ADVANCES IN MOTORCYCLE TECHNOLOGY

Addressing New Vehicle Safety Features within Rider Training – Advanced Rider Assistance Systems (ARAS)

Round Table Discussion

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OBJECTIVES

1. Identify current and emerging vehicle safety features on motorcycles
2. Identify current and emerging vehicle safety features on automobiles
3. Discuss the impact of vehicle safety features on what we teach in RE
4. Define a basic framework for if, when, where, and how to start integrating this knowledge base into rider education

WHAT THIS SESSION IS **NOT** ABOUT…

- Specific models/manufacturers
- Comparison of models
- Current curriculum specifics
- Micro-mobility & offroad equipment, i.e., “e-bikes”

WHY?

If not us, WHO?

If not now, WHEN?

DEFINITIONS

Establishing common lexicon

WHAT ARE ADVANCED DRIVER/RIDER ASSISTANCE SYSTEMS?

Systems using a variety of sensors, software technology and safety features working together to reduce crashes are known as Advanced Driver or Rider Assistance Systems (ADAS or ARAS).

WHAT ARE ADAS/ARAS?

Employ on-board sensors and software technology that sense and monitor conditions inside and outside the vehicle to identify potential risk situations. Some of these sensors and software technologies include:

- Cameras
- GPS - Global Positioning System
- LiDAR - “Laser Illuminating” or “Light Detection and Ranging”
- RADAR - “Radio Detection and Ranging”
- Ultrasound

WHAT ARE ADAS/ARAS?

Categories of Safety Features

1. Warnings
2. Intervention
3. Assistance
4. Parking assistance
5. Other driver/rider assistance features

- Forward Collision Warning
- Lane Departure Warning
- Blindspot Warning
- Adaptive Cruise Control

Automatically warn or intervene to avoid or reduce or mitigate crashes.

WHAT ARE ADAS/ARAS?

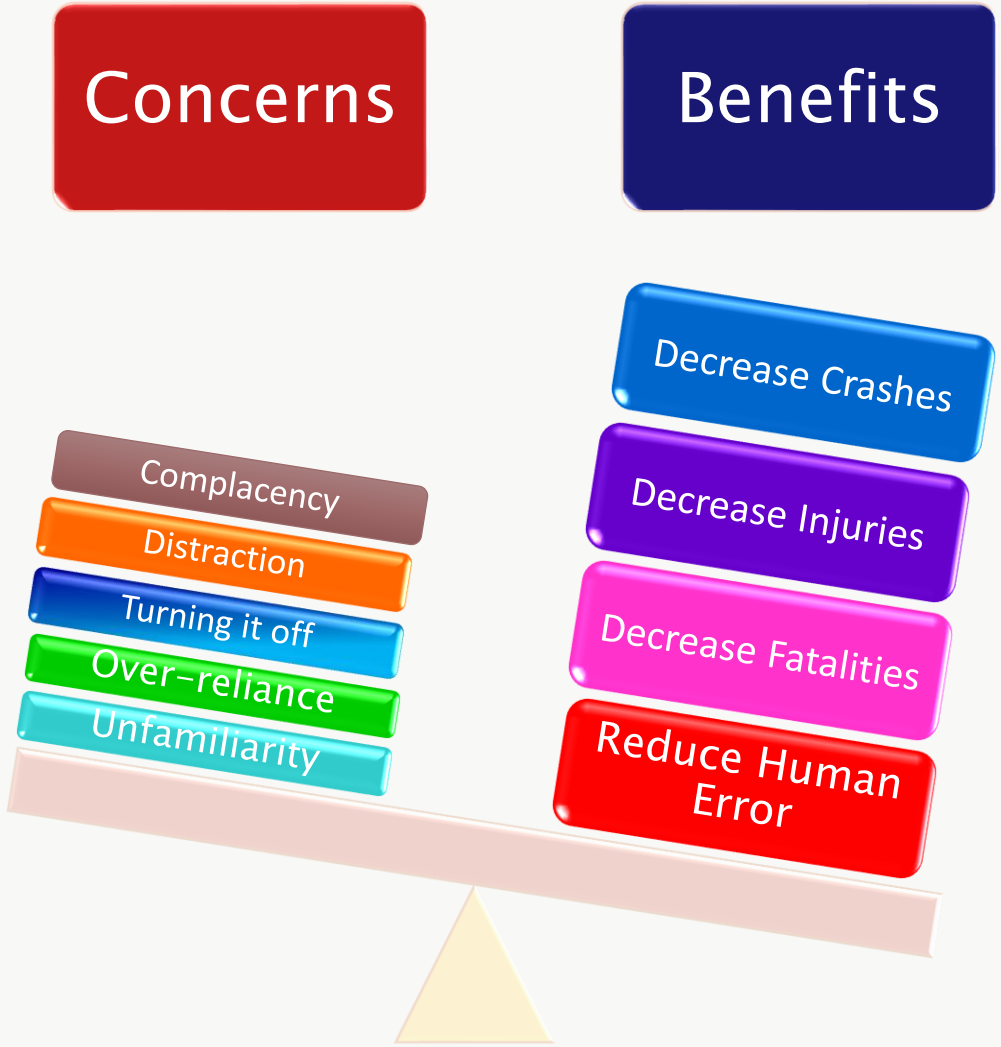
These safety features are designed to enhance the safe operation of the vehicle and assist the driver/rider with certain driving/riding tasks, if needed.

THE DRIVER/RIDER MUST:

- Remain engaged in the driving/riding task.
- Drive/ride as if they do not have these safety features.
- Maintain awareness/alertness.
- Read the owner's manual!
- NOT rely fully on the safety features.

POTENTIAL BENEFITS OUTWEIGH THE CONCERNS

How do the potential benefits outweigh the potential concerns?



HIGH LEVEL POTENTIAL CONCERNS

ADAS/ARAS alone may not produce a reduction in crashes.

The safety features must work, drivers/riders must be knowledgeable and use the technology correctly to achieve reductions in risk.

Mix of all highway users using different vehicle safety features.

For next several decades, or more, there will be generations of safety features.

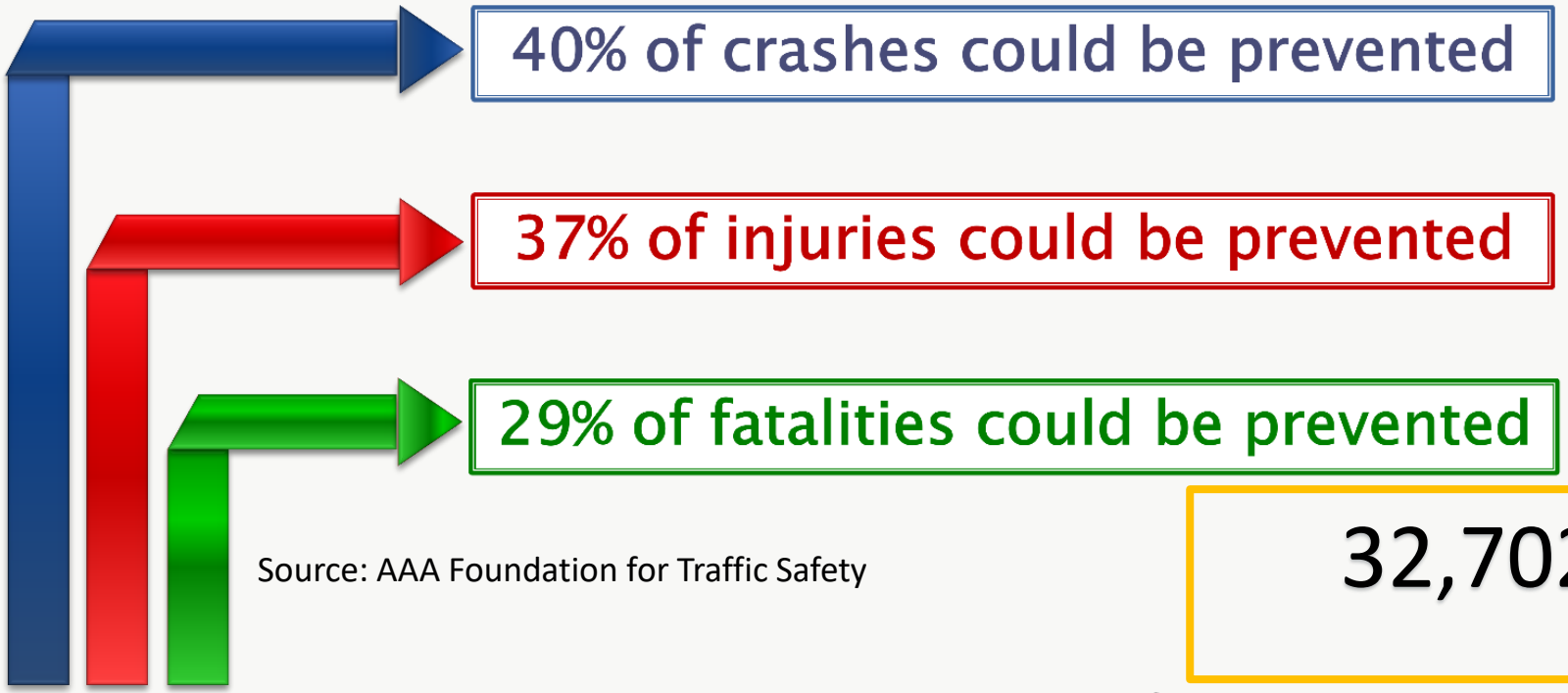
POTENTIAL CRASH, INJURY AND FATALITY REDUCTION

A study analyzed crash reports and examined conditions in which 5 individual features would likely have prevented a collision. The features were:

- Forward Collision Warning
- Automatic Emergency Braking
- Lane Departure Warning
- Lane-Keeping Assist and
- Blind Spot Warning

POTENTIAL CRASH, INJURY AND FATALITY REDUCTION

The study estimates that ADAS safety features, if installed on all vehicles could have the potential to help prevent approximately:

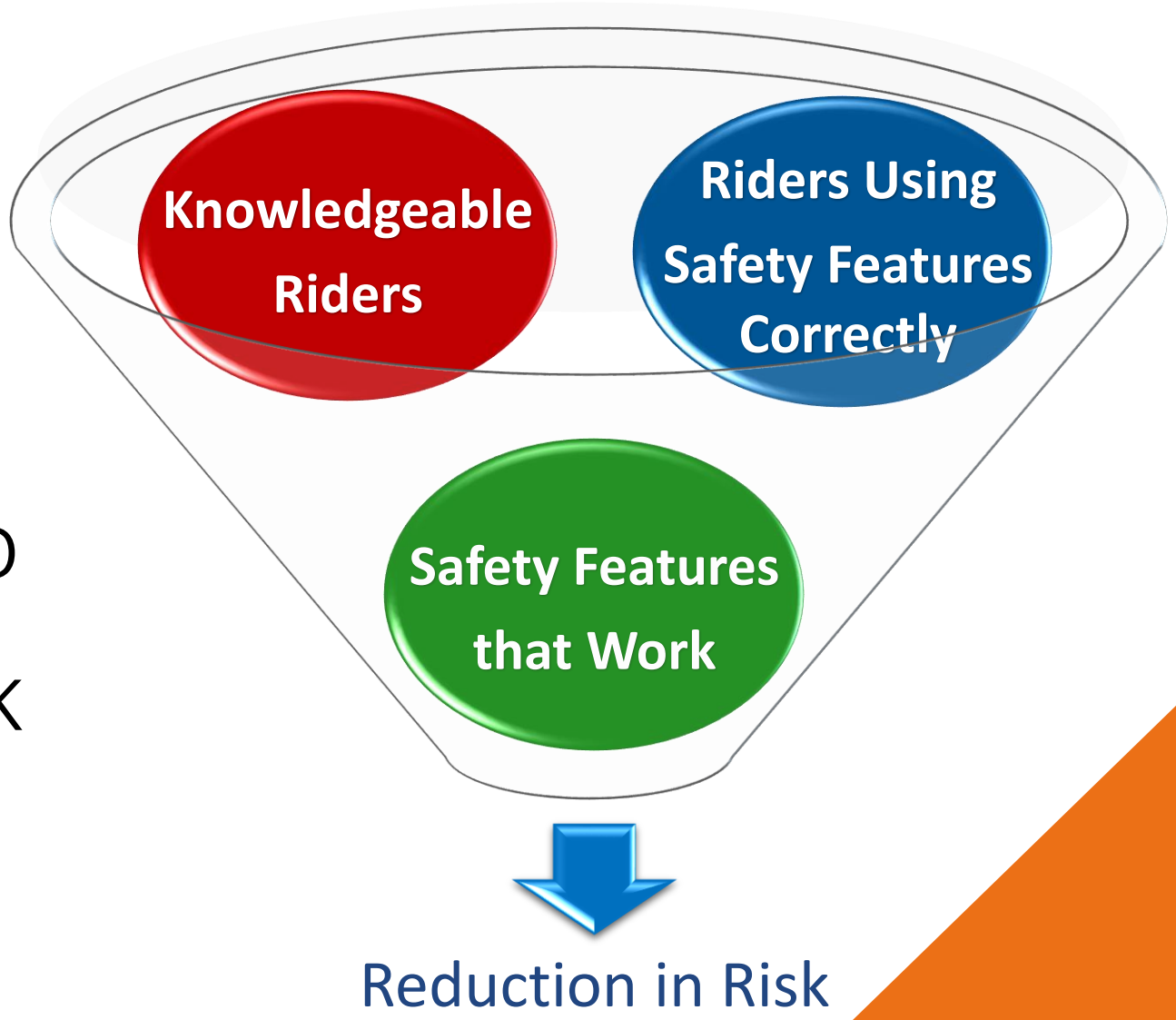


Source: AAA Foundation for Traffic Safety

$$32{,}702 - 9{,}496 = 23{,}206$$

(Reduction in fatalities)

THREE FACTORS THAT MUST EXIST TO ACHIEVE REDUCTIONS IN RISK



3 BASIC STEPS INVOLVED

1. Sensing
2. Processing
3. Acting or Not Acting

Similar to SEE, SIPDE, IPDE, etc.

HOW IT WORKS

1. Sensing

Sensors and software technologies will “read” the surrounding environment to gather data.

- Cameras
- GPS
- LiDAR
- RADAR
- Ultrasound

2. Processing

HOW IT WORKS

- This data will be processed and analyzed by the onboard system, creating usable information.
- Systems make determinations that no action is necessary more often than they are taking action.

3. Acting or Not Acting

HOW IT WORKS

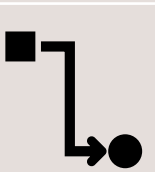
- Required to detect everything the driver/rider can see but also what the driver can't – or hasn't noticed.
- Usually more than one type of sensor and/or software technology is used.
- Each type has strengths and limitations.

ADAS SAFETY FEATURES DEVELOPMENT CONTINUES

- ADAS/ARAS safety feature development has not stopped and will continue to develop rapidly over the coming years and decades.
- More will become available:
  - next month,
  - next year,
  - and so on.

GROUP DISCUSSIONS: IDENTIFY CHALLENGES

How do vehicle safety features both mitigate and increase potential conflicts?



How is ADAS/ARAS going to impact what we do?

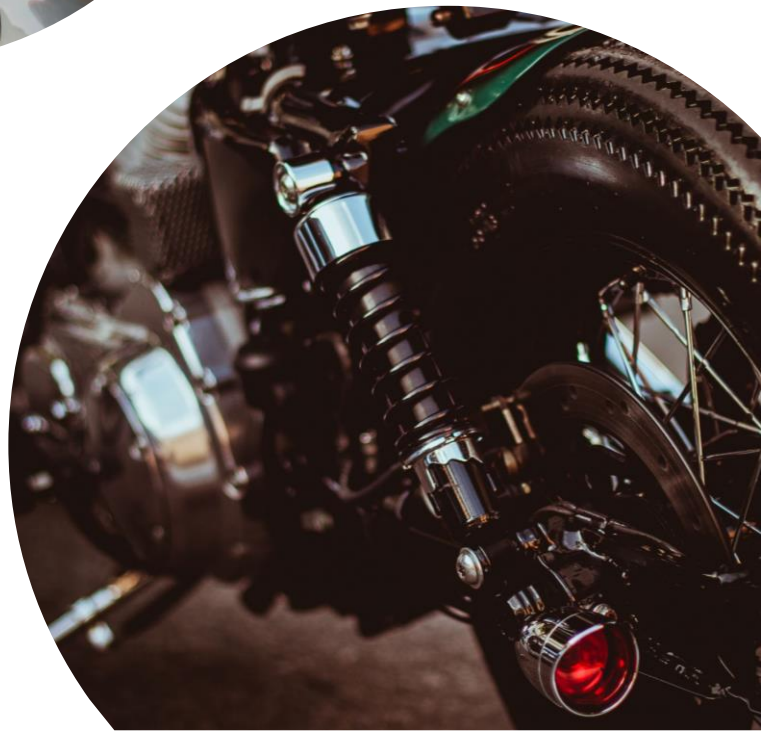
Identify challenges with integrating ARAS knowledge into RE.

What kind of information:

- do we need from others (manufacturers, engineers, etc.), and
- can we share to help instructors/coaches understand how these things work and what to teach both in the classroom and on the range?

NEXT STEPS

Define a basic framework for if, when, where, and how to start integrating this knowledge base into rider education



NEXT STEPS

- Where do we go from here?
- Webinars?
- Info sessions?
- Other?

QUESTIONS

Thank you!

Hope to see you tomorrow in Part II – Addressing Electric & Automatic Motorcycles within Rider Training