



**COLORADO STATE
UNIVERSITY**

Health Impacts of the 3 Revolutions

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Policies



Urban Design

Density
Mixed Land
Use/
Diversity
Connectivity

Transport
Infrastructure

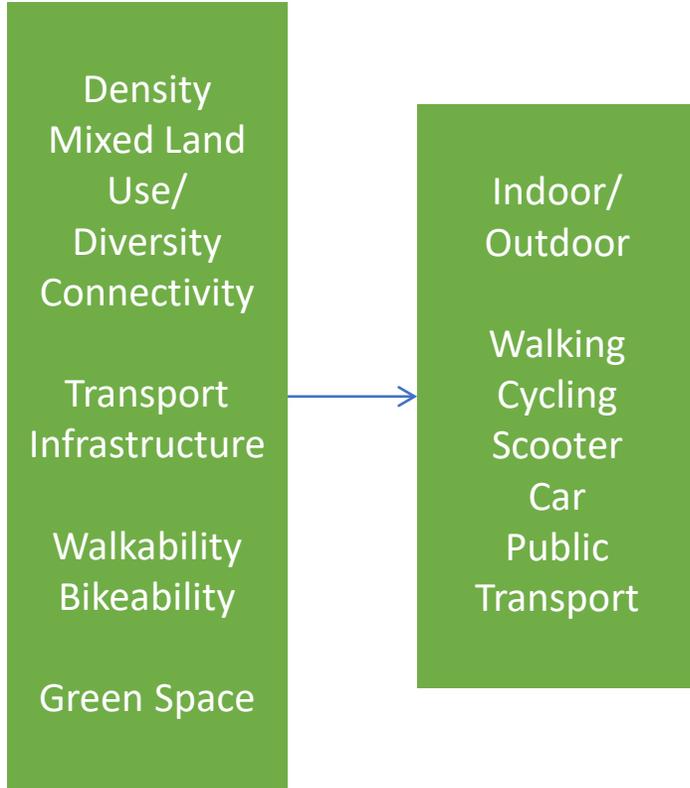
Walkability
Bikeability

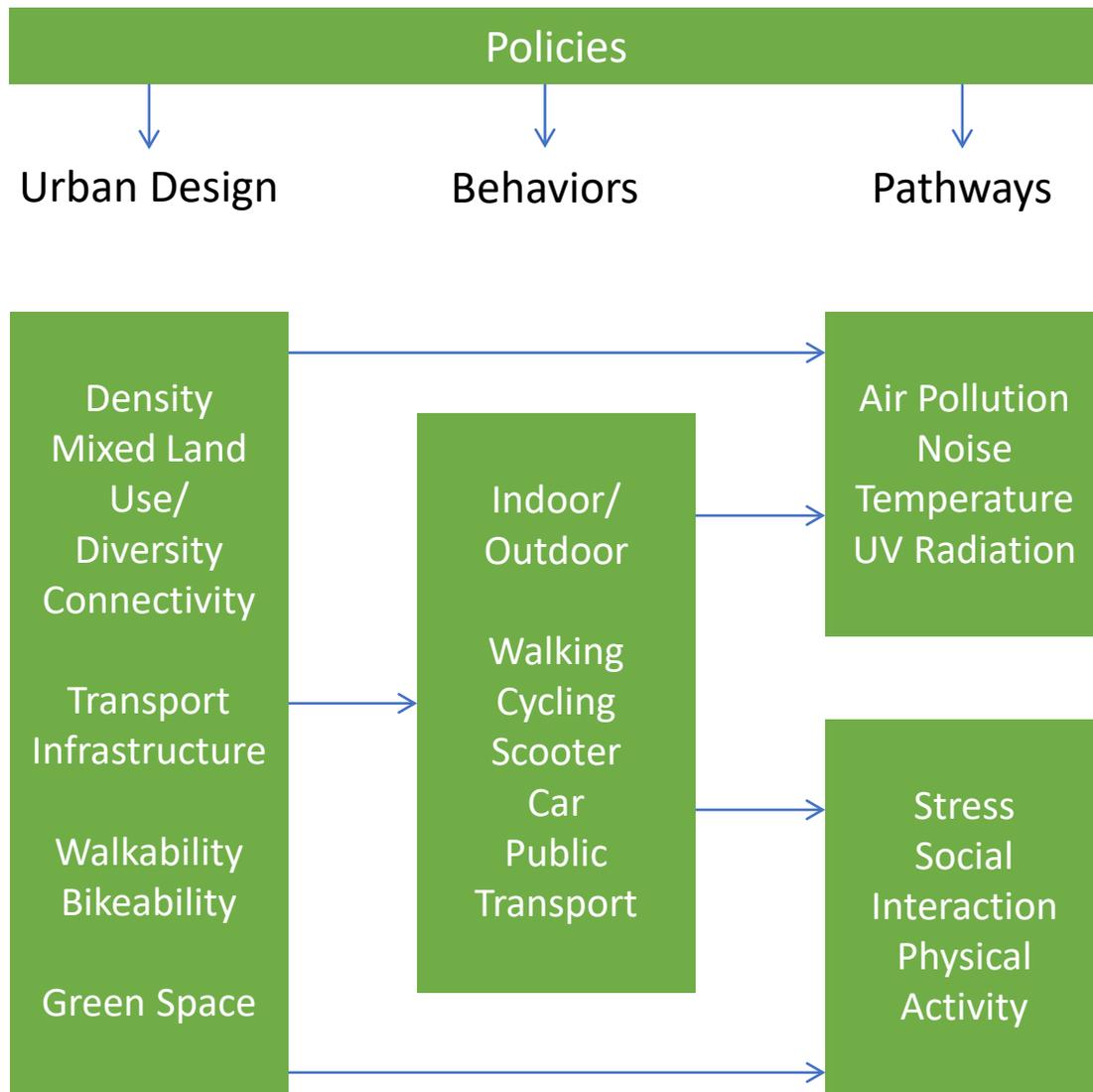
Green Space

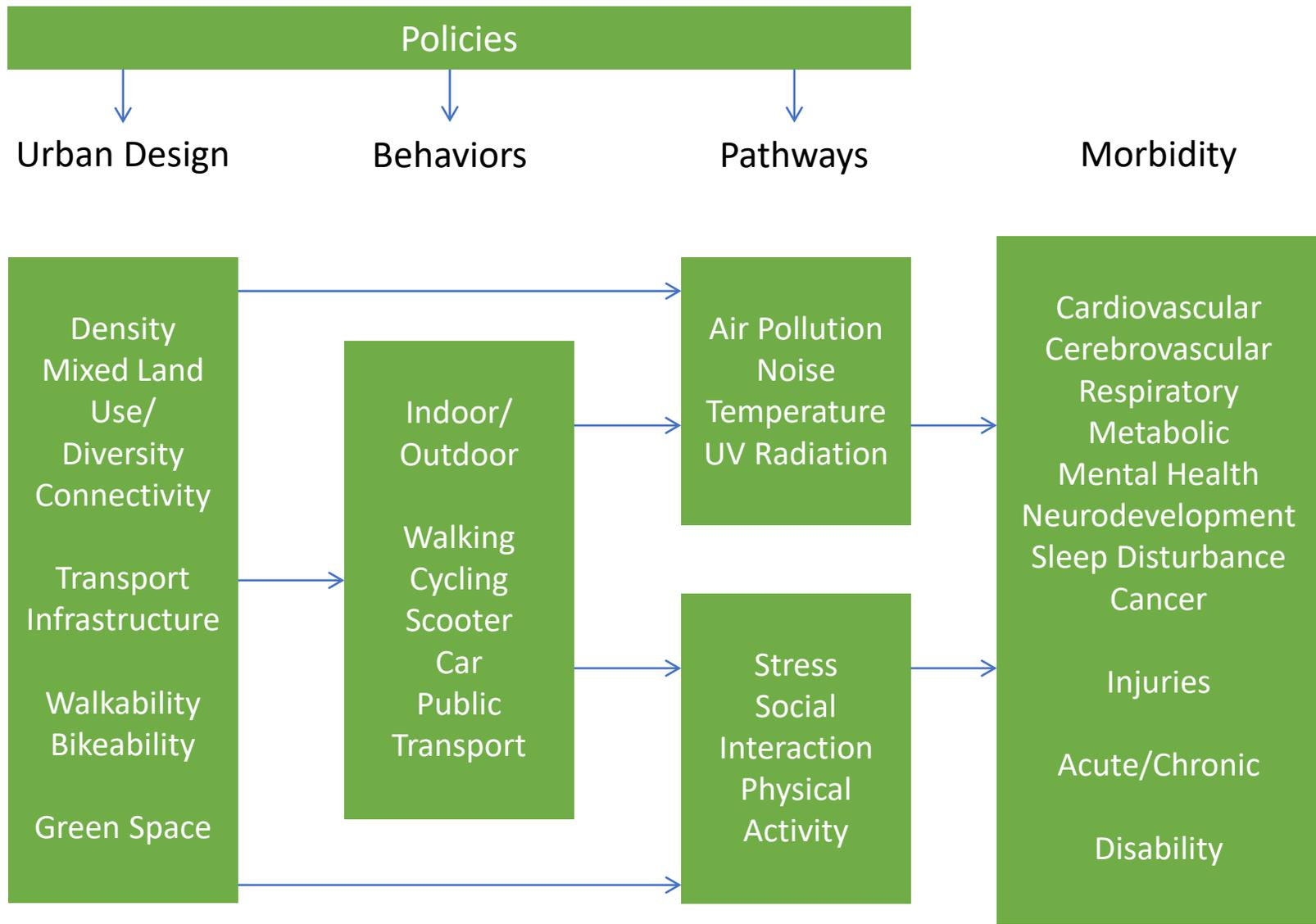
Policies

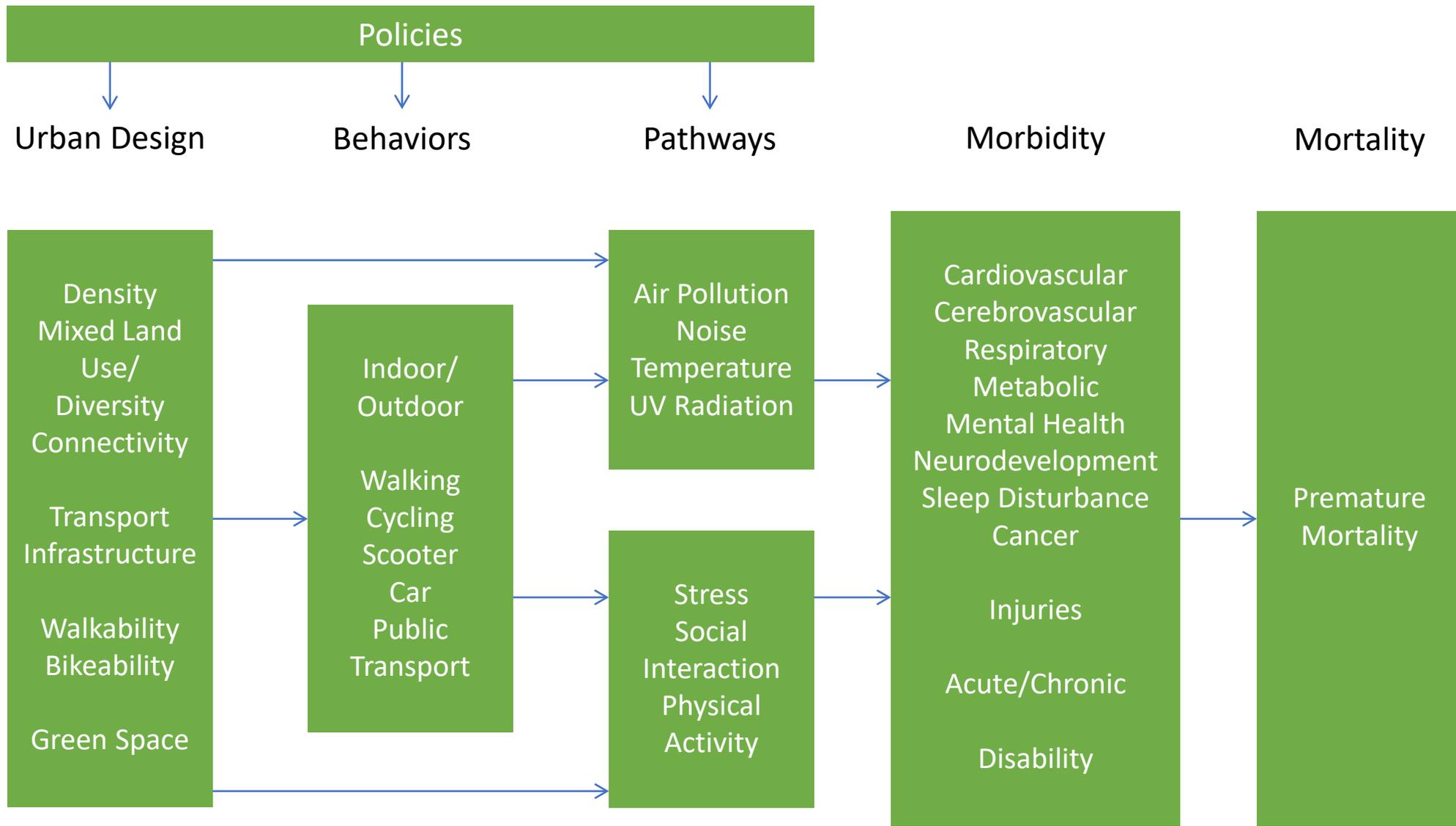
Urban Design

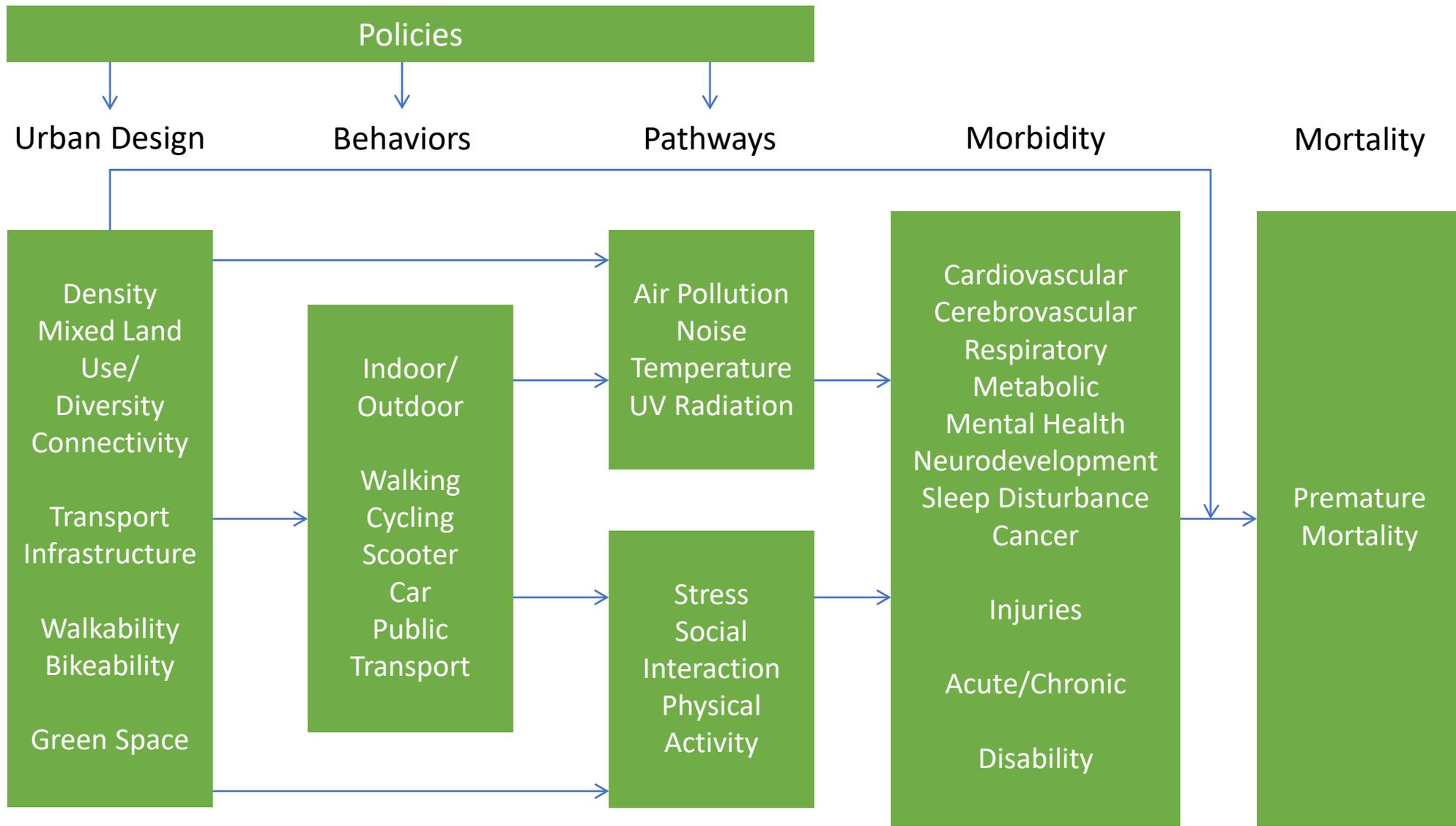
Behaviors

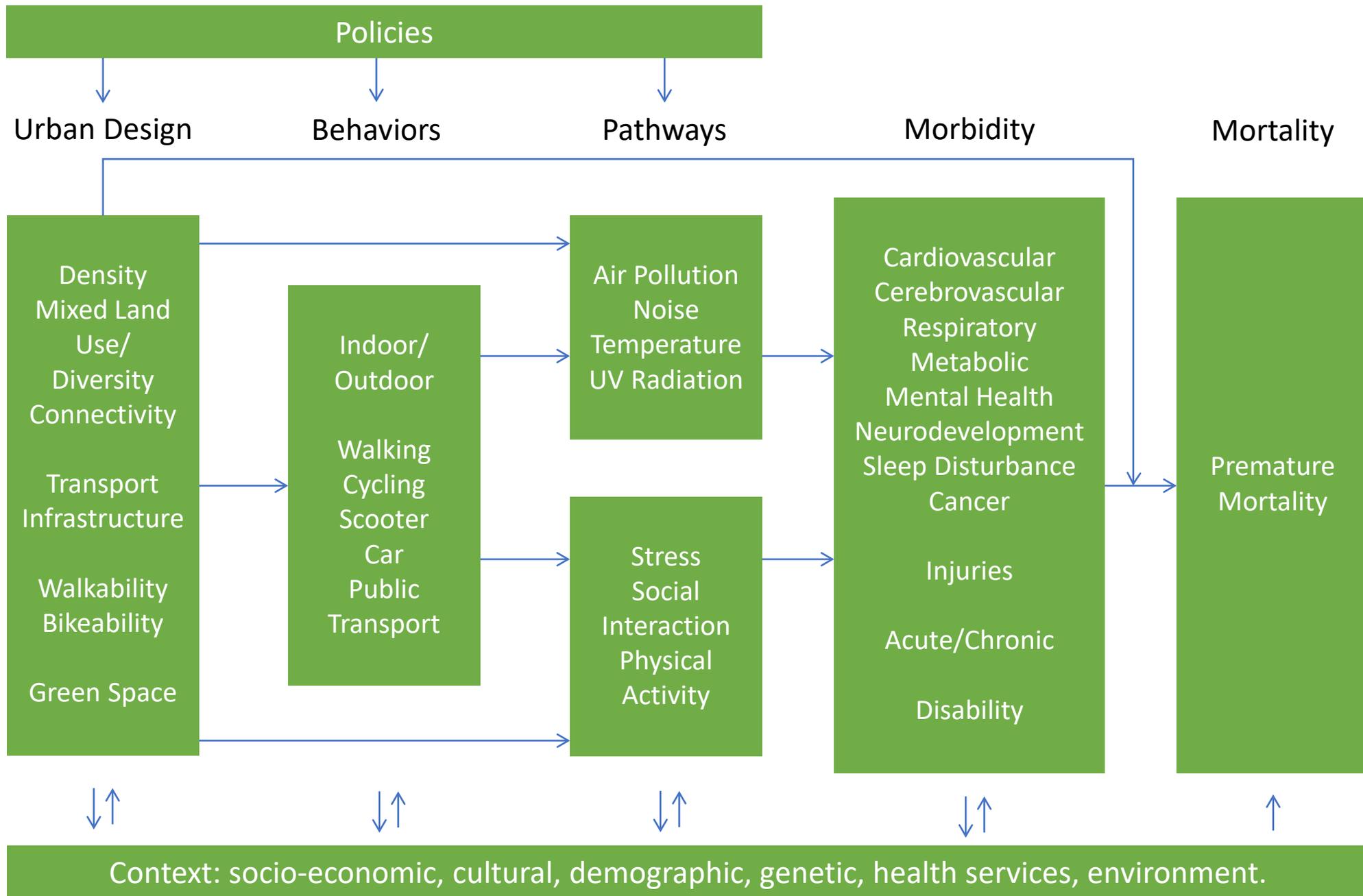














12 - Bike Sharing Systems



EU28

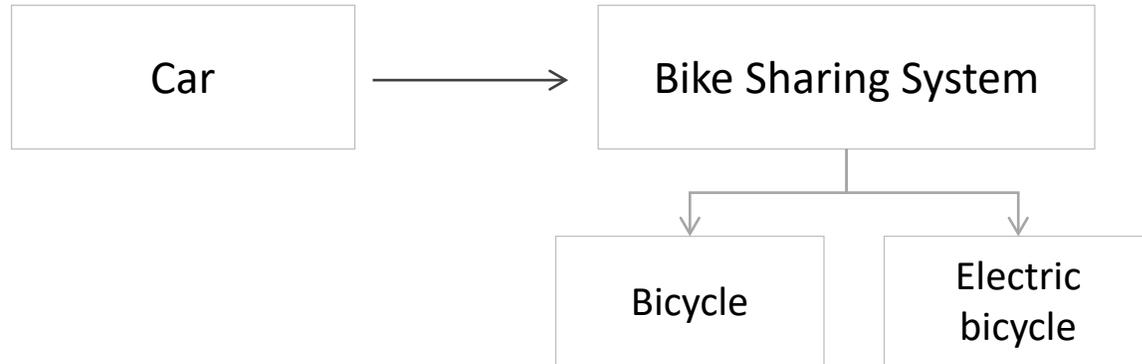
> 2000 bikes

Data availability

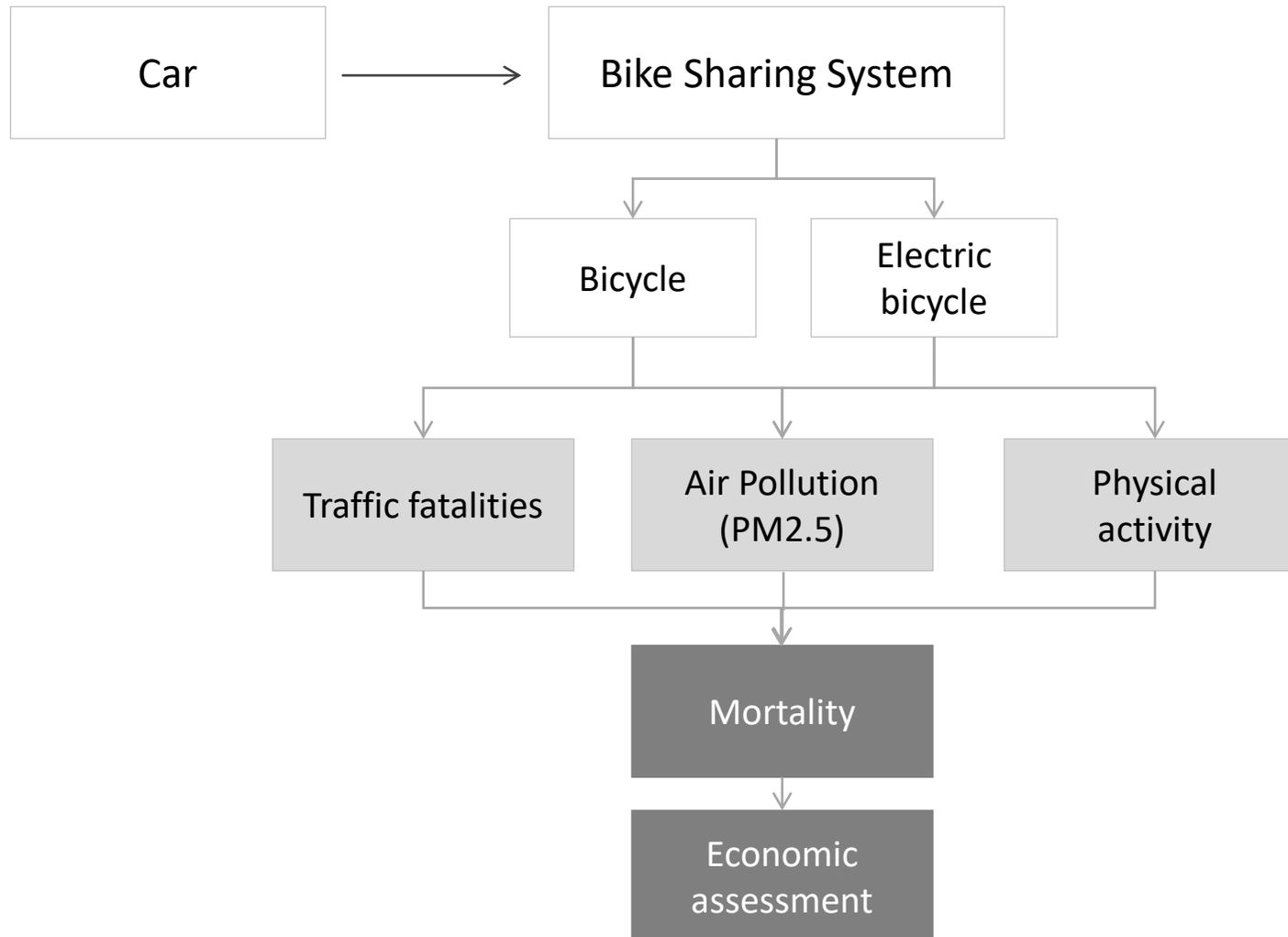
AIM



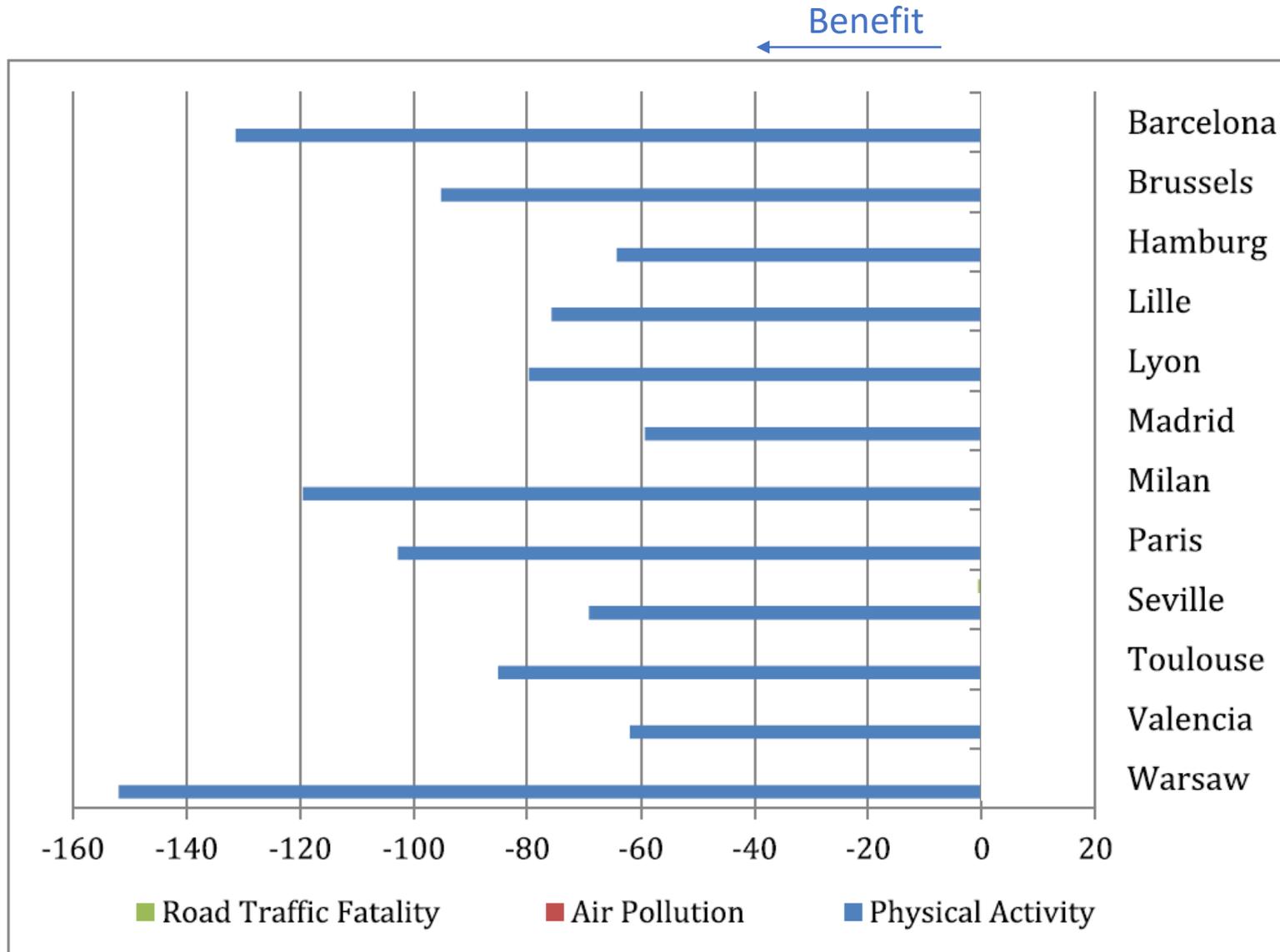
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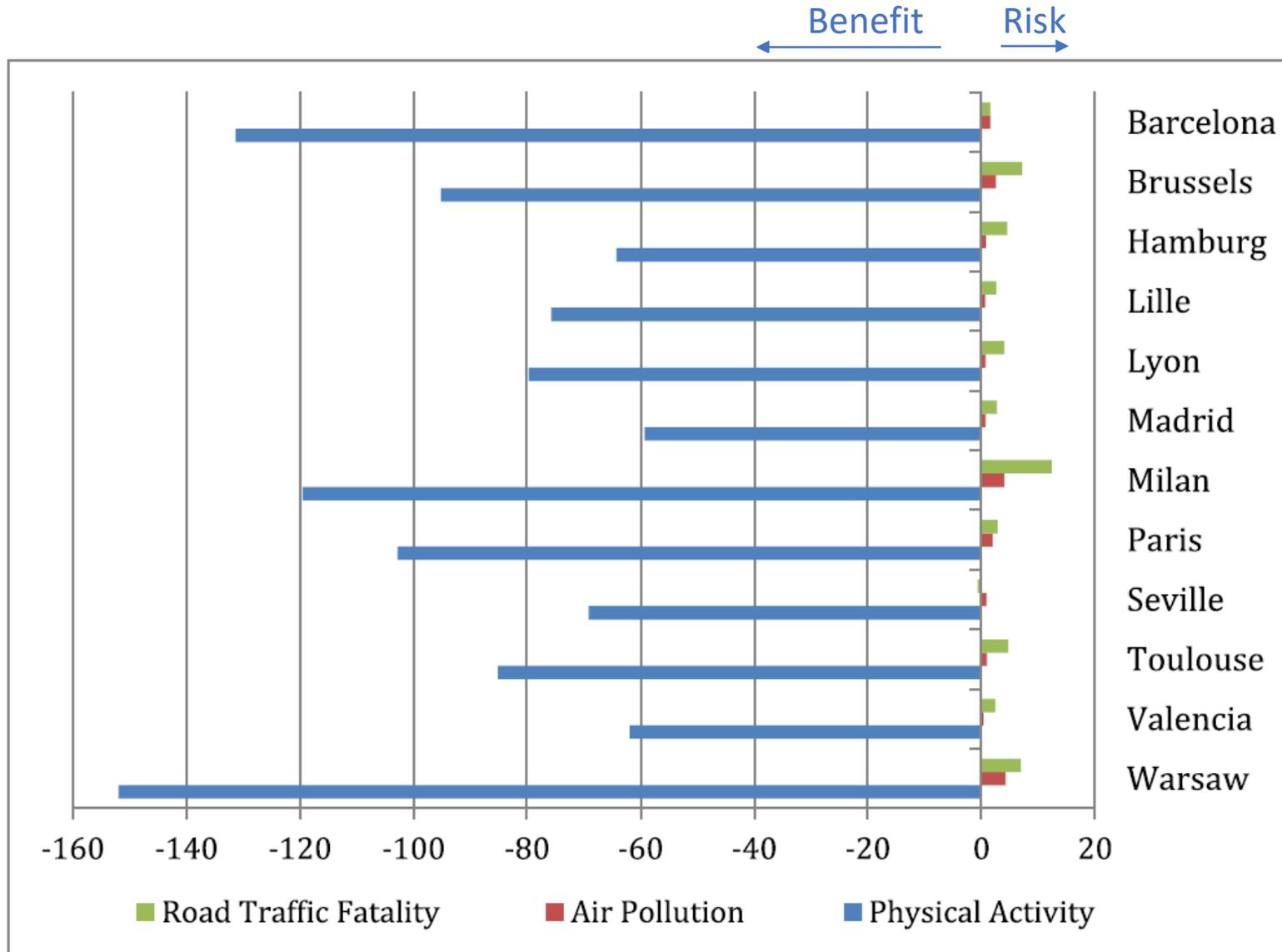
AIM



Bike Sharing Systems in Europe

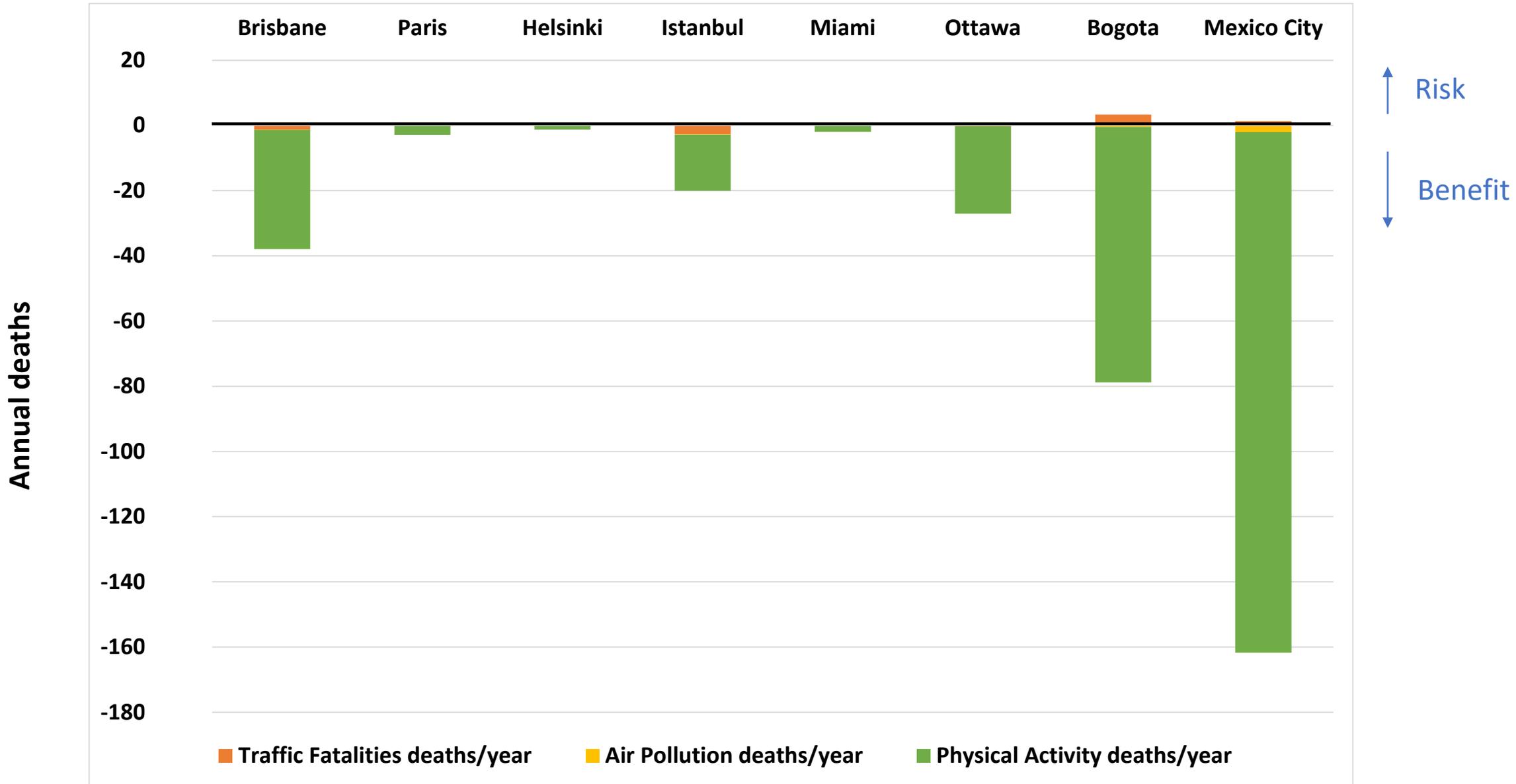


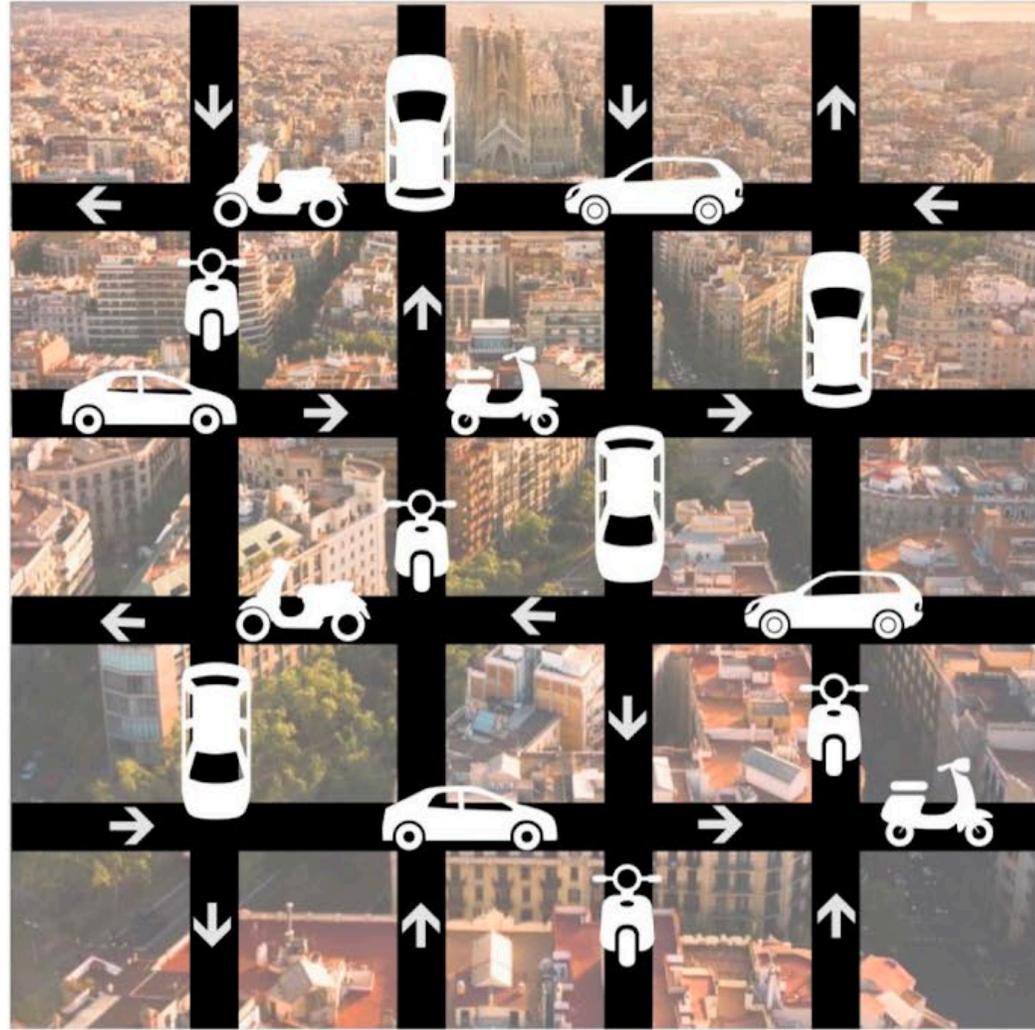
Bike Sharing Systems in Europe



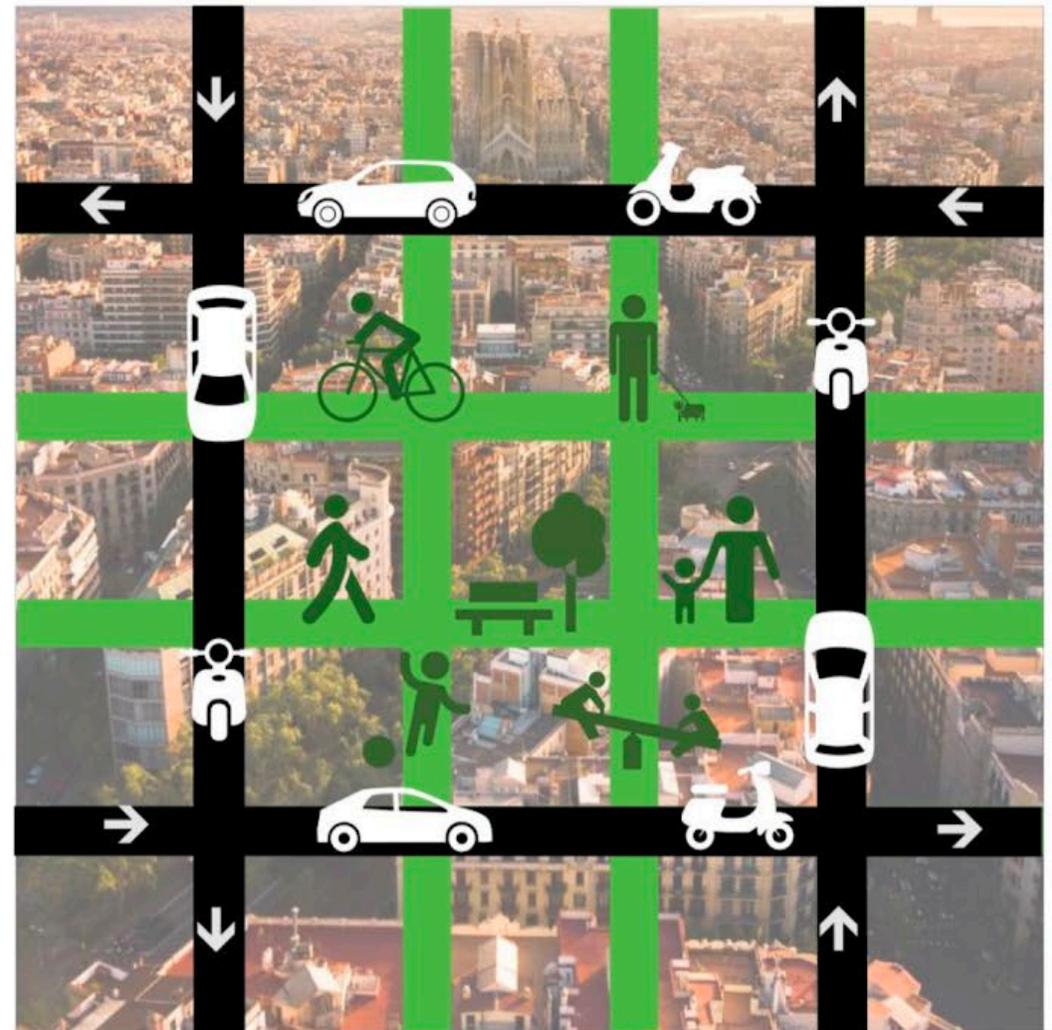


Bus Rapid Transit
deployed in 197 cities and counting





Baseline situation



Superblocks model



Barcelona Superblock San Antoni

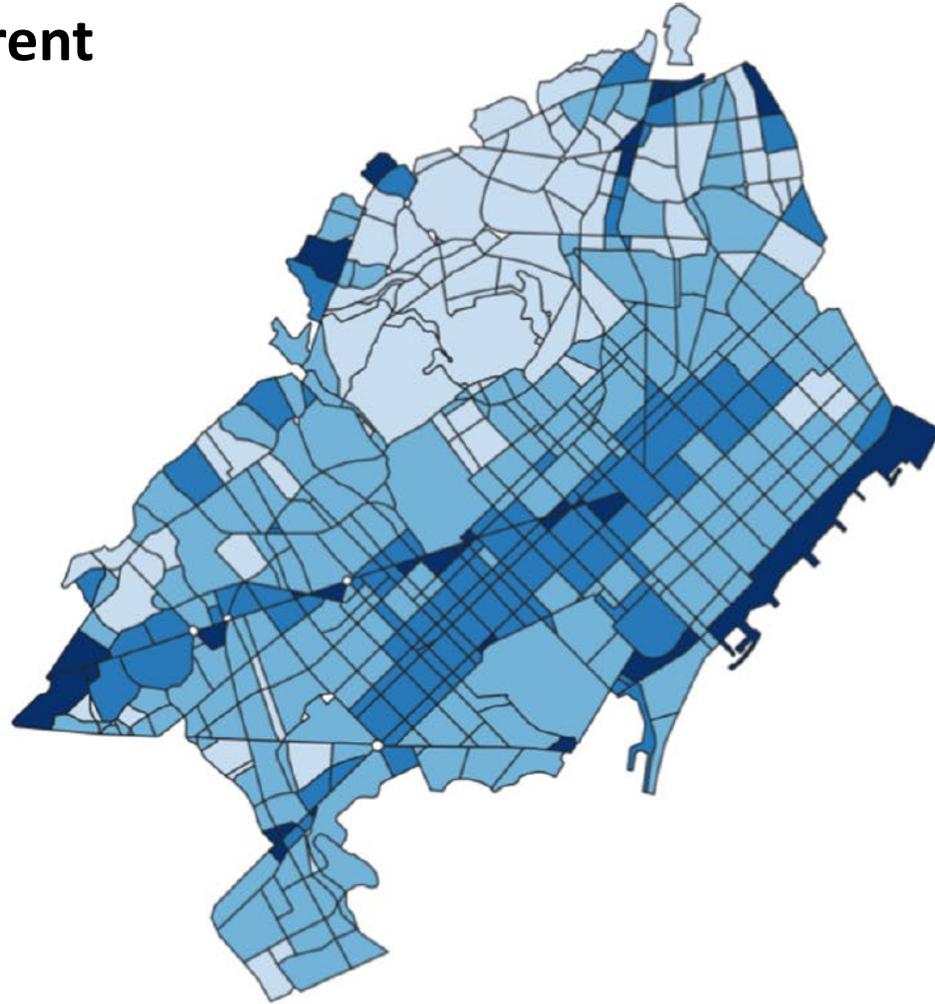
Before



After

NO₂ (µg/ m³)

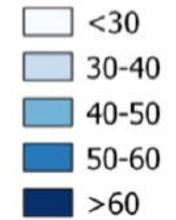
Current



0 1 2 3 4 km

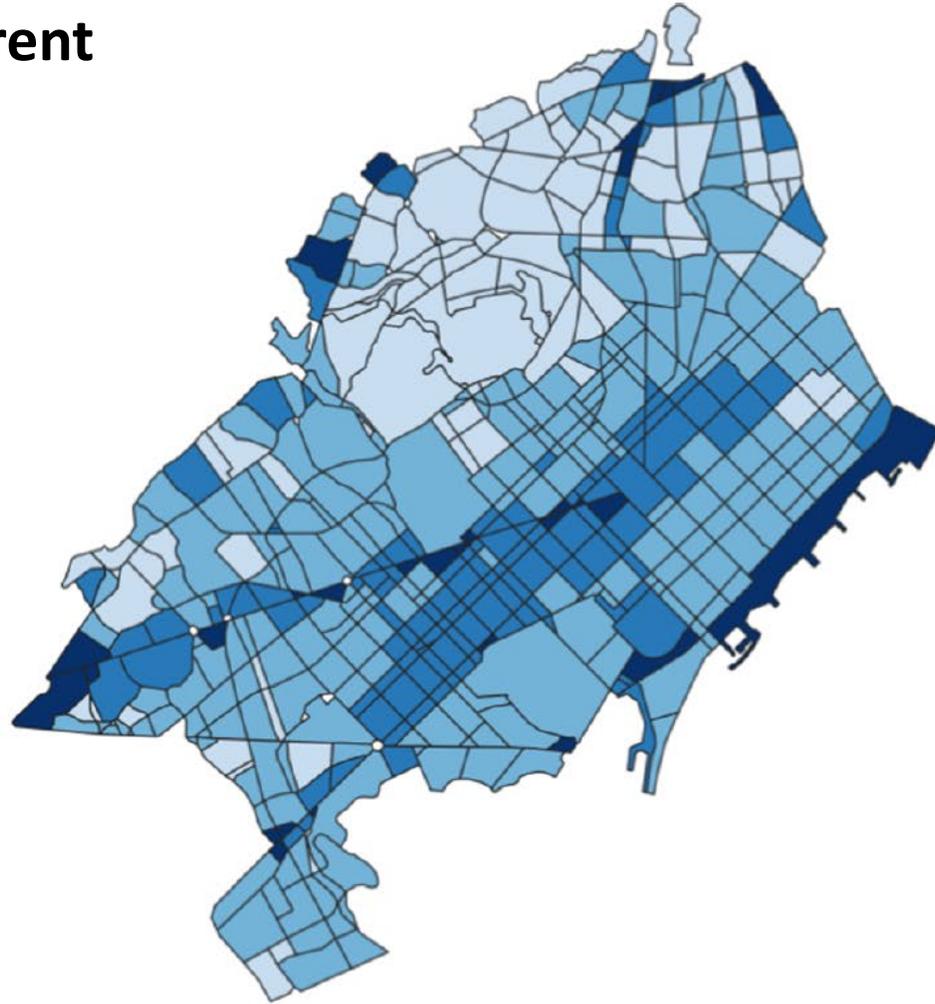


NO₂ (µg/m³)



NO₂ (µg/ m³)

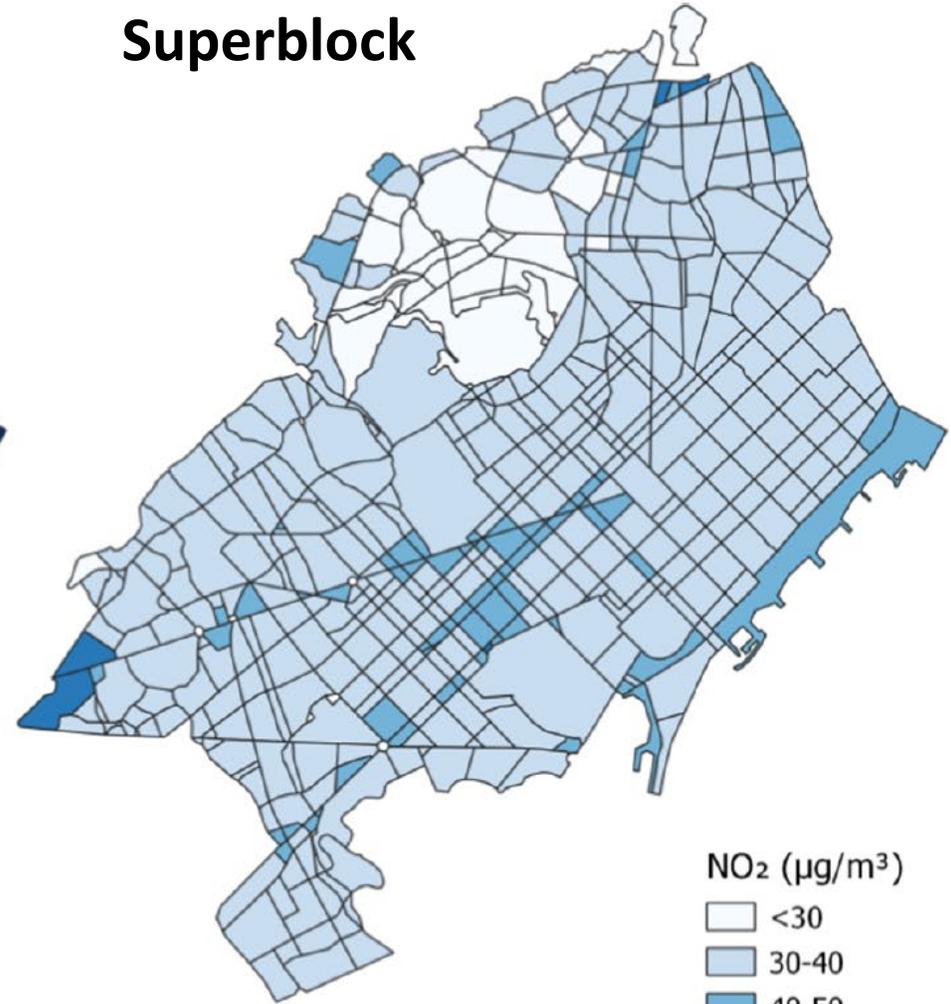
Current



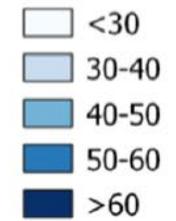
0 1 2 3 4 km



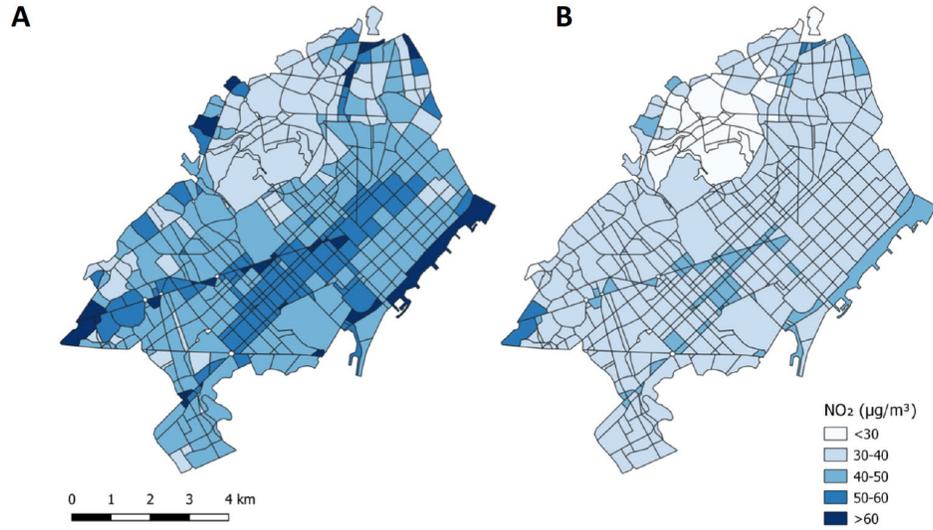
Superblock



NO₂ (µg/m³)



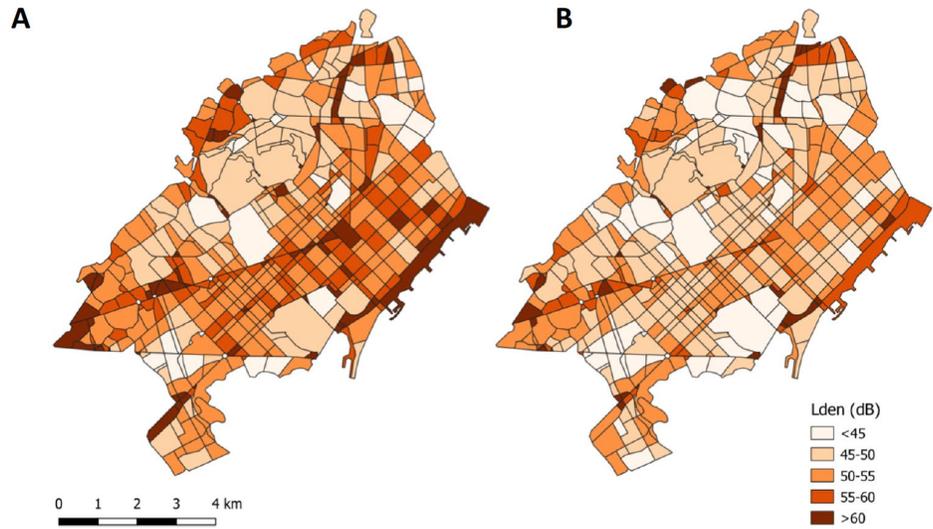
NO₂ (µg/ m³)



Green space (%)



Road noise (L_{den} dB)



Temperature (°C)

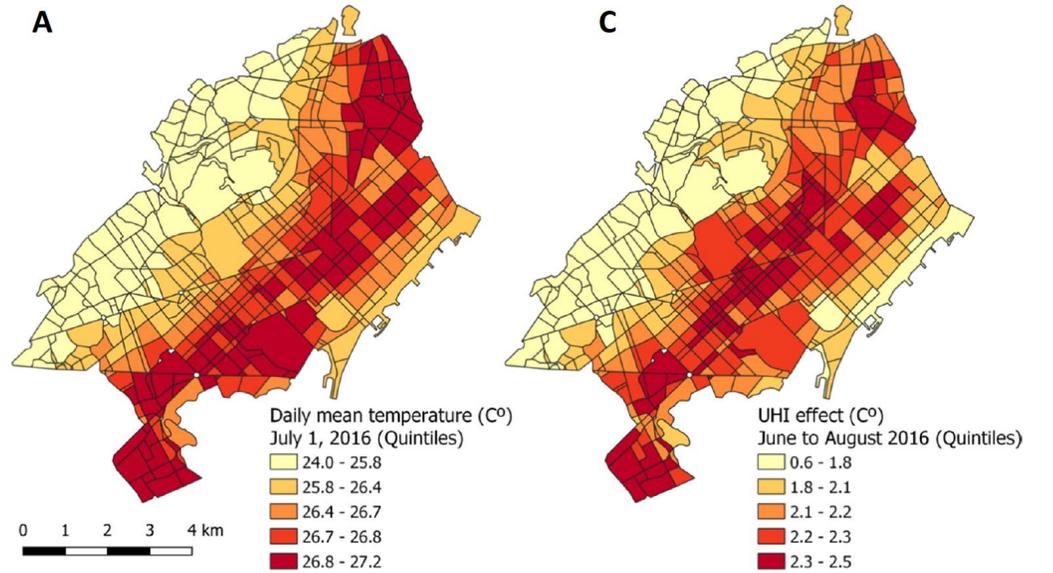
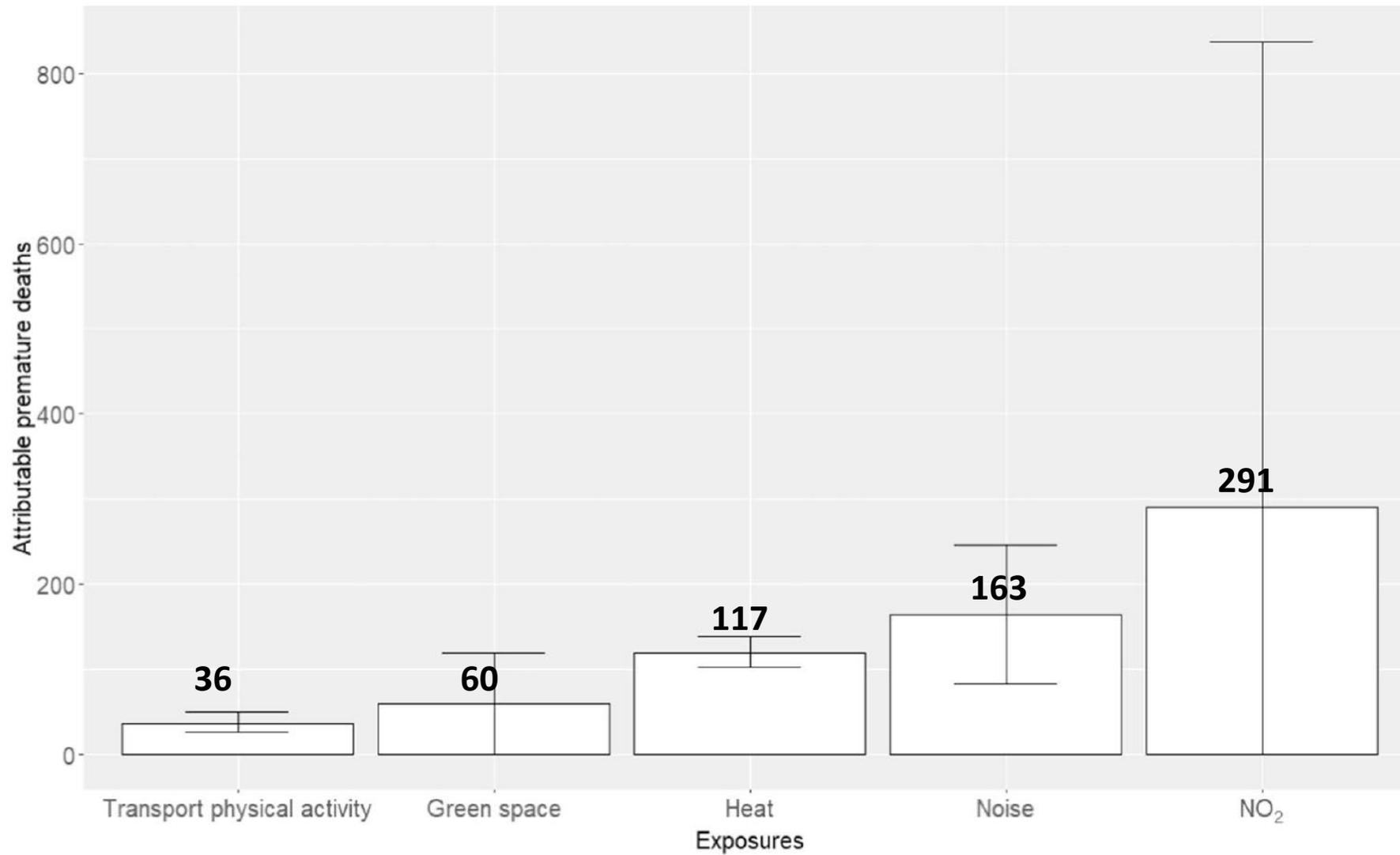


Fig. 5. Baseline and Superblocks environmental exposure levels.



667
Preventable deaths

Fig. 6. Annual preventable premature deaths estimated for the Barcelona Superblock model.



Tree canopy 2025

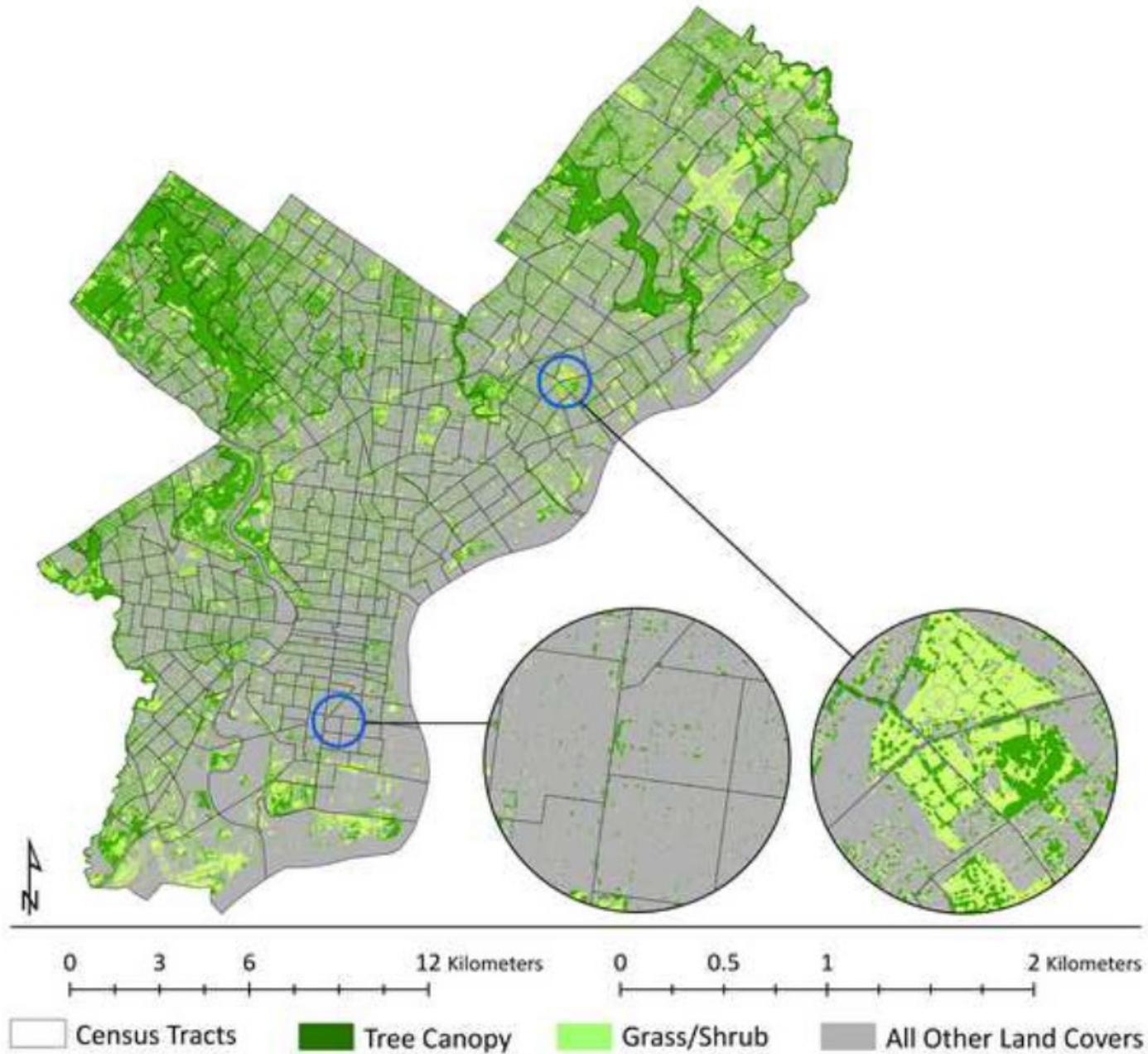


Table 3. Annual preventable premature adult deaths (years 2016-2025) by count and percent, and economic impacts

	Preventable Premature Adult deaths				Economic value ^{1,2}	
	Count	95% Interval	Percent	95% Interval	Value in millions	95% Interval
SCENARIO 1: 5% increase tree coverage						
Total Mortality						
City-wide	265	(156, 320)	1.9%	(1.1%, 2.3%)	\$2,543	(\$1502, \$3075)
SCENARIO 2: 10% increase tree coverage						
Total Mortality						
City-wide	526	(309, 638)	3.8%	(2.2%, 4.6%)	\$5,052	(\$2970, \$6125)
SCENARIO 3: 30% tree coverage						
Total Mortality						
City-wide	718	(414, 877)	5.2%	(3.0%, 6.4%)	\$6,890	(\$3981, \$8425)

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48 mph

100m

Road

Power

Data

MENU

INFORMATION

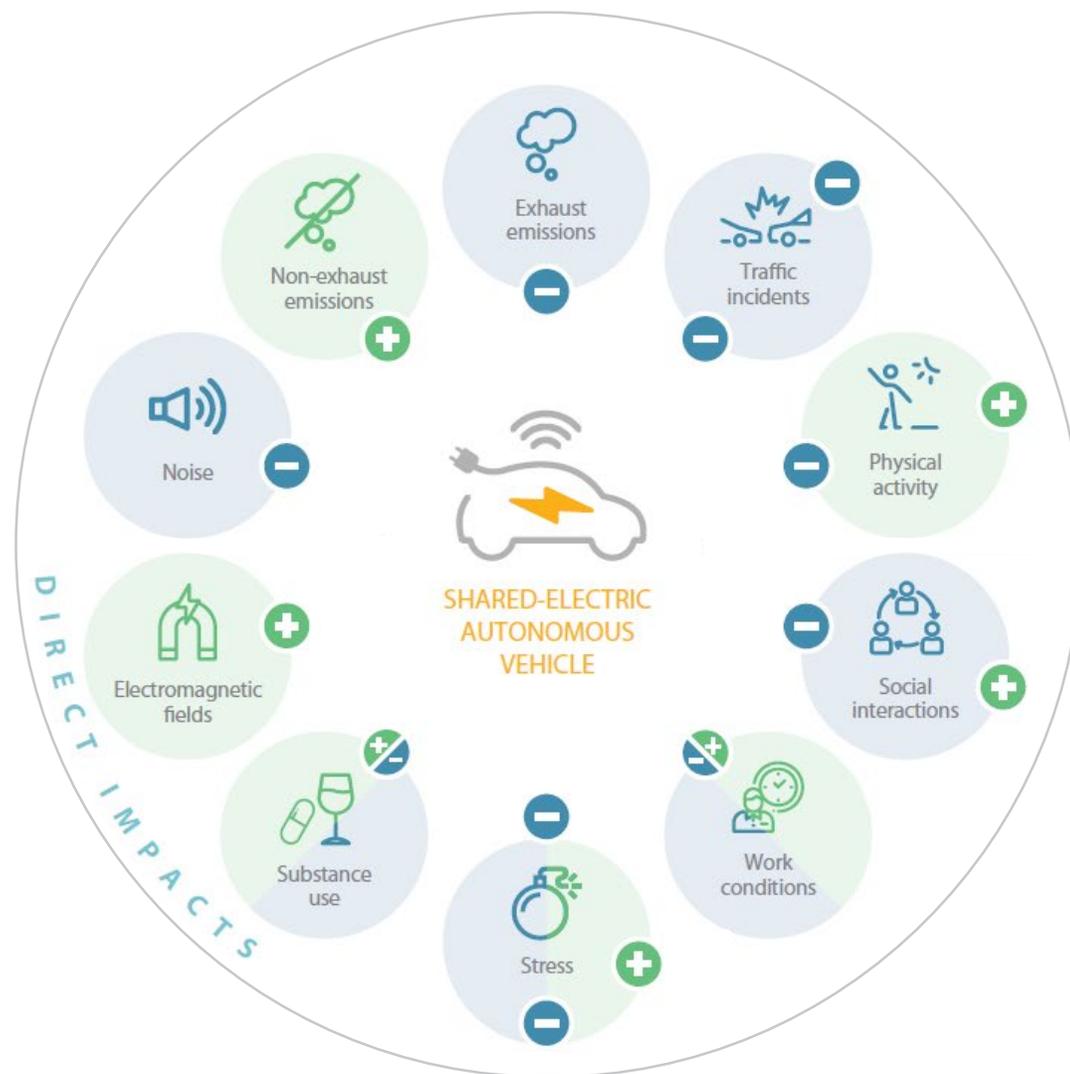
Autonomous Mode

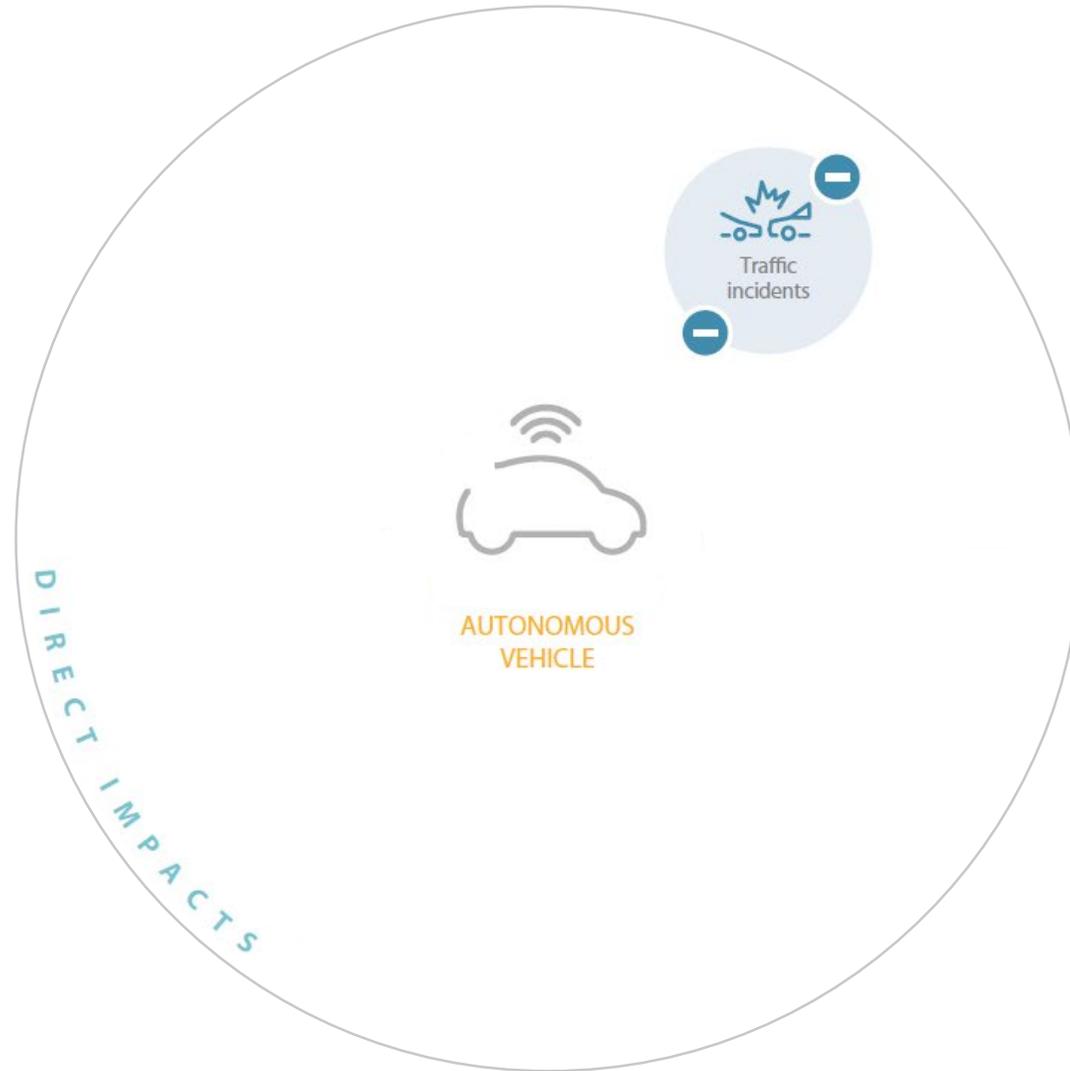
DRIVER

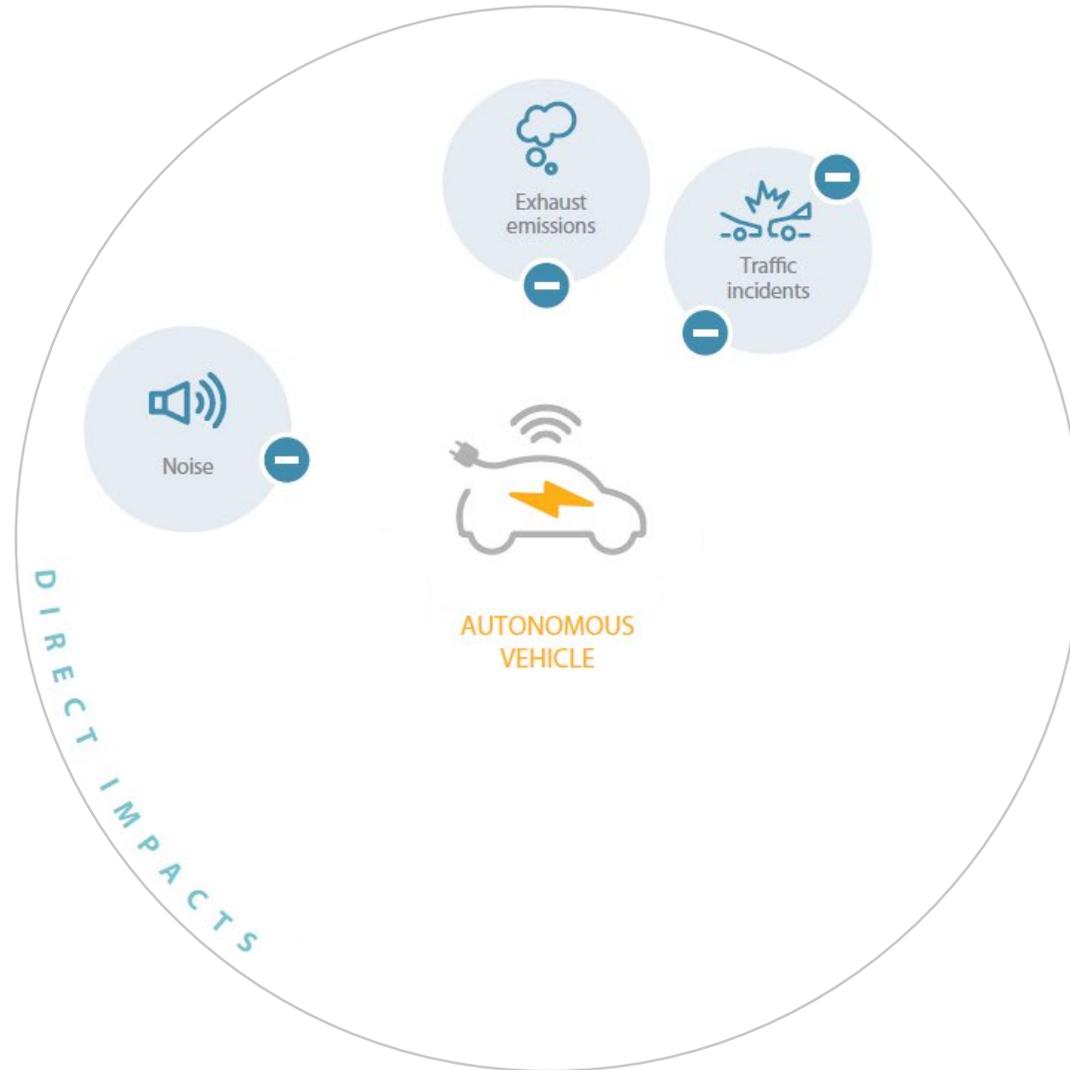
Location



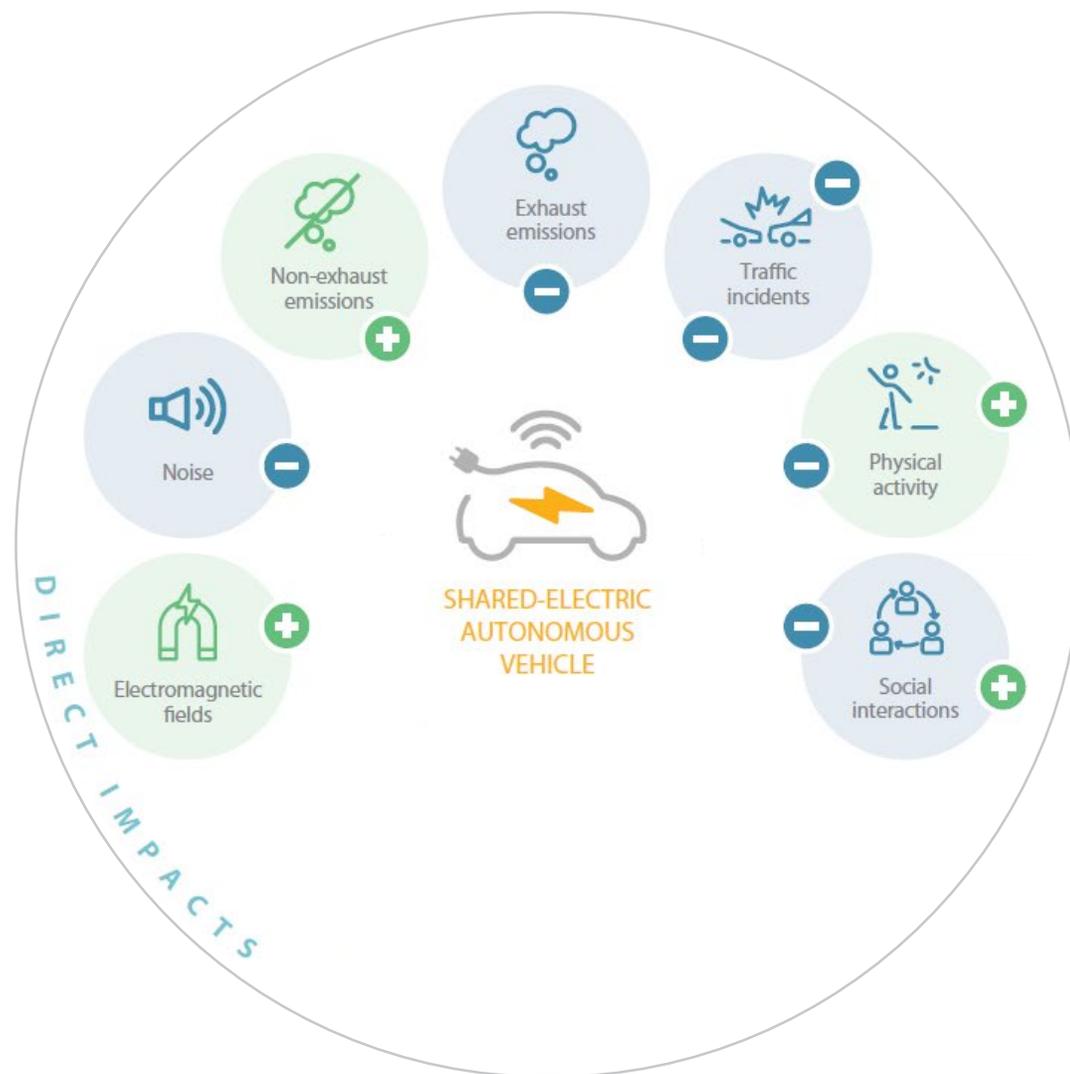
WAYMO

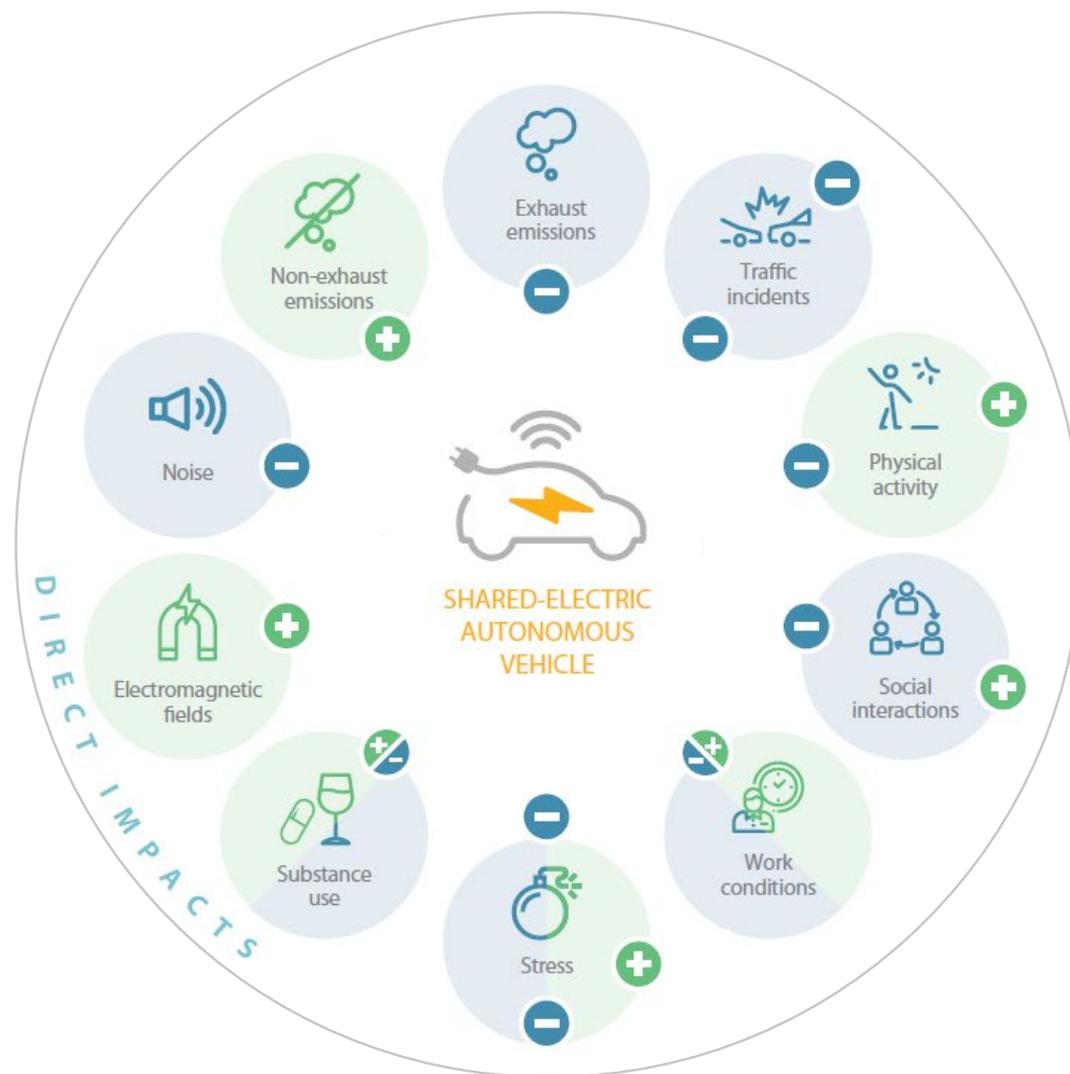


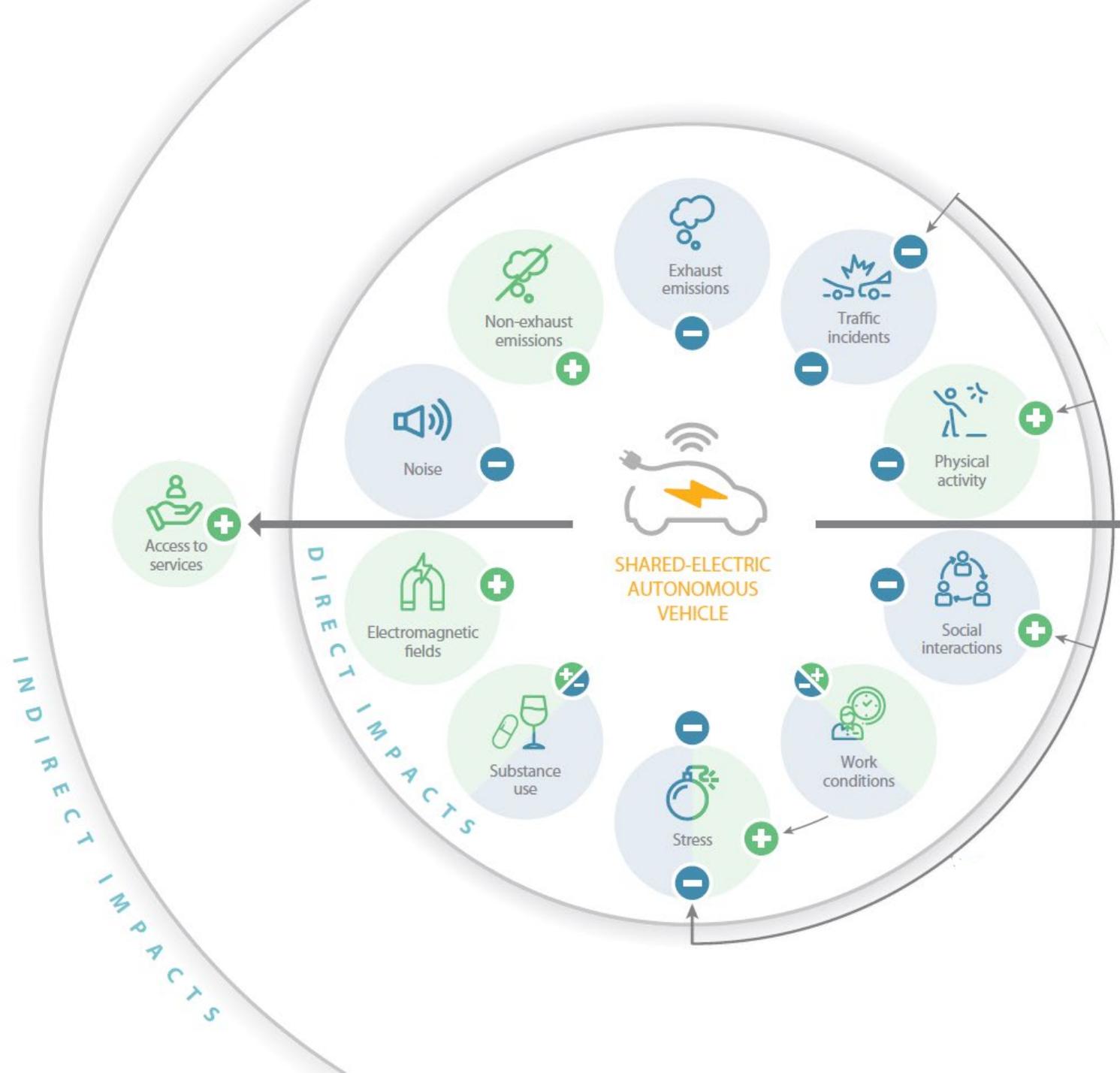


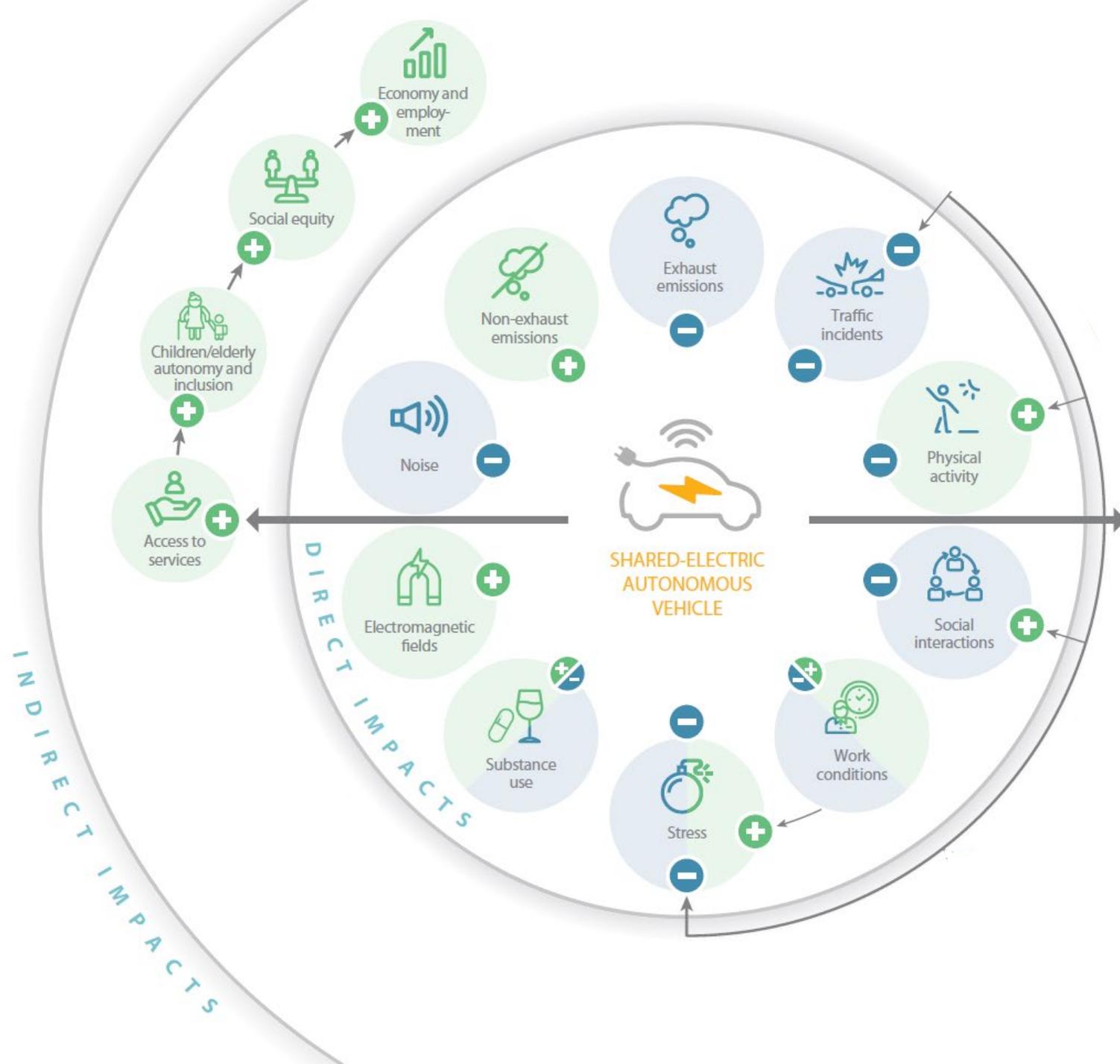


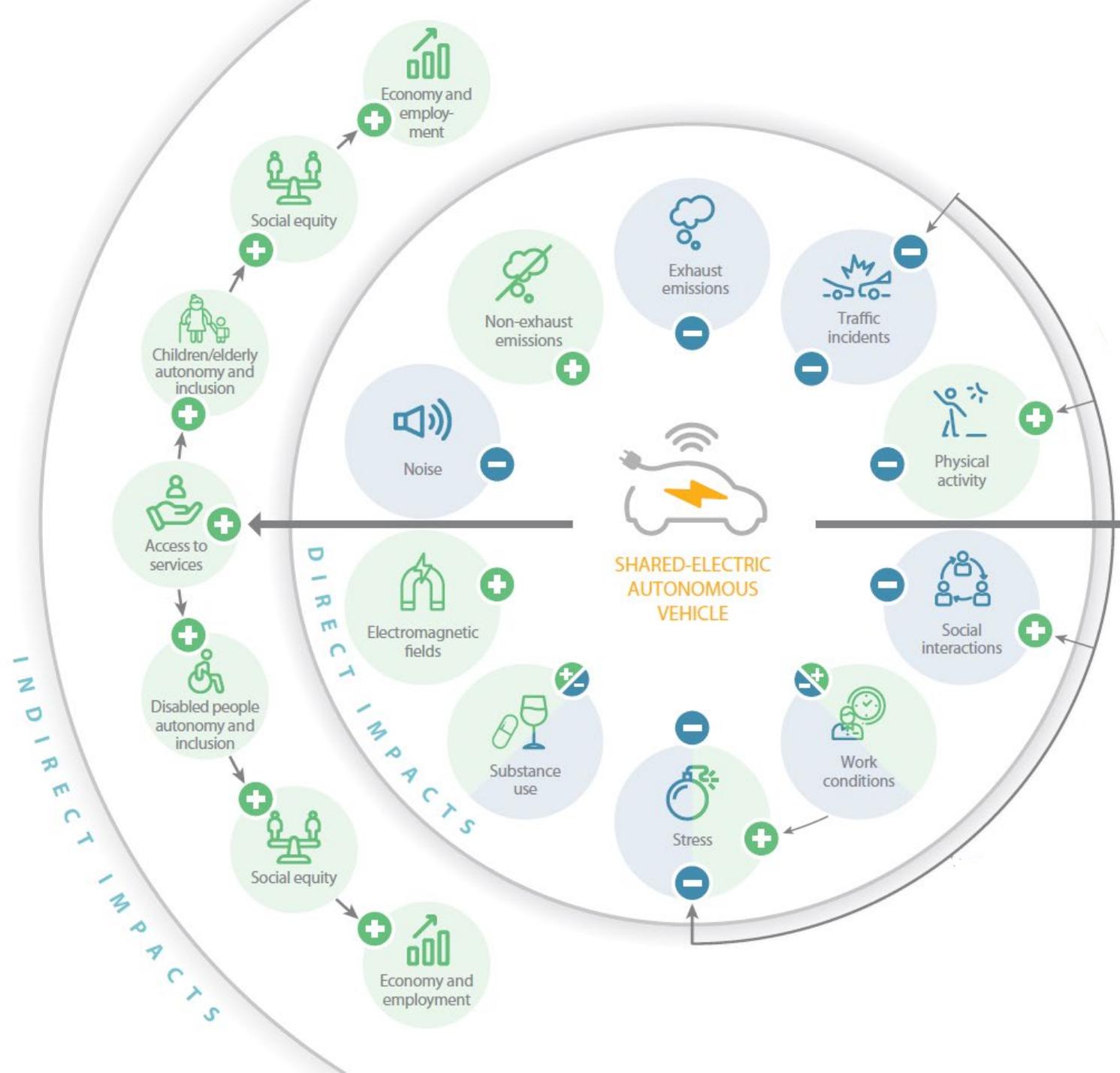


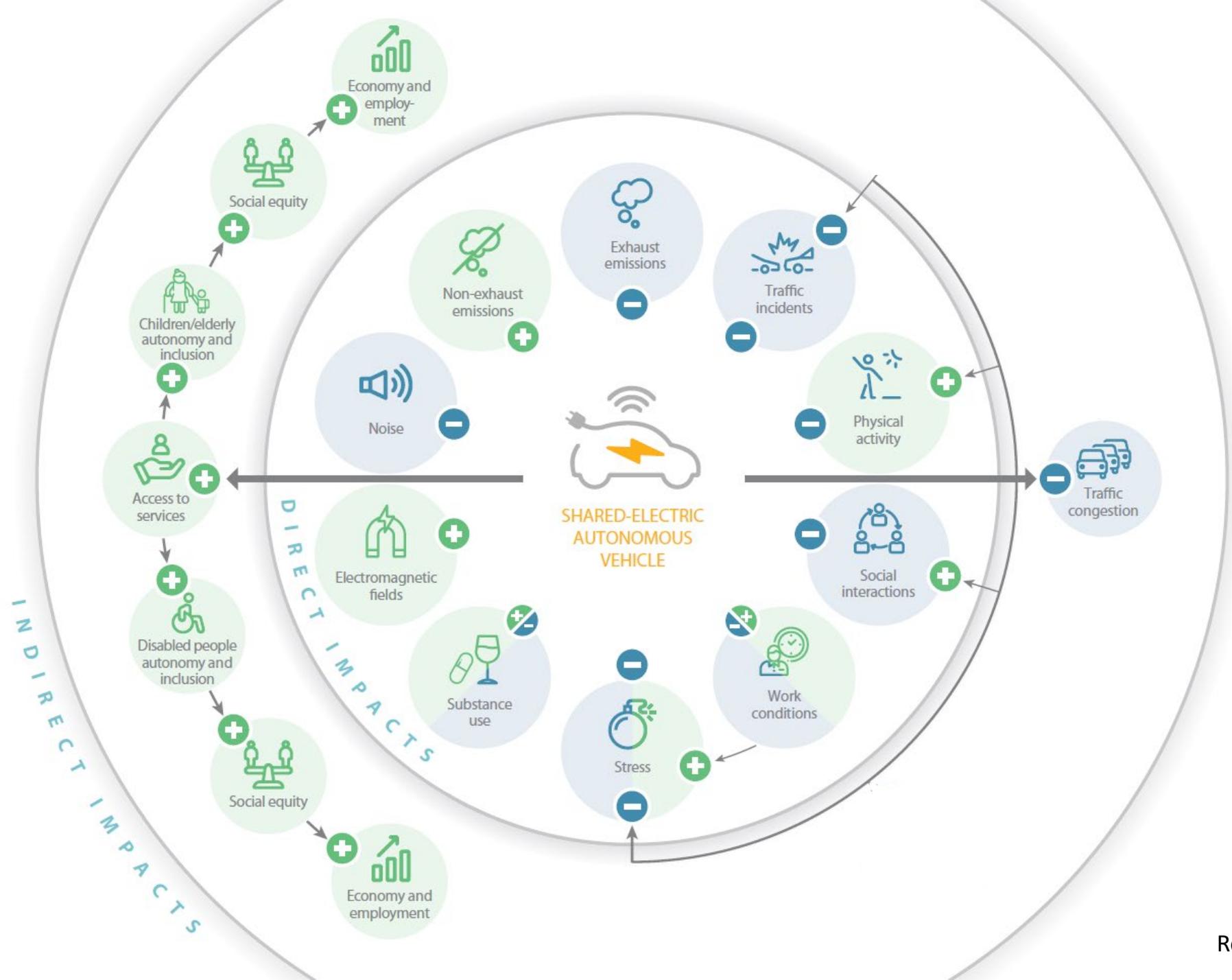


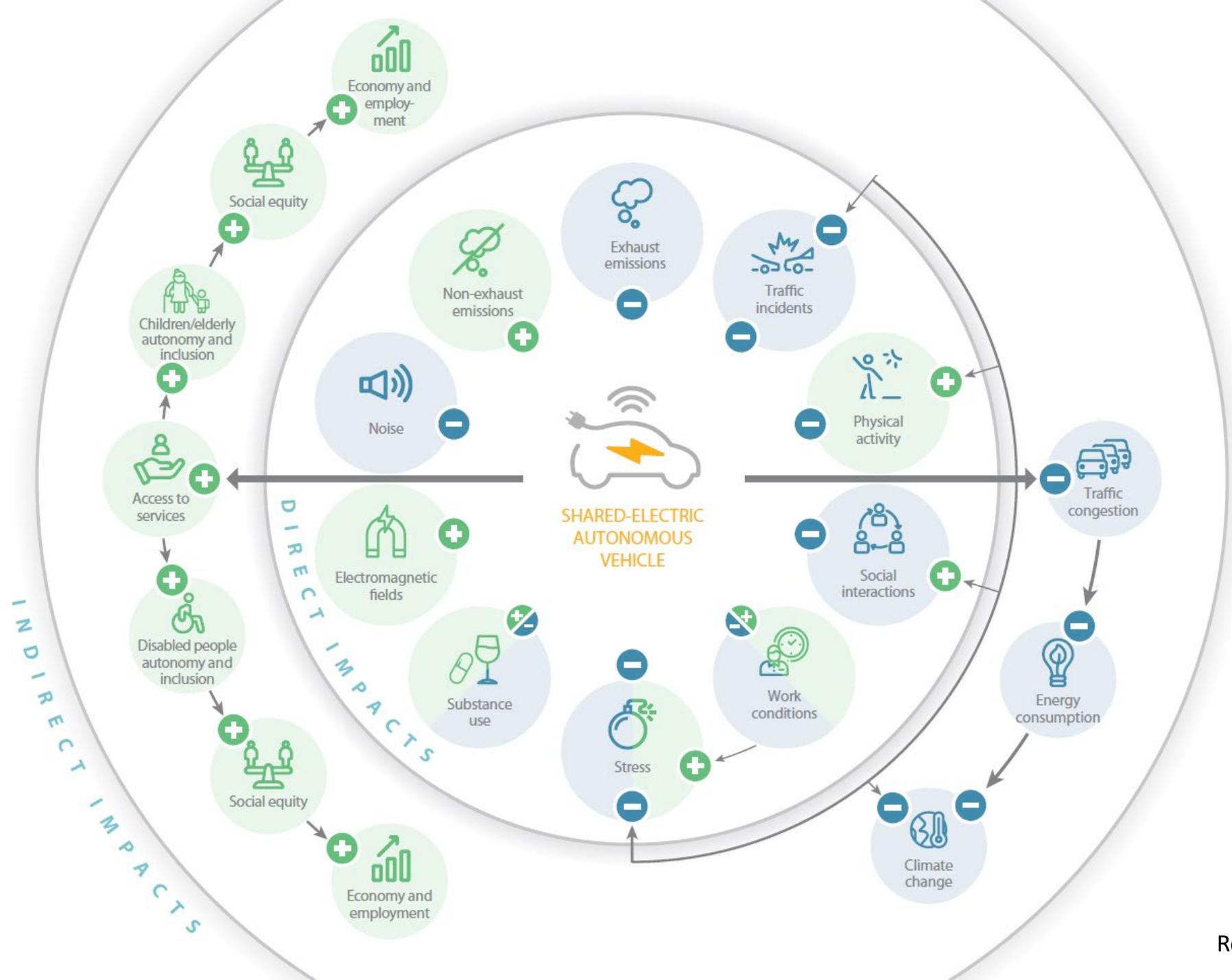


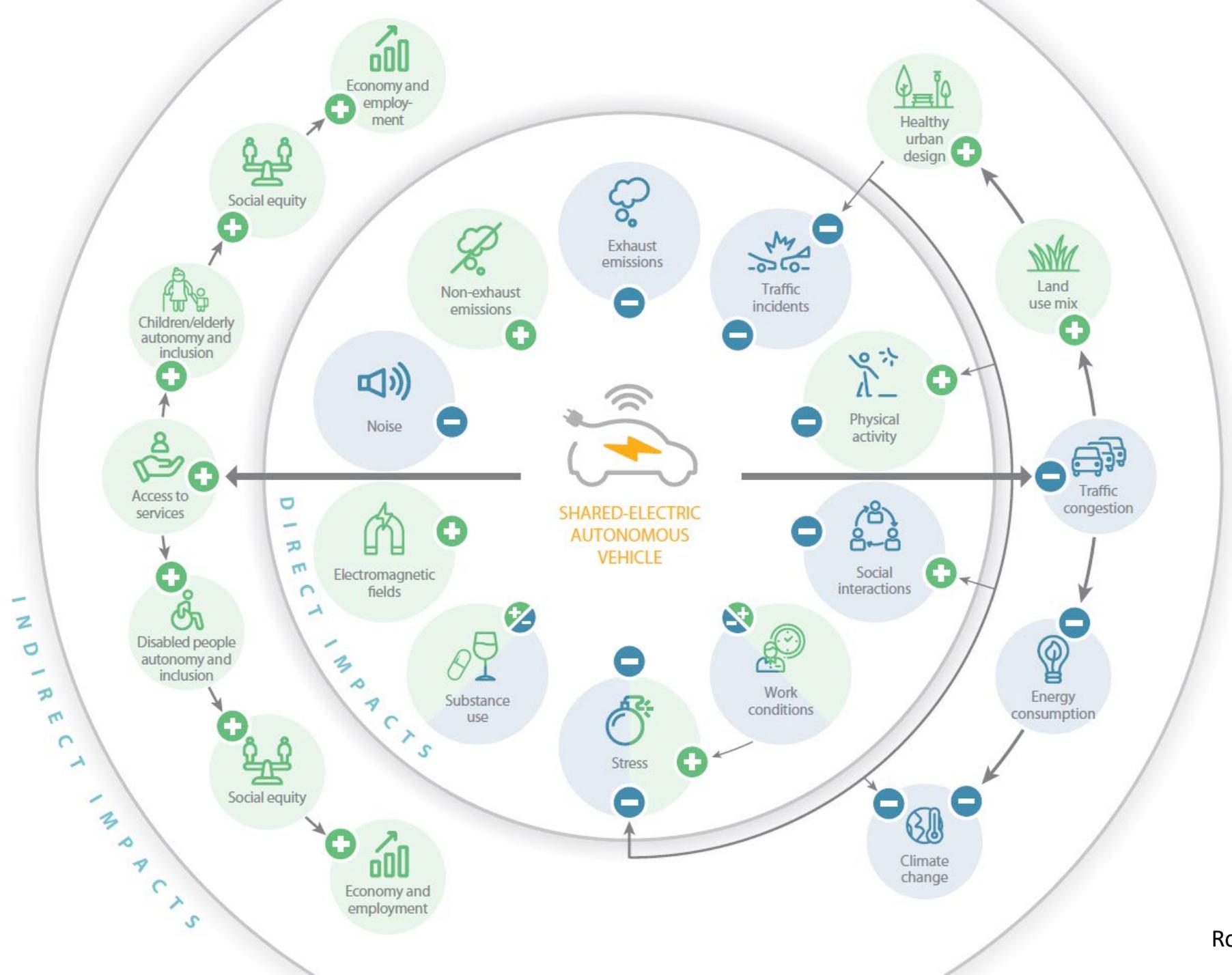


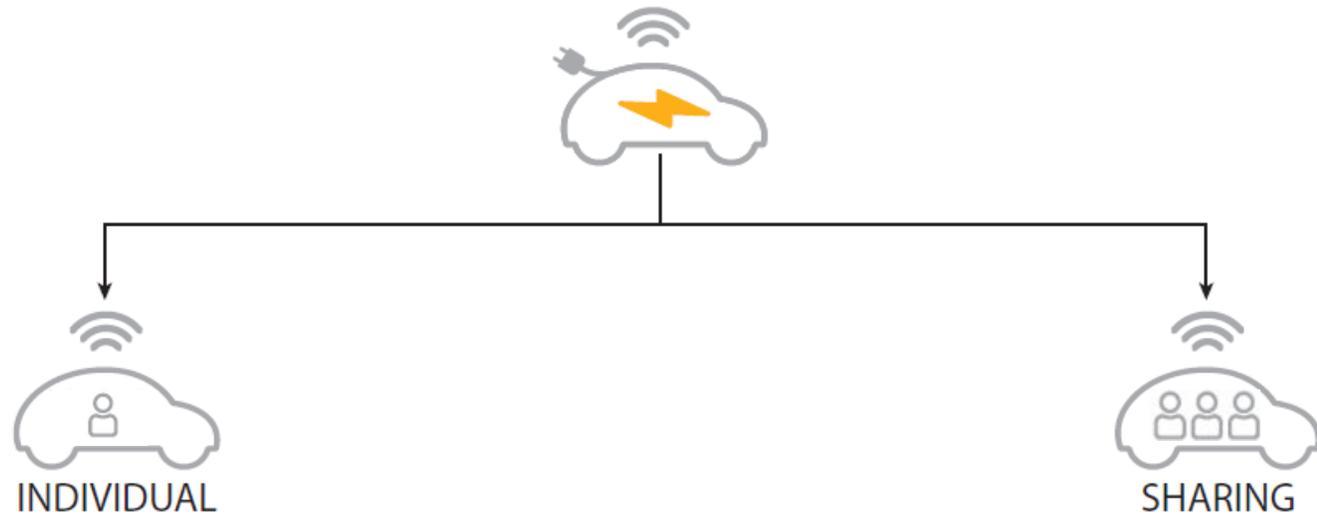


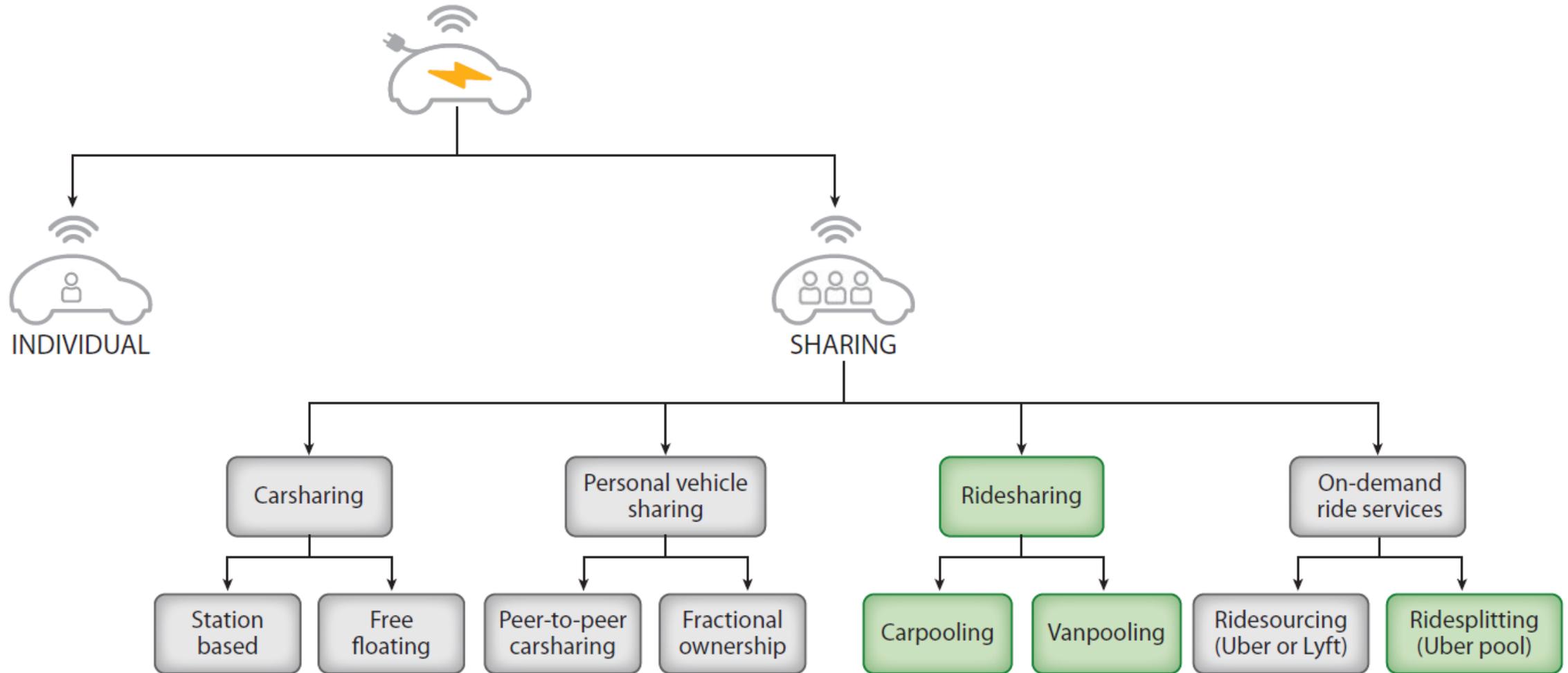














SHARING

AUTONOMOUS VEHICLES



RISK

FOR PUBLIC HEALTH



BETTER

FOR PUBLIC HEALTH



INDIVIDUAL

AUTONOMOUS VEHICLES



MAJOR RISK

FOR PUBLIC HEALTH



RISK

FOR PUBLIC HEALTH



NON-ELECTRIC

AUTONOMOUS VEHICLES



ELECTRIC

AUTONOMOUS VEHICLES

Main recommendations

1. AVs could result in **health risks and/or benefits.**
2. Proper policies prioritizing **electric AVs** in a format of **ridesharing or ridesplitting** would optimize benefits for health.
3. AVs should be designed to **support public and active** transportation.
4. AVs should be **prioritized** in disadvantageous communities.
5. AVs should **contribute** to an urban planning revolution with a vision for **equitable healthy urban design.**
6. AV policies and regulatory frameworks should be implemented **before** the complete introduction of **AVs** into the market.

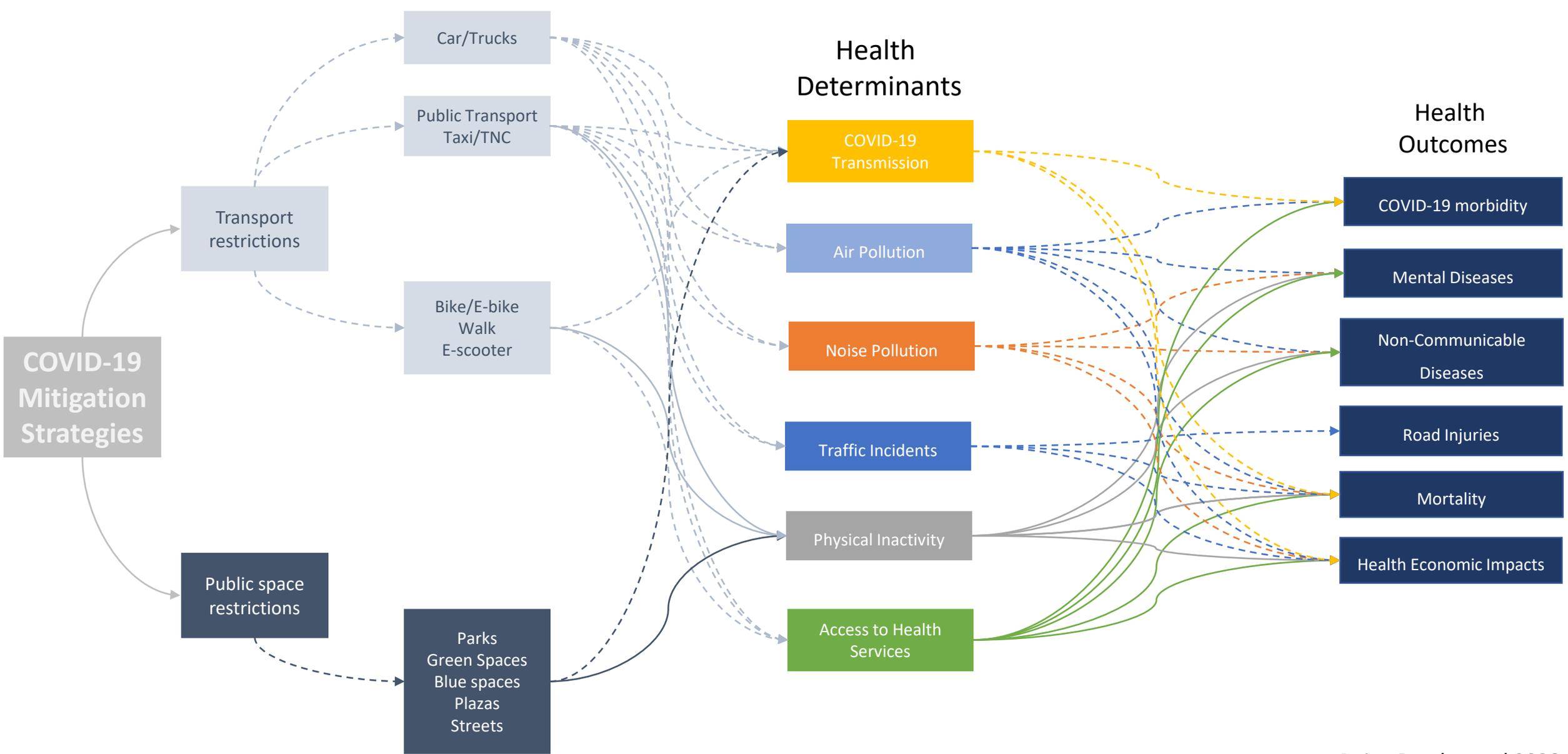
Thanks!

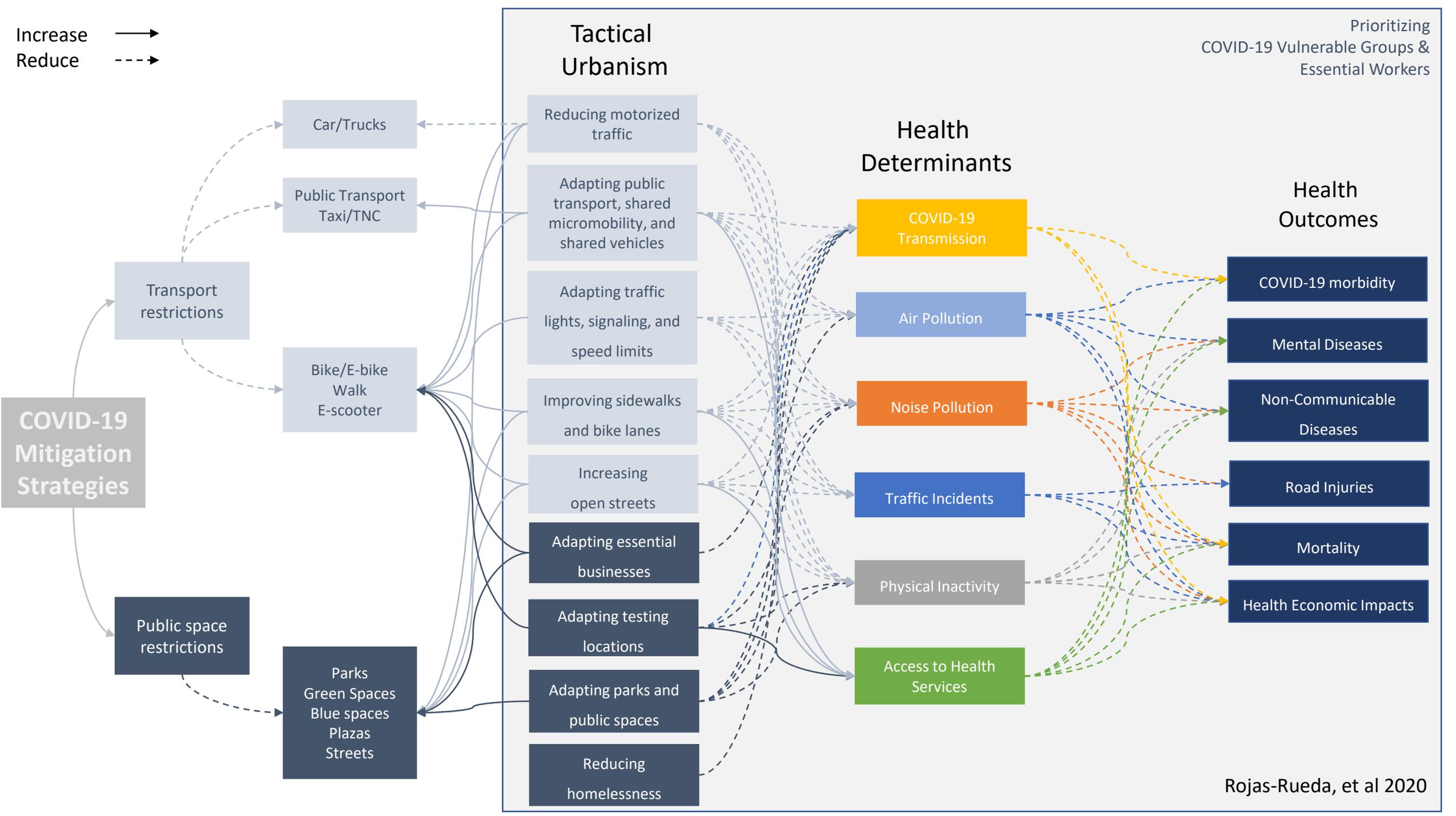
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**ENVIRONMENTAL AND
RADIOLOGICAL HEALTH SCIENCES
COLORADO STATE UNIVERSITY**

Increase →
Reduce - - - →





Tactical Urbanism for COVID-19

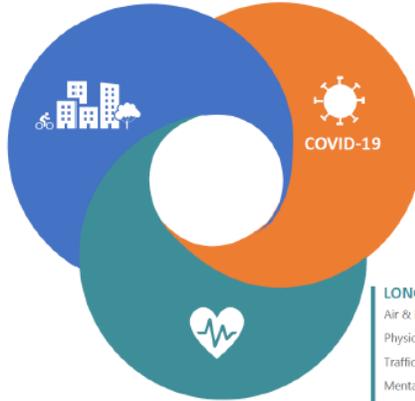
short-term interventions with a long-term health vision

Tactical Urbanism is a low-cost, temporary intervention that can be quickly implemented in cities of any size. Many of these interventions can be made permanent to promote urban improvements and public health.

This infographic summarizes Tactical Urbanism interventions that can support COVID-19 mitigation strategies with a long-term health vision. Tactical Urbanism is a complementary tool to containment strategies, such as a coordinated government response, wide-spread testing, contact tracing, and quarantine. These interventions should at least be considered until curative treatment and/or a vaccine becomes widely available.

TACTICAL URBANISM INTERVENTIONS

- Prioritize vulnerable groups & essential workers
- Expand sidewalks & bike lanes
- Implement open streets
- Adapt parks & public spaces
- Adapt traffic lights & signaling
- Reduce speed limits
- Adapt public transport
- Adapt shared micro-mobility
- Adapt shared vehicles
- Adapt essential businesses
- Provide transport options for testing locations beyond cars
- Adapt homeless shelter & services



SHORT-TERM OUTCOMES

COVID-19 Mitigation

- Air & noise quality
- Physical activity
- Traffic incidents prevention
- Mental health
- Non-communicable diseases prevention
- Reduced demand for health services
- Equity promotion

LONG-TERM OUTCOMES

- Air & Noise Quality
- Physical Activity
- Traffic Incidents Prevention
- Mental Health
- Non-communicable Diseases Prevention
- Reduced Demand For Health Services
- Equity Promotion

1. General tactical urbanism recommendations.

Implement tactical urbanism interventions early; discourage the use of public spaces and public transport for confirmed and suspected cases; encourage physical distancing (2 meters/ 6 feet); encourage physical activity; expand public open spaces; restrict access to public areas where physical distancing is not possible; avoid large gatherings; design interventions and prioritize implementation for vulnerable groups and essential workers; inform, promote, and enforce traffic safety regulations; and inform (clearly and accessibly) physical distancing orders and tactical urbanism changes (areas, uses, and schedules).



2. Sidewalks and bike lanes.

Promote walking and biking; expand sidewalks and bike lanes width, length, and connectivity to support physical distancing and traffic safety; expand sidewalks and bike lanes around parks, trails, and public spaces to reduce pressure on those spaces; implement protected bike lanes; expand bike parking; create pedestrian and cycling corridors and/or schedules for vulnerable populations (e.g., elderly and immunocompromised); use existing cycling and walking infrastructure proposals to guide the expansion; and encourage the use of bike helmets.



Source: David Rojas, MD, PhD david.rojas@colosate.edu
Emily Morales, MCRP emorales@logansimpson.com



May 2020

3. Open streets.

Implement everyday open streets; expand current open streets; enforce physical distance; avoid large gatherings; create user schedules favoring vulnerable populations; and utilize open street traffic management protocols to support the expansion of new sidewalks and bike infrastructure.



4. Parks and public spaces.

Keep large public spaces (e.g., parks, open spaces, squares, plazas) open where physical distance can be maintained; expand small open spaces; enforce physical distance; avoid large gatherings; expand bikes/e-scooter parking; create user schedules favoring vulnerable populations; and prevent peak usage, informing and organizing users visits across different time windows.

5. Traffic lights, signaling, and speed limits.

Shift from actuated to fixed traffic signals; adjust traffic light timing favoring pedestrians and cyclists; provide updated, clear, and accessible tactical urbanism signaling; include stay-at-home and physical distancing recommendations on traffic screens and signs; and lower traffic speed limits.



6. Public transport, shared micromobility (e.g., bikes, scooters), and shared vehicles (e.g., taxi, Uber/Lyft).

Implement strict cleaning protocols and support efficient ventilation in vehicles and stations; implement back-door boarding; suspend in-person fare collection or implement waived fares; distribute face coverings, protective glasses, gloves and sanitizer to drivers and passengers; limit passenger-driver interaction; enforce physical distancing; close every other row of seats; reduce maximum occupancy and increase service on crowding routes; install physical barriers (e.g., sneeze guards and partitions); create user schedules favoring vulnerable populations (e.g., elderly); support services for essential workers; promote bike-share; expand bike/e-scooter parking; encourage the use of bike/scooter helmets; integrate shared micromobility to public transit and bike lanes; and discourage or stop ridesharing (carpooling or vanpooling) and ridesplitting (e.g., Uber pool).



7. Motorized traffic.



Concentrate motorized transport in few streets and remove traffic lanes/parking space to support car-free streets, active transportation, and traffic safety; and when possible concentrate freight traffic on main roads and at nighttime to improve traffic safety.

8. Essential business.

Designate bike shops as essential services; expand sidewalks for on-sidewalk queuing, restaurant seating, and outdoor markets; avoid large gatherings; enforce physical distance; provide service to non-motorize transport; and establish dedicated delivering/loading zones.



9. Testing locations.

Provide transport options to access testing sites and other health services beyond cars.

10. Homelessness.

Provide and adapt homeless shelters and services suited for physical distancing and COVID-19.



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