



ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

PROTECTING VULNERABLE ROAD USERS IN THE AGE OF ASSISTED AND AUTOMATED DRIVING BETWEEN CURRENT RULES AND NEW PERSPECTIVES

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FROM THE ERA OF UNREGULATED PRODUCTS IN AN UNREGULATED ENVIRONMENT TO THE ERA OF HIGHLY REGULATED PRODUCTS IN A HIGHLY REGULATED ENVIRONMENT

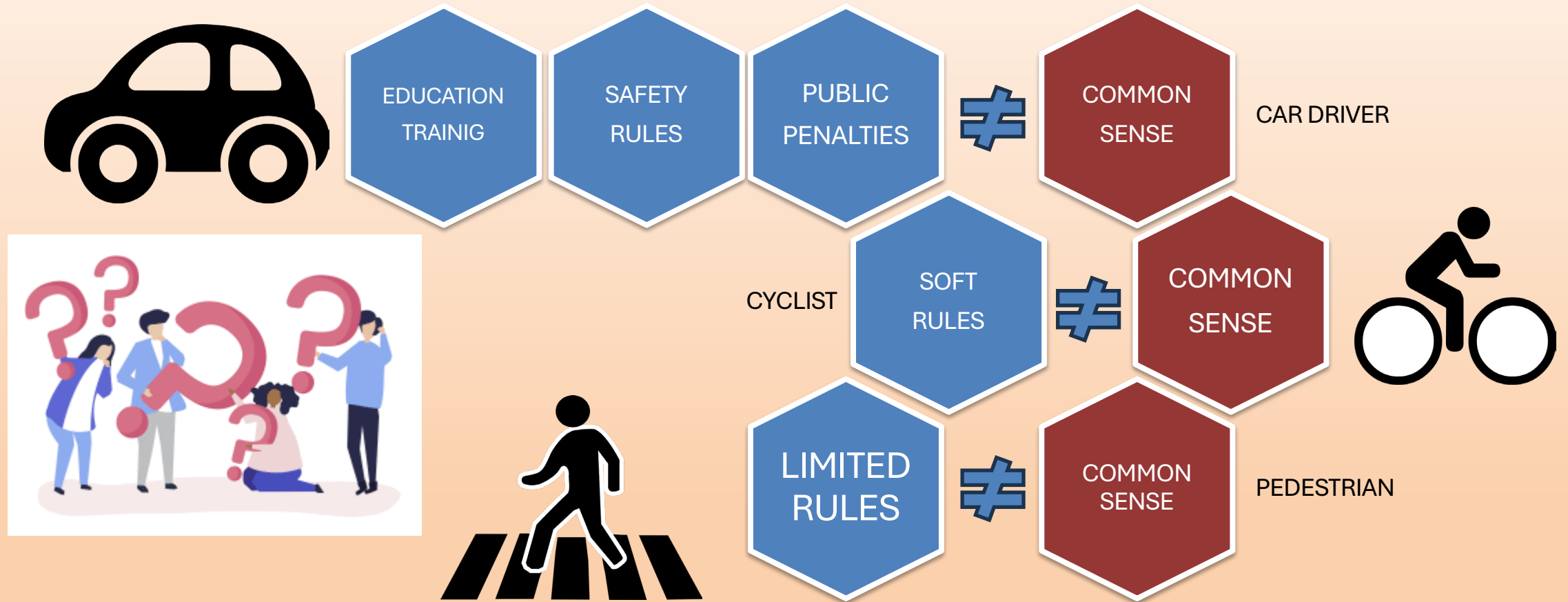
Traffic Laws – State Driving test and License

From the average person's duty of care to compliance with harmonized technical standards



REASONABLE TRAFFIC SAFETY AS A CHAIN OF MANY RINGS

THE FIRST RING: TRAFFIC LAWS (THE PREVENTION OF ACCIDENT)



THIS SYSTEM, ALTHOUGH COMPLEX AND EXPENSIVE, HAS A LOW RATE OF EFFECTIVENESS AND A HIGH LEVEL OF VIOLATION



REASONABLE TRAFFIC SAFETY AS A CHAIN OF MANY RINGS

THE SECOND RING: LIABILITY

(MANAGING THE COST OF ACCIDENTS AND GRANTING COMPENSATION)



STRICT
LIABILITY
RULES

COMPULSORY
LIABILITY
INSURANCE



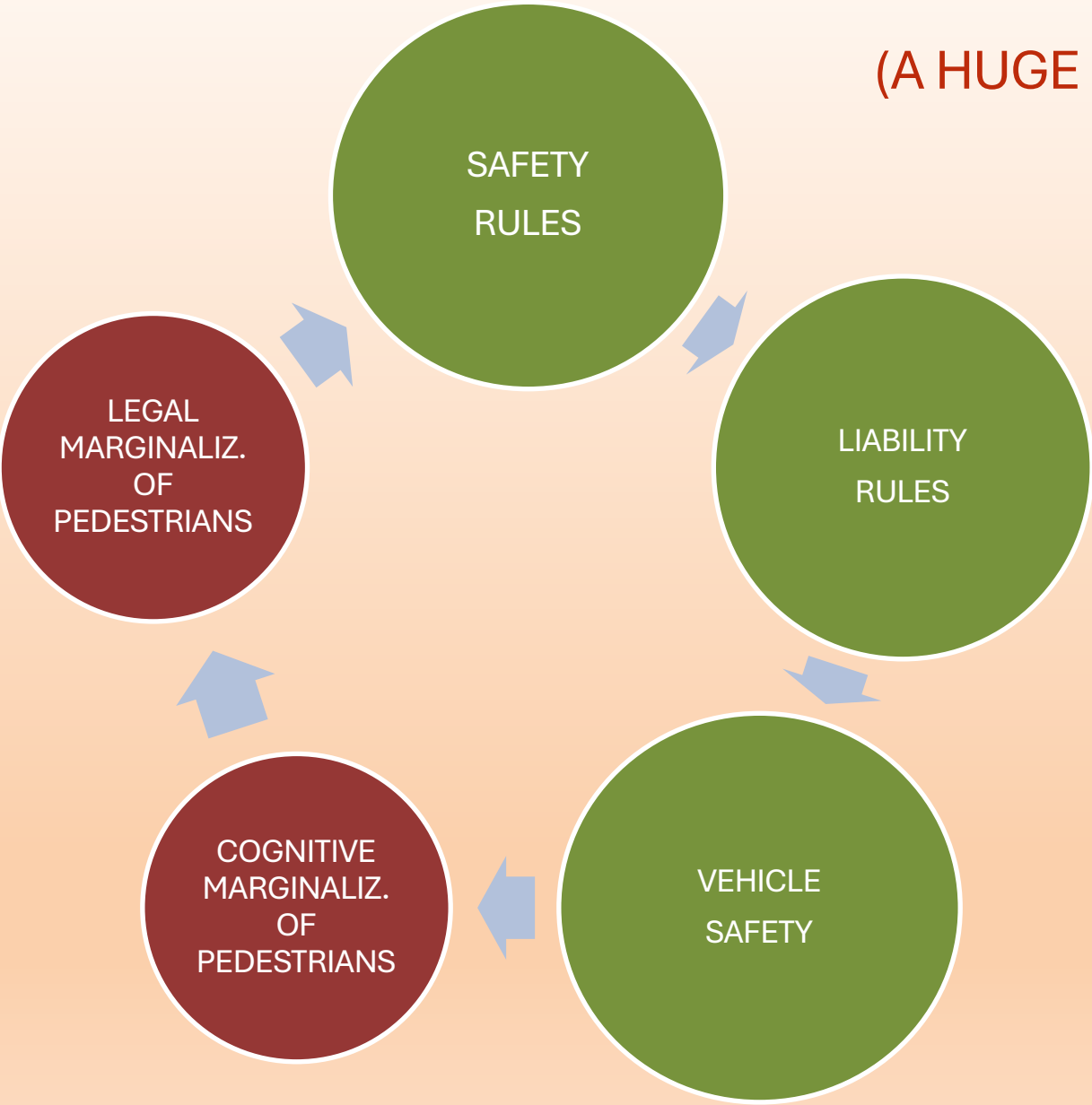
REASONABLE TRAFFIC SAFETY AS A CHAIN OF MANY RINGS

THE THIRD CHAIN: ACTIVE AND PASSIVE VEHICLE SAFETY

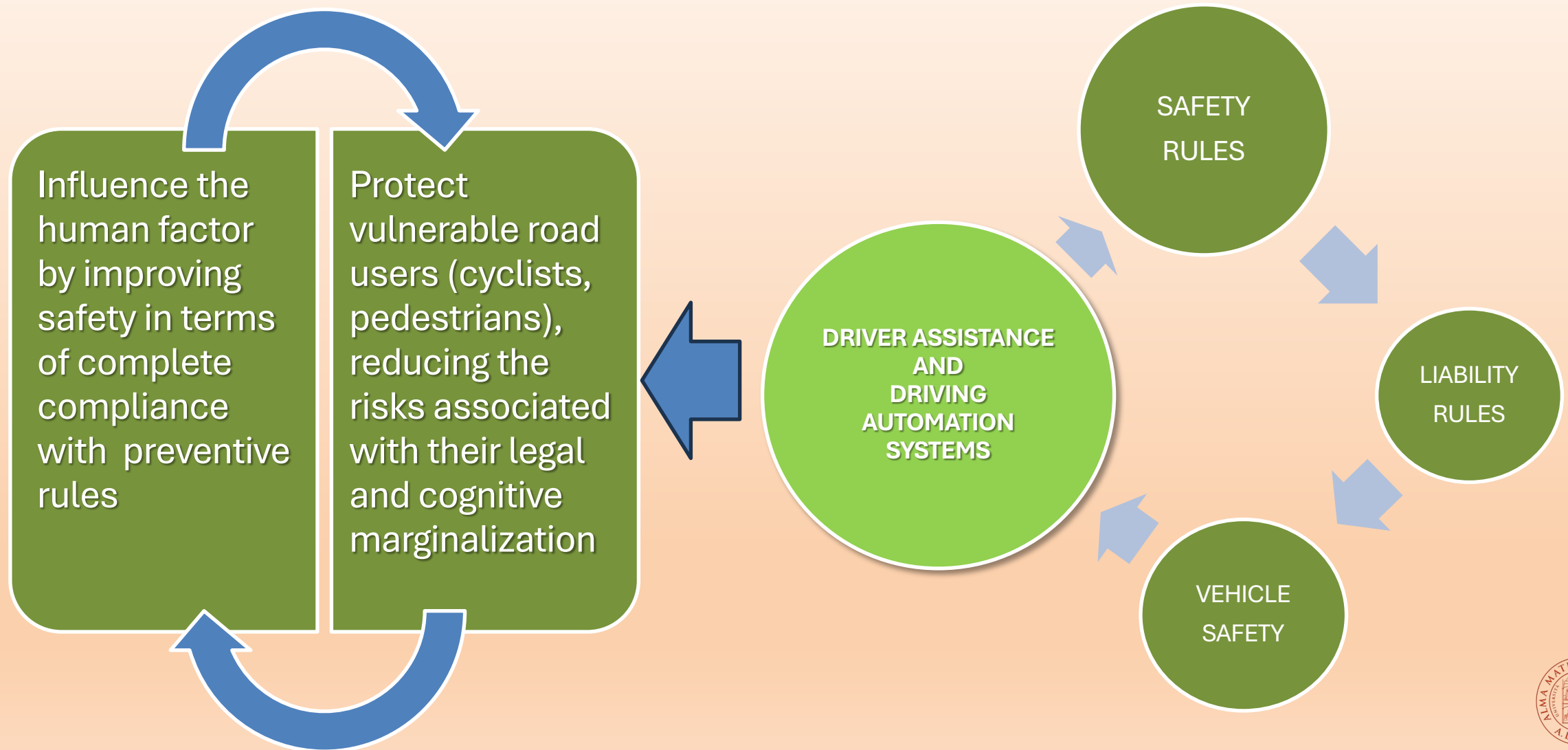
(AVOID ACCIDENTS AND MITIGATE THEIR CONSEQUENCES FOR OCCUPANTS AND THIRD PARTIES, INCLUDING PEDESTRIANS AND CYCLISTS)



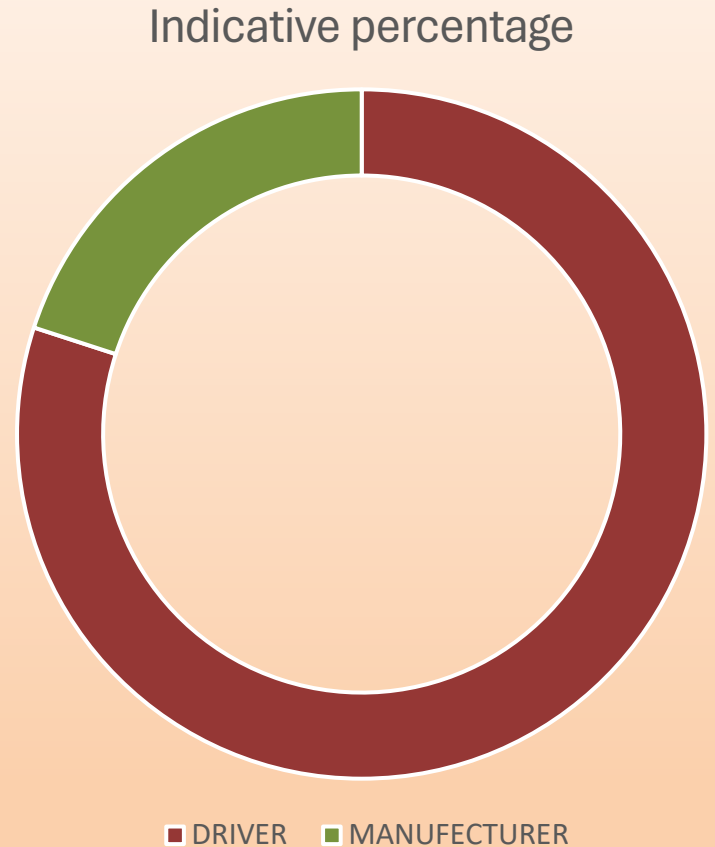
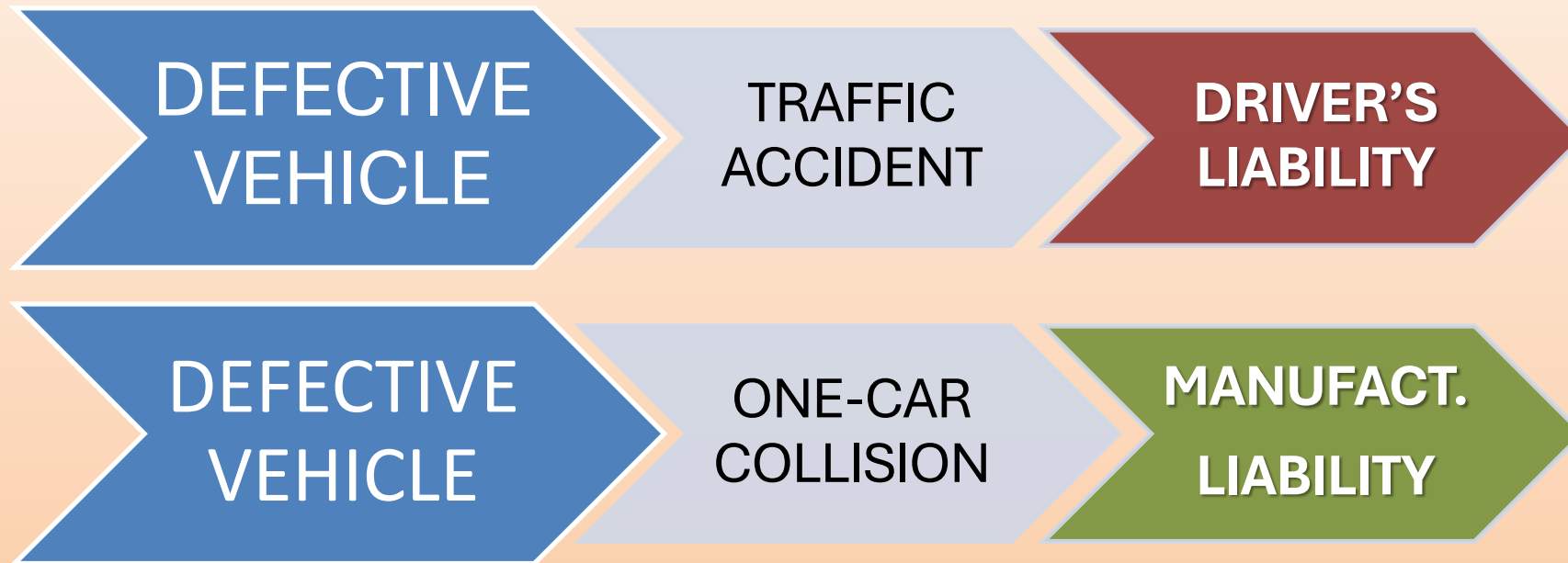
THE CHAIN AS IT IS ...
(A HUGE EFFORT, BUT STILL A FEW WEAK SPOTS)



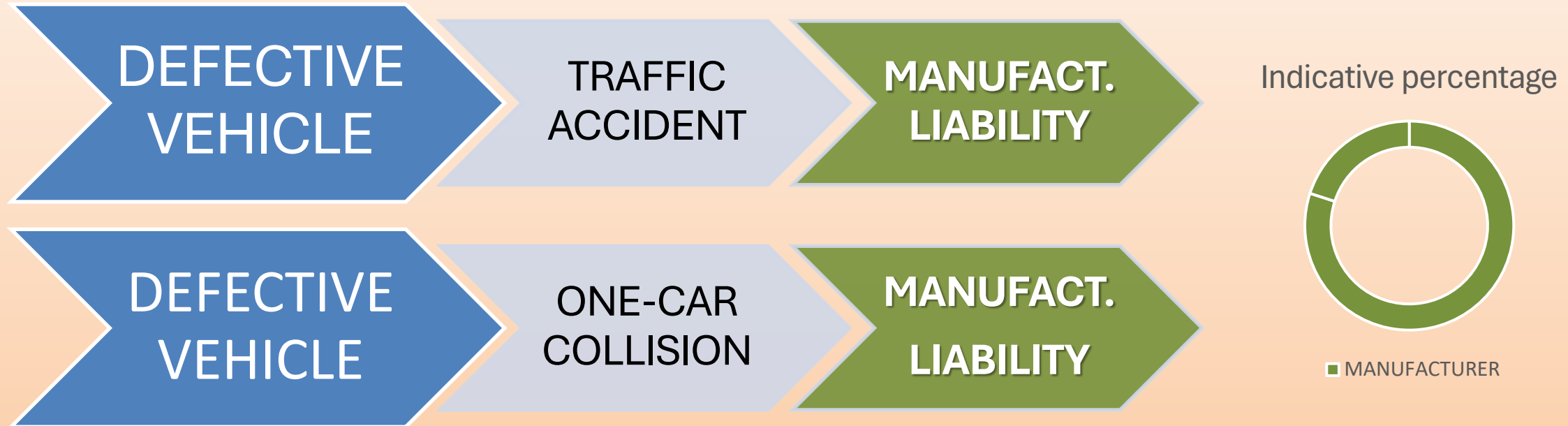
... AND THE CHAIN AS IT COULD BECOME ... (MARGINALIZING THE WEAK SPOTS)



FROM DRIVERS' LIABILITY TO "MARKET ENTERPRISE RESPONSIBILITY" (MER) (THE CURRENT SCENARIO)

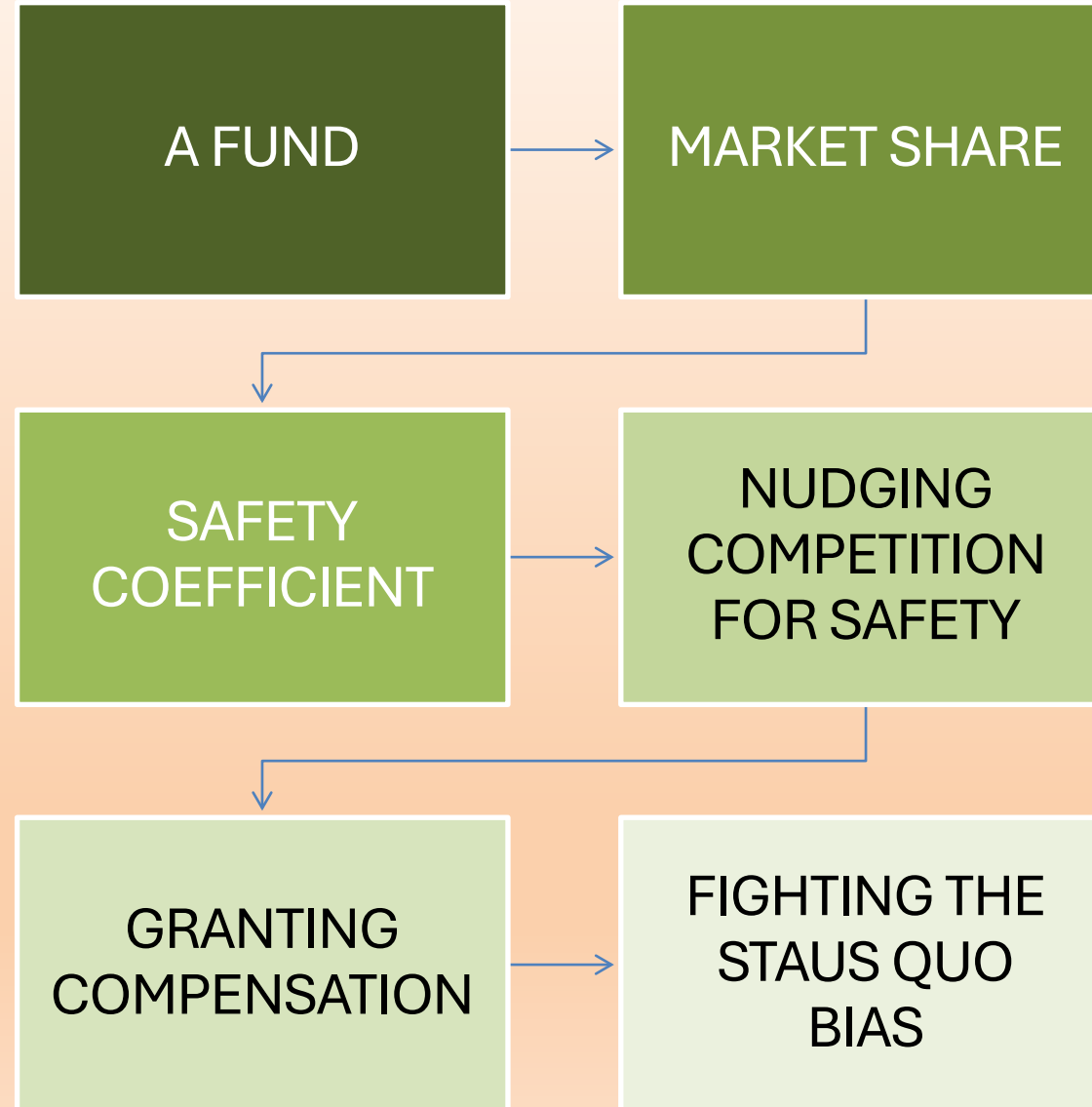


FROM DRIVERS' LIABILITY TO "MARKET ENTERPRISE RESPONSIBILITY" (MER) (WITH DRIVER ASSISTANCE AND DRIVING AUTOMATION SYSTEMS)



HOW CAN THE LEGAL SYSTEM BOTH TAKE NOTE OF THE **IMPOSSIBILITY OF TRACING** AN ACTUAL DEFECT AND **GUARANTEE FULL PROTECTION** AND AFFORDABILITY TO THOSE INJURED IN THE SMALL PERCENTAGE OF ACCIDENTS CAUSED BY A MALFUNCTIONING OF AUTOMATED GUIDED VEHICLES ?

FROM DRIVERS' LIABILITY TO "MARKET ENTERPRISE RESPONSIBILITY" (MER) (A LAW & ECONOMICS APPROACH)



FROM DRIVERS' LIABILITY TO "MARKET ENTERPRISE RESPONSIBILITY" (MER) (MER IN DETAIL)

MER MAY BE THE ANSWER:

- ✓ CREATE A FUND THROUGH CONTRIBUTIONS FROM ALL AUTOMATED VEHICLES MANUFACTURERS
- ✓ EACH MANUFACTURER PAYS A SUM PROPORTIONAL TO (A) THE **NUMBER OF VEHICLES SOLD** AND (B) THE AMOUNT OF RISK INTRODUCED INTO SOCIETY
- ✓ IN FACT, A **SAFETY COEFFICIENT** IS APPLIED: A MEASUREMENT OF THE VEHICLE'S ABILITY TO AVOID ACCIDENTS AND TO PROTECT ITS OCCUPANTS
- ✓ THUS, THE MANUFACTURER CAN REDUCE THE SUM PAID, BY INVESTING IN ACTIVE AND PASSIVE SAFETY, WITHOUT LIMITING THE NUMBER OF VEHICLES SOLD
- ✓ TO SUM UP: THE AMOUNT PAID TO FEED THE FUND WILL BE **DIRECTLY PROPORTIONAL** TO THE NUMBER OF VEHICLES SOLD AND INVERSELY PROPORTIONAL TO THEIR SAFETY COEFFICIENT
- ✓ THIS NEW SYSTEM OF COMPENSATING THE INJURED PARTY WILL ALSO HAVE A POSITIVE EFFECT IN TERMS OF **GAINING THE TRUST** OF THE CONSUMER, WHO, HISTORICALLY, IS CONSTANTLY AFFECTED BY THE *STATUS QUO* BIAS, I.E. THE TENDENCY NOT TO TRUST PARTICULARLY INNOVATIVE PRODUCTS, ESPECIALLY WHEN THEY AFFECT VITAL ASPECTS OF HIS OR HER EXISTENCE



ASSISTED DRIVING, AUTOMATED DRIVING AND THE RISK OF INCREASING A COGNITIVE MISMATCH BETWEEN CAR DRIVERS AND PEDESTRIANS

New legal instrument on the use of automated vehicles in traffic (“LIAV GE”)

- **NEED TO INCREASE CONSUMER AWARENESS** AND UNDERSTANDING OF AUTOMATED VEHICLES, INCLUDING THE ACCURATE DEPICTION OF THE CAPABILITIES AND LIMITATIONS OF AUTOMATION IN VEHICLE MARKETING;
- **HUMAN CENTERED DESIGN** OF THE VEHICLE AND ITS INTERFACES INCLUDING INTUITIVENESS, DESIGNS BASED ON PROPER ASSESSMENTS OF HUMAN NEEDS AND LIMITATIONS, ETC.; AND,
- **FOSTERING SAFE INTERACTIONS** WITH OTHER ROAD USERS (INCLUDING HUMAN-OPERATED VEHICLES AND VULNERABLE ROAD USERS SUCH AS PEDESTRIANS, CYCLISTS ETC.)



ASSISTED DRIVING, AUTOMATED DRIVING AND THE RISK OF INCREASING A COGNITIVE MISMATCH BETWEEN CAR DRIVERS AND PEDESTRIANS

New legal instrument on the use of automated vehicles in traffic (“LIAV GE”)

The system was born with a lack of effectiveness for the driver and a marginalization of pedestrians. In the future, the efficiency of the driving system will be improved by driving automation assistance mechanisms, but we need to focus on the human factor of the pedestrian **in three directions**

1. MAKE **ROAD SAFETY EDUCATION** TRULY PART OF THE (CONTINUOUS) EDUCATION SYSTEM
2. **NUDGING** THE INDUSTRY, USING THE **LEVERAGE OF ESG-LIKE FACTORS** TO ACHIEVE PERSONAL SAFETY AND SUSTAINABLE CITIES (e.g. car manufacturers will communicate to their users which car is the best for pedestrians’ protection, and tell the pedestrians how to behave to exploit the safety mechanisms designed for their protection, creating a virtuous circle)
3. USE THE **MER** AS A **LEVER** TO CREATE AN INCENTIVE FOR MANUFACTURERS TO MAKE CARS WITH A **HIGH SAFETY COEFFICIENT** FOR PEDESTRIANS AND THEREFORE WITH LOWER LIABILITY-INSURANCE COSTS





THANK YOU !

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