Office of Safety Research and Development

Federal Highway Administration
Safety Research & Development

Presented to the

Research & Technology Coordinating Committee

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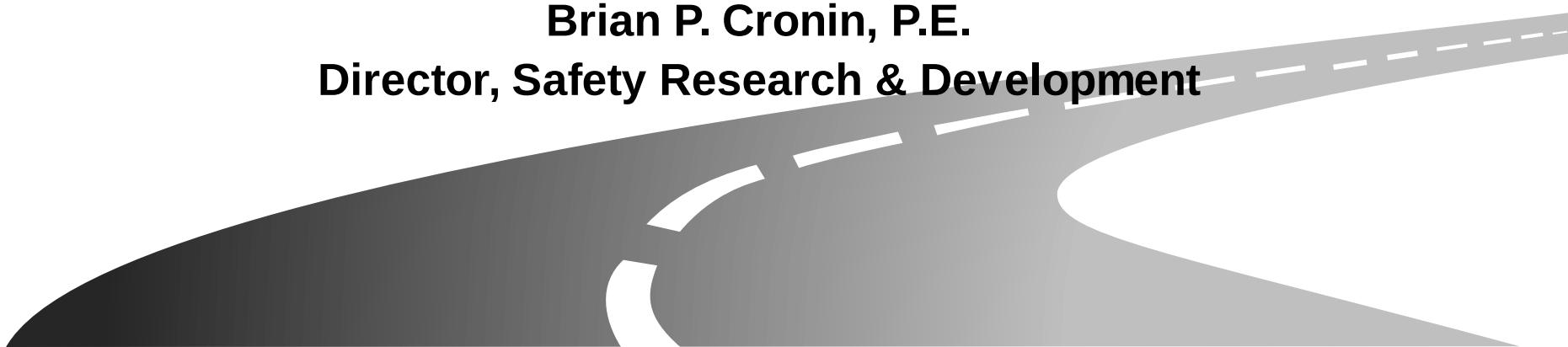
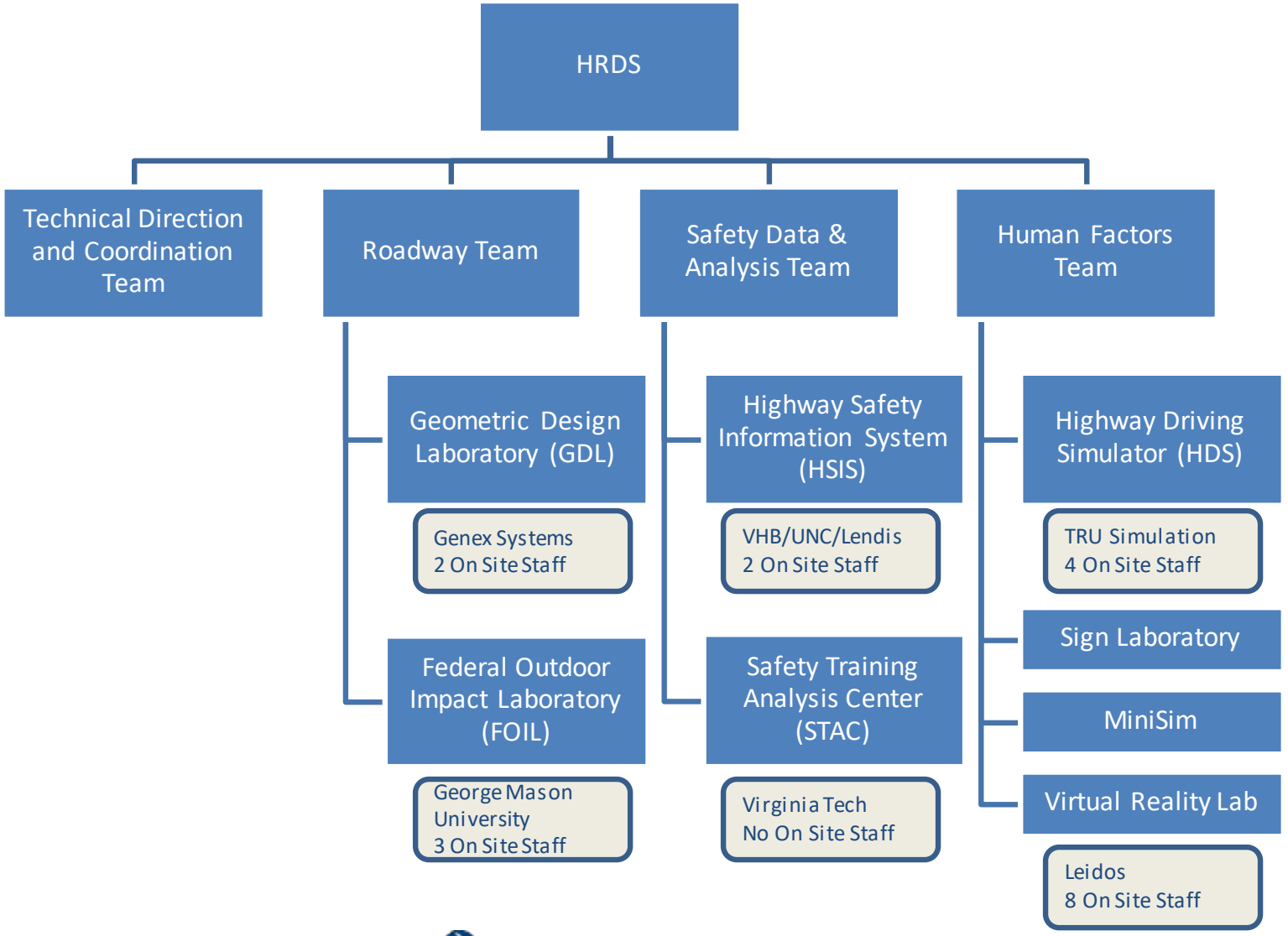


Safety R&D Teams

- Technical Direction & Coordination
- SHRP2 Safety Implementation
- Roadway Safety
  - Providing information to prevent and reduce the severity of roadway departure crashes.
- Safety Data & Analysis
  - Supporting systematic, knowledge-based approaches to reducing highway injuries and fatalities.
- Human Factors
  - Understanding road user behavior to improve safety.

Team Structure and Labs



Safety Program Roadmaps

- Roadway Departure
  - Funding Split: 19% HSA; 81% HRDS
- Data and Analysis
  - Funding Split: 32% HSA; 68% HRDS
- Intersections
  - Funding Split: 43% HSA; 57% HRDS
- Ped/Bike
  - Funding Split: 73% HSA; 27% HRDS
- Human Factors CPP
- Local and Rural Roads CPP
- HSIP CPP
- PCB CPP

Roadway Safety

Roadway Safety Research
Examinations of speed management, intersections and roadway design in order to keep vehicles on the road.

Roadway Departure Research
Laboratory, simulation and field study tasked to minimize the consequences when a vehicle leaves the road.

Intelligent Transportation Systems
Development of technologies and protocols for vehicles and infrastructure to securely communicate information.

FOIL Future Contract

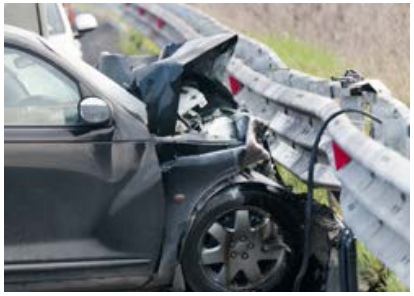
- **Mutually beneficial no-cost contract/agreement**
  - Mimic Federal Railroad Administration's (FRA) Transportation Technology Center (TTC)
  - RFI
    - Two responses, one proposal (GMU) and one non-interest
    - One interested party did not respond in time but would be interested
  - FRA contract review
  - RFP for FOIL contract to start in 2020

FOIL Testing

- Current FOIL Testing Projects:
  - Future Materials Hardware Feasibility (Polyester Polymer Concrete)
  - Development of an FE Tree Model
  - Rumble Strip Full Scale Testing
  - NCHRP 15-53 - Roadside Barrier Designs Near Bridge Ends with Restricted Rights of Way
  - NCHRP 03-119 - Application of MASH Test Criteria to Breakaway Sign and Luminaire Supports and Crashworthy Work-Zone Traffic Control Devices
  - NCHRP 22-29B - Continuation of Super Elevated Full Scale Test
  - DOS Security Perimeter Barrier Development

FOIL Tests per Year					
	2018	2017	2016	2015	2014
Full Scale Crash Tests	10	13	33	11	3
Pendulum Tests	154	37	60	45	37

Safety Data & Analysis



Research

Capturing consistent, high-quality data allows researchers to identify key safety questions, then develop and deploy effective safety improvements.

Safer Road Designs

Safety-focused data and effective tools allow practitioners to evaluate and compare the safety of roadway design alternatives.

Better Safety Investments

Quality data and cutting edge analysis help safety professionals decide how best to allocate resources to achieve the greatest safety improvements.

Highway Safety Information System (HSIS)

- Consists of data from 7 states
  - Crash
  - Roadway
  - Traffic

- Provides quality data to road safety researchers (often in support of other national research programs, such as NCHRP)
- Conducts research to support FHWA's focus areas
- Supports development and use of data collection and analytical tools for the study of highway safety

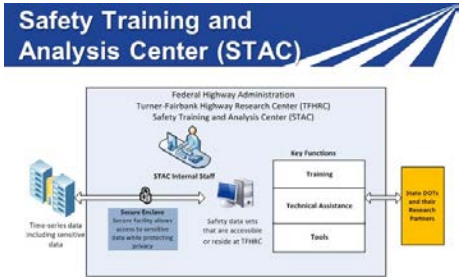
HSIS

HSIS Products

- Data
  - > 50 NCHRP Studies
- HSIS Summaries
- FHWA Research Reports
- Journal Articles (TRR, AAP, ITE, …)
- Tools
  - FHWA Pedestrian and Bicycle GIS Safety Analysis Tools
  - FHWA GIS Safety Analysis Tools
  - Pedestrian and Bicycle Crash Analysis Tool (PBCAT)
- www.hsisinfo.org

Safety Training and Analysis Center (STAC)

- A Secure Enclave:
  - Established at TFHRC
  - To access PII in SHRP2/NDS data
  - Remotely access NDS data from VTTI
- Tools Available
  - Data analysis tools (Python, SAS, R)
  - Roadway Information Database (RID)
  - Video Analytics Tools
- https://highways.dot.gov/data-sets/safety-training-and-analysis-center/about-stac



STAC Goals and Supporting Actions

- Expand understanding of the SHRP 2 Safety Data
  - Informational material for a variety of audiences
- Expand access to these data, incl. PII
  - Pilot test secure data access
  - Enclave at TFHRC
- Expand usability of these data
  - Data analysis tools and reduced data set development
  - EAR tools, Dynamic-segmentation tool for non-GIS proficient users
- Expand user base
  - Research opportunities – Fellowships, Sabbaticals
  - BAA, IAP, Pooled Fund
  - Naturalistic Study Data Pooled Fund Study (6 States)

Ongoing SHRP2 FHWA Activities

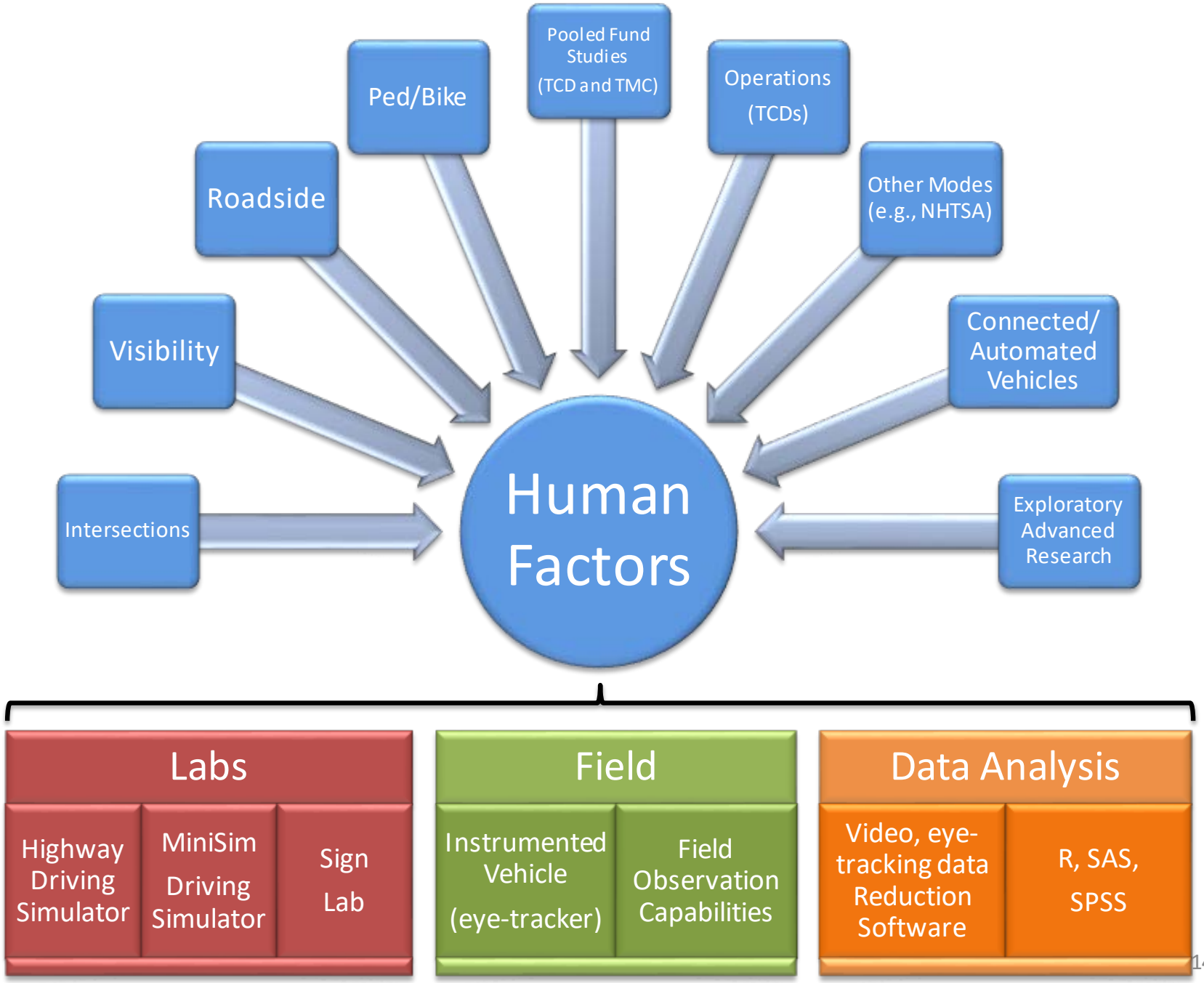
- SHRP2 Implementation Assistance Programs
  - Speed (WA, MI)
  - Weather (WY)
  - Pedestrians (FL)
  - Lighting (WA)
  - Work Zones (MN)
- Broad Agency Announcement Recipients
  - Safety Enforcement (NY)
  - Elderly Drivers (FL, IA)
  - Work Zones (MI, MO)
  - Rural (IA)
  - Speed-Safety Relationships (MO, OH, UT)

Human Factors

Driving Simulations
Examining driver responses in simulators to conduct safe and effective testing of new and existing driving scenarios and technologies.

Laboratory Experiments
Conducting studies to assess comprehension of signing and alternative designs.

Real World Testing
Studying driver behavior and performance in a real world setting.


Pooled Fund Studies (TCD and TMC)
Ped/Bike
Operations (TCDs)
Roadside
Other Modes (e.g., NHTSA)
Visibility
Connected/ Automated Vehicles
Intersections
Human Factors
Exploratory Advanced Research
Labs
Highway Driving Simulator
MiniSim Driving Simulator
Sign Lab
Field
Instrumented Vehicle (eye-tracker)
Field Observation Capabilities
Data Analysis
Video, eye-tracking data Reduction Software
R, SAS, SPSS

Laboratory Capabilities Expansion

- Level 2 Automation Field Research Vehicle
- Integration of Field Research Vehicle with Highway Driving Simulator
- Virtual Reality Lab Bike Simulator
- Multiplayer Simulator Platform Development