

Conspicuity by Many Other Names: How Technology, Training, Judgment, and Strategies Can Supplement Neon Green

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A Presentation to

AMA International Women's Conference
Carson City, NV
July 2012

The paper defines the concept of conspicuity and summarizes previous research on conspicuity factors. Technological advances that may impact conspicuity are introduced. Limitations of each of these traditional views of conspicuity due to brain functions are explored and explained. MSF's approach to conspicuity, termed "strategic conspicuity" is discussed along with several training activities designed to stretch your hazard awareness abilities. Strategic conspicuity is a rider-based solution that challenges a rider to be aware, use judgment, have a strategy, and self-reflect on the many possible responses to hazards that are under the control of the motorcyclist.

Conspicuity by Many Other Names: How Technology, Training, Judgment, and Strategies can Supplement Neon Green.

Dr. Sherry Williams
Director, MSF Quality Assurance & Research

Conspicuity (con-spik-CUE-i-tee):

A term used to define the condition of being "visible", "easy to notice" or "obvious"; the ability of an object to draw attention to itself, even if no one's actively searching for it. Rider conspicuity, therefore, is the ability of a motorcyclist to draw attention to themselves, even though other drivers may not be actively looking for them.

“I didn't see the motorcycle.”



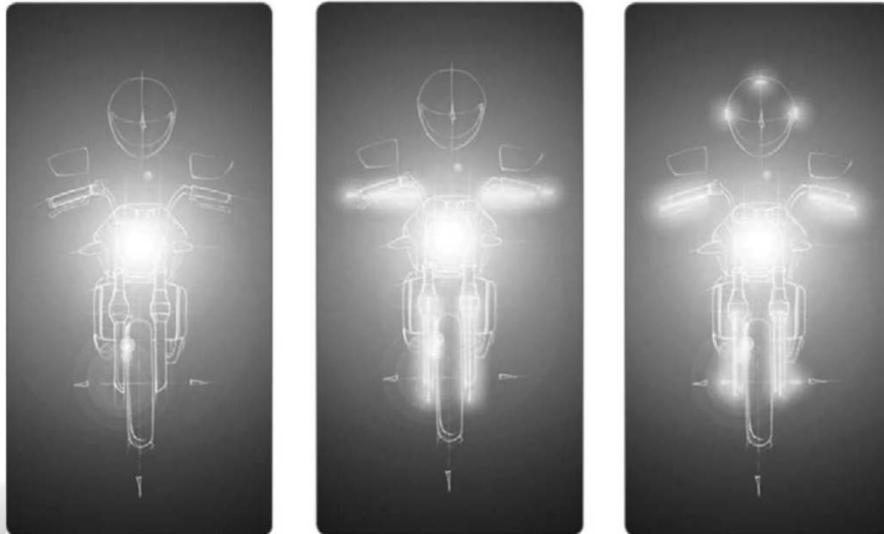
2 vehicle, at fault:

MC: 30-70%
OVD: 30-70%

Man drives into a rockslide:

http://www.youtube.com/watch?feature=player_embedded&v=gBmE92n5mEI

- Day time lights – small effect
- T-shape recognized faster



- White helmet lowers risk compared to black
- Reflective or fluorescent gear lowers risk
 - Hurt report
 - Consider the age of the report (1981)
 - Population proportion of neon – white gear compared to black

24%

37%

- Some inconsistencies





- Motorcycle
 - Reflective material on frontal area studied

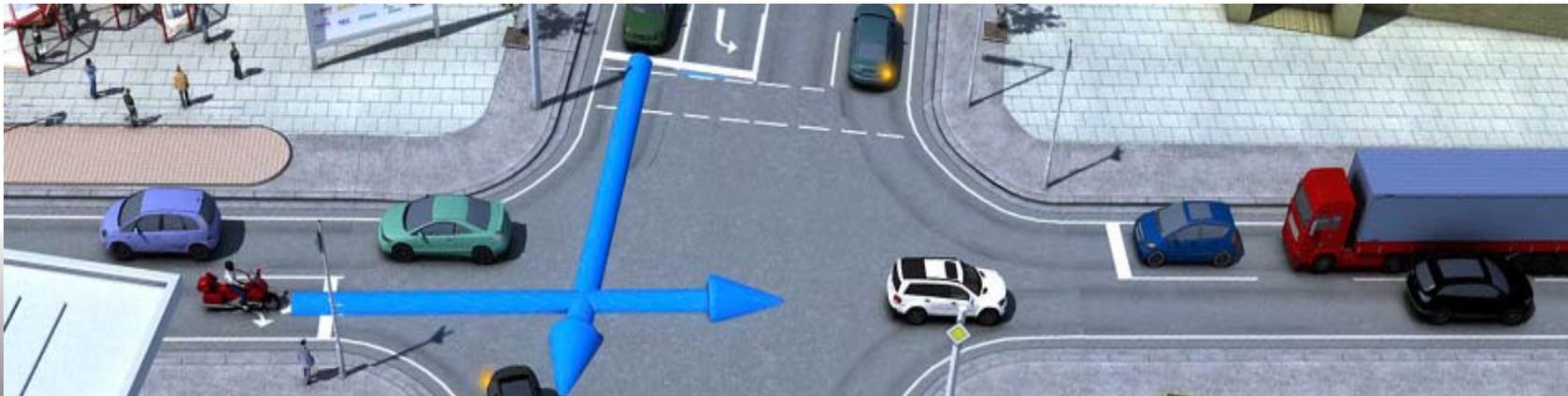


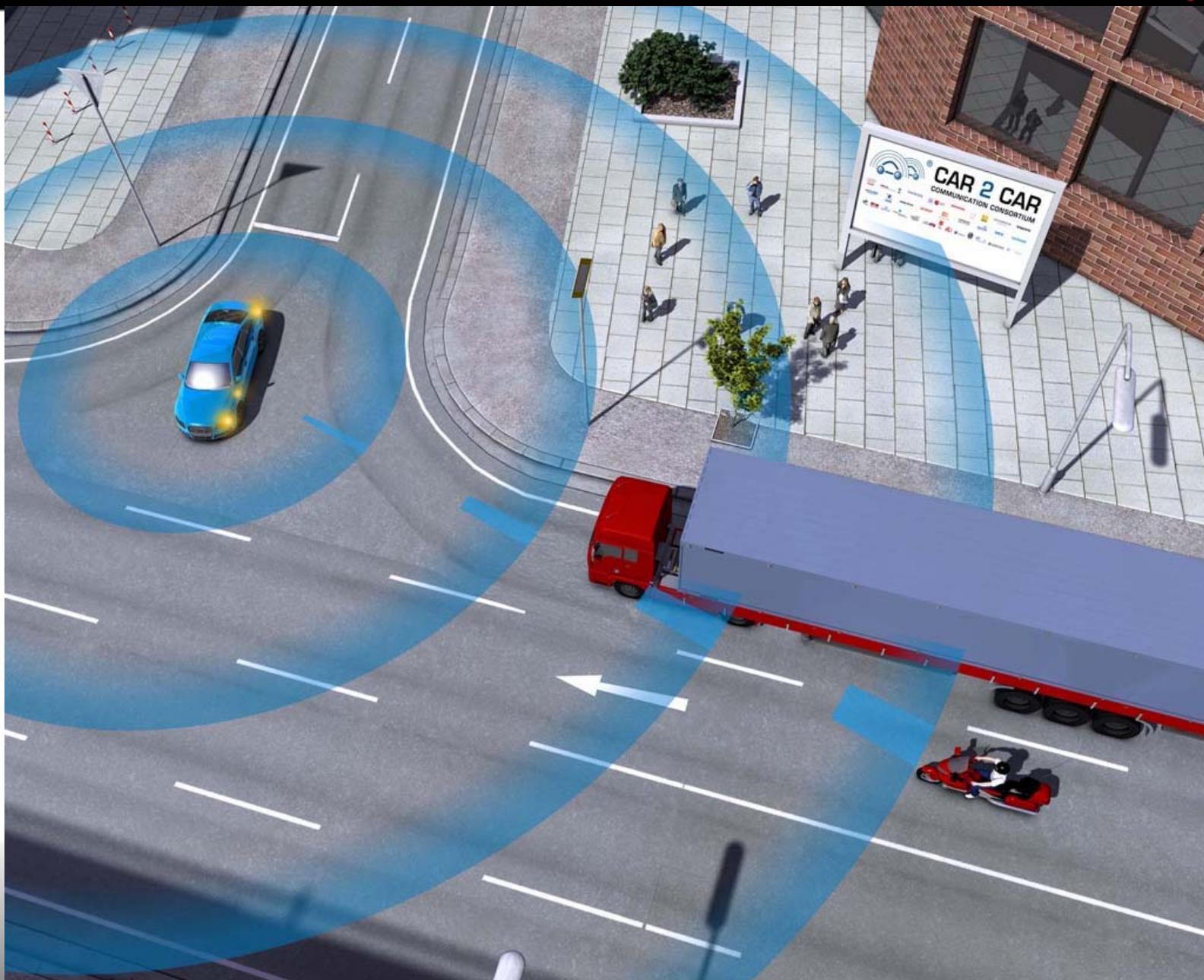
- Contrast & Context
 - High contrast needed in low salience condition
 - Object/Background dependent
 - Hole et al. (1996): the contrast between motorcyclists and background plays a considerable role in motorcyclists' conspicuity.
- Expectation-dependent
 - Langham et al. (2002) suggest that even highly conspicuous objects (like a police car with flashing lights) will not be identified quickly enough as a potential hazard if a driver's expectations are not equal to the actual traffic situation.
 - Common objects (89%) versus uncommon objects (48%)
 - Car drivers who are also licensed motorcycle riders are involved in fewer car-motorcycle collisions than car drivers who do not hold a motorcycle licence (Magazzù, Comelli and Marinoni, 2006).
- Little crash data is currently available on this issue.

- Automobile-based
- Motorcycle-based
 - Collision Warning System
 - ABS brakes

Vehicle to vehicle collision warning systems

- V2V, V2I
- 10-20 years?
- Welcome in the modern automobile?
- Useless nannies designed to coddle inattentive drivers?
- One motor carrier has reported that its front-end crash incidents have decreased 75 percent since it installed the devices in half of its trucks.





BMW Motorrad ConnectedRide - Collision Warning

http://www.youtube.com/watch?feature=player_detailpage&v=o7JHQs9XWwQ

- Cell phone-based applications
 - Cyclists warning display system (ISS Ltd.)
 - Warning cyclists that a potentially dangerous maneuver is about to occur and placing the onus on them to act accordingly.
- iOnRoad app

CWS: Cell-phone based



iOnRoad Introduction



-  Safe
-  Careful
-  Warning



Distance Warning Alert Sound

Replay

Next

Technology: ABS brakes



- Prevent wheel lock up under extreme braking
- Proven equalizer
- Add \$1000 to cost, 20 # to weight
- Studies
 - Experienced riders
 - Novice riders
- Braking in a curve?
- Mandatory?
- Used market?

A Rider-Based Solution, Strategic Conspicuity

- Awareness
- Judgment
- Strategy
 - Adaptable to situation
- Self Reflection leading to Rider Improvement
- Many possible responses under a motorcyclists control

Rider Education Training System (RETS)



/////// A Level 4 Rider



Improving Awareness / Perception

http://www.myvidster.com/video/249582/The_monkey_business_illusion



the invisible gorilla

We truly are arguing that directing our eyes at something does not guarantee that we will consciously see it.

the invisible gorilla



And Other Ways Our Intuitions Deceive Us

Christopher Chabris and Daniel Simons

the invisible gorilla

The problem is not with the limitations on motor control, but with limitations on attention resources and awareness.

the invisible gorilla



And Other Ways Our Intuitions Deceive Us

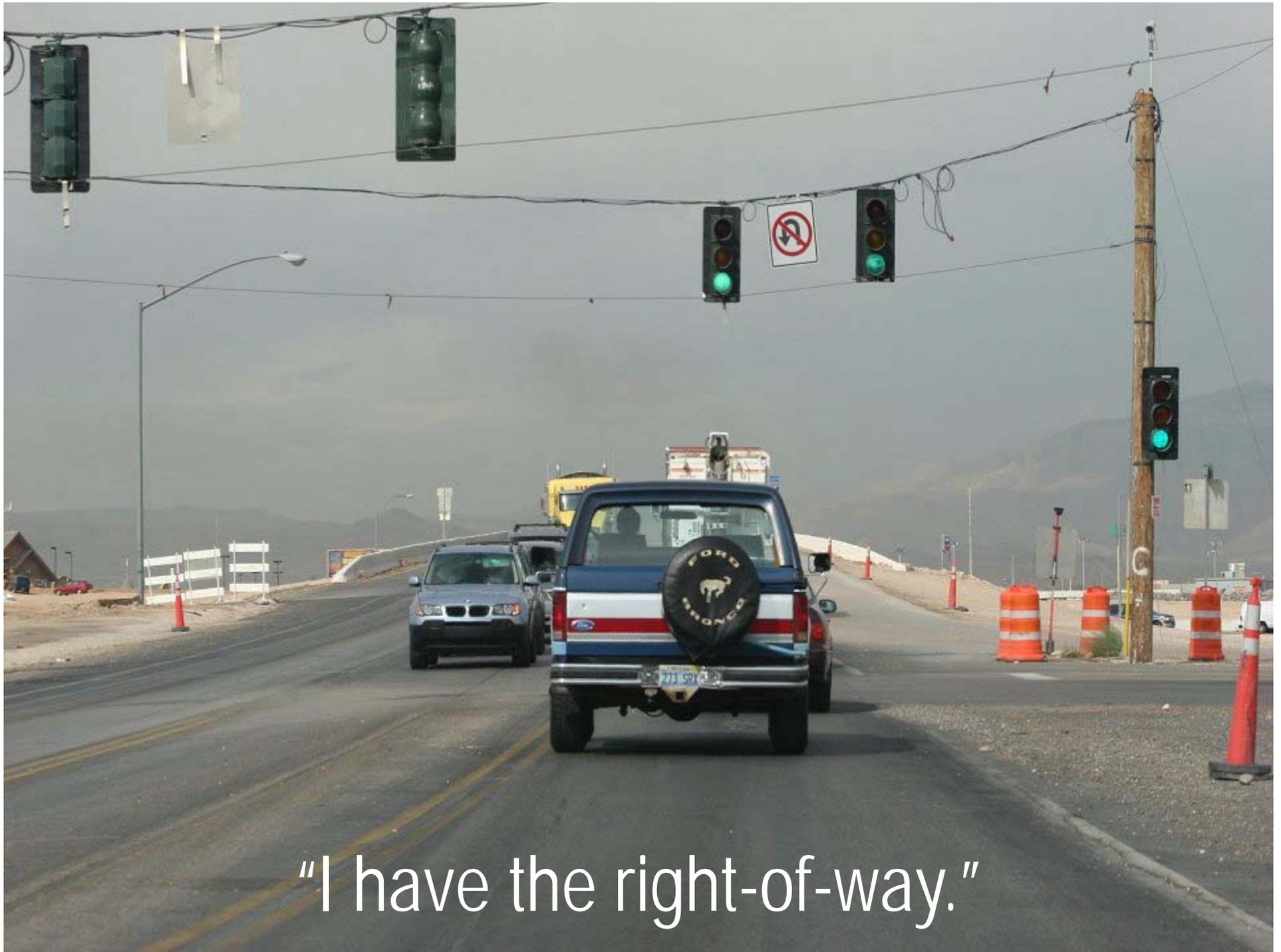
Christopher Chabris and Daniel Simons

You're riding down the road.

What do you see in this scene?



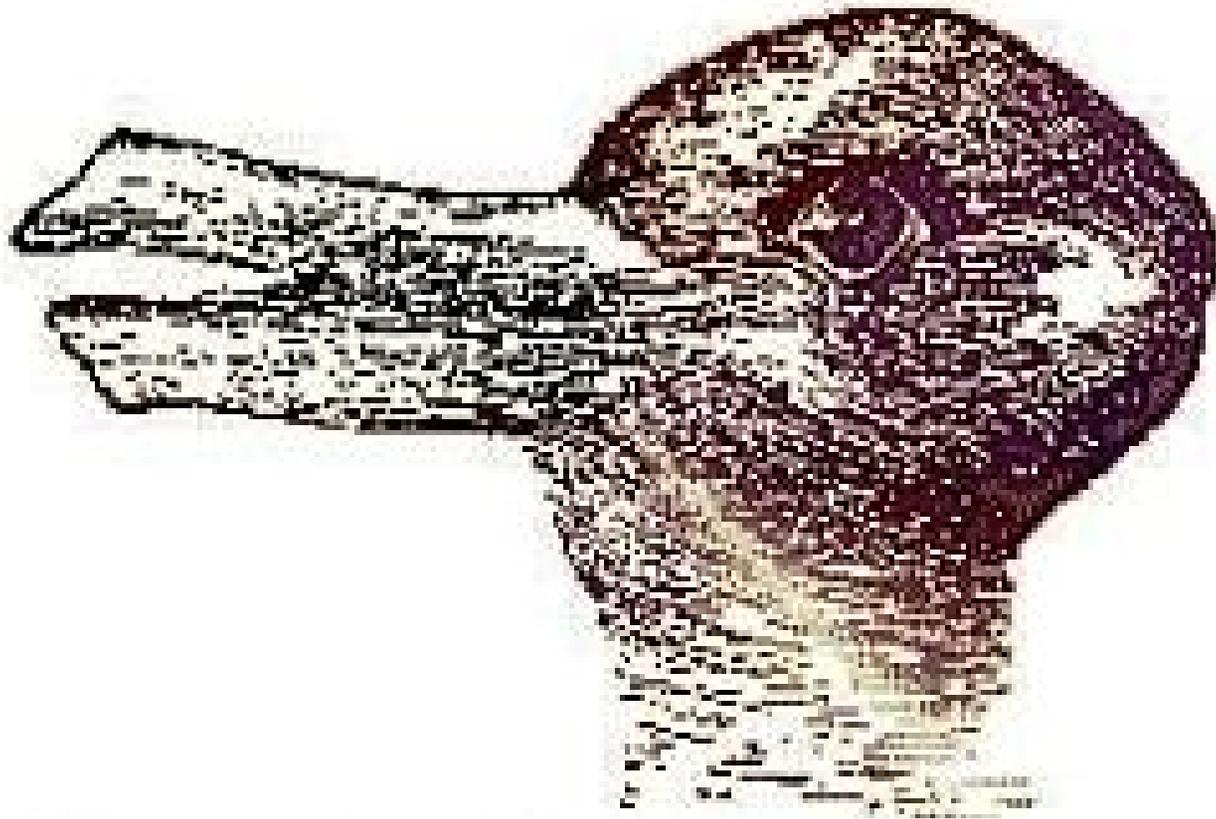




"I have the right-of-way."

Agree or Disagree?

Our eyes don't necessarily tell our brain what we see; rather our brain tells our eyes what to look for.



What do you see here?

An organizing schema



Traffic Controls & Roadway Features

Escape Paths

Highway Users

Surface Conditions

Possible Escape Paths

2-lane, 2-way traffic



Possible Escape Paths

3 lanes going one way



NEWS Naturalistic Study of Motorcyclists The New MSF CORE Curriculum

MSF Update Washington DC 3-31-10 View Slideshow

RiderCourse Info Library / Safety Tips Host An Event MSF News MSF Products
RiderCoach Info Training Site Support State Laws and Reports Donate to NMSF Contact/FAQ

Search MSF Site

Version Espanola Aquil

3 Ways to Find the RiderCourseSM Nearest You:

- Click on your state above
- Call (800) 446-9227
- Select from the list below

Find a RiderCourse

5, 5, 7, 1, 4, 4, 5

Students have graduated from MSF RiderCourses since 1974. 400,000 motorcyclists enroll in our courses each year.

Key Messages:

- Get trained and licensed
- Wear protective gear -- all the gear, all the time -- including a helmet manufactured to the standards set by the DOT
- Ride unimpaired by alcohol or other drugs
- Ride within your own skill limits
- Be a lifelong learner by taking refresher rider courses

Free Safety Tips for Car Drivers & Motorcyclists

Ian Ziering Talks About Motorcycle Safety:

Welcome to the Ride
5 min - Discover the diverse aspects of street motorcycling. Welcome to the club!
Hi-Res | Lo-Res

Basic RiderCourse Highlights
5 min - Explore our hands-on, 15 hour, Basic RiderCourse training program.
Hi-Res | Lo-Res

Group Riding
10 min - Learn about riding formations, pre-ride meetings, hand signals, and more. Host an Event
Hi-Res | Lo-Res

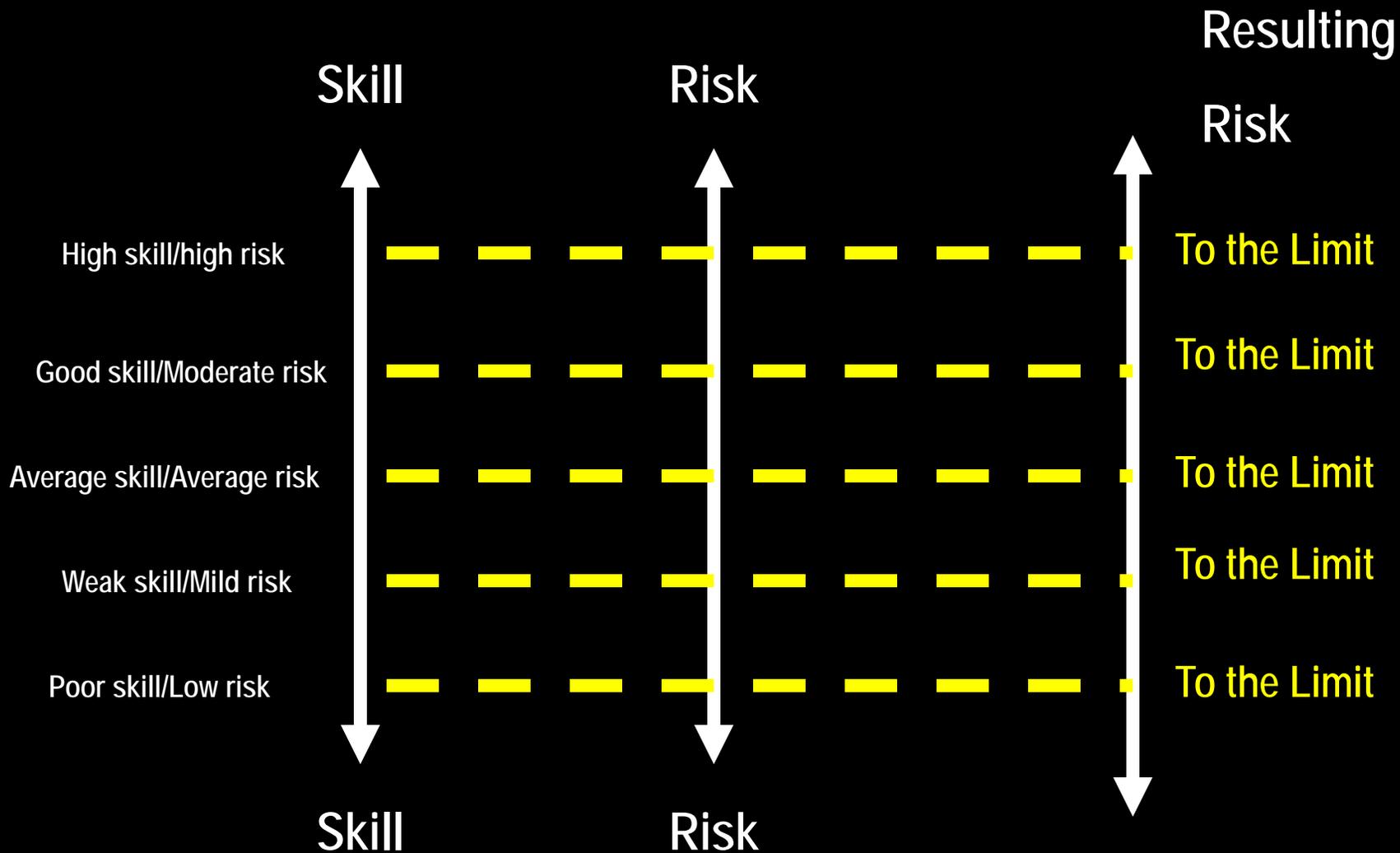
Common Road
3 min - Learn how car drivers can share the road safely with motorcyclists.
Hi-Res | Lo-Res

Left-click image to play; right-click to download.
You may use the above video clips for your own projects.

RIDER PERCEPTION CHALLENGE!
Test the limits of your perceptual abilities.
Click Here

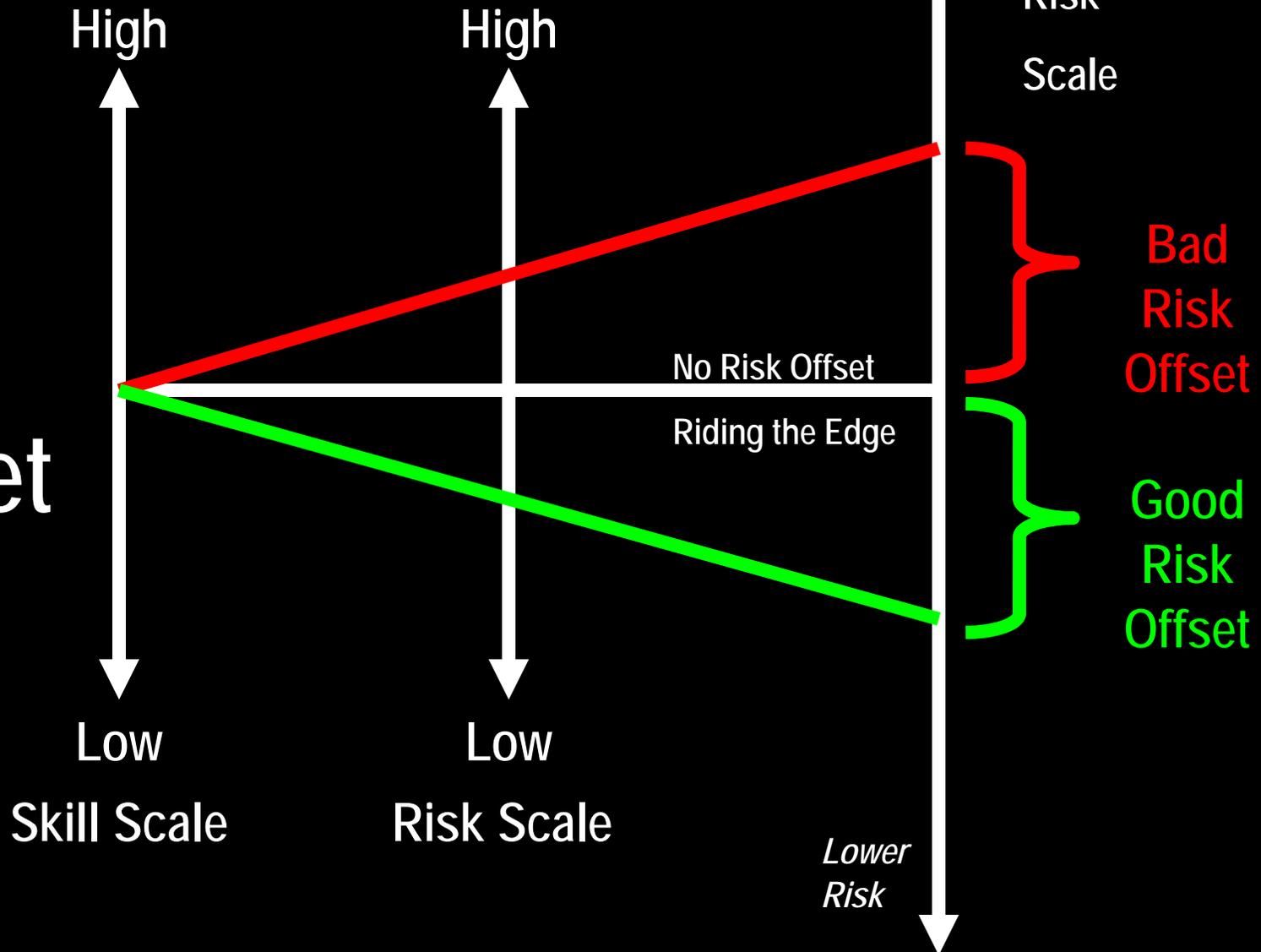
NEW MSF **CA** **Coach**
Take a hands on, half-day training class for entry-level scooter riders offered by the Motorcycle Safety Foundation®
Visit Website >>

Self Assessment: Skill and Risk

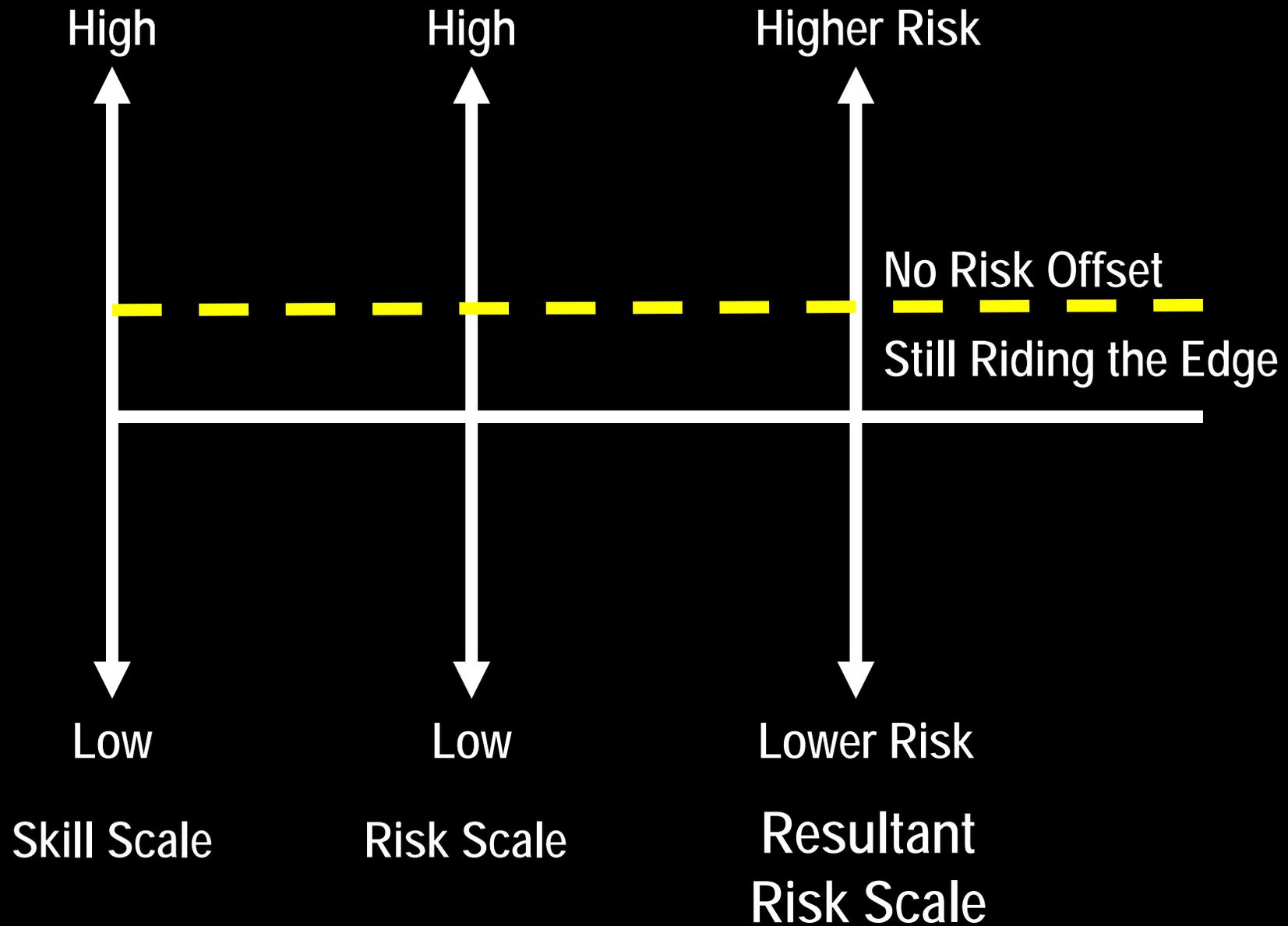


Overall & Moment-to-Moment

Risk Offset



Value of safety training if higher risks are taken?



Value of safety training!



Target Risk 2

A new psychology of safety and health

What works? What doesn't? And why...



Gerald J.S. Wilde

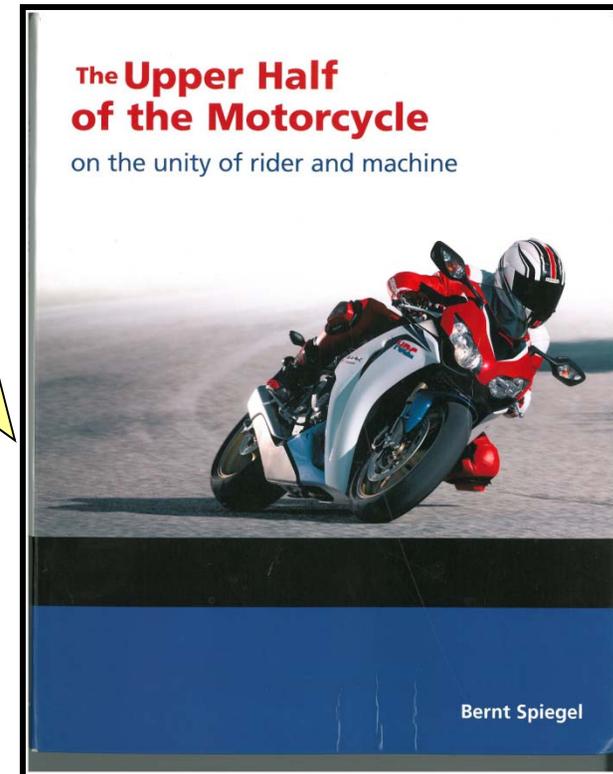
Are you a Level IV Rider?

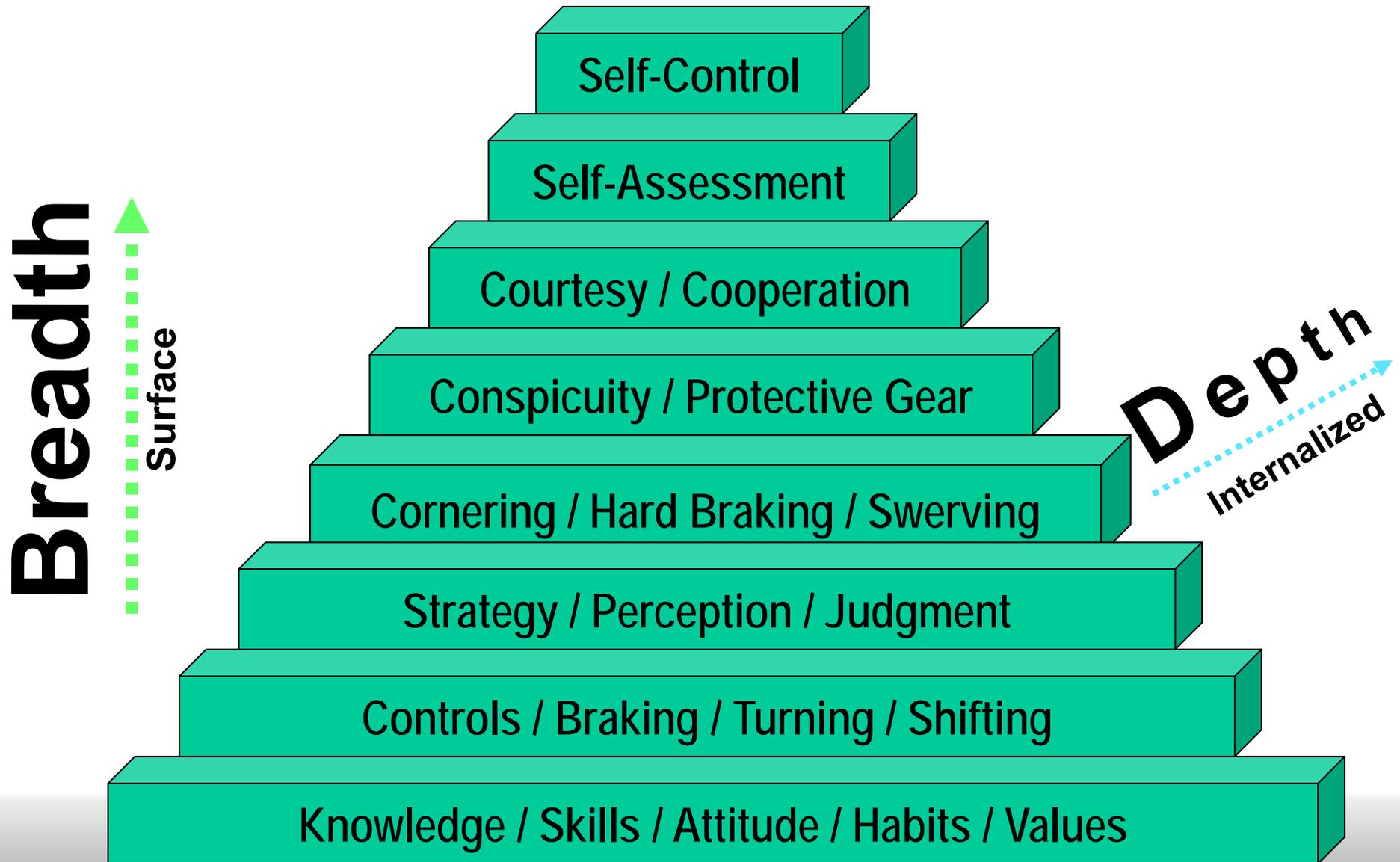
- Level 0 = Self taught and/or rides without a license**
- Level I = Completes a learn-to-ride course & licensed**
- Level II = I + Completes additional courses**
- Level III = II + Reflects on experiences**
- Level IV = III + Lifelong learner & subconsciously safe**

The Upper Half of the Motorcycle

Improvement requires a constant intent to improve.

The implementation and maintenance of this intent is a task that requires the utmost in rational control, which is a *duty—a “leadership duty”—of the conscious self.*





////// **Last year MSF curricula were used to train over 500,000 riders (6 million riders to date)**

Thanks to...

- 9,499 certified *RiderCoaches*
- 275 certified *RiderCoach* Trainers
- Over 10,000 certifications
- 1,102 RERP Sponsors managing 2,691 sites
- State, Military, Other Administrators



Learning-to-Ride

Basic *RiderCourse* (BRC)
Standard
Expanded
Small Group
Tutoring
Skills Practice
Formal Remedial Training

Basic *RiderCourse* 2
License Waiver
Skills Practice

Street *RiderCourse* 1

Basic Bike Bonding *RiderCourse*

Returning Rider BRC

3-Wheel BRC

Scooter BRC

Improving-the-Ride

Street *RiderCourse* 2

Advanced *RiderCourse*

Safe Motorcyclist
Awareness and
Recognition Trainer
(SMART)

Ultimate Bike Bonding
RiderCourse

MSF Kevin Schwantz
RiderCourse

Street *RiderCourse* 3

Specialized Programs

*Introductory Motorcycle
Experience*

*ScooterSchool: Introduction
to Scooters RiderCourse*

Military Motorcycle
RiderCourse

Military *SportBike
RiderCourse*

DirtBike School: DirtBike BRC

Trail Riding *RiderCourse*

State Education Programs

Online Programs

Host-An-Event

Intersection –
Motorist Awareness

Share the Adventure –
Group Riding

Street Smart –
Rider Perception

Riding Straight –
Alcohol Awareness

SeasonedRider –
Aging Awareness

Introduction to
Motorcycling – *Non-Rider
Awareness*

Essential Core

Basic *RiderCourse*
Street *RiderCourse* 1
Basic Bike Bonding *RiderCourse*

Expanded Core

Essential Core plus
Street Smart – Rider Perception
Advanced *RiderCourse*
Street *RiderCourse* 2

Recommended Core

Expanded Core plus
Ultimate Bike Bonding *RiderCourse*
MSF Kevin Schwantz *RiderCourse*



Rider Perception

SMARTrainer

Basic Bike-Bonding RiderCourse

Ultimate Bike-Bonding RiderCourse

Street RiderCourse

3-Wheel Basic RiderCourse

Scooter Basic RiderCourse

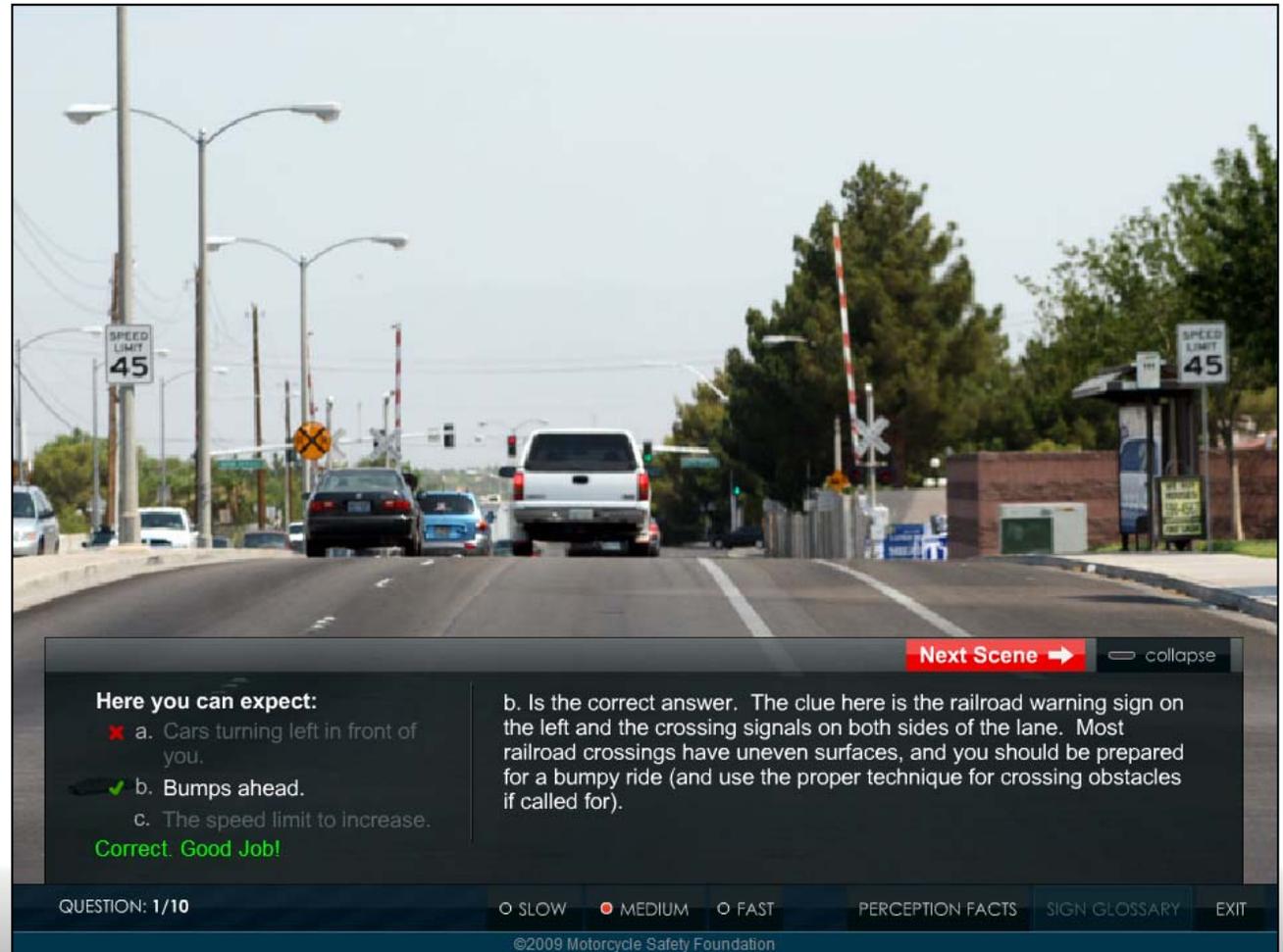
Military Sportbike RiderCourse

Advanced RiderCourse

////// *Rider Perception*

Modern visual
technology

Improves rider's
perceptual skills



The screenshot shows a first-person perspective of a motorcycle rider on a road. In the distance, a white pickup truck is driving away. To the left, a black car is turning left. A railroad crossing is visible ahead with a yellow diamond warning sign on the left and crossing signals on both sides. Speed limit signs for 45 mph are visible on both sides of the road. The interface includes a 'Next Scene' button with a right arrow and a 'collapse' button with a left arrow. A quiz overlay is present at the bottom of the scene.

Here you can expect:

- a. Cars turning left in front of you.
- b. Bumps ahead.
- c. The speed limit to increase.

Correct. Good Job!

b. Is the correct answer. The clue here is the railroad warning sign on the left and the crossing signals on both sides of the lane. Most railroad crossings have uneven surfaces, and you should be prepared for a bumpy ride (and use the proper technique for crossing obstacles if called for).

QUESTION: 1/10 SLOW MEDIUM FAST PERCEPTION FACTS SIGN GLOSSARY EXIT

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////// **SMARTrainer**



Hazard
perception

Risk
management

Play back
and coaching

////// Basic Bike-Bonding RiderCourse

////// Ultimate Bike-Bonding RiderCourse

Drills on skills

Slow speed
focus

Fine motor
skills



//// **Street Rider Course (SRC 1, SRC2)**



Light residential riding

Light suburban traffic

Complex traffic situations

////// **3-Wheel Basic RiderCourse**

Same concepts as Basic *RiderCourse*, now applied to 3-wheel motorcycles



////// *Scooter Basic RiderCourse*



Same concepts as Basic *RiderCourse*, now applied to scooters

/////// Military Sportbike RiderCourse *Advanced RiderCourse*

U.S. Navy helped pilot
MSRC

60% enrolled

61% reduction in Navy
motorcycle-related
fatalities

MSF releases ARC

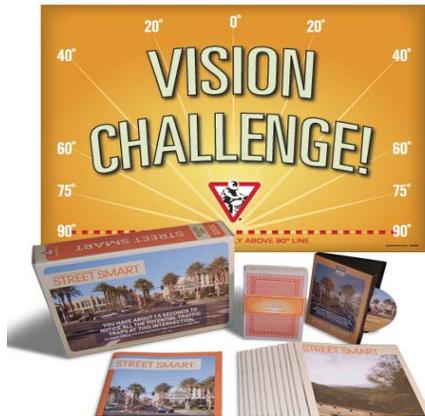
Public, private



////// **Modular-type courses provide:**

- More breadth and depth
- Multiple points of entry and renewal
- Individualized coaching
- Segmented learning opportunities
- Distributed practice





Intersections – All Roadway Users

Share the Adventure – Group Riding

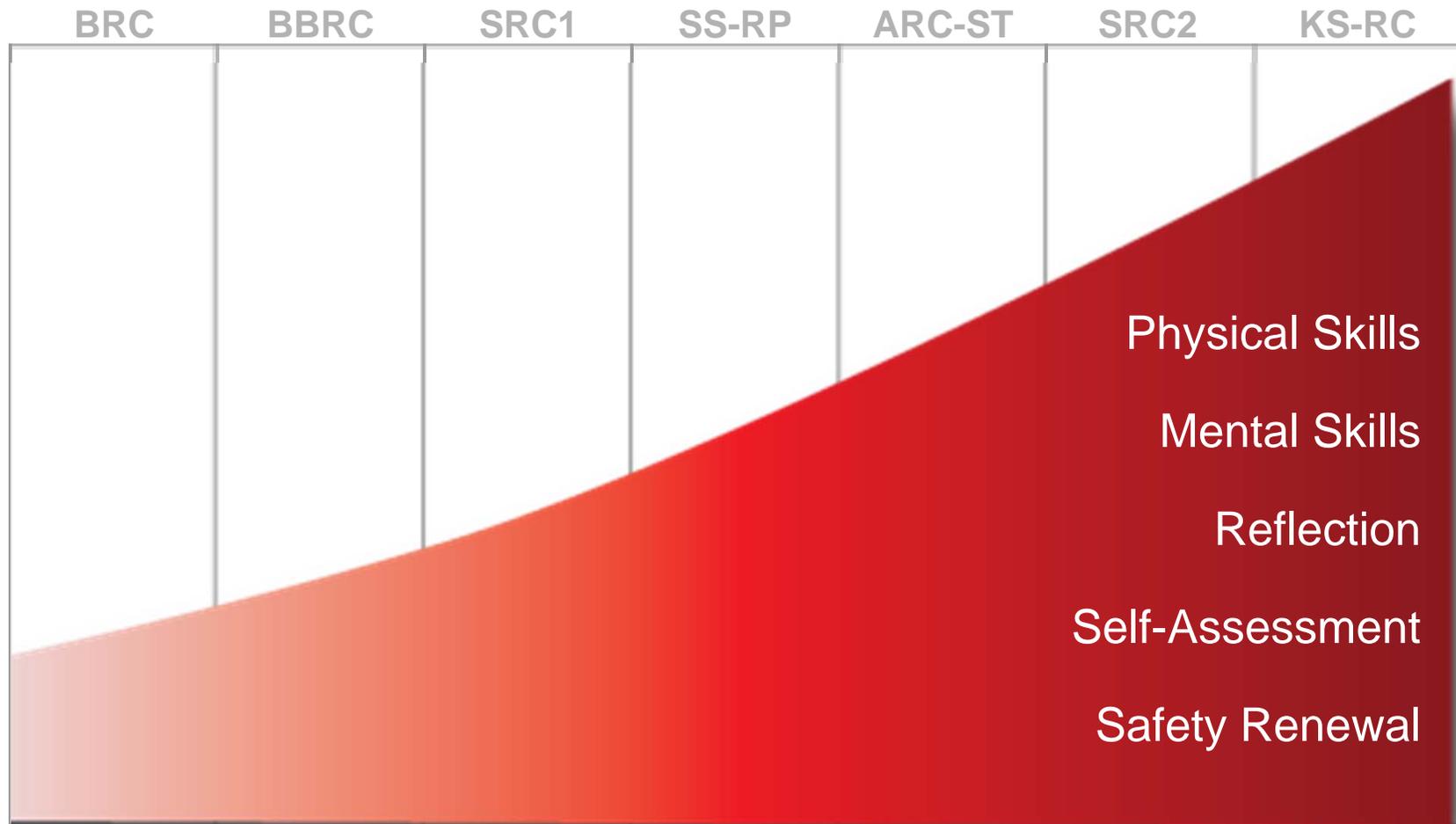
StreetSmart – Rider Perception

Riding Straight – Alcohol Awareness

Seasoned Rider – Aging Awareness



Developing the Whole Rider



Continuum of Learning

A Rider-Based Solution, Strategic Conspicuity

- Awareness
- Judgment
- Strategy
 - Adaptable to situation
- Self Reflection leading to Rider Improvement
- Many possible responses under a motorcyclists control

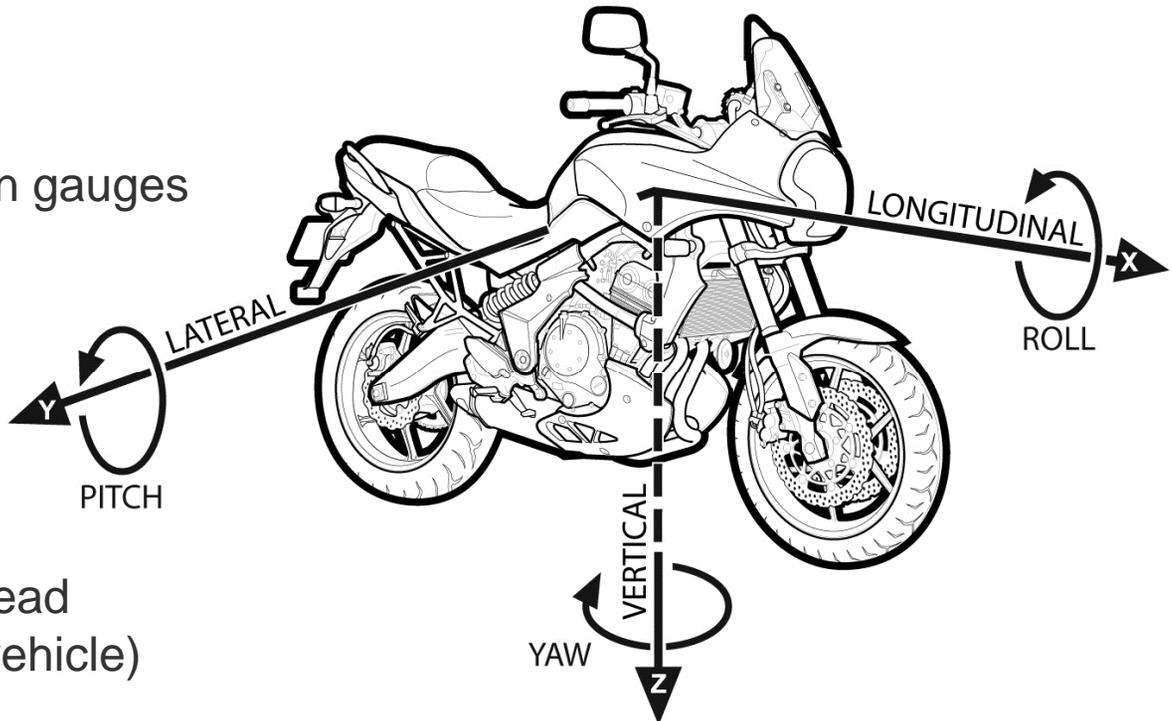
The MSF 100
**Naturalistic Study
of Motorcyclists**

/////// MSF, its members, and VTTI are conducting the first ever, Naturalistic Motorcyclist Study.

- 100+ participant-owned motorcycles
- One year per bike, ext. 400-500K miles
- Data collection 2012 and 2013
- Recruiting primarily on Age and Bike
- We will track other factors (e.g., training, experience)
- MSF will collaborate worldwide to allow use

////// Instrumentation Installed

- Color Video cameras (5)
- Lane tracking
- Helmet / Gaze tracking
- Front and rear brake strain gauges
- Accelerometers (3 axes)
- Gyro (3 axes)
- Speed
- Turn signals
- GPS
- Forward radar (speed to lead vehicle; distance to lead vehicle)
- Continuous collection
- 8-12 month capacity
- Expandable measures



Instrumented Motorcycles - Unobtrusive



Sample Data



754331



The MSF 100 Naturalistic Study of Motorcyclists



Bike Model Listing

- Kawasaki Ninja ZX600, ZX-6R (2009 – 2012)
- Suzuki GSX-R1000 (2009, 2011 – 2012)
- Harley-Davidson Sportster 883 (2004 – 2012)
- Harley-Davidson Sportster 1200 (2004 – 2012)
- Harley-Davidson Iron 883 (2009 – 2012)
- Harley-Davidson Forty-Eight (2010 – 2012)
- Harley-Davidson Seventy-Two (2012)
- Honda Rebel CMX 250 (2001 – 2011)
- Yamaha V-Star 650 (2002 – 2011)
- Honda Goldwing 1800 (2006-2011)
- Harley-Davidson Ultra Classic Electraglide (2008-2011)

Sport Bikes



Suzuki GSX-R1000
2009, 2011 – 2012



Kawasaki Ninja
ZX600/ZX-6R
2009 – 2012

Cruisers



Honda Rebel 250
2001 – 2011

Yamaha Vstar
650
2002 – 2011



Cruisers (continued)



Harley-Davidson
Sportster 883/1200
2004 – 2012

Iron 883
2009 – 2012

Forty-Eight
2010 – 2012

Seventy-Two
2012

Touring

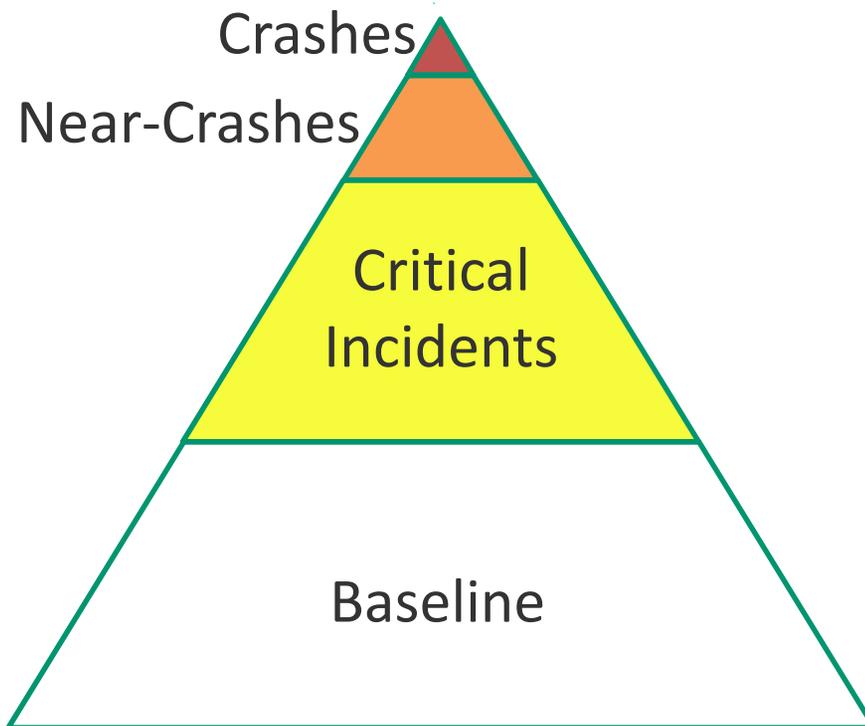


Honda Goldwing
2006-2011

Harley-Davidson
Ultra Classic
Electraglide
2006-2011



////// **Naturalistic Method**



Able to identify:

- Interaction of rider attributes, behaviors, roadway, adjacent vehicles, and environment.
- Factors in crashes using time-series video and numeric data.
- Factors not detectable through crash investigation.
- Compares crash-involved rider to himself / herself at all other times.
- Pre-event data, seconds, minutes, days, weeks, months prior to.
- Differences between successful and unsuccessful evasive maneuvers.
- Rider performance and behavior in non-critical and critical riding.
- Attributes and habits of safe riders
- Detailed exposure data across numerous factors
- Research questions that arise in the future.

////// The Value of Video

- Provides “perfect witness.”
- Documents rider, vehicle, roadway, and environmental variables sufficiently to support a wide range of investigations.
- Numerous variables can be identified post-collection based on new research questions or observation.
- Accurately records the sequence of many rapidly occurring actions.
- Captures factors that do not leave a physical record or may not be accessible in witness recall.

////// Current status: The Largest EVER!

- 50 fully instrumented motorcycles on the road
- All 3 markets up and running (VA, CA, FL)
- ~ 9000 trips recorded
- 2700 hours – 67,000 miles of data
- Preliminary observations in one year



Our Member Companies

We stand behind our work.



Motorcycles



Who's in your corner?