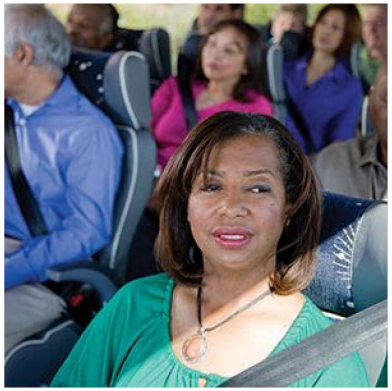


Federal Motor Carrier Safety Administration

# FMCSA

## Crash Prediction Models

Jenny Guarino
Analysis Division

# AGENDA

- Background
- Project outline
- State outreach overview

# PROJECT OUTLINE

- Literature review ✓
- Identify States with active crash prediction models/tools ✓
- State outreach ✓
- Develop a white paper to include: ✓
  - Opportunities for nationwide prediction model.
  - Challenges in developing/maintaining a system.
  - Recommended steps for FMCSA.

# QUESTIONS ASKED—DEVELOPMENT

- When was the system implemented?
- Who, if any, were the partners in the development of the system?
- What was the cost to develop your system? What are the costs for maintenance?
- What data was used to develop the system? Is additional data required for maintenance?

# QUESTIONS ASKED—TECHNICAL DETAILS

- What data does the crash prediction model currently use?
- What are your system requirements (e.g. how is it hosted)?
- How is the system maintained?
- What is the scope of system (e.g. State-wide, county, city, road segment, etc.)?
- Are there options built in to expand scope (e.g. from city to State)?

# QUESTIONS ASKED—USE AND INTERFACE

- Who are the end users (e.g. public, law enforcement, highway safety, planners, etc.)?
- What are the tools in the system (e.g. outputs, reports, etc.)?
- What is the platform type presented to users (e.g. web-based)?
- Would it be possible to get a demo or screen shots?
- What were your lessons learned and main hurdles in development/implementation/use?

# OUTREACH TO STATES (9)

| State | Crash Prediction Status | Crash Prediction Scope |
|---|---|---|
| **Alabama** | Crash prediction model under development* | Annual hot spot analysis to set goals and plan program activities |
| **Connecticut** | Crash prediction model under development | |
| **Indiana** | Functioning crash prediction model | Statewide; State and local law enforcement |
| **Missouri** | Functioning crash prediction model | Statewide; State law enforcement |
| **Nevada** | Functioning crash prediction model | Partial State coverage; State law enforcement |
| **North Carolina** | Electronic crash reporting only | |
| **Ohio** | Crash prediction model under development | |
| **Tennessee** | Functioning crash prediction model | Statewide; State and local law enforcement |
| **Wisconsin** | Crash prediction model under development | |

# KEY TAKEAWAYS – DATA ACCESS

| State: | Data Currently Utilized: |
|---|---|
| **Alabama** | • Historical crash data<br>• Traffic volume |
| **Connecticut** | • Historical crash data<br>• Traffic exposure data/traffic volume<br>• Roadway geometric data |
| **Indiana*** | • Historical crash data<br>• Weather data<br>• Traffic volumes<br>• Census data<br>• Major holidays<br>• Latitude/longitude<br>• Traffic and road conditions |
| **Missouri*** | • Historical crash data<br>• Roadway information; includes road geometry and traffic volume<br>• Weather |

States with active crash prediction models are noted with an "*".

# KEY TAKEAWAYS – DATA ACCESS, CONT.

| State: | Data Currently Utilized: |
|---|---|
| **Nevada*** | • Historical crash data<br>• Infrastructure data; includes traffic volume, speed measurement, and traffic signal information<br>• Weather data<br>• Waze |
| **North Carolina** | • Historical CMV Crash Data<br>• Truck volume data |
| **Ohio** | • Historical crash data<br>• Law enforcement activity data<br>• Occasional use of traffic volumes and speeds |
| **Tennessee*** | • Historical crash data<br>• Weather data<br>• Special event data |
| **Wisconsin** | • Historical crash data<br>• Law enforcement activity data |

States with active crash prediction models are noted with an "*".

# KEY TAKEAWAYS – ELECTRONIC REPORTING

| State | Electronic Reporting |
|---|---|
| Alabama | 100% |
| Connecticut | 100% |
| Indiana* | 100% |
| Missouri* | 68% |
| Nevada* | 100% |
| North Carolina | 87% |
| Ohio | 73% (100% for mapping and analysis) |
| Tennessee* | 100% |
| Wisconsin | 100% |

States with active crash prediction models are noted with an "*".

# KEY TAKEAWAYS – MAPPING CAPABILITIES

| Corridor/Road Segment: | Grid: |
|---|---|
| **Alabama** | Indiana* |
| **Connecticut** | Missouri* |
| **Nevada*** | Ohio |
| **North Carolina** | Tennessee* |
| **Wisconsin** | |

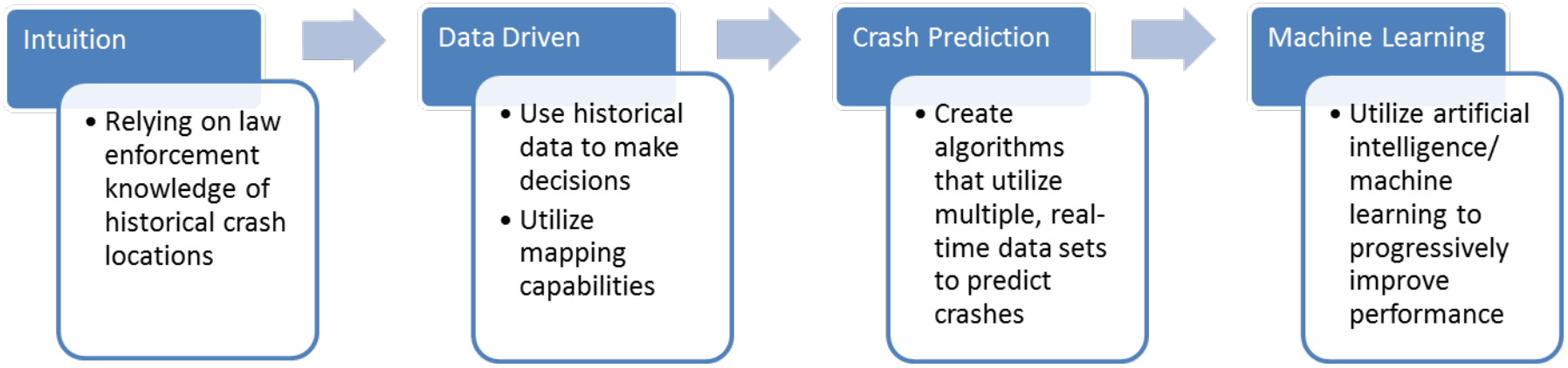
- All States interviewed used various forms of heat mapping to display the hot spot corridors/road segments or geographical areas where crashes had either historically occurred, or were most likely to occur (based on prediction models)

States with active crash prediction models are noted with an "*".

# RECOMMENDATIONS FROM STUDY

- Develop necessary partnerships:
  - These would include the National Highway Traffic Safety Administration (NHTSA) for crash data, the Federal Highway Administration (FHWA) for roadway data, and the National Weather Service (NWS) for use of weather application program interface (API) data. Some States have also partnered with WAZE for use of their real time data.
- Engage stakeholders.

# NEXT STEPS AT FMCSA




- The above figure shows how States have evolved their analytical abilities.
- FMCSA has three options moving forward:
  - Develop analysis tools to assist with policy and planning efforts.
  - Work with DOT partners to develop a DOT-wide crash prediction model or provide coordinated data sets to States that are interested in developing their own.
  - Work with NHTSA to leverage Electronic Data Transfer (EDT) to pilot large scale crash prediction modeling capabilities.

# THANK YOU – FOR MORE INFORMATION:

- **FMCSA website:** www.fmcsa.dot.gov
- **For general inquiries:** FMCSA_Host@dot.gov
- **Crash predictability:** Jenny.Guarino@dot.gov