easier, but ownership paradigms are still old-model
- Risks: minimal

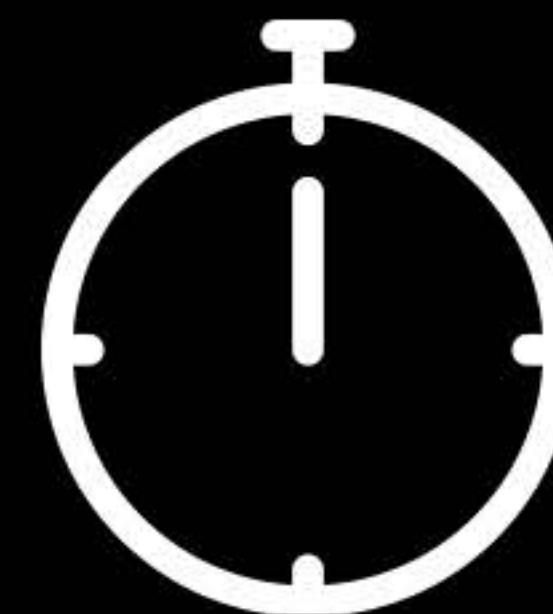




# MULTIMODAL TODAY: WORK IN PROGRESS

- Very different transit strategies
- Inefficiently meshed
- Lots of waiting
- No coordination of vehicles between modes, just calculations of schedules and notifications of delays (reporting, not orchestrating)
- Car-centric approaches dominate (roads, car services, car-sized buses, etc)





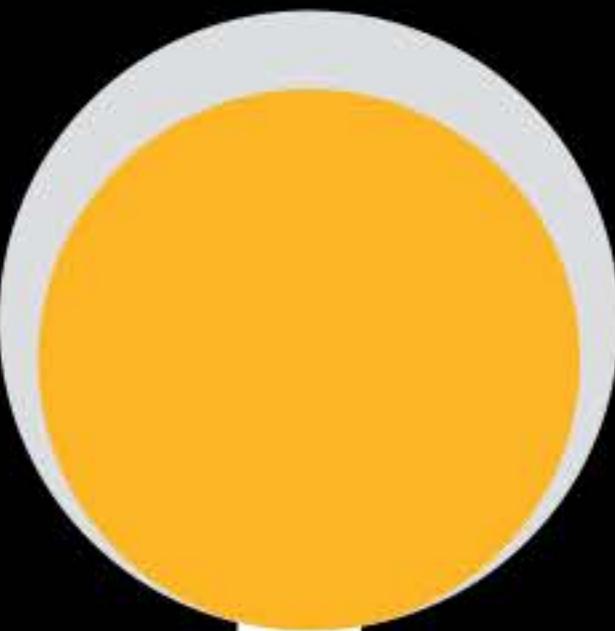
# 1.5 HYBRID DIGITAL AUTOMOBILITY

- Range: most of earth
- Ownership: individual, mesh/shared, public
- Utilization of resources: 80%+
- Degree of agency: high
- Degree of conscious planning: near-zero
- Cost: proportional to use
- Challenges: fair access, cost of the commons, legacy edges, security and surveillance

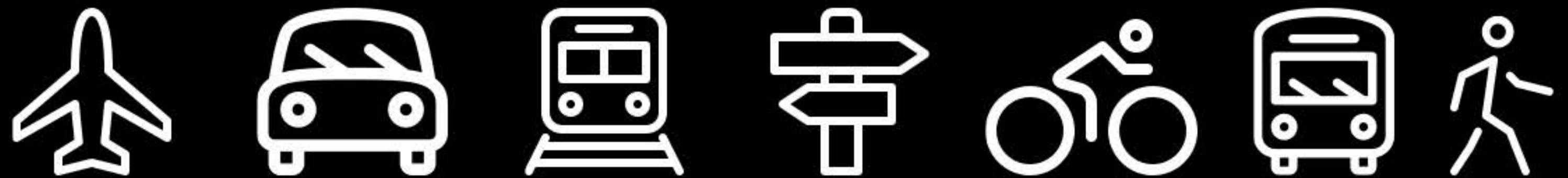




# DAY IN THE AUTOMOBILE LIFE: TRAVERSING A SMARTER CITY



**THE OUTCOME IS THE DESTINATION  
NOT THE TRANSPORTATION**

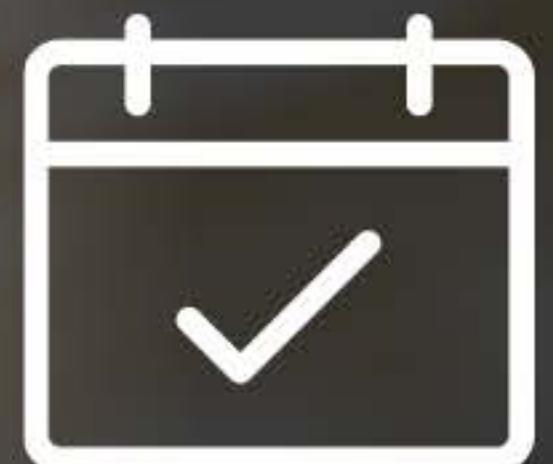
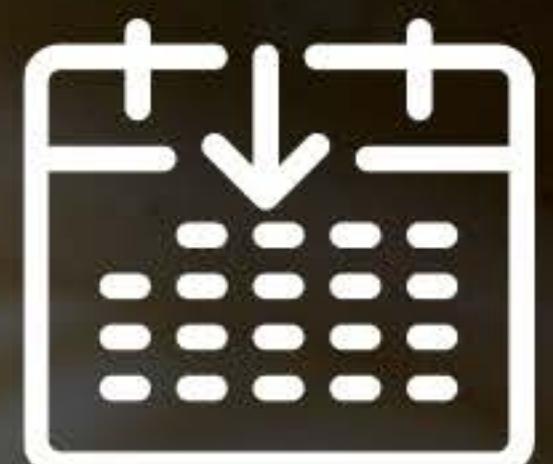


# DIGITAL TRANSIT AT THE BEGINNING OF THE DAY

- Map system requests from calendar
- Calendar predicts meeting & transit times
- Actual meeting times—and biosensors—inform suggested travel time
- Travel time converts to transit tickets with itinerary, cost, passenger, baggage, metadata
- Vehicles and sensors coordinate for handoff, decision-making, customization and efficiency



LIGHTS ON, HEAT ON,  
COFFEE BREWING



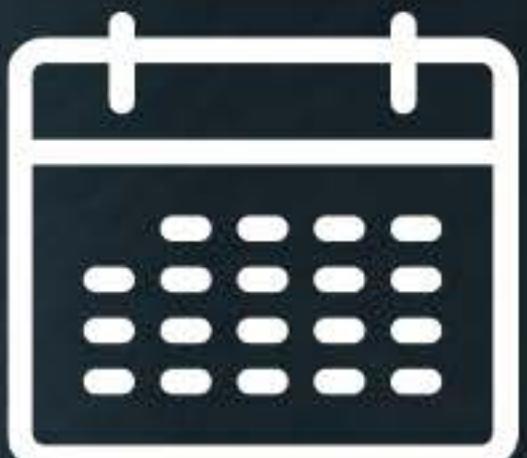
# MESH CYCLE



STAR

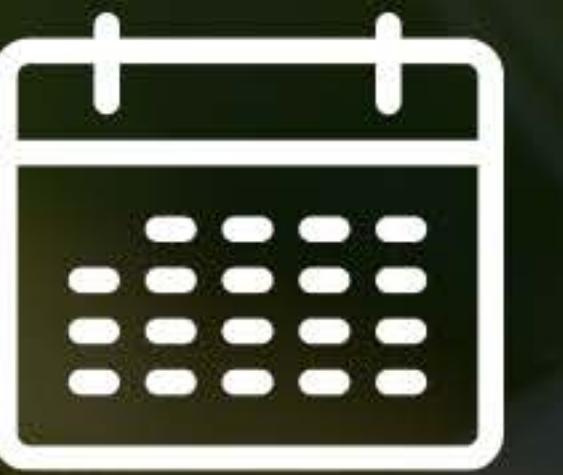
Electric Scooter  
Electrically Assisted Scooter

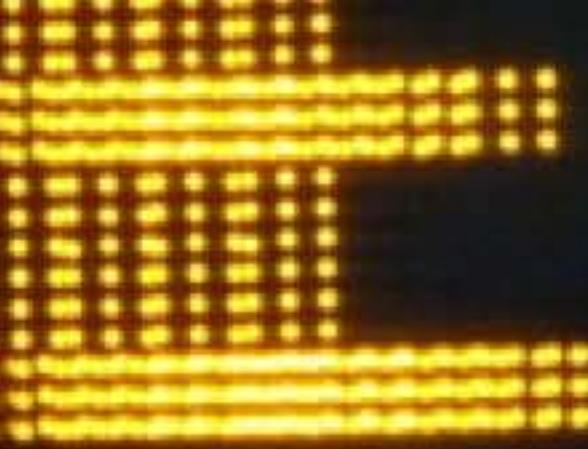
# BAGGAGE





# COMPANY BUS

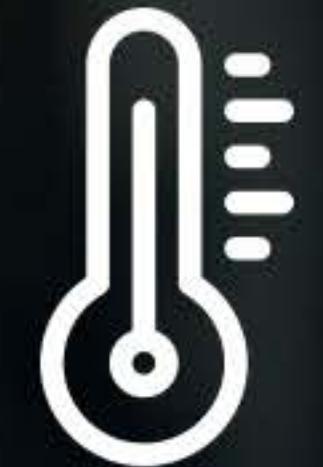




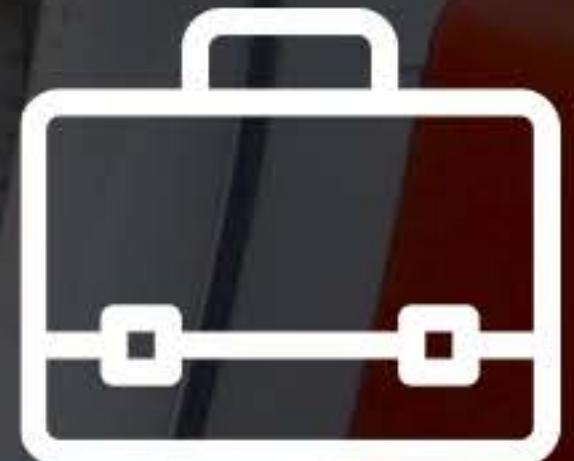
PUBLIC TRAIN



JENNA

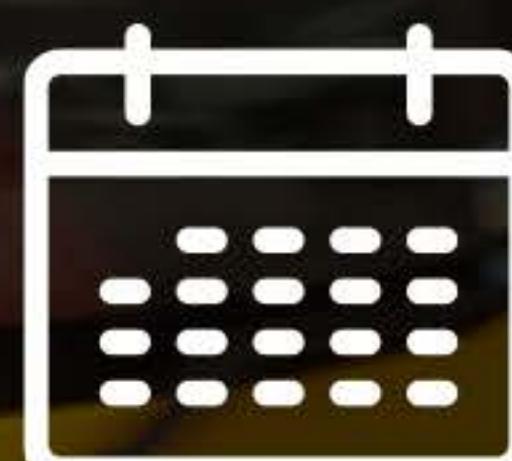


# MESH SCOOTER



# ANALOG TAXI

大阪市建設局  
巡回パトロールカー





A close-up photograph of a person's lower legs and feet walking on a paved surface. The person is wearing dark trousers and dark lace-up boots. The path has a yellow tactile paving strip near the bottom left corner. The background is blurred asphalt.

**GOOD WEATHER, BIG  
LUNCH: WALKING**

# MESH-OWNED DIGITAL CAR



Groceries



Home



Swipe to drive



Jessica's nearby. Reroute?



Groceries



Jessica



Home



Swipe to reroute

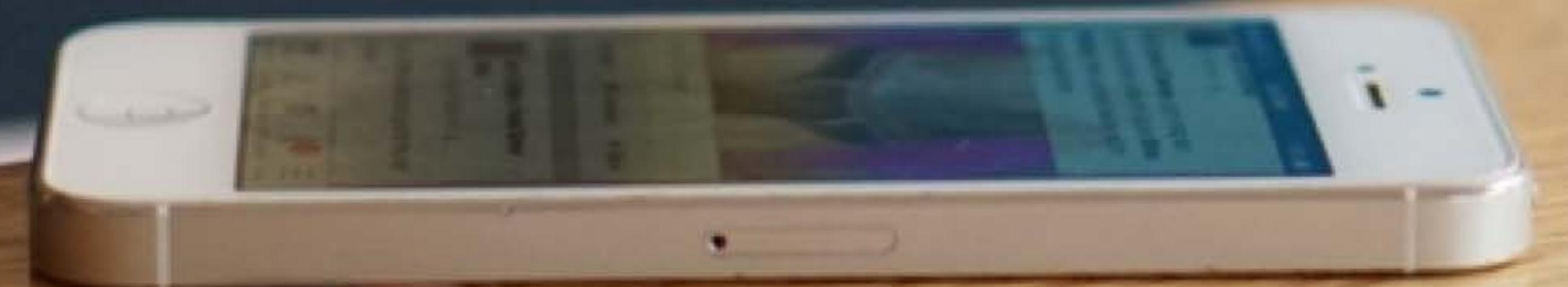


PICKS UP PACKAGE FOR BROTHER



# DINNER ON THE TABLE

# INSTANT INVOICE (RESOURCES RECEIVED AND GIVEN)





**UNDERUTILIZED TRAIN +  
CALENDAR OPENING + SMART  
FINANCES = MID-WEEK GETAWAY**



# **DESIGN CHALLENGE:**

## **A PLATFORM FOR AUTOMOBILITY**

SNT

SHARED OWNERSHIP

SEMI-OPEN APIs

BIG DATA

LITTLE DATA

DEMAND  
ADAPTATION

SOCIAL/DIGITAL  
ID & REPUTATION

OTHER MULTI-  
SIDED  
PLATFORMS

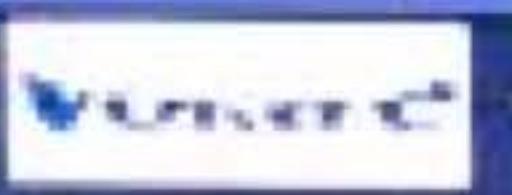


# ORCHESTRATION

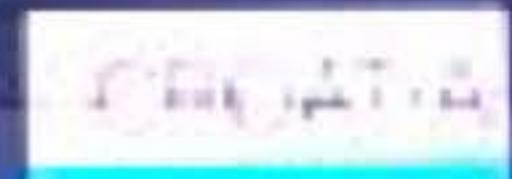




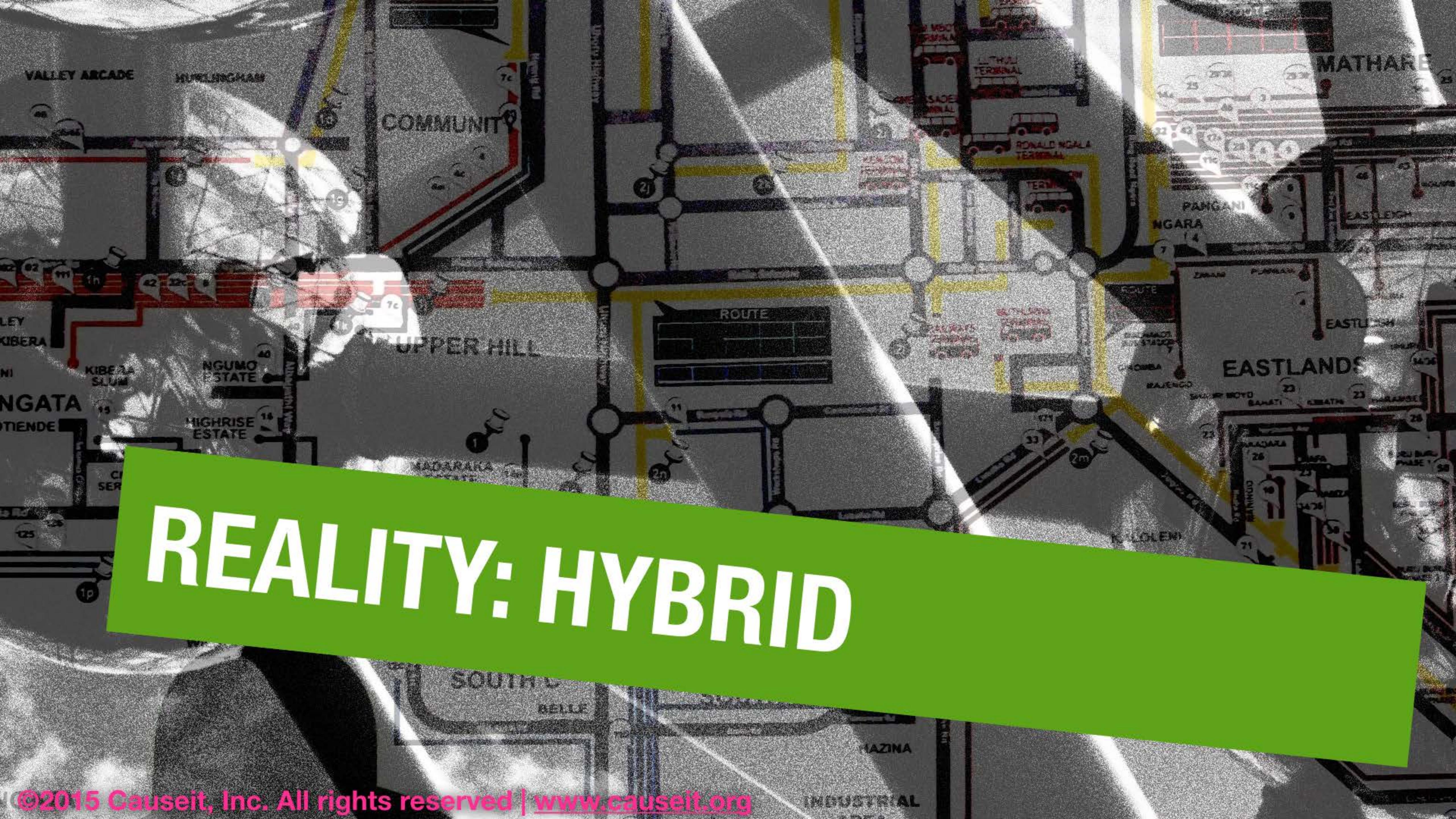
**OPTION: MESH APPROACH**

16. 45	GENEVE		IB	1896
16. 55	FLORENCE		VA	2387
17. 00	WARSAW		LO	1831

## OPTION: CENTRAL APPROACH

17	MUNICH		AZ	548
17. 35	LISBON		JK	28145
17. 40	BELGRADE		OU	661

# REALITY: HYBRID



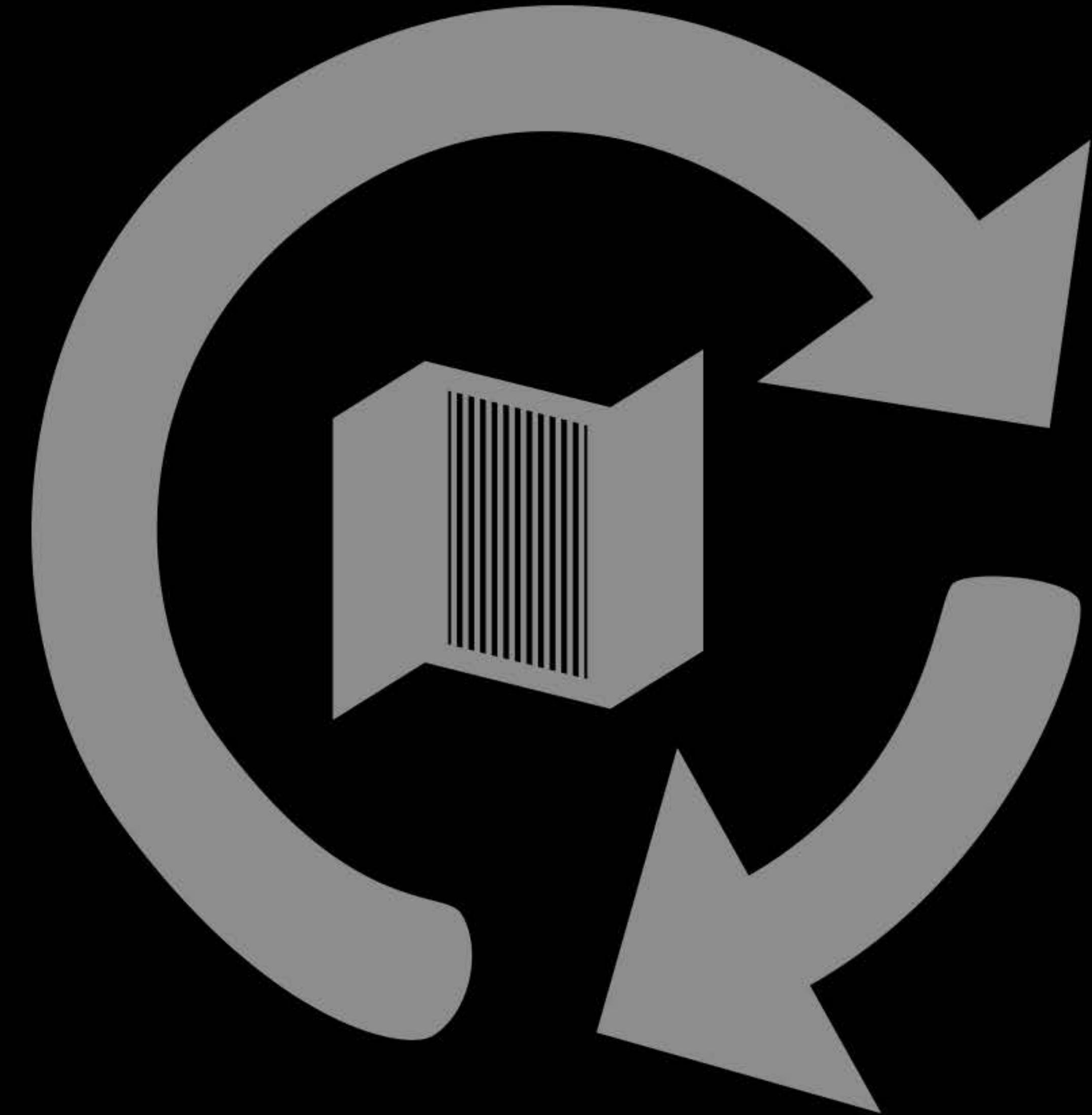
# PAYMENT & RESOURCES





# SHARING-RELATED COSTS: WEAR AND TEAR, FUEL/ENERGY

# **RECIPROCAL CREDITS: CONTRIBUTIONS AS WELL AS BENEFITS**





**SECURITY**



# SHOULD BLOCKCHAIN LEDGERS—OR ANY LEDGERS—BE USED IN TRANSIT?



# SPOOFING: THE PLATFORM MUST AUTHENTICATE



# **ADVANCED, PERSISTENT THREATS: ADAPTIVE INTELLIGENCE NEEDED**



**SAFETY**

# MAINTENANCE

## SAFE MODES AND GRACEFUL SHUTDOWN

# NEGOTIATION AND MITIGATION: VEHICLES MUST HAVE BOTH RULES (DON'T/DO THIS) AND DOCTRINE (PLEASE DO THIS)



# EXAMPLE: A COLLISION COURSE





# EXAMPLE: AN INEVITABLE ACCIDENT



# EXAMPLE: A ROGUE VEHICLE

# EXAMPLE: RADIO-SILENT VEHICLES



# EXAMPLE: OFF-PLATFORM CRISES (E.G. NATURAL DISASTER)





## EXAMPLE: EQUIPMENT FAILURE



**WHOSE JOB IS IT?**



**WHOSE LIABILITY IS IT?**

# 2.0 FULLY DIGITAL AUTOMOBILITY

- Range: earth
- Ownership: individual, mesh/shared, private, public
- Utilization of resources: highly efficient
- Degree of agency: high
- Degree of conscious planning: near-zero
- Cost: fair, proportional
- Challenges: fair access, cost of the commons, legacy edges/forced legacy retirement, security and surveillance

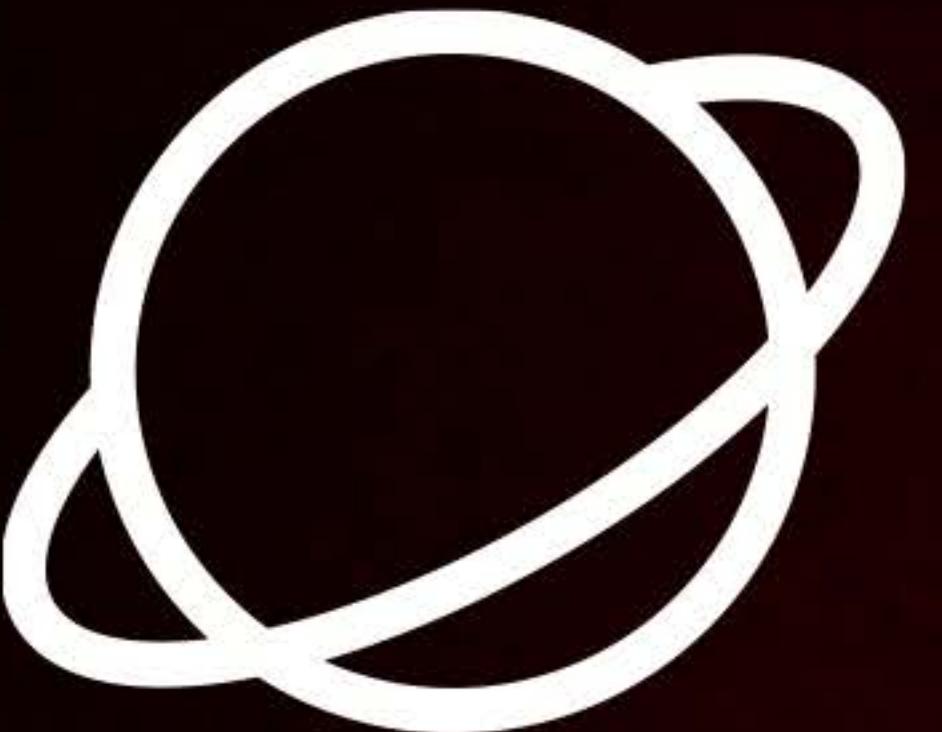
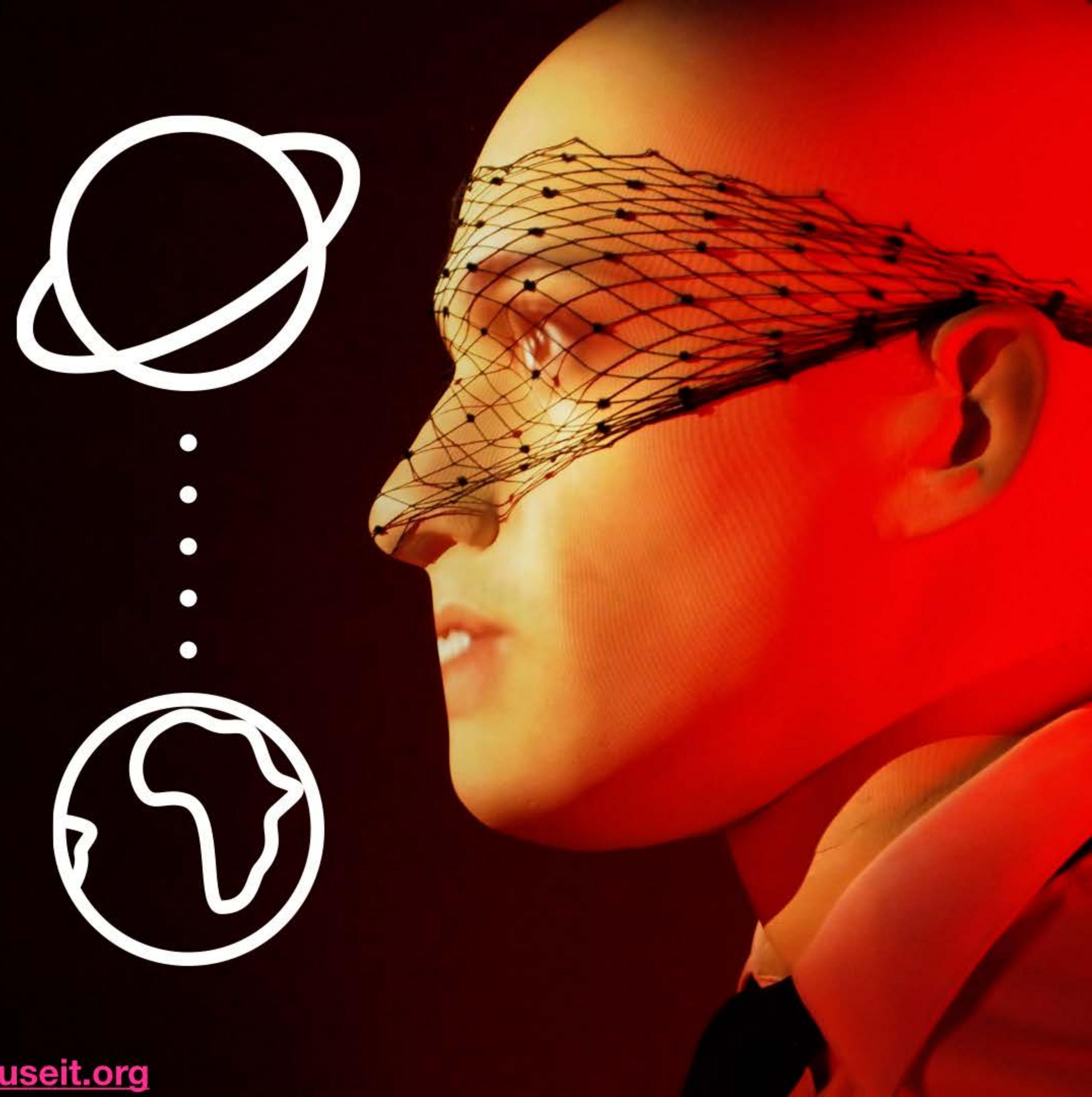




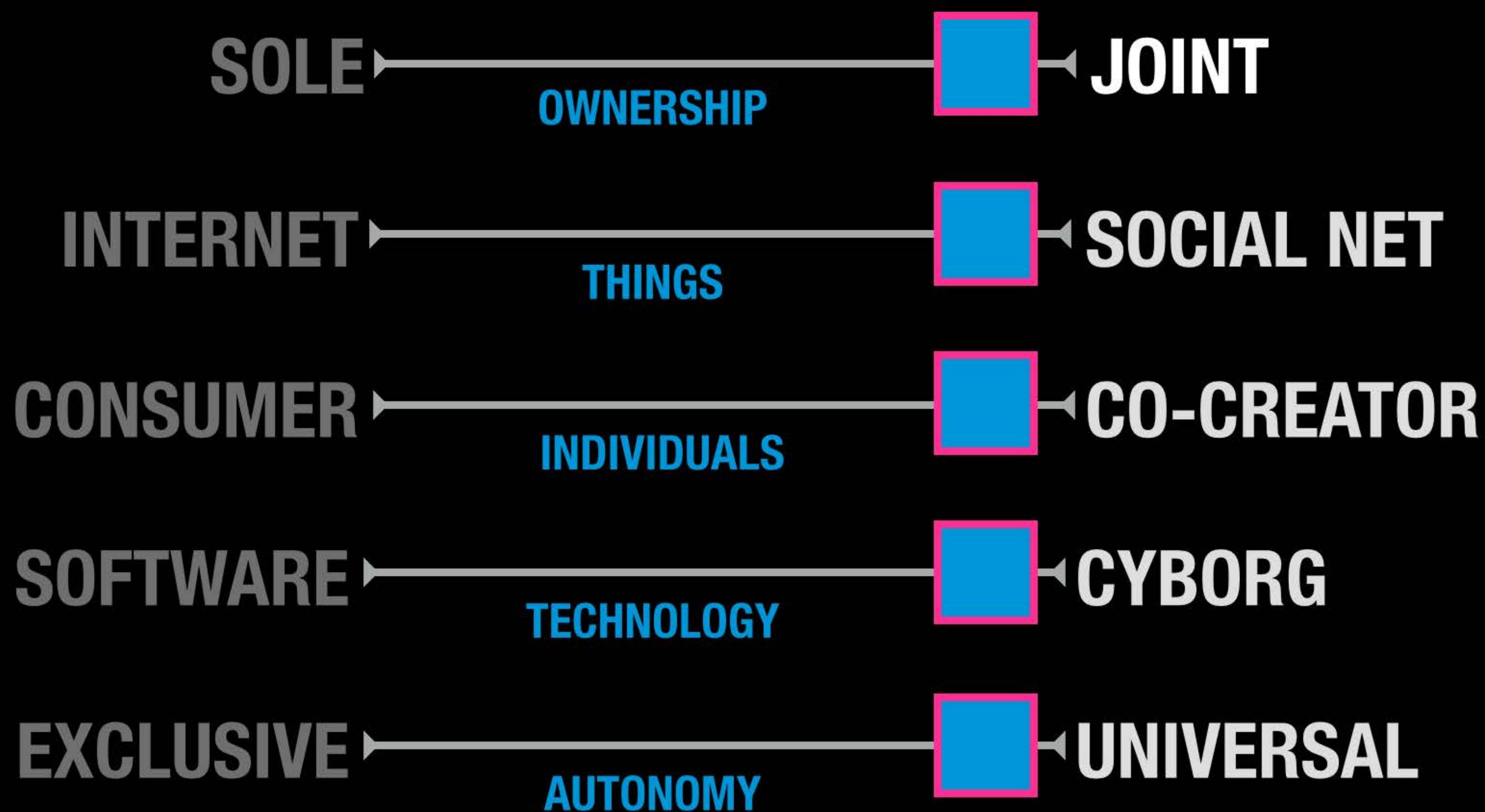
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# 3.0 FULL, DIGITAL TELEPRESENCE

- Range: web
- Fuel: pure data streams
- Ownership: irrelevant
- Utilization of resource: highly efficient
- Degree of agency: high
- No conscious planning
- Cost: fair, proportional
- Challenges: emotional & spiritual presence



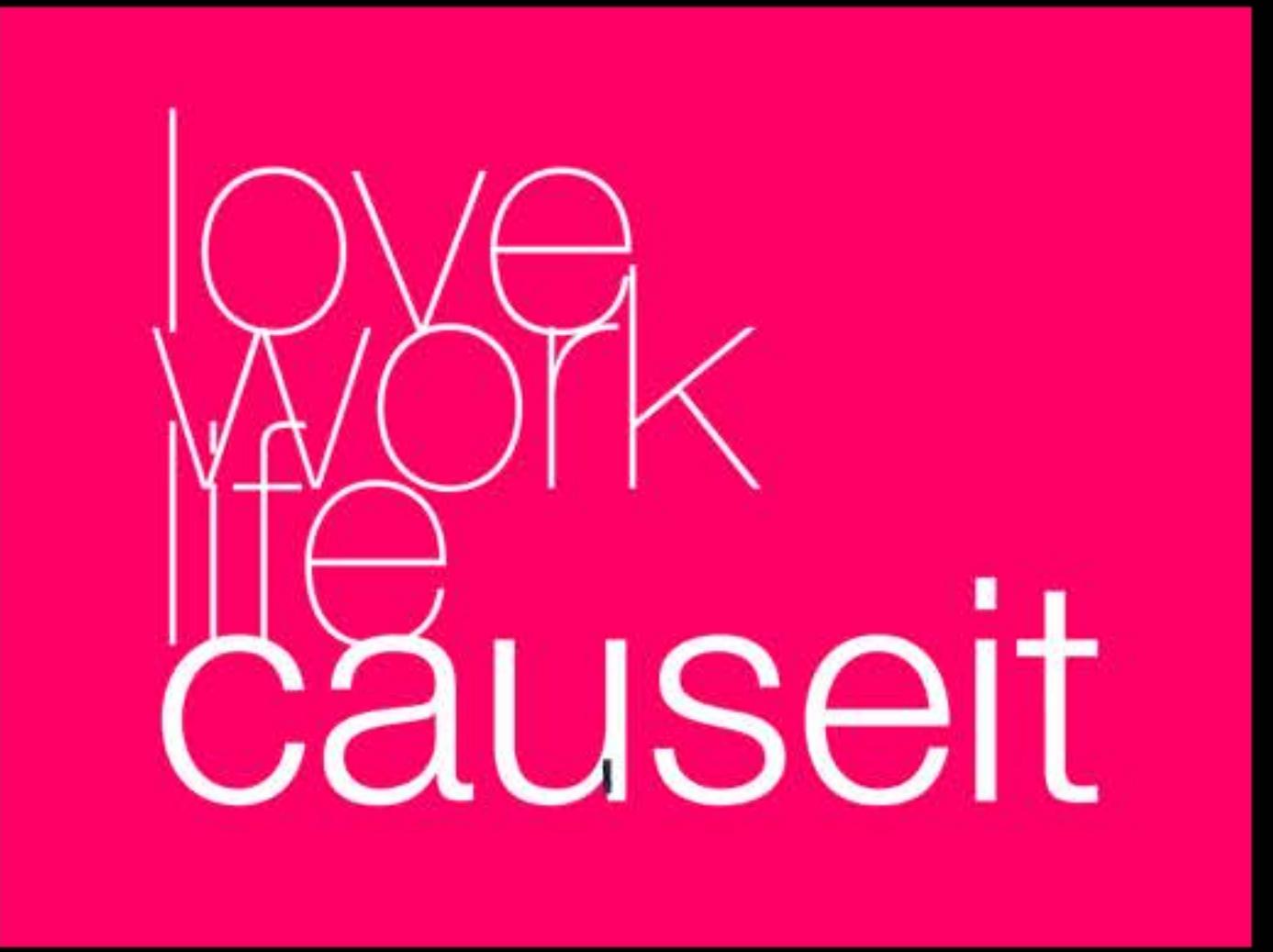
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# 4.0 POST-PRESENCE?



# THE TECHNOLOGIST'S CHALLENGE



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