



Too late to escape from the car dependency?

Car dependency impeding mobility for all

MBA 610 | Fall 2023
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Agenda

01

Car Dependency

Growth in necessity and popularity

02

Issues

Social, Economic, Environmental

03

Stakeholders

Government, Corporate, Populace and variables

04

System Analysis

Casual Loop Diagram, Logic Framework and Interventions

01

Car Dependency

Cars are being prioritized over people and the environment.



U.S. Car Dependency

Land

- 30%-50% of urban land is dedicated to cars
- 292 million vehicles
- 7 parking spots/car
- 2 billion parking spots

Money

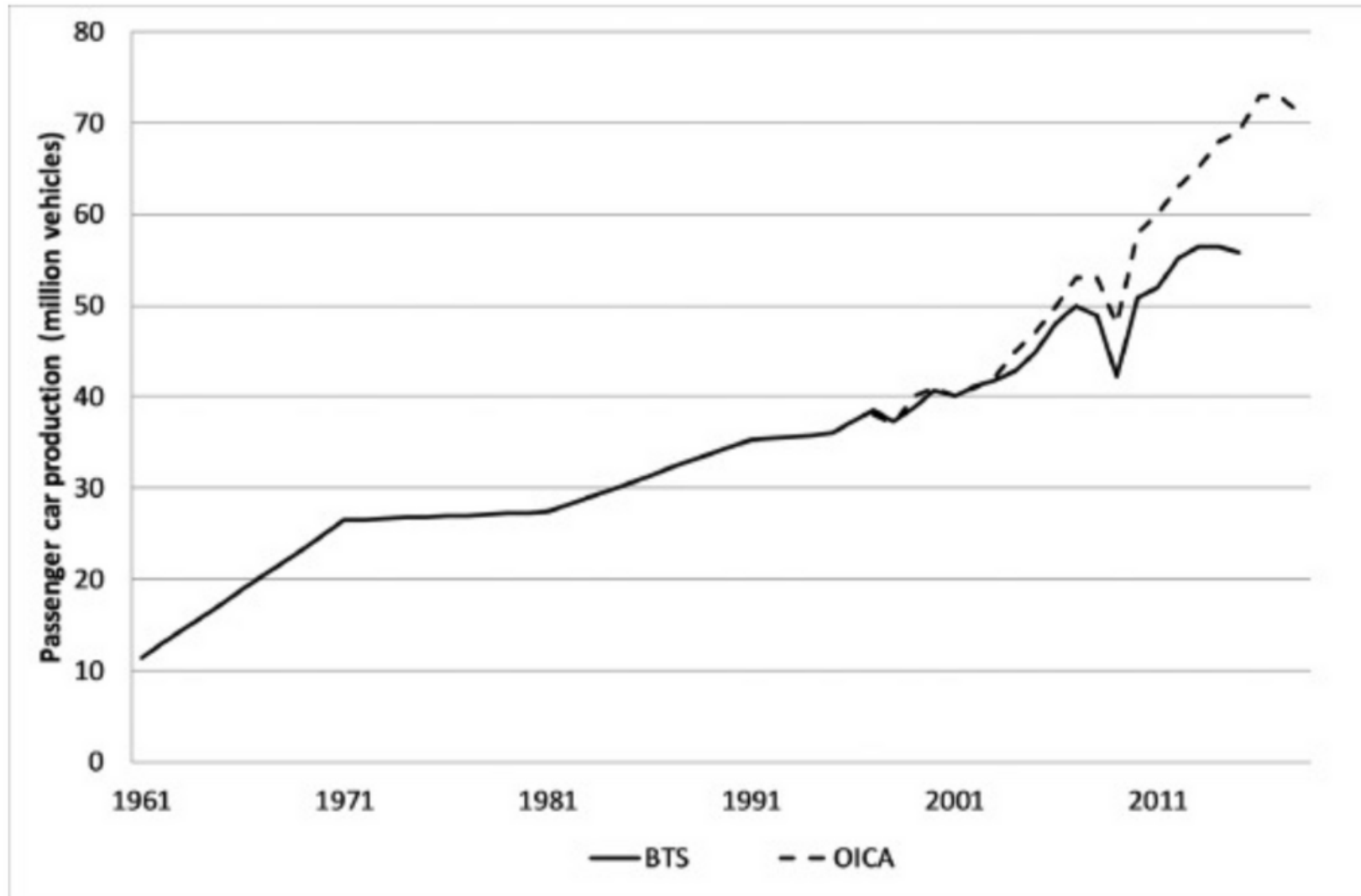
- Tesla: \$764B valuation and \$81.5B revenue in 2022
- Total funding spent for public transit in 2021: \$77B
- 80-20 Highway-Transit Split

Vehicles

- 87% trips take place in cars
- Over 90% of households have cars



Behavior Over Time - Car Production



8 million
vehicles
1961

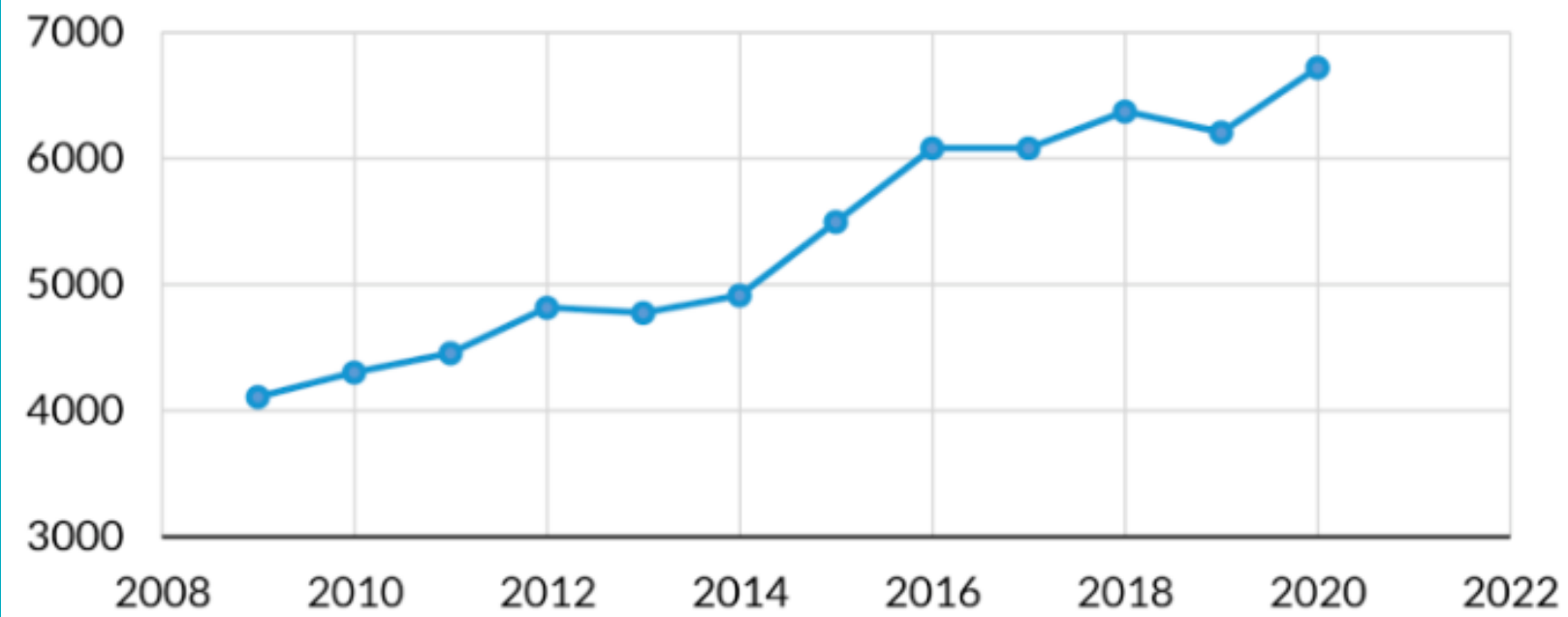
85 million
vehicles
2022

U.S. car production over time

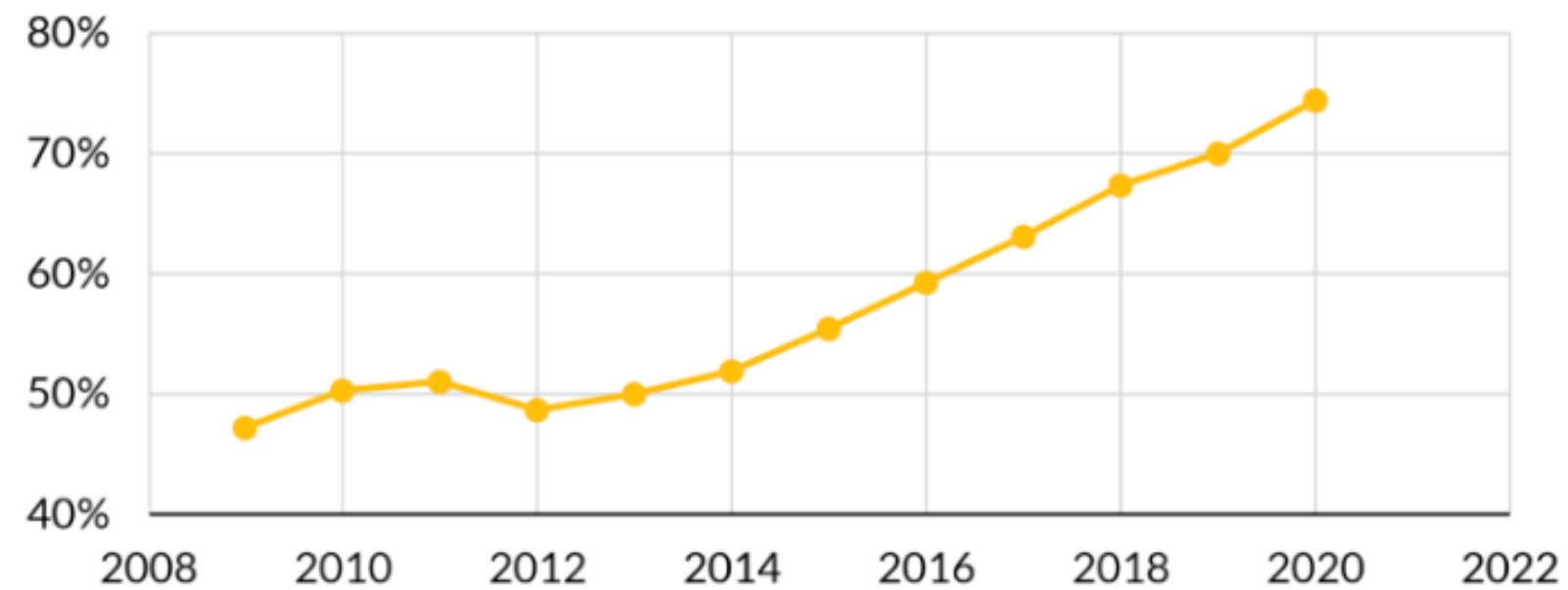


Pedestrian fatalities and share of large car sales

Reported number of pedestrian fatalities



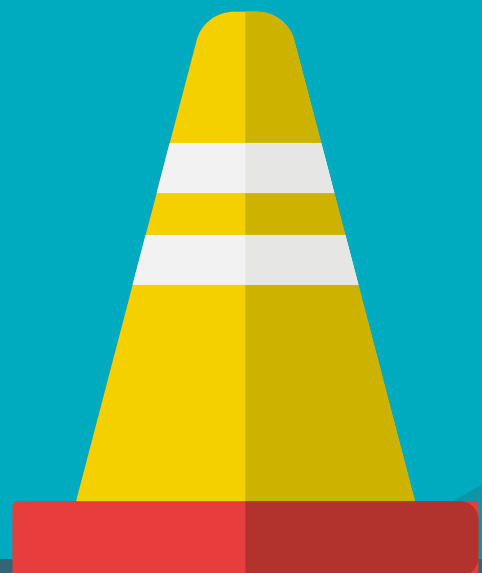
Share of vehicle sales that are large cars



Sources: Fatality Analysis Reporting System, Federal Reserve Economic Data, and Governors Highway Safety Association.

Note: Large cars are SUVs, pickup trucks, and minivans.

URBAN INSTITUTE



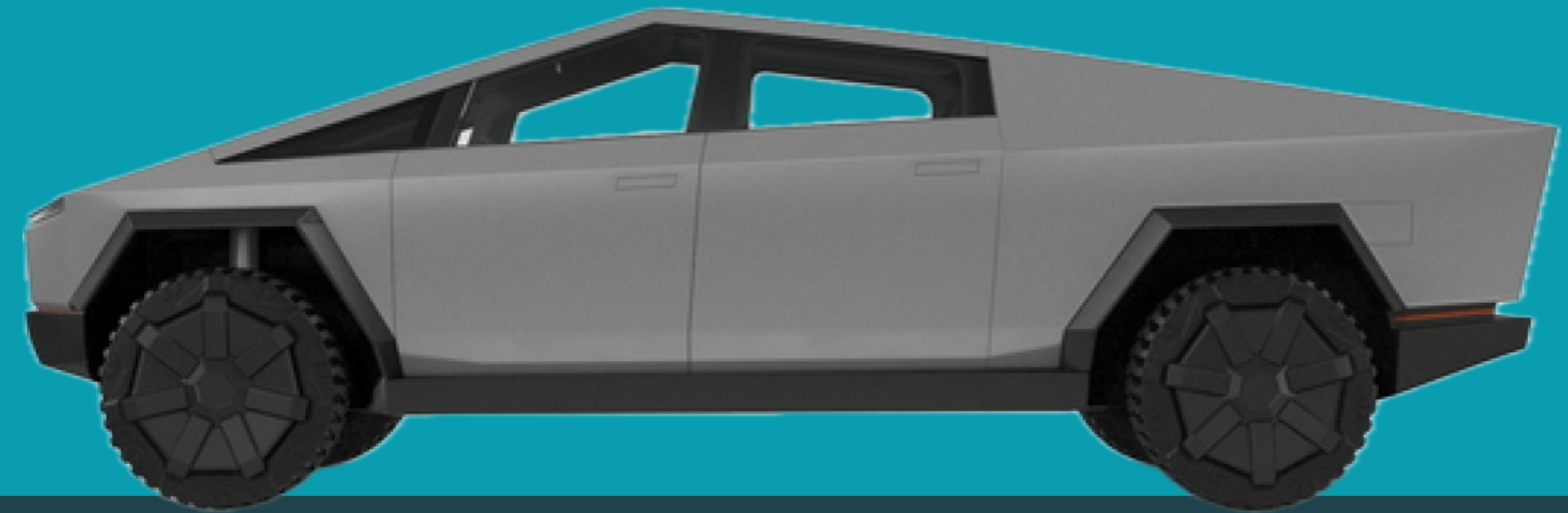
Car Dependency is continuing. For now

ELECTRIC CARS

Heavier and more expensive than ICE cars
Thus more likely to kill pedestrians and bikers
upon collision

AUTONOMOUS CARS

Deployment in your city may be decades away
May increase trips and traffic



Car Culture

Petromasculinity

Rolling coal



Anti-environmentalism

Ecomodern Masculinity



Elon Musk  

@elonmusk · [Follow](#)

Beats a Porsche 911 while towing a 911

Watch on X



02

Issues



Issues with Car Dependency

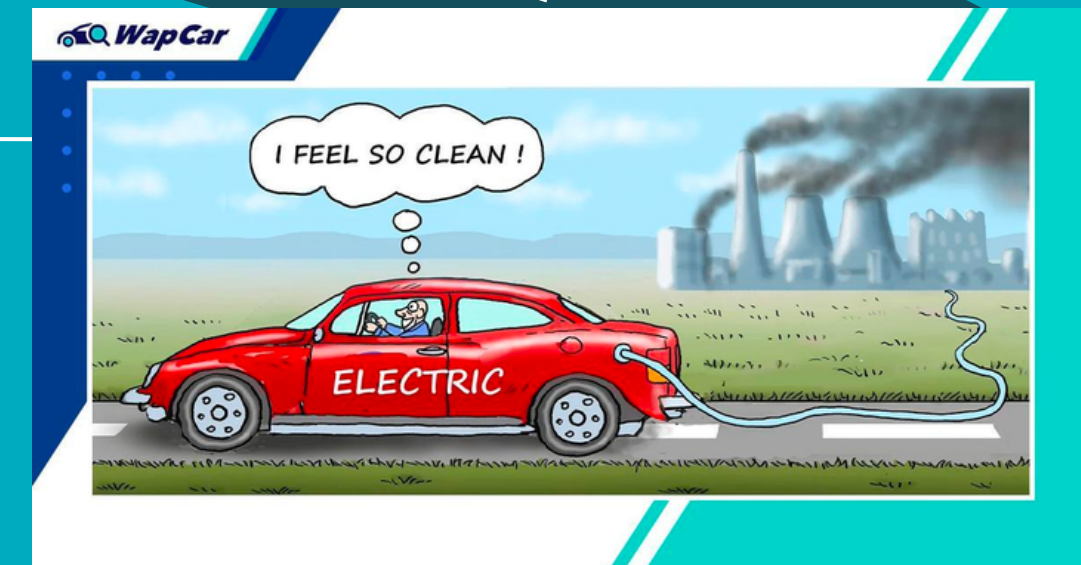
1 Asphalt

- Negative impacts on hydrological cycle, urban heat island effect, biodiversity of flora and fauna



2 Pollution

- Cars account for 60% of air pollution



3 Serious Injuries and Deaths

- Car crashes are the leading cause of death in people between ages 1-54
- Over 60,000 injuries and 500 fatalities in parking lots alone



Issues with Car Dependency Continued

4 Health Issues

- Sedentary: Americans die earlier compared to other developed nations
- Asthma/respiratory issues



5 Congestion

- More pollution, more stressed
- spend 3 days sitting in traffic per year



6 Economic

- \$48,000 new car price -> \$1.5 trillion auto loans



03

Stakeholders



Stakeholder Analysis

Stakeholder 1: Government

Local, State, Federal
DOT's, DMV's, California
Air Resources Board
(CARB)

Stakeholder 2: Corporate

Automakers, ride and
micromobility sharing
services, transportation
footprint of major
corporations

Stakeholder 3: Populace

Mass population that
includes commuters,
advocacy/lobbyist
groups, vulnerable
communities



Needs, Concerns and Behaviors

We build infrastructure, create policies and regulations and operate public transit.



Government

Local, State, Federal Agencies

"We want to balance competing interests and meet the needs of the community in the most fiscally responsible way."

Regulate the system

We sell transportation goods and services and dictate commute



Corporate

Automakers, major corporations

"We want profit growth indefinitely."

Influence the system

We commute, shop, travel, street race, and attend sports events as well as vote and rally.



Populace

Mass Population

"We want to get to where we want to go in the easiest, safest and coolest way."

Impact and are impacted by the system

Variables

Social

Serious injuries and deaths, safety, sociodemographics and needs, ease, societal pressures and cultural norms

Environmental

Emissions and pollution

Political and Economic

Car sales, insurance and maintenance costs, lobbying efforts, government funding, regulation and policy

04

Systems Analysis

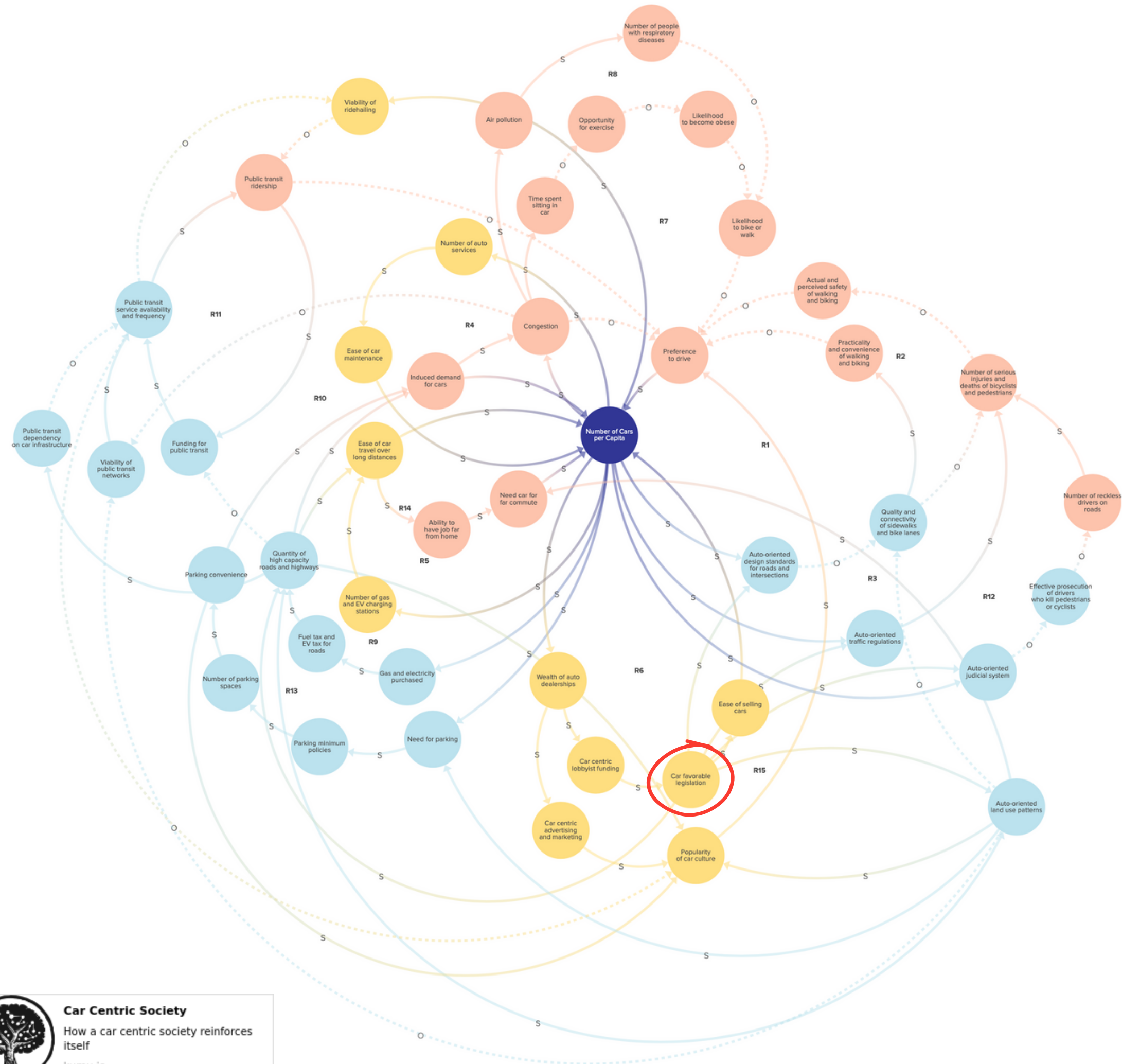
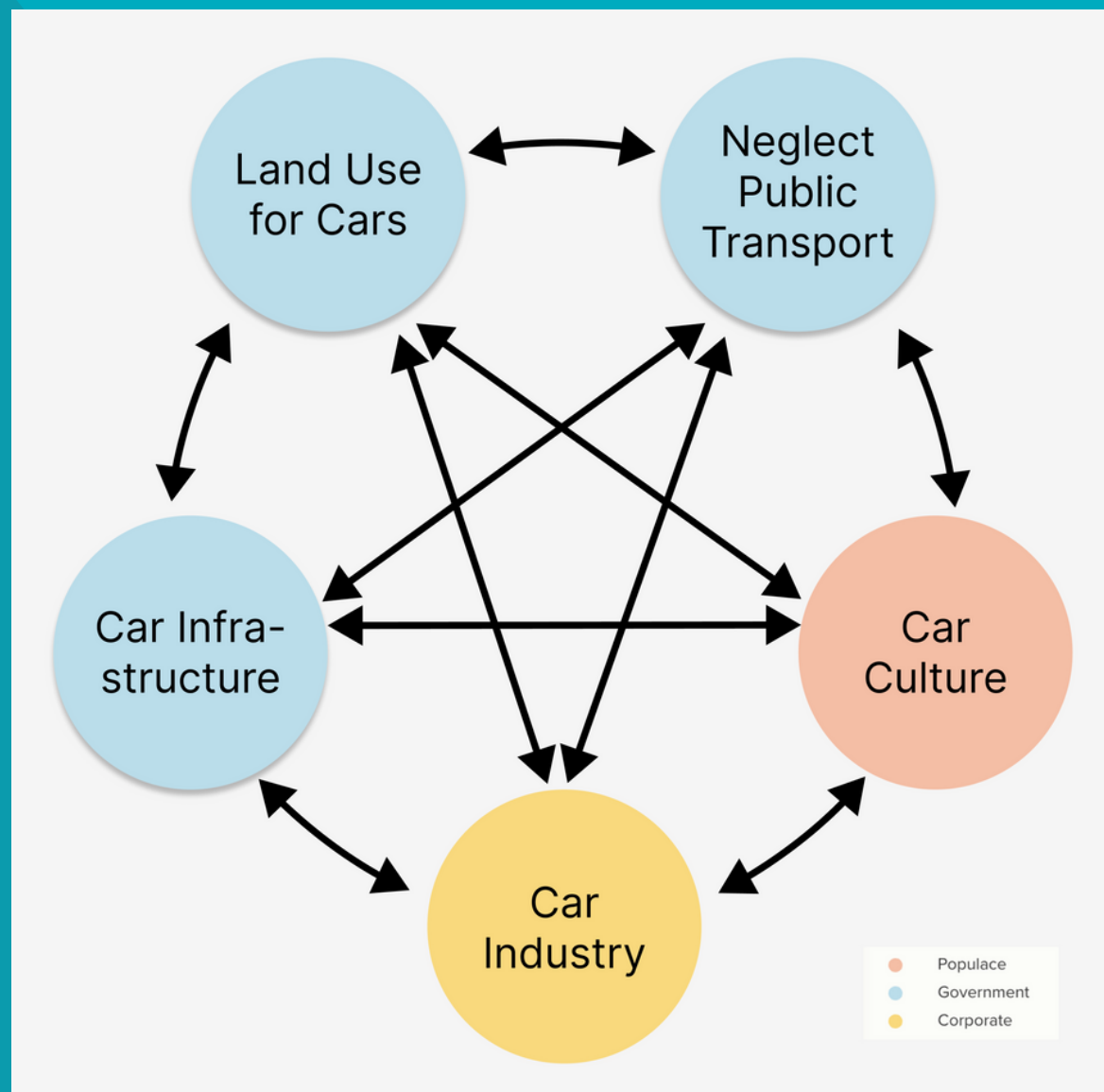
Shoes of people who died from being hit by cars->



Causal Loop Diagram



126 loops identified

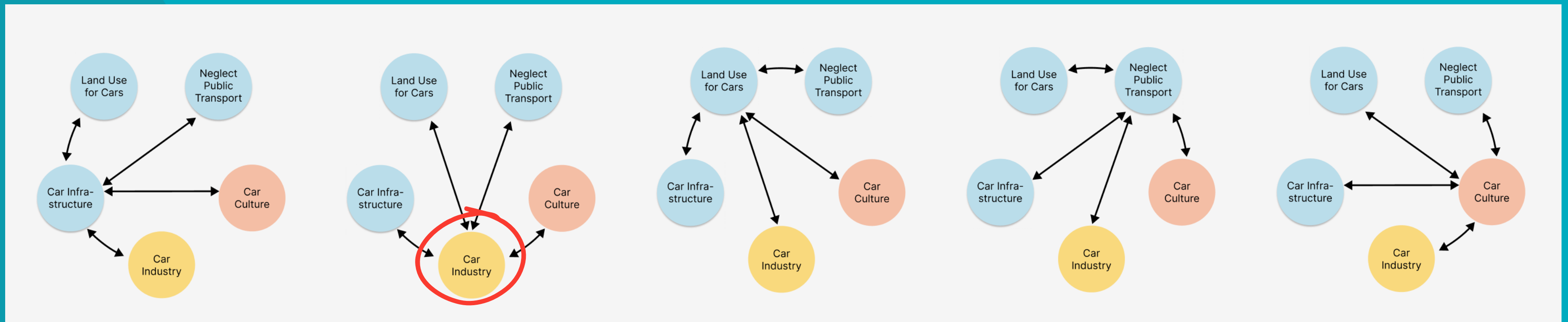
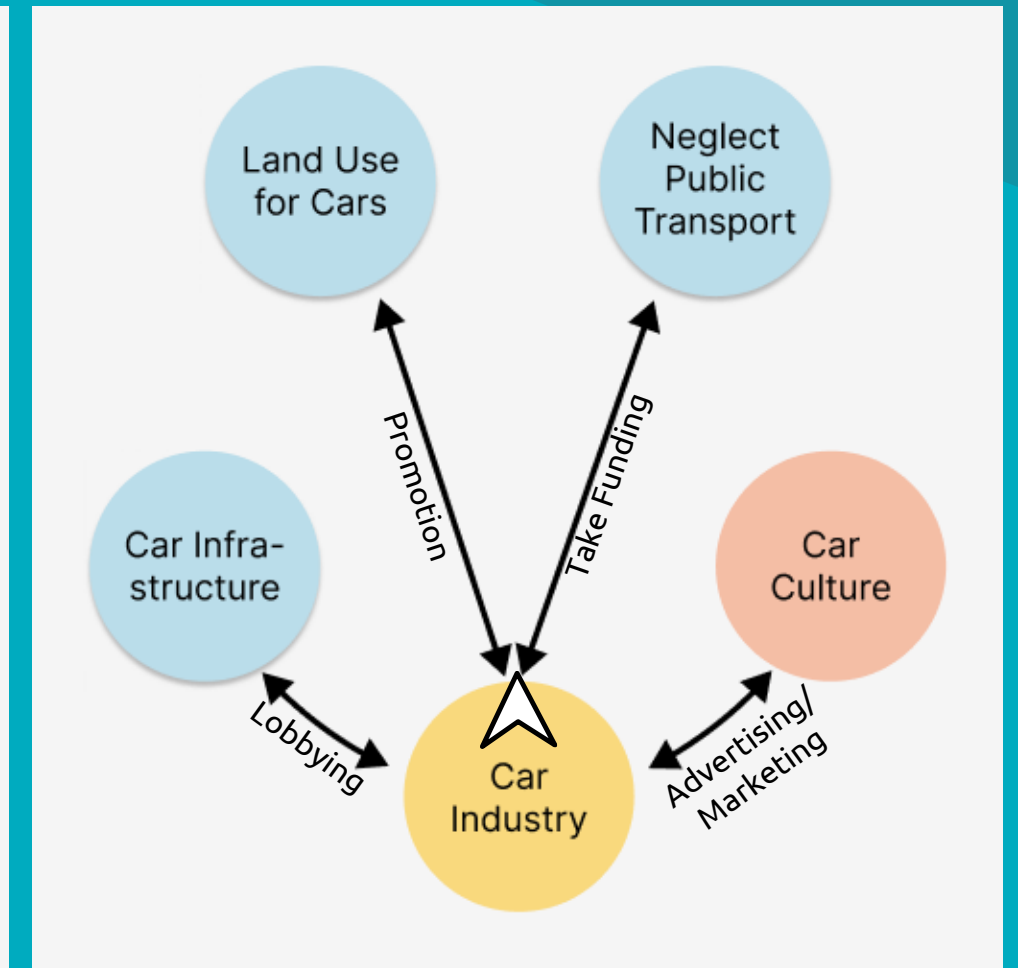
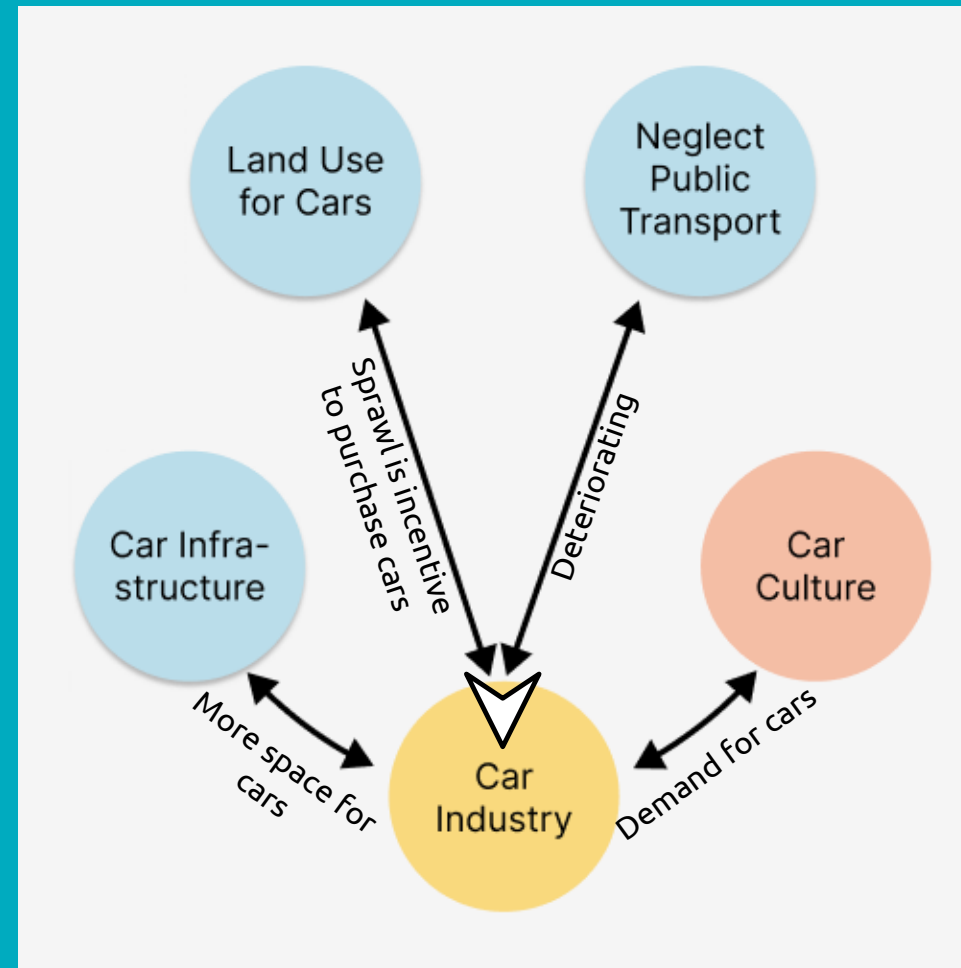


Car Centric Society
 How a car centric society reinforces itself
 kumu.io

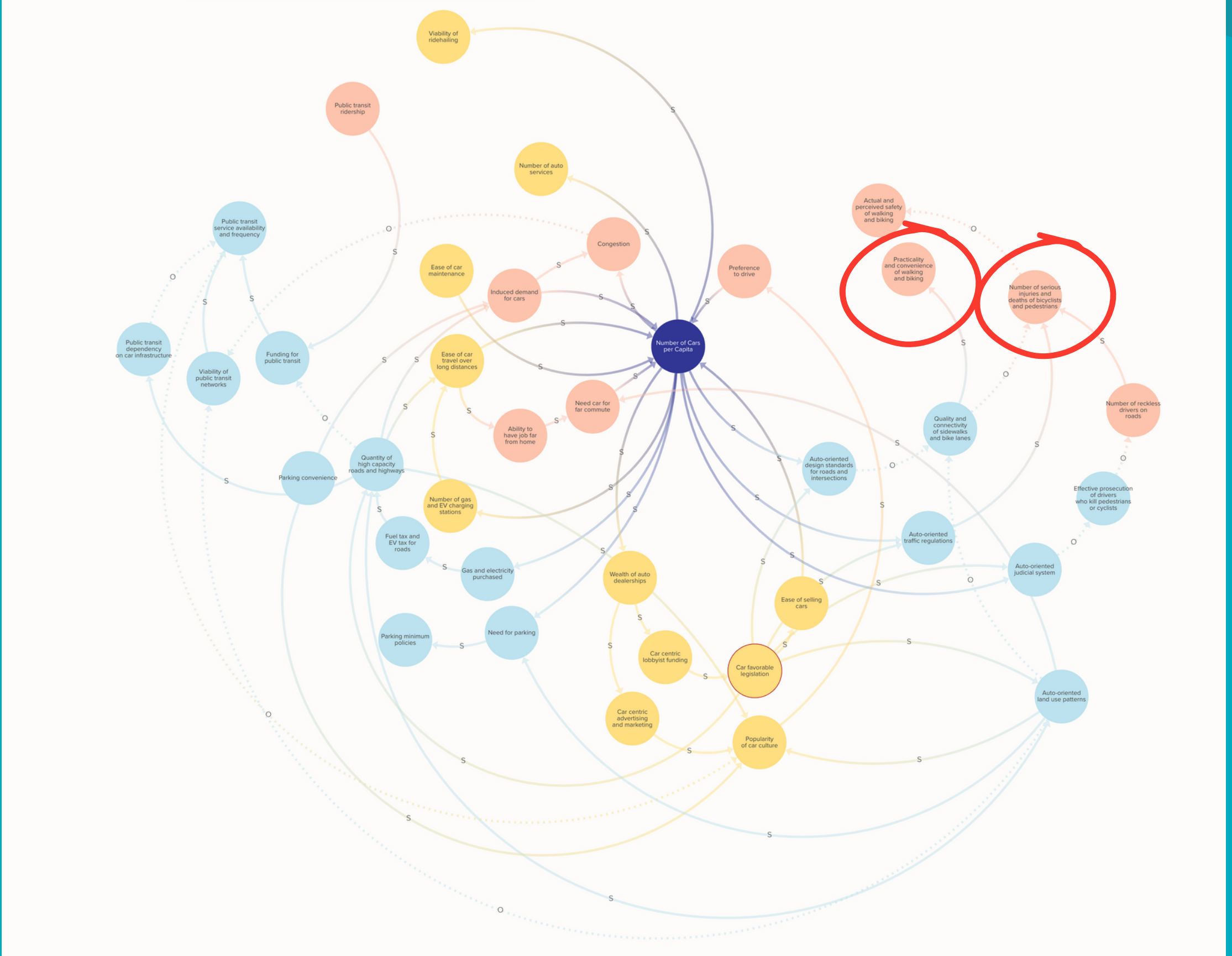
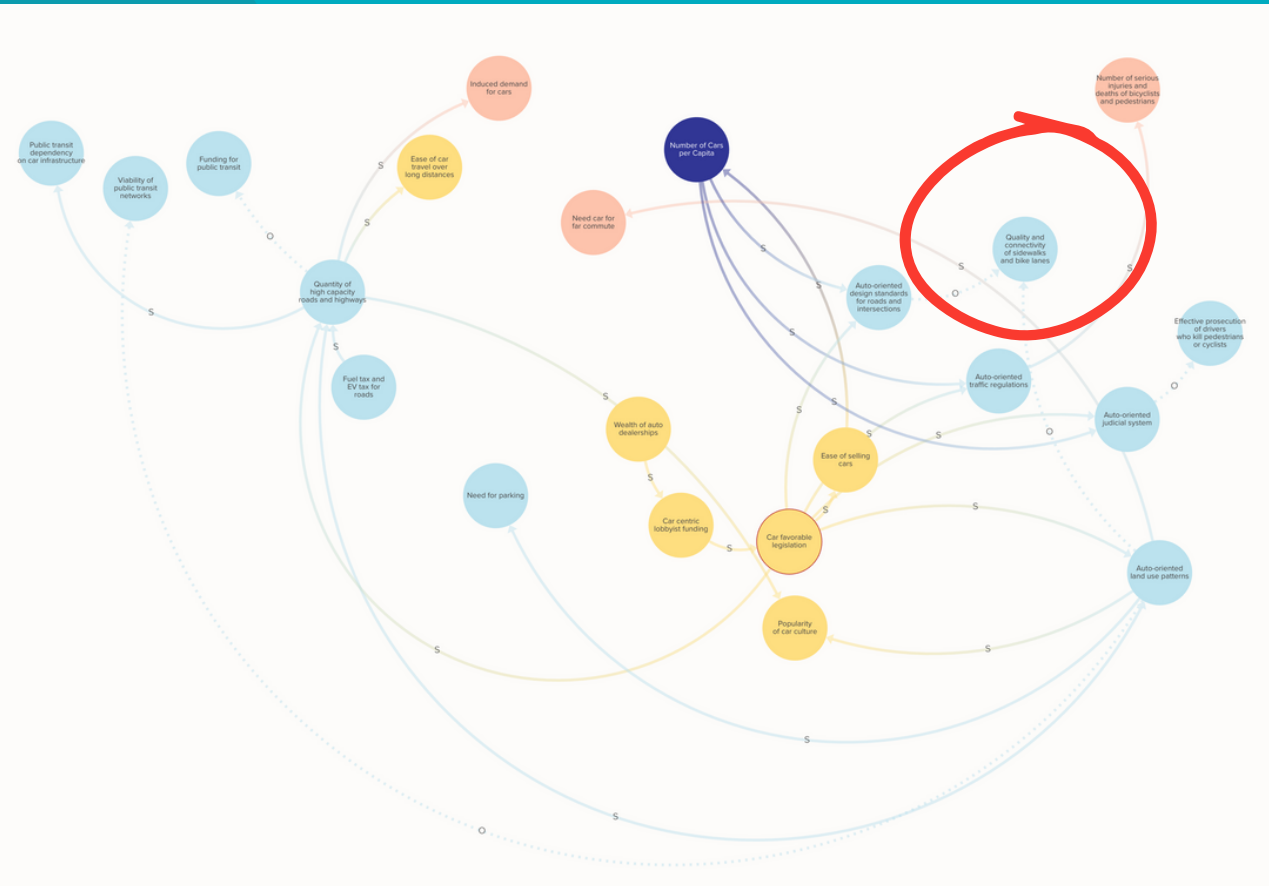
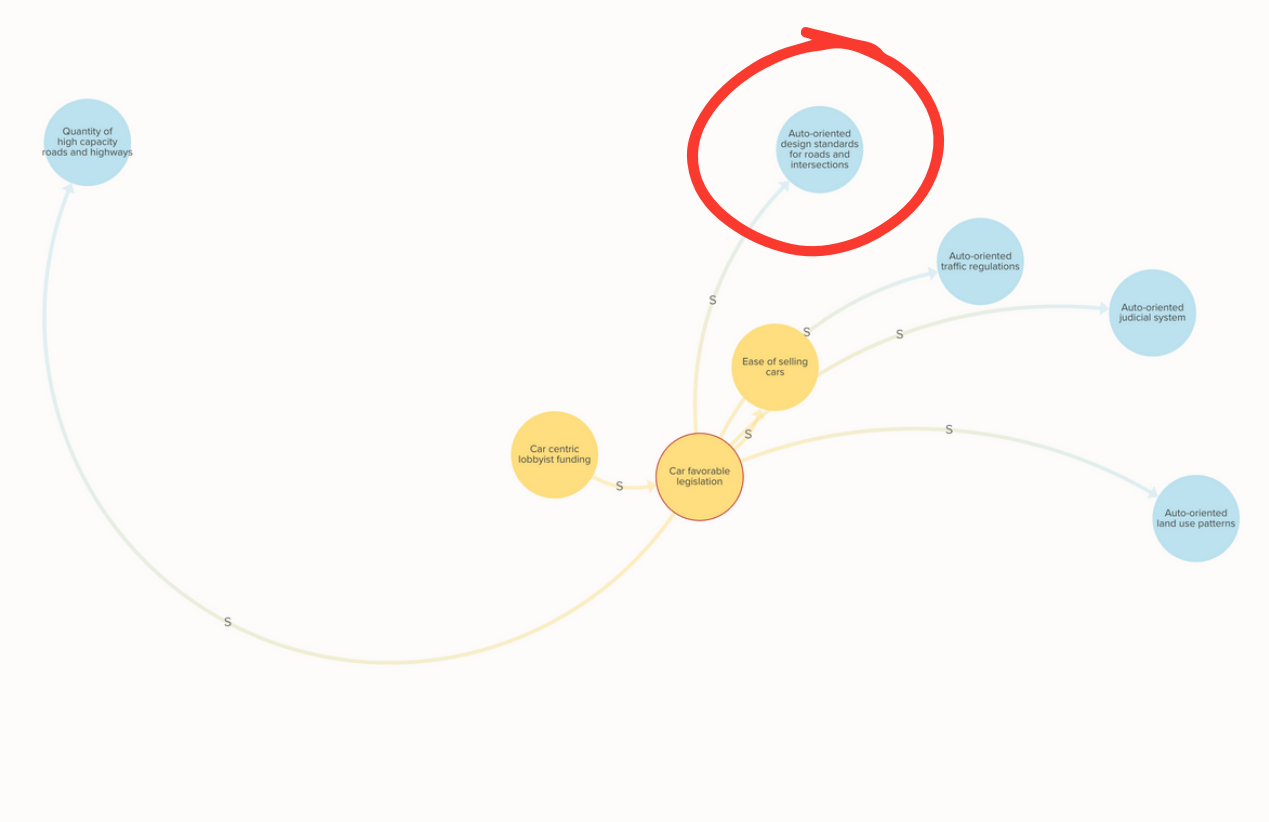
Car Industry

Behaviors resulting in growth of the car industry.

Car industry causing car dependency.



Car Favorable Legislation



Tragedy of the Commons Archetype and Interventions

Car Ownership

CERTIFICATE OF ENTITLEMENT (COE)

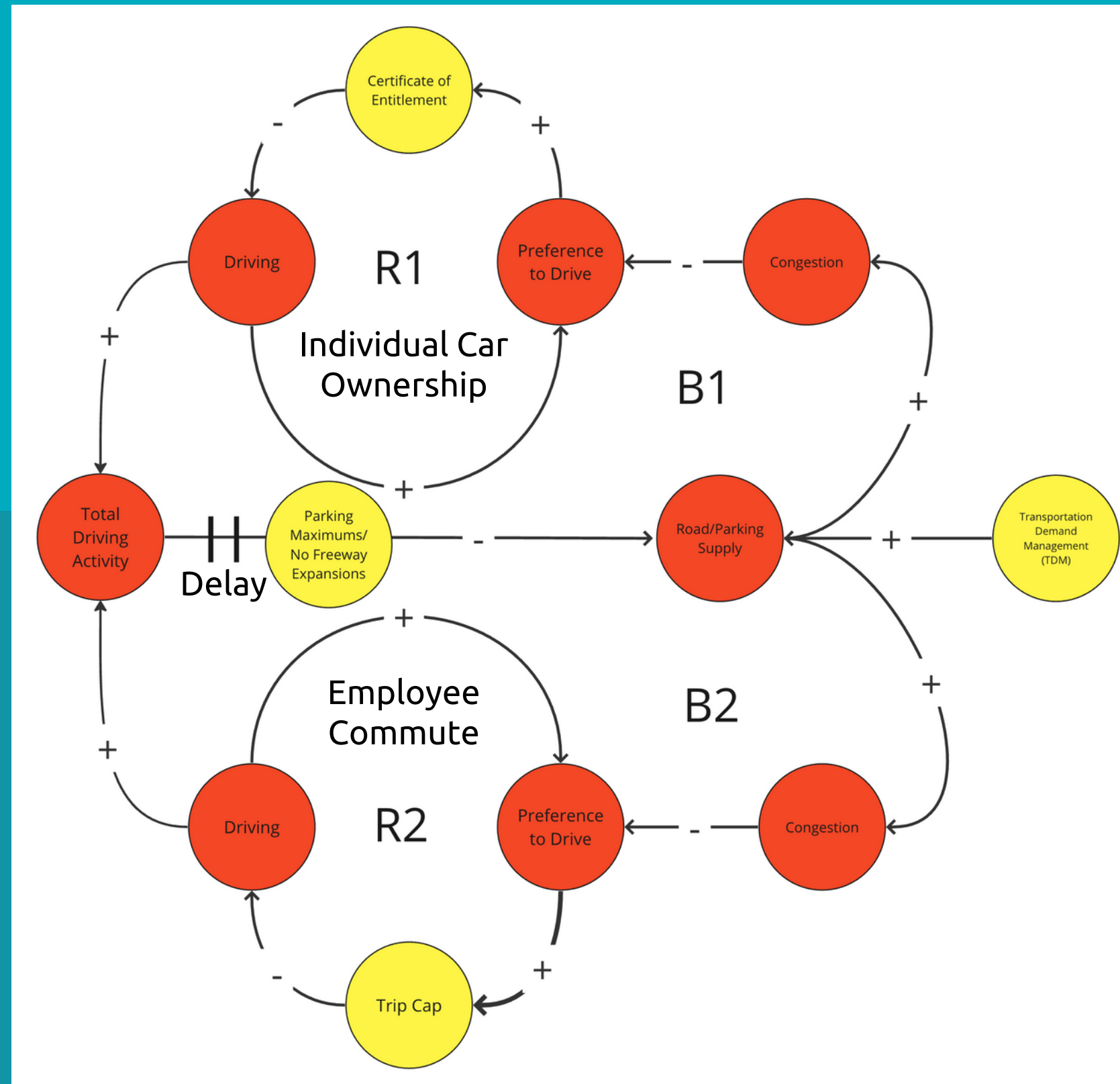
Requirement of a COE that regulates number of vehicles

Car Infrastructure and Cost to Drive

REDUCE / CHARGE

Shorten delay in people feeling congestion by reducing supply with cap on parking and prohibiting lane expansions on freeways.

Alternatively, can also shorten delay by increasing parking fees and lane tolls.



System Capacity

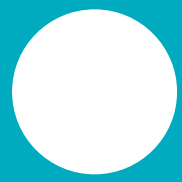
EFFICIENCY

TDM adds capacity to system with shared rides and smaller vehicles

Driving Trips

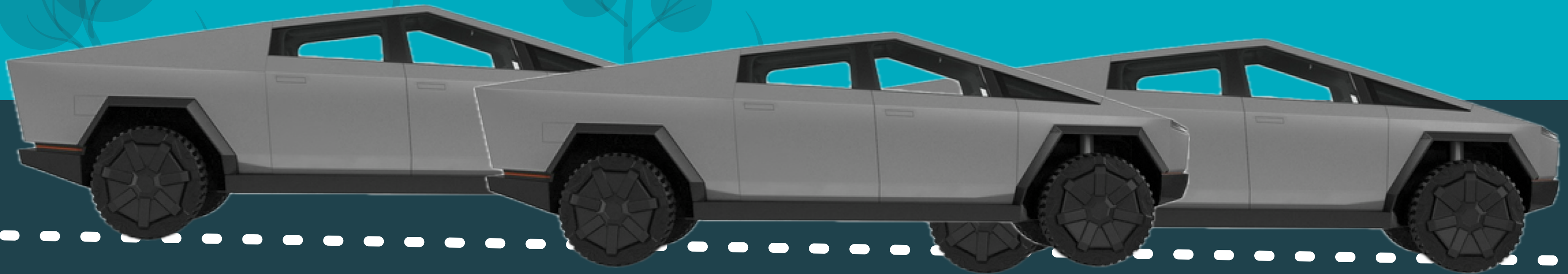
TRIP CAPS

Trip caps are mandated by a city for large employers to regulate the number of trips going to/from a work site during AM and PM peak hours



Conclusion

In the US, cars are being prioritized over people and the environment. This is an **issue** because it impacts safety, land use, pollution, and socioeconomic inequality. By analyzing the relationship between **government, corporate, and populace** stakeholders, and their behaviors impacting the system, our resulting insight is that the **interdependency of the system** is a catalyst to exponential behavior change.



THANKS

Questions?



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