



2023 Spring Conference at Rocky Gap Resort
Flintstone, Maryland

Beyond Engineering – Working Together to Save Lives

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May 11, 2023

BIOGRAPHY

- Director of MDOT/MVA Highway Safety Office
- 29+ years at the University of Maryland Baltimore – research analyst/epidemiologist
- PhD, Epidemiology



ABSTRACT

Beyond Engineering – Working Together to Save Lives

Maryland uses a multi-disciplinary approach to crash prevention and severity mitigation, including strategies that address roadway design, driving behaviors, technology, and policies by working with our wide network of partners across the State. Partners who carry out this work include, but are not limited to, academic institutions and staff, agricultural professionals, engineers, first responders, government officials, law enforcement, policymakers, public health professionals, and traffic planners. This presentation will provide information on the current state of highway safety in Maryland and discuss opportunities for collaboration that will reduce motor vehicle fatalities across the State.



**2023 Spring Conference at Rocky Gap Resort
Flintstone, Maryland**

Beyond Engineering – Working Together to Save Lives



Maryland
Highway
Safety
Office

May 11, 2023

**ZERO DEATHS
MARYLAND**





ZERO DEATHS
MARYLAND



DRIVECAM.



+0.0



+0.0

Frame Time
-8.00

Event Recorder
ER000B47

Date
7/6/2009

Time
11:05:15 PM EST





Technical data sidebar with a decorative graphic on the right. The graphic features stylized, overlapping shapes in red, white, and yellow.

Frame Time
-8.00

Event Recorder
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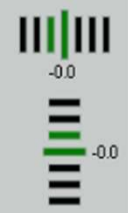
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11/4/2008

Time
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ZERO DEATHS
MARYLAND

DRIVECAM



Frame Time
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Event Recorder
ER90370E
Date
6/29/2009
Time
9:56:07 PM EST





Technical data sidebar:

- Scale: A vertical scale with a green bar at the top and a red bar at the bottom, with a green bar in the middle. The top is labeled '+0.0' and the bottom is labeled '-0.0'.
- Frame Time: -8.00
- Event Recorder: ER00DD16
- Date: 6/26/2009
- Time: 3:00:58 PM EST



THE MHSO'S MISSION

The MDOT MVA Maryland Highway Safety Office is dedicated to saving lives and preventing injuries by reducing motor vehicle crashes through the administration of a comprehensive network of traffic safety programs.



OUR CURRENT REALITY

Traffic fatalities are a public health crisis affecting all road users.

1.25M

Lives lost globally each year from traffic crashes

Source: World Resources Institute

42,915

Lives lost on US roads in 2021

Source: NHTSA

7,485

Pedestrians killed in US traffic crashes in 2021

Source: NHTSA

THE STATE OF SAFETY IN THE STATES

- 42,915 fatalities in 2021 – 10 percent increase from 2020
- 1 death = 114 serious injuries (NHTSA 2022)
- Trends are heading in the wrong way for:
 - Users of urban roads
 - Drivers 65 and older
 - Pedestrians
 - Bicyclists
 - Motorcyclists
 - American Indian/Alaska Native people
 - Black/African American people
 - Hispanic/Latinx people (NHTSA, Sept 2022)

ONE WEEK IN MARYLAND



10
FATALITIES

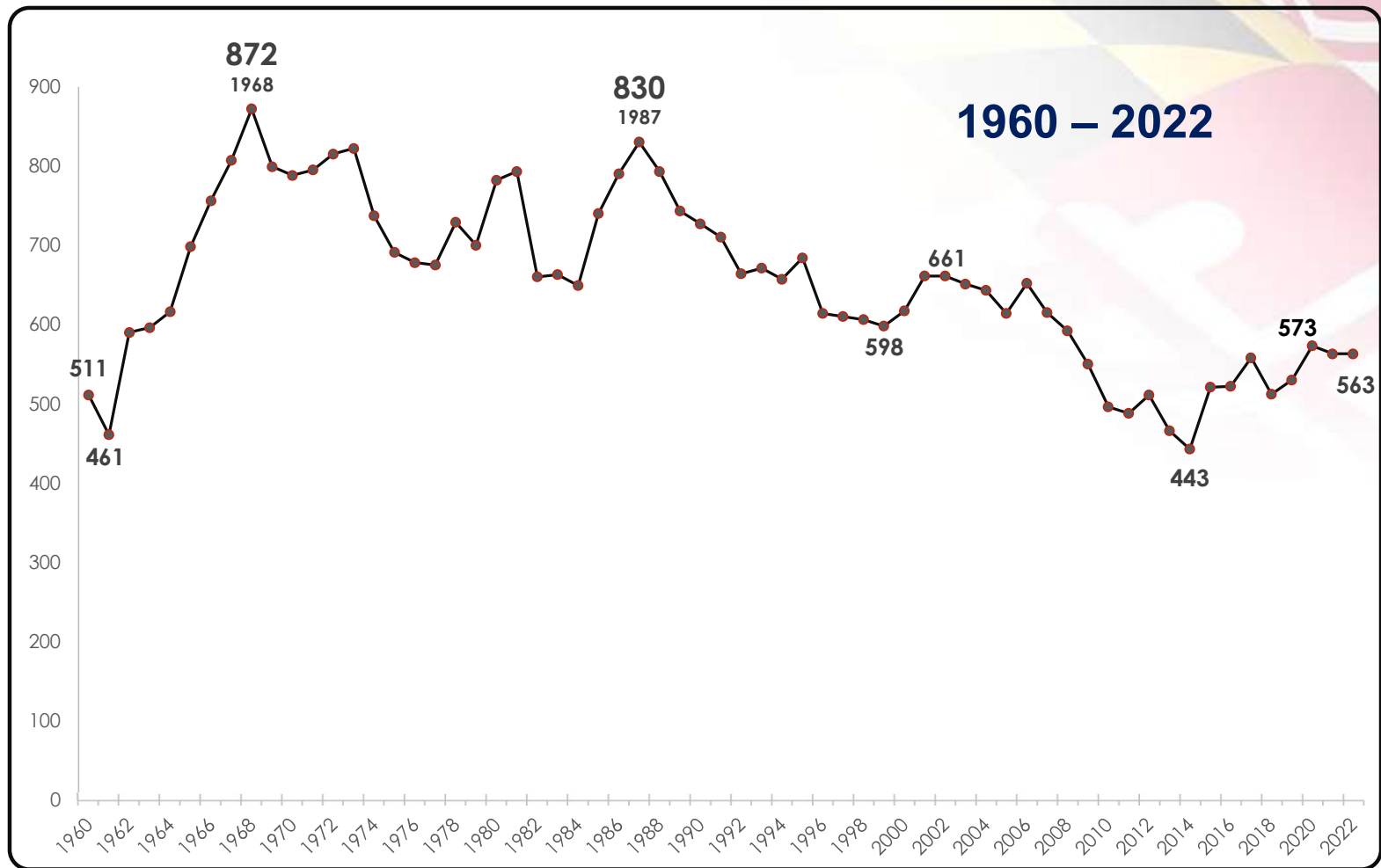
60
SERIOUS
INJURIES

2,229
POLICE-REPORTED
CRASHES



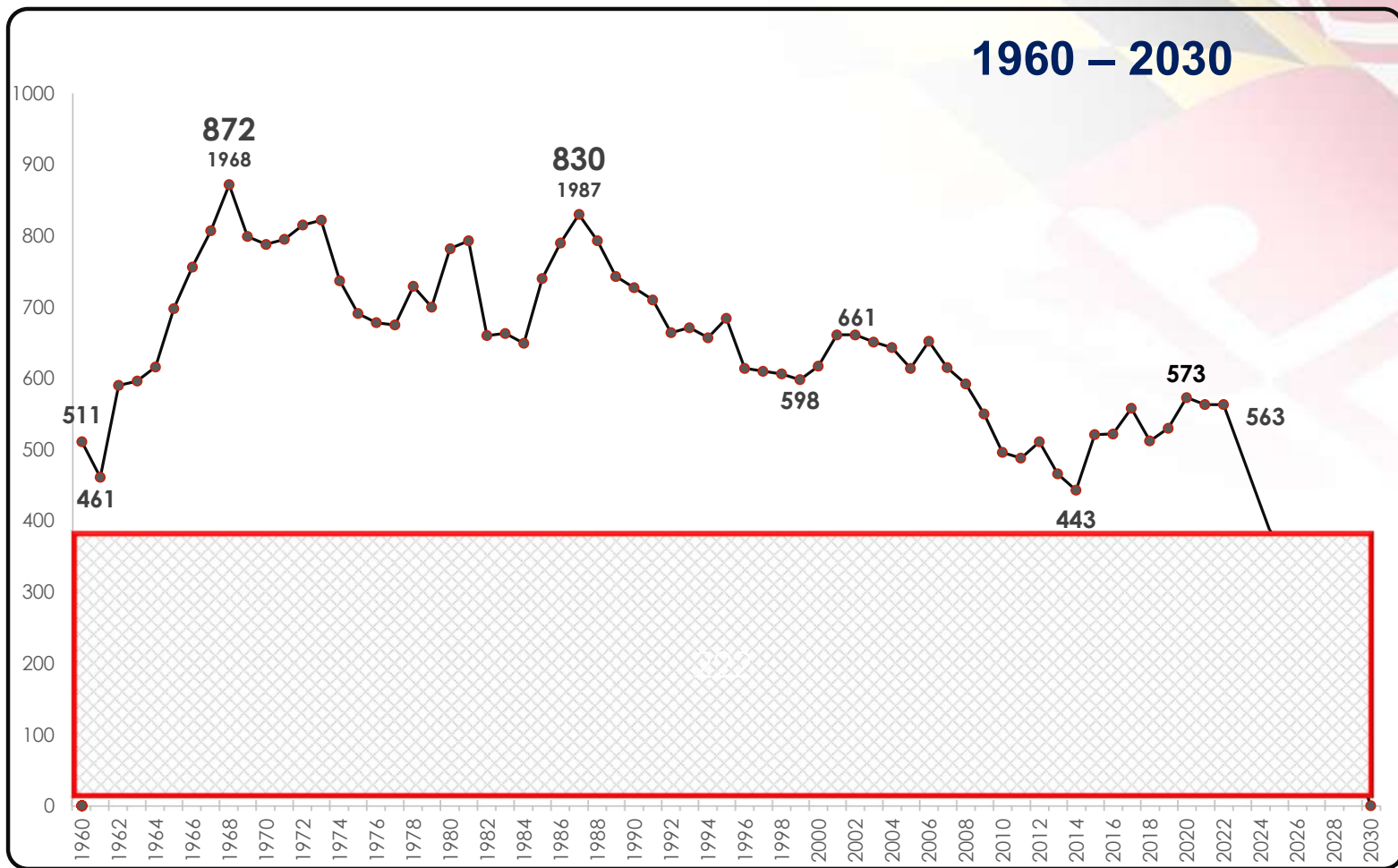
**ZERO DEATHS
MARYLAND**

HISTORICAL TRENDS: TRAFFIC FATALITIES ON MD ROADS



**ZERO DEATHS
MARYLAND**

HISTORICAL TRENDS: TRAFFIC FATALITIES ON MD ROADS



WHAT'S BEHIND THE INCREASE?

Risky driving behaviors

- Speeding
- Impaired driving
- Restraint use
- Distraction

Roads designed for speed

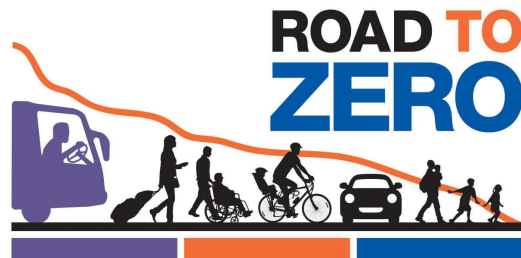
Lowered enforcement

- Pandemic
- News reports
- Pause in HVE programs



GHSA, NHTSA, IIHS

Collaborative Efforts



Collaborative Efforts

VISION

TARGET

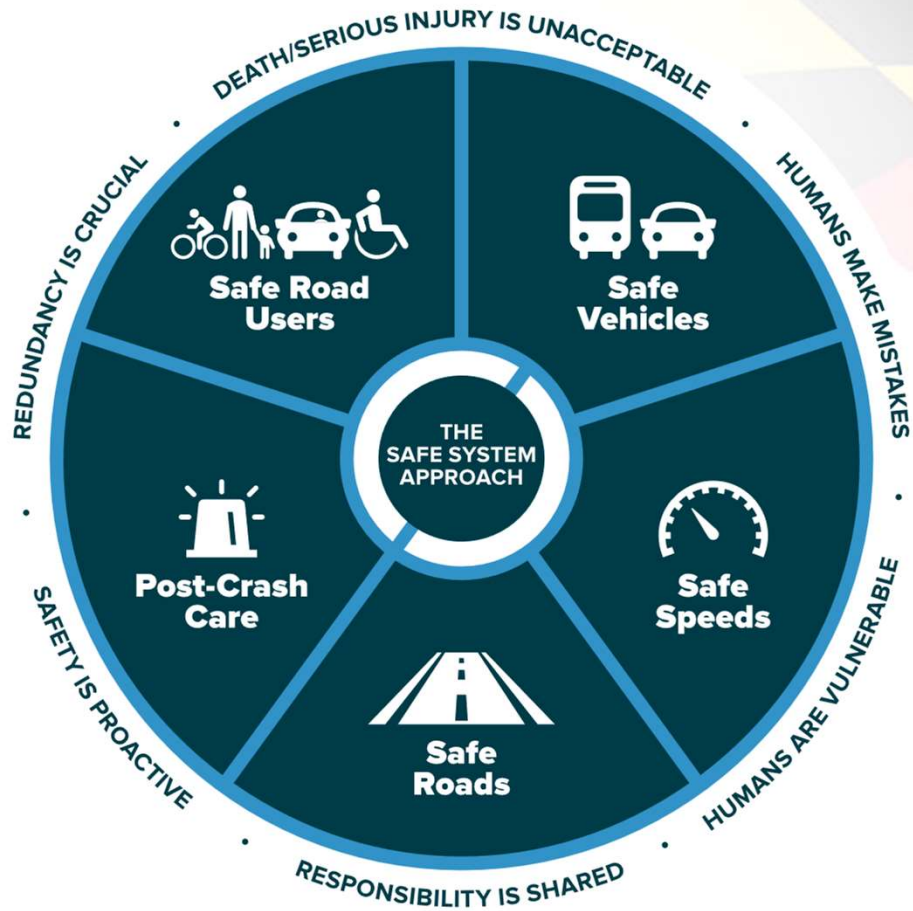
ZERO IS OUR GOAL

A SAFE SYSTEM IS HOW WE GET THERE

Deaths™

National Strategy on Highway Safety

**THE SAFE
SYSTEM
APPROACH**



**THE 6 SAFE
SYSTEM
PRINCIPLES**



Death/Serious Injury is Unacceptable

Redundancy is Crucial

Safety is Proactive

Responsibility is Shared

Humans are Vulnerable

Humans Make Mistakes

THE 5 SAFE SYSTEM OBJECTIVES



Safe Roads: Determine ways to make roads safe for all users

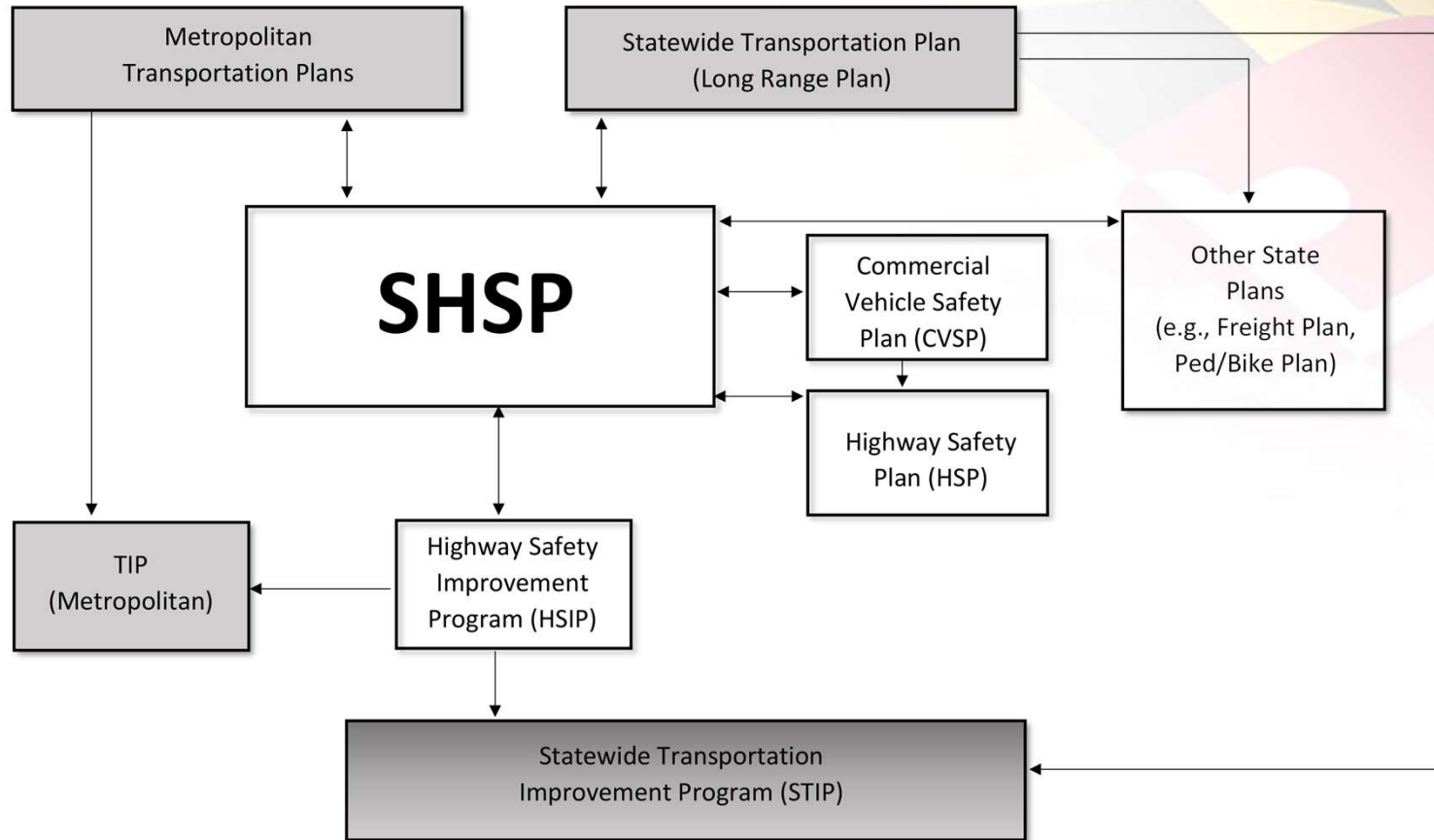
Safe Road Users: Ensure everyone is using the system correctly

Safe Speeds: Match speeds with road context

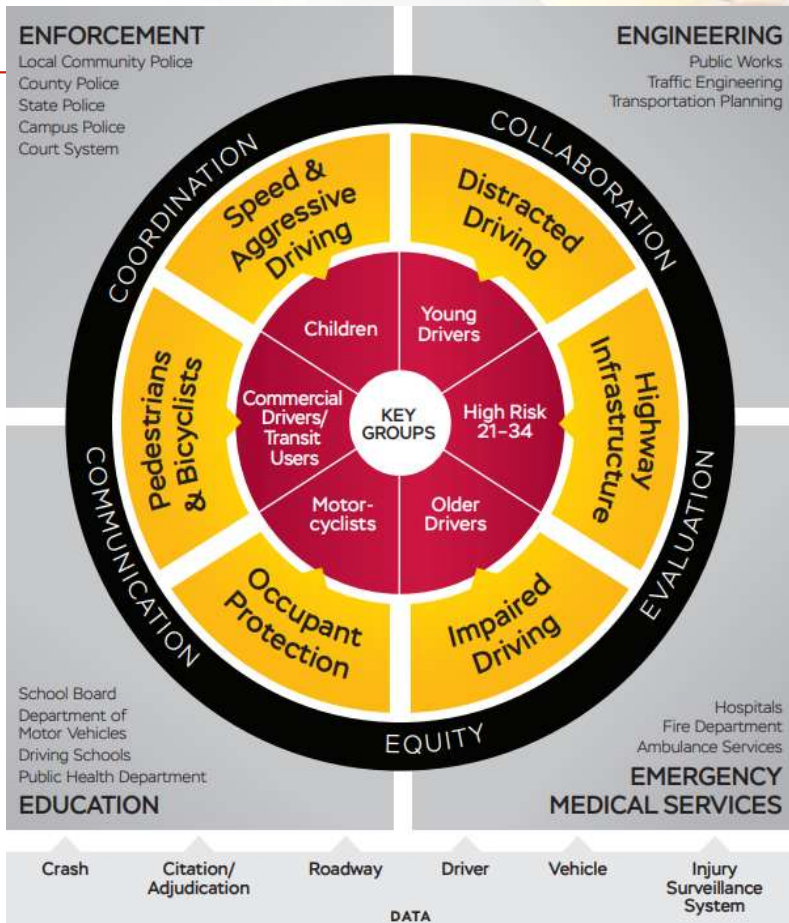
Safe Vehicles: Understand how innovation can enhance transportation safety

Safe Post-Crash Care: Ensure emergency response can get to and from a crash site quickly and data are shared

Coordinated Transportation Safety Planning



STRATEGIC HIGHWAY SAFETY PLAN



ZERO DEATHS
MARYLAND

AUTOMATED VEHICLES

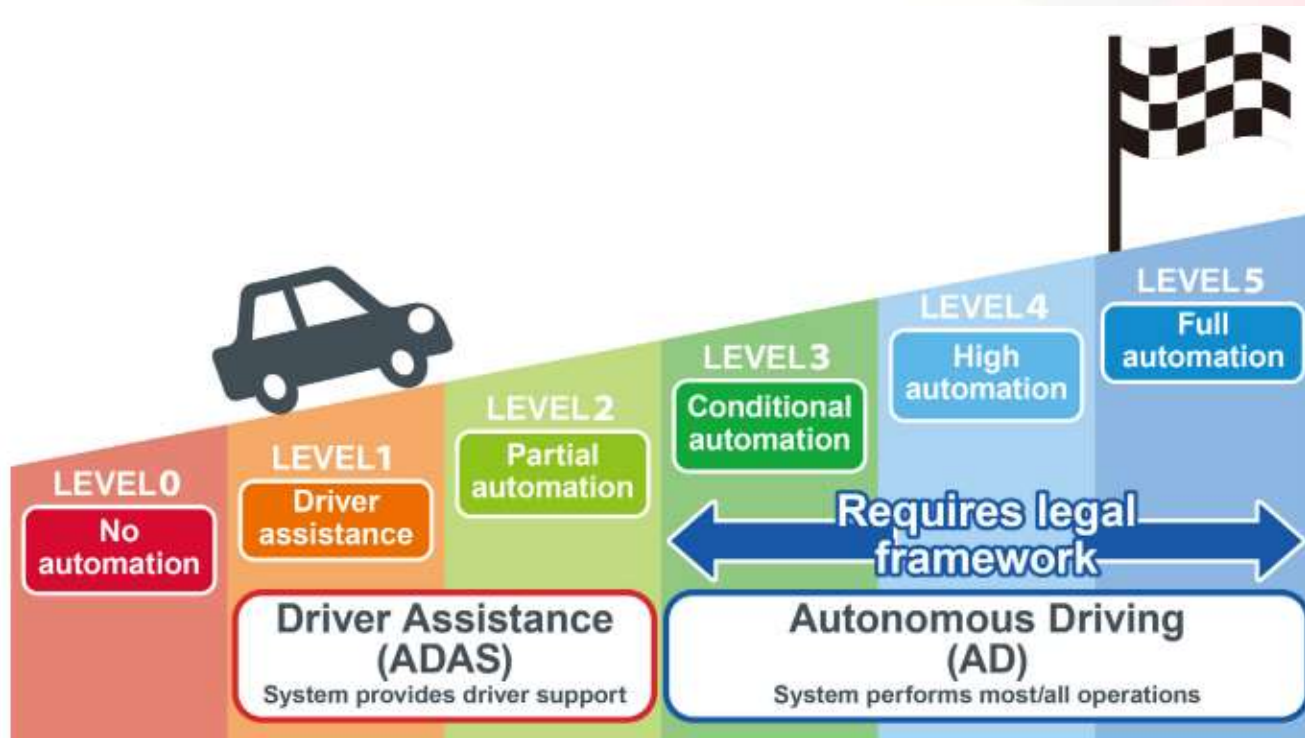
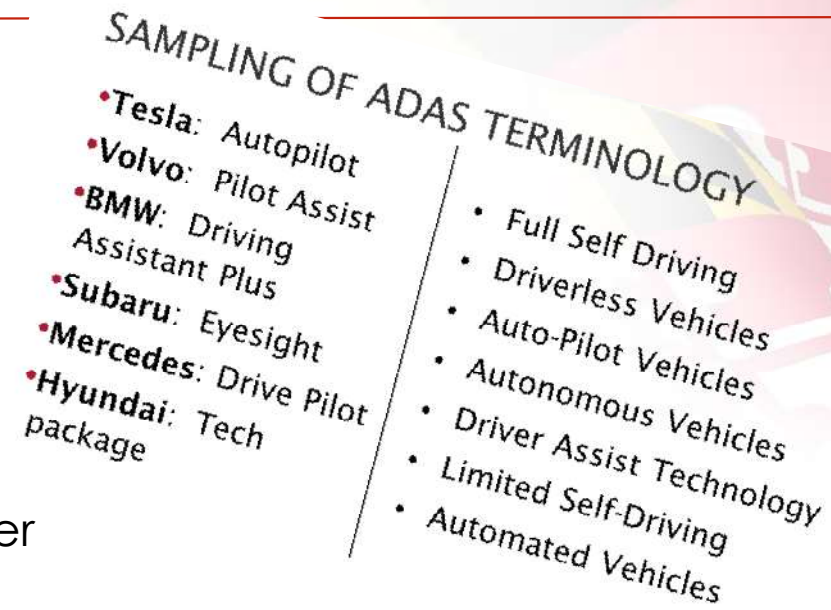


Image source: www.rohm.com/blog/-/blog/id/8030373

WORDS MATTER

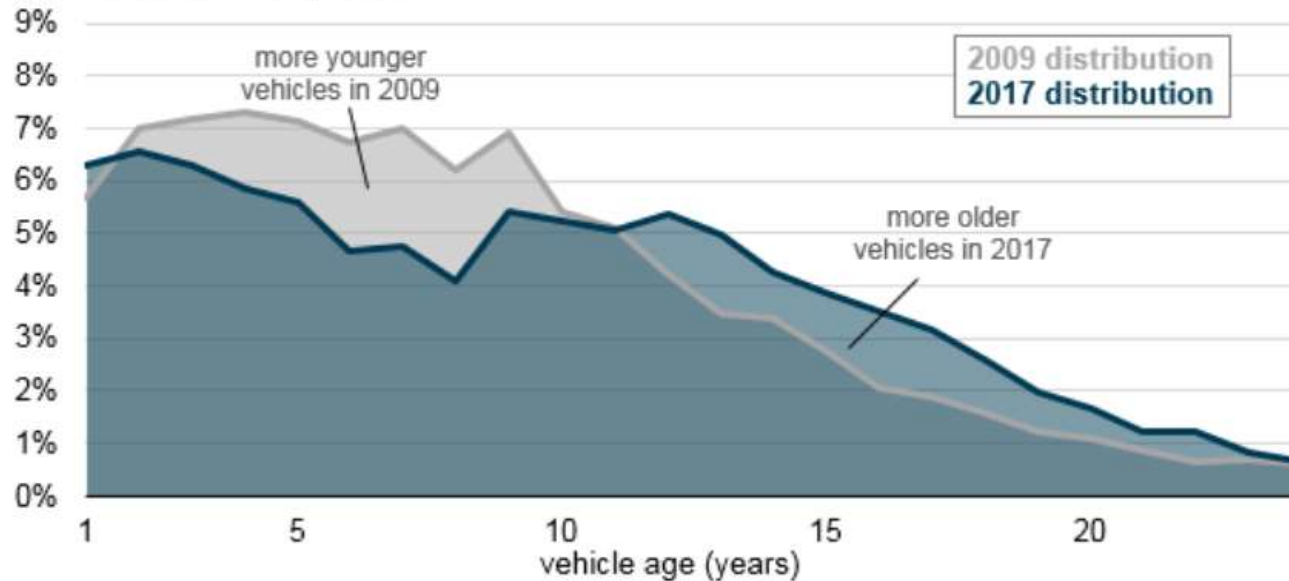
- Safety features **different** brand names **among OEMs**
- Phrasing may lead to **over-reliance**
- Not always clear to driver when systems **disengaged/disabled**



“ADAS” = Advanced Driver Assistance Systems

TURNING OVER THE FLEET

U.S. household vehicle age distribution (2009 and 2017)
percent of household vehicles



Source: U.S. Department of Transportation, Federal Highway Administration, [National Household Travel Survey](#)

COMING SOON



SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
25	26	27	28	29	30	1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31	1	2	3	4	5

Holidays and Observances: 4: Independence Day

Handmade
CENT MARYLAND

NHTSA PREVALENCE STUDY

- Alcohol #1 Cannabis #2
- Half of drivers tested for more than one category of drug
- Alcohol most often detected alone
- Cannabis usually detected with at least one other drug

CANNABIS LEGALIZATION

- Retail sales = 4% increase in collision claims (HLDI 2020)
 - CO, NV, OR, WA vs surrounding states
- Legalization and retail sales associated with a 6% increase in injury crash rates (Farmer, et al., 2021)



**ZERO DEATHS
MARYLAND**

CANNABIS + ALCOHOL

- Increased reaction time and decreased lateral control of the vehicle vs alcohol or cannabis alone (Simmons et al. 2022)
- Young adults reported higher levels of sensation seeking and heavier alcohol use, compared with alcohol alone (Linden-Carmichael et al., 2019)

Sensation seeking.

These include :

- Impulsiveness
- Trying out new things
- Engaging in anti social behavior
- Taking risks

PREDICTORS OF INJURIES AND FATALITIES

SE/environment

- Median household income ↑
- Percent population 65+ ↑
- Average visibility (miles) ↓

~36%

Exposure

- VMT ↑
- Percent rural VMT ↑
- Percent who bike/walk to work ↑

~58%

Enforcement

- Speeding ↓
- Impaired ↓
- Distracted ↓
- Safety Equipment ↓
- Red light citations ↑

~6%

↑ : significant positive correlation
An increase will increase occupant injuries & fatalities

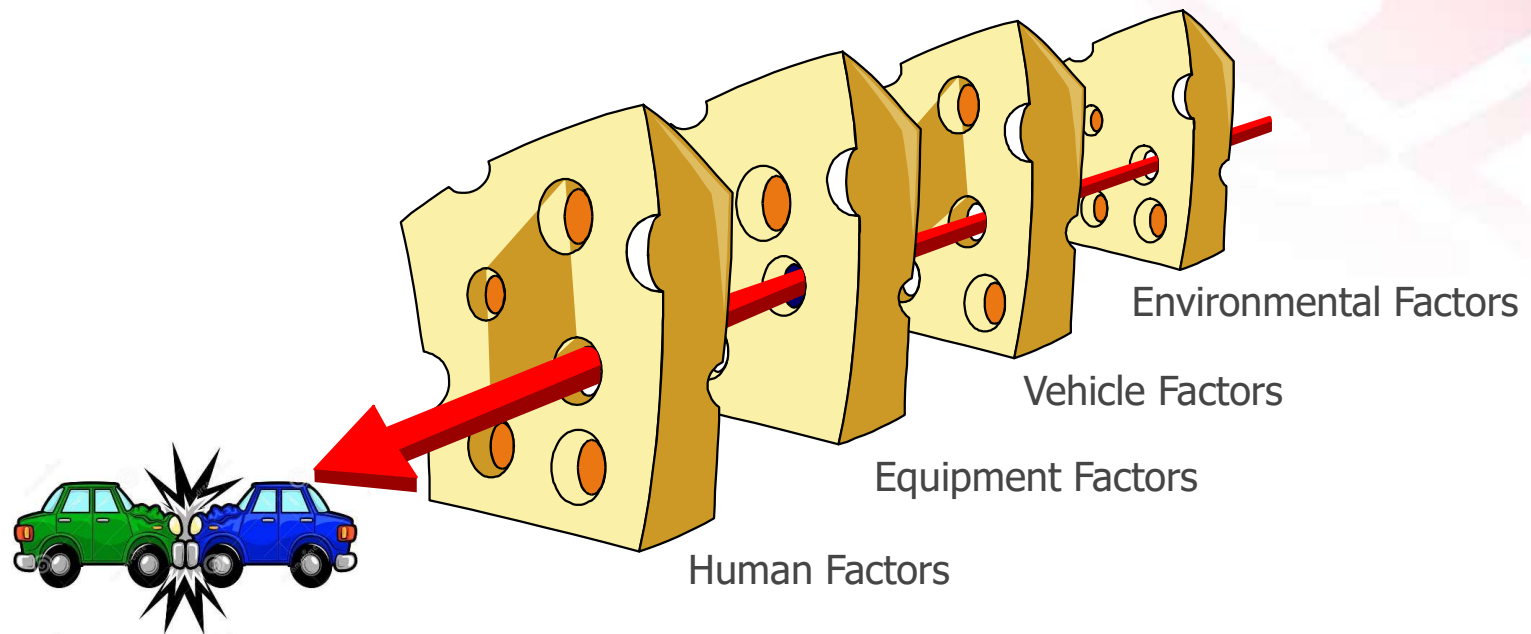
↓ : significant negative correlation
An increase will reduce occupant injuries & fatalities

Prepared for the
Maryland Highway Safety Office
by H. Liu

CRASH CORE

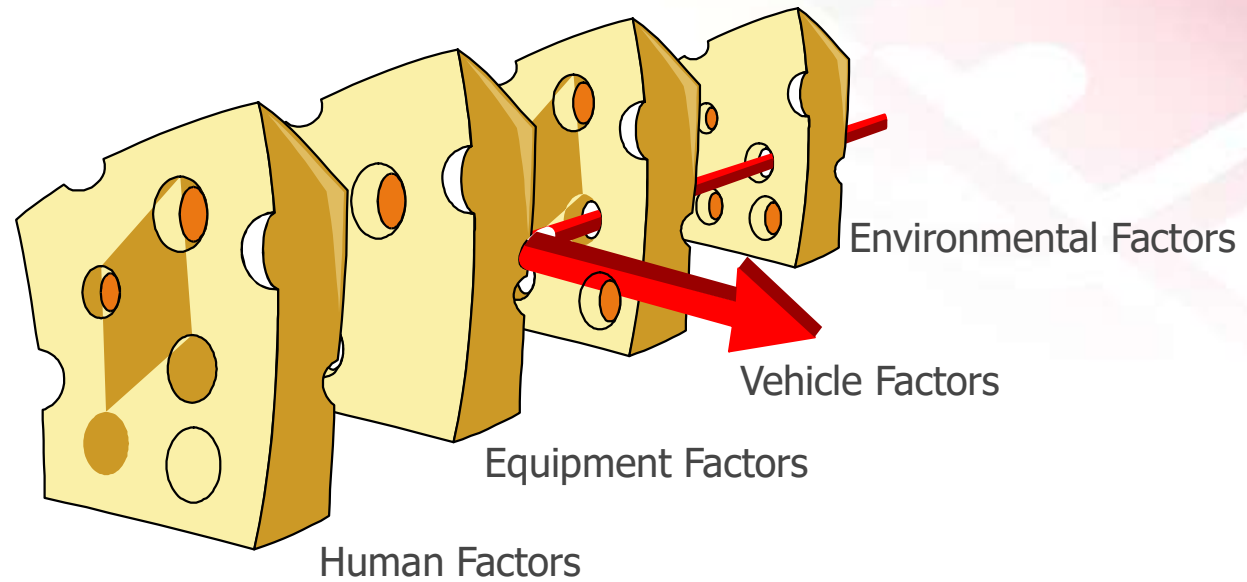
**ZERO DEATHS
MARYLAND**

CUMULATIVE ACT EFFECT



Reason's "Swiss cheese" model of causation

CUMULATIVE ACT EFFECT



Successive layers of defences, barriers and safeguards



be the
focused
driver



be the
share
the road
driver



be the
make a plan
driver



be the
buckled up
driver

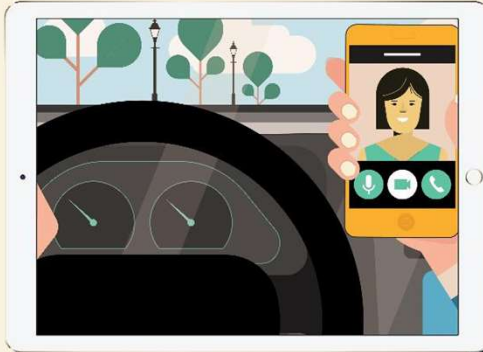


be the
slow down
driver



be the
look twice
driver





VIDEO



put your phone down while driving



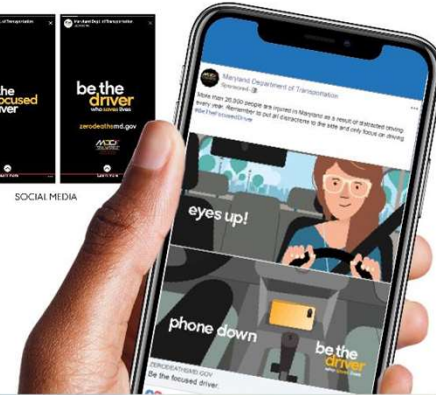
OUT-OF-HOME



SOCIAL MEDIA



STREAMING AUDIO



DISTRACTED DRIVING CAMPAIGN

the focused driver

Principal takeaway message:
Put your phone down while driving. Holding your phone while driving is against the law.





**what
to do**
during a roadside
emergency



every situation is different

› prepare › assess › use good judgment › stay vigilant

IF THERE IS NOT AN IMMEDIATE EMERGENCY

› Do everything you can to get your vehicle off the highway

IF YOU ARE ABLE TO REMAIN IN YOUR VEHICLE

› Remain buckled and facing forward

IF YOU ARE UNABLE TO REMAIN IN YOUR VEHICLE

› Do not stand near the vehicle

› Move to higher ground, or behind a guardrail/embankment

If you need help, contact roadside assistance. If you're on an interstate call #77 or 9-1-1 if it is an emergency and wait until help arrives.

**ZERO DEATHS
MARYLAND**

move over or slow down



M&D MARYLAND DEPARTMENT OF TRANSPORTATION


**ZERO DEATHS
MARYLAND**




move over or slow down



MDOT
MARYLAND DEPARTMENT
OF TRANSPORTATION



move over or slow down



MDOT
MARYLAND DEPARTMENT
OF TRANSPORTATION

**ZERO DEATHS
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HOW DO WE GET TO ZERO?

Show up and do the work.
No matter what anyone says.....

If they praise you.....

If they criticize you.....

If no one even notices.....

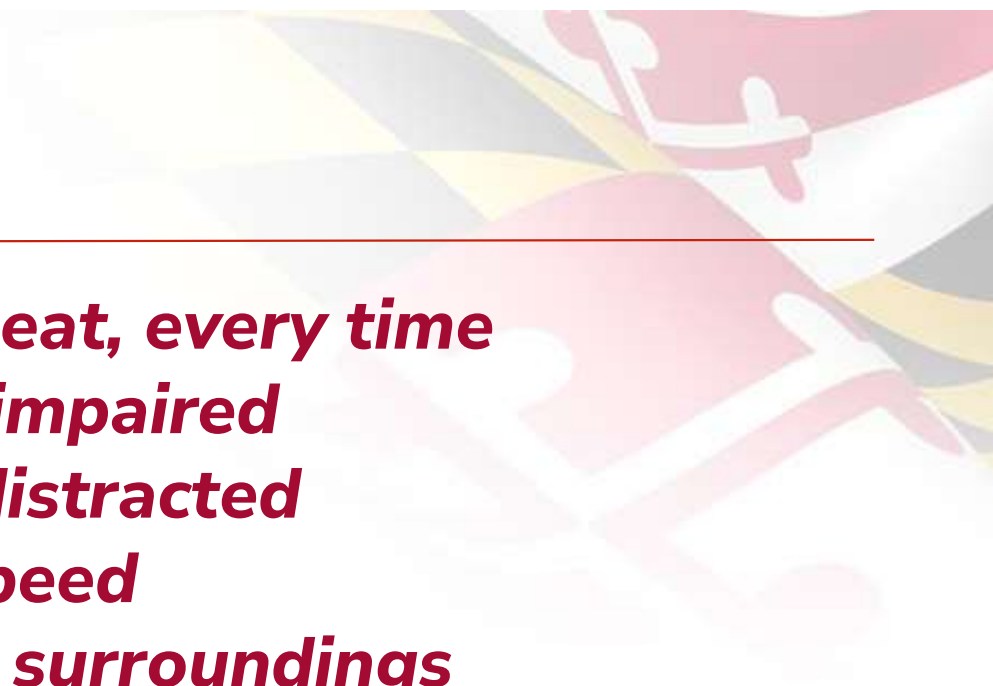
Just keep showing up, doing the work,
and leading the way.

Adapted from Jon Gordon's The Power of Positive Leadership

HOW DO WE GET TO ZERO?

Lead with passion.
Fuel up with optimism.
Have faith.
Maintain hope.
Be stubborn.
Fight the good fight.
Refuse to give up.
Ignore the critics.
Believe in the impossible.
Show up.
Do the work.
You'll be glad you did.

Adapted from Jon Gordon's The Power of Positive Leadership



Buckle up...every seat, every time
Don't drive impaired
Don't drive distracted
Don't speed
Be aware of your surroundings

Every crash is preventable.
Every life counts.

QUESTIONS?

Contact:

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