Massive Unstructured Data in Highway Transportation

IEEE Big Data 2013

October 9
Presentation Outline

• EAR Program Background
• Why Big Data?
• Future Vision
What is the EAR Program?
Key Processes

- Focus on high-risk, high payoff research
- Merit review is used to enhance the quality of research processes and results
- Research stakeholders are involved throughout
- Commitment to successful project handoff
Program Status

• 150+ Initial stage investigations
• Six solicitations resulting in
  – 52 projects awarded; 23 ongoing
  – $43M federal, $17M match
• 7th closed October 2012
  – Topics: Novel binders, low-powered, wireless sensors
• 8th closed March 2013
  – Topics: Connected highways, video analytics for highway safety
Focus Areas

Connected highway system concepts
Breakthrough concepts in material science
Human behavior and travel choices
New technology and advanced policies for energy and resource conservation
Technology for assessing performance

Cross-cutting
Nanoscale research
Information sciences
Connected Highway Systems

• New Data

• New Communications
  – V2X, V2V
  – DSRC, Cellular, etc.

• Enabling Technologies
  – Localization and mapping
  – Extended situational awareness
Human Behavior

• Massive New Data
  – Naturalistic driving studies
  – Communications metadata
  – Social networking

• But
  – Unstructured and unrelated
  – Emerging and evolving uses
Assessing Performance

• Massive New Data
  – Roadside sensors
  – Vehicle based sensors
  – Structural health monitoring

• Predictive Modeling
  – Actionable information
Program Coordination

Scanning

Scoping

Research

Transition
Potential Impact

• Use of data improves safety
  – Understanding behavior provides improved design, regulation, & active crash avoidance systems

• Use of data improves mobility
  – Real-time, automated system management frees owners & operators to focus on strategy
  – Improved energy efficiency
Thank You

EAR Program website
www.fhwa.dot.gov/advancedresearch

David Kuehn
Program Manager
(202) 493-3414
david.kuehn@dot.gov