

ATSI Advanced Technology Safety Initiative

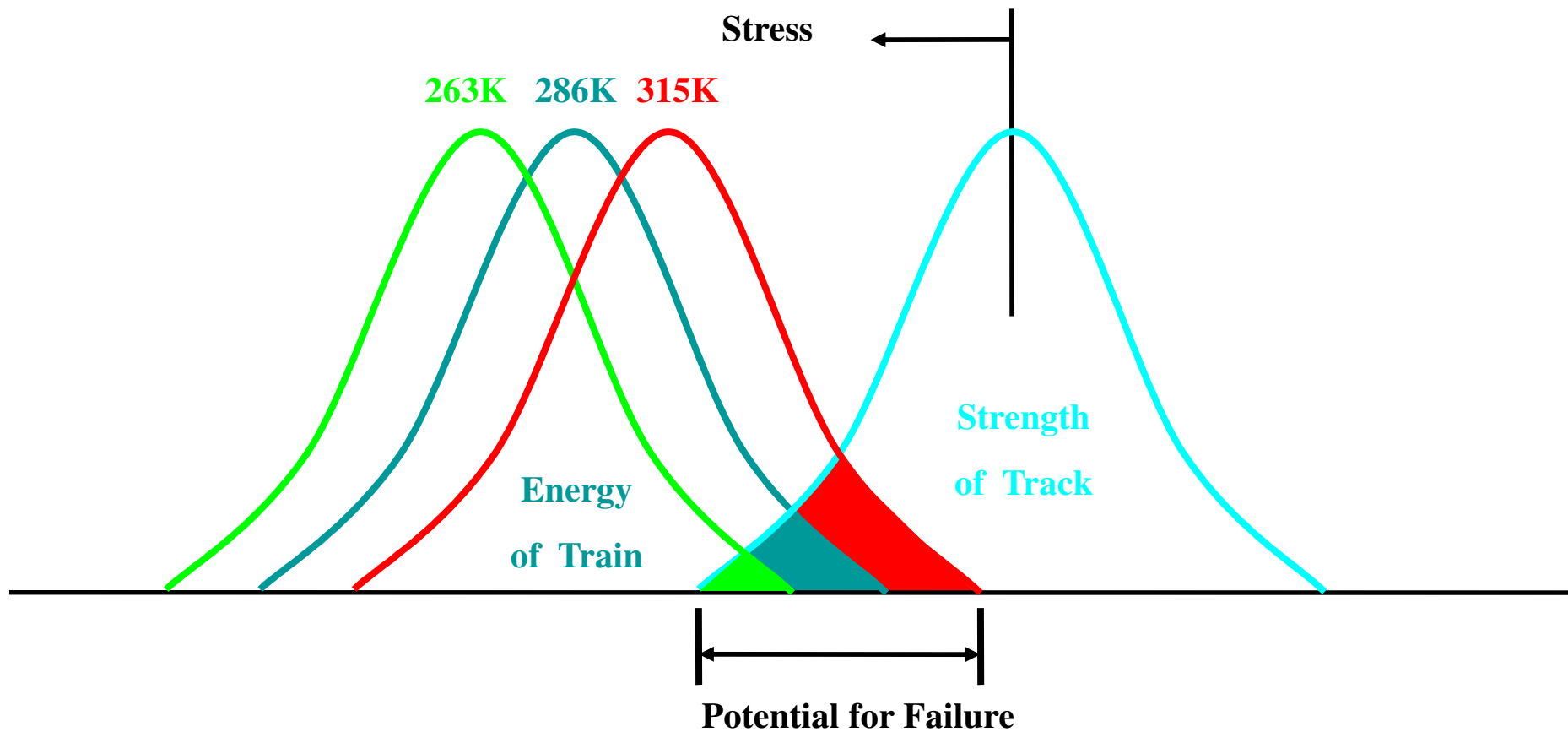
October 18, 2010



ASSOCIATION OF
AMERICAN RAILROADS



What is “ATSI”?



Potential for Failure Where a Car Places Stress on the Track at a Level Higher than the Localized Track Strength



ATSI HISTORY

- Task Force Established in 2002
- Objectives:
 - Reliably detect equipment that exhibits high levels of stress
 - Reduce derailments
 - Develop methods to proactively predict equipment that will place high stress on the track in the future
 - Reduce delays and service interruptions
 - Work with equipment owners to develop efficient methods to proactively maintain the fleet
 - Keep switching and out-of-service time to a minimum



Current Detector Technology

- Wheel Impact Load - high impact wheels
- Truck Performance - stiff or poorly steering trucks
- Trackside Acoustic Bearing - internal bearing defects
- Truck Hunting - detects “hunting” at the detector site
- Wheel Temperature - hot and cold wheel
- Weigh-in-Motion - overloads, shifted loads
- Warm Bearing Trending - temperature increases over time
- Wheel Profile - flange and tread measurements
- Ultrasonic Wheel Inspection - internal defects
- Low Airhose - pairs of cars with low hanging air hoses



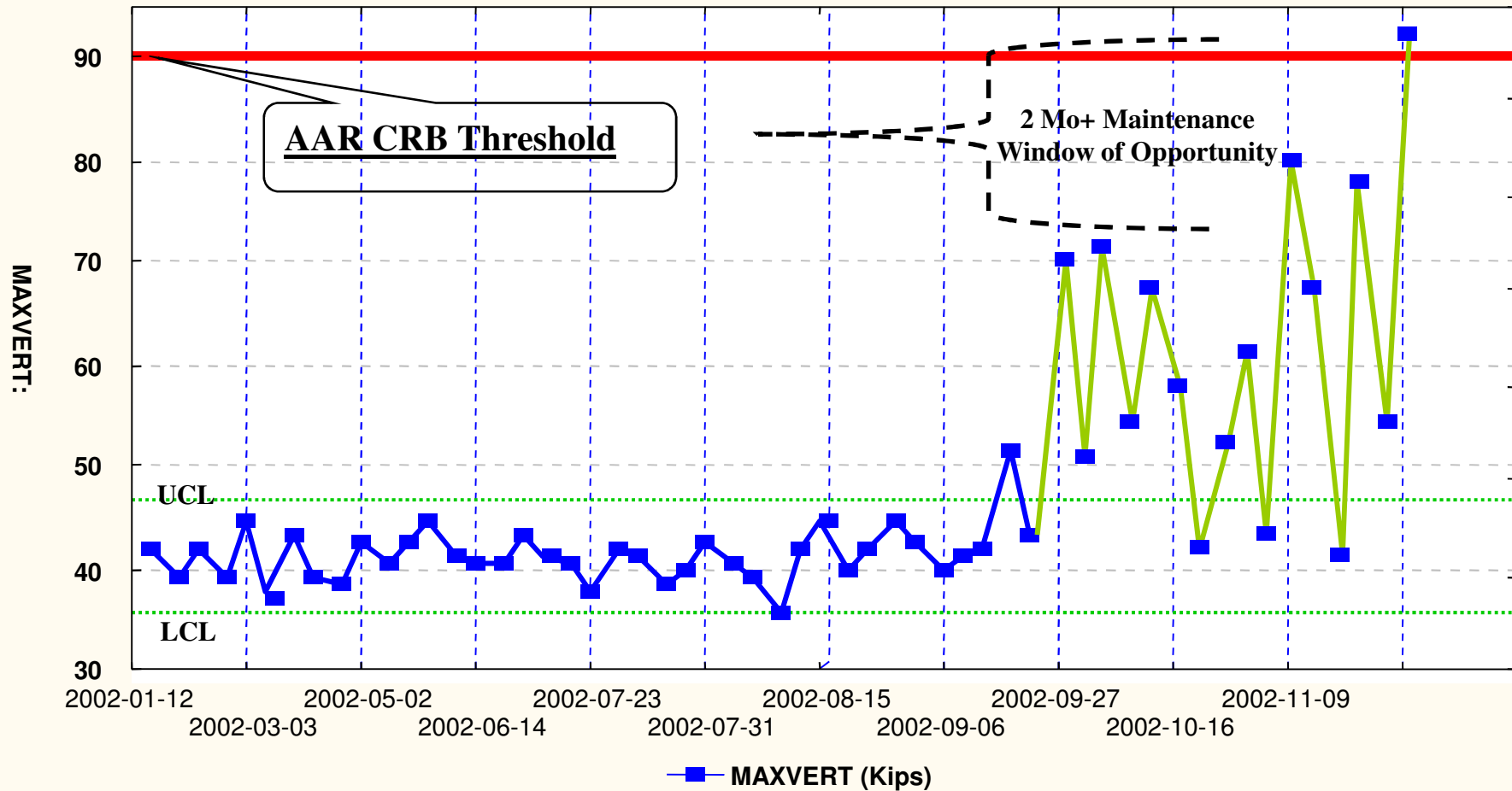
Future Detector Technologies

- **Vision Systems**
 - Brake shoes
 - Safety appliances
 - Coupler / draft gear systems
 - Outlet doors
 - Handbrakes
 - Axles
 - Wheels



Trend Analysis for Predictive Maintenance

Time/Trend Plot of Wheel Impact Loads





ATSI Objectives

- Reliably detect cars that exhibit high levels of stress
 - Reduce derailments
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WHAT IS EHMS?

- Equipment Health Management System
- An Industry-wide Communication Mechanism Supporting ATSI
- Leverages The Integrated Network Of WILD, truck hunting, ABD and TPD Data Through InteRRIS[®] and Railinc's Products (UMLER, EMIS, Early Warning)



EHMS – Alert Levels

- “Window Open”
 - WILD readings from 65 KIPS to less-than 80 KIPS
 - Advance notice to start monitoring car
- “Opportunistic Repair Window”
 - WILD readings from 80 KIPS to less-than 90 KIPS
 - Allow for proactive maintenance
- “AAR Condemnable Window”
 - WILD readings from 90 KIPS to less-than 140 KIPS
 - Remediated per Rule 41 and 44
- “Final Alert Window”
 - WILD readings over 140 KIPS
 - Remediated per Rule 41 and 44

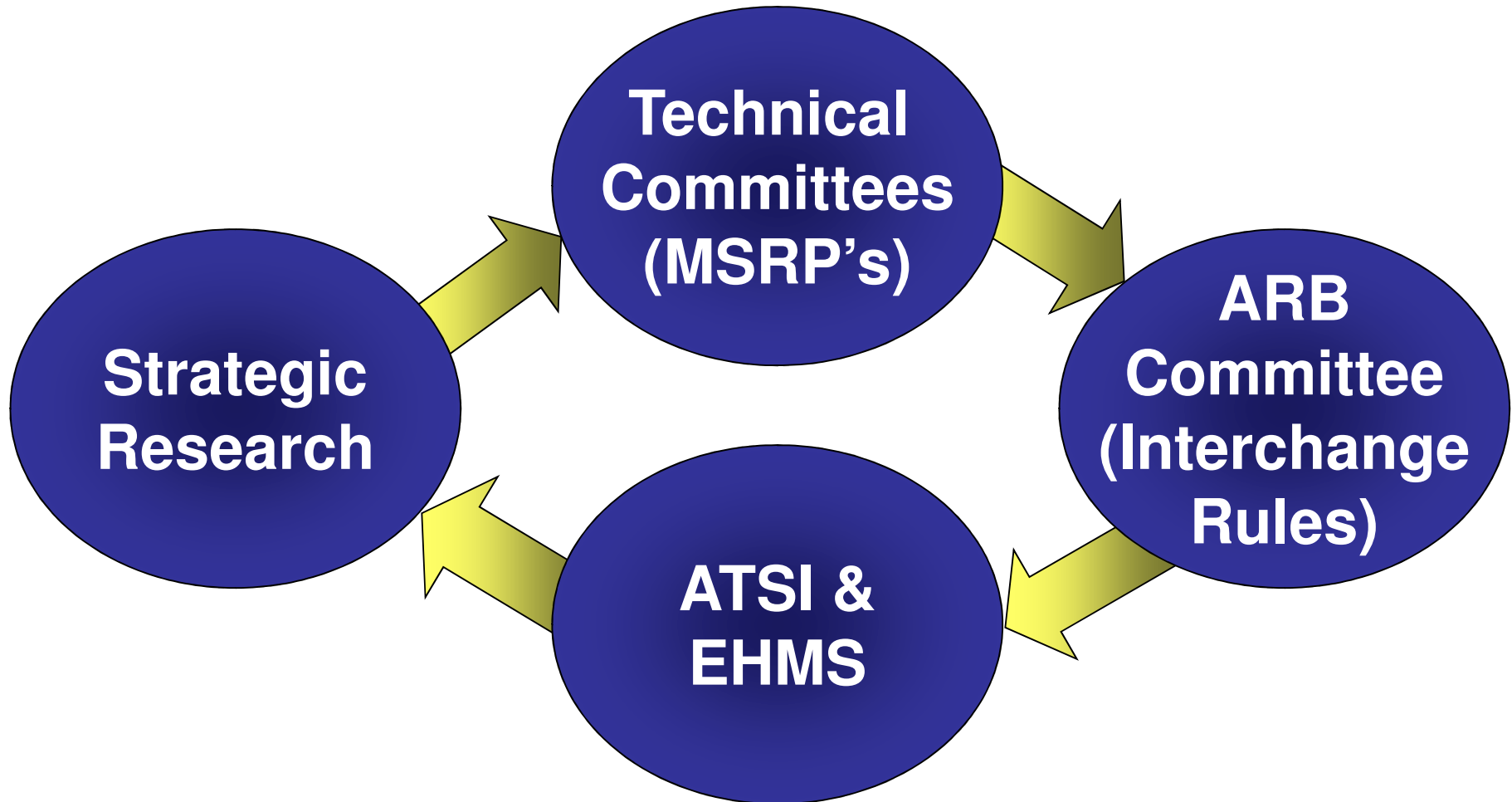


Window of Opportunity

- The “Window of Opportunity” Is the Period of Time Between When a Car Starts Exhibiting Poor Performance and Prior to the Railroad Making Repairs at AAR or Other Condemning Limits
- Mechanisms for Opening/Closing Window of Opportunity
 - Window Opening - Single point real-time database with alerting system
 - Window Closing - Single point data entry similar to Car Repair Billing system



ATSI Interaction with Other Committees





Data Summary Benefits

Accelerated deployment of detector technology
Supports the AAR Rule making process
Accelerated realization of ATSI vision

Current Approved Data Summaries

Wheel Impact – in place

Truck Performance – in setup

Optical Geometry – in setup



ATSI/EHMS 5 Year Technology Roadmap

Strategy to consider technology for ATSI Alerts when:

Data available in InteRRIS

Sufficient research has proven technology as capable

ATSI Roadmap based on information from Research, Rules and Technical committees

Revised Roadmap for beginning of Development Process

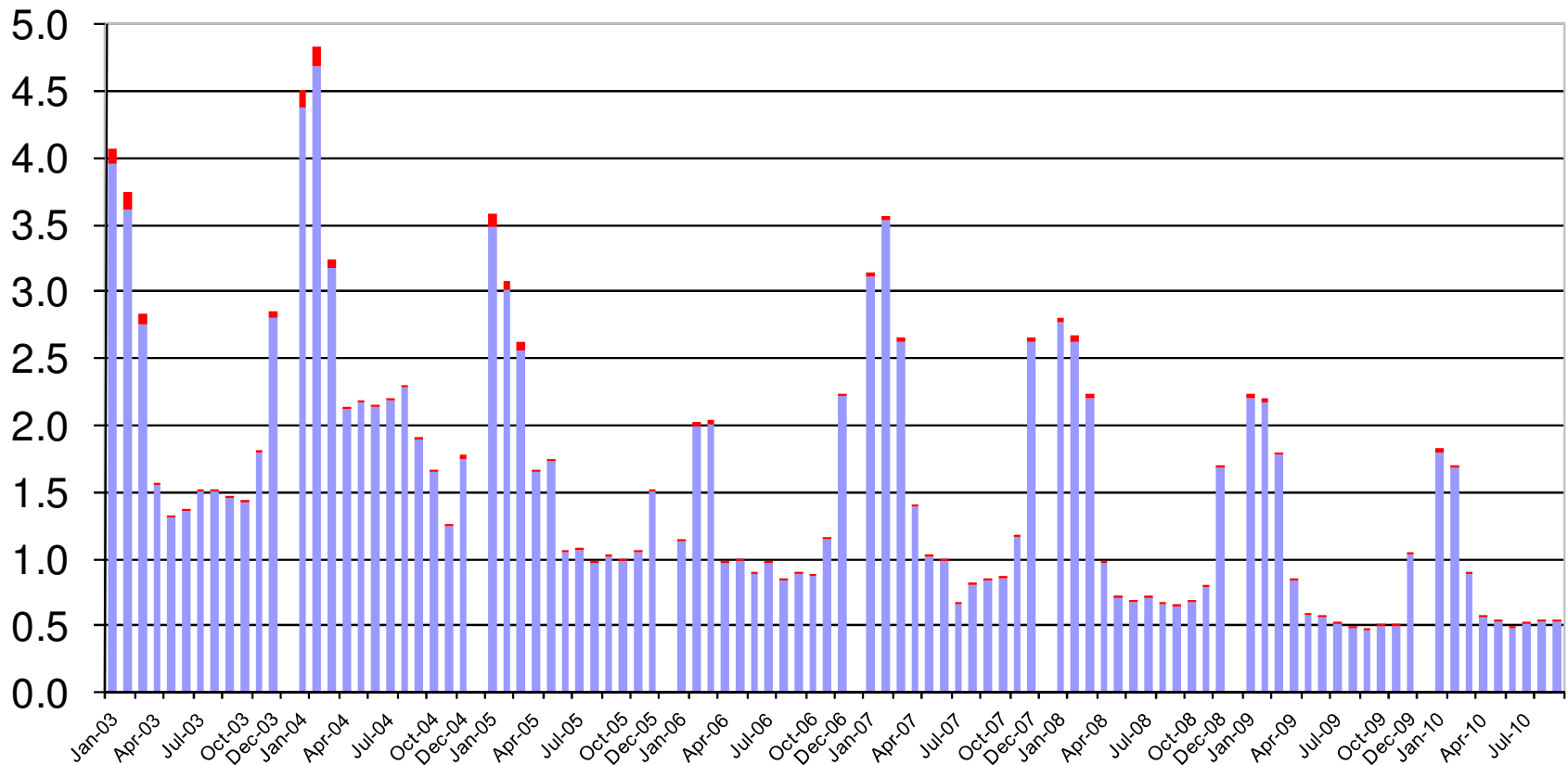
- **2009 – Wheel Profile, Brake Performance, Truck Performance, Composite Rules**
- **2010 – Brake Shoe Vision System, AEI Improvements, Car Performance History, Composite Rules**
- **2011 – Car Clearance System, Low Hose Detection, Cracked Wheel, Safety Appliance Vision Systems, Virtual AEI, Composite Rules**
- **2012 – Underframe Inspection Systems, On-Board Detection Integration, Composite Rules**
- **2013 - Other New Technology, Composite Rules**



InteRRIS® WILD Statistics Update

Wheel Impact Statistics
WILD Hits/1000 Wheels*

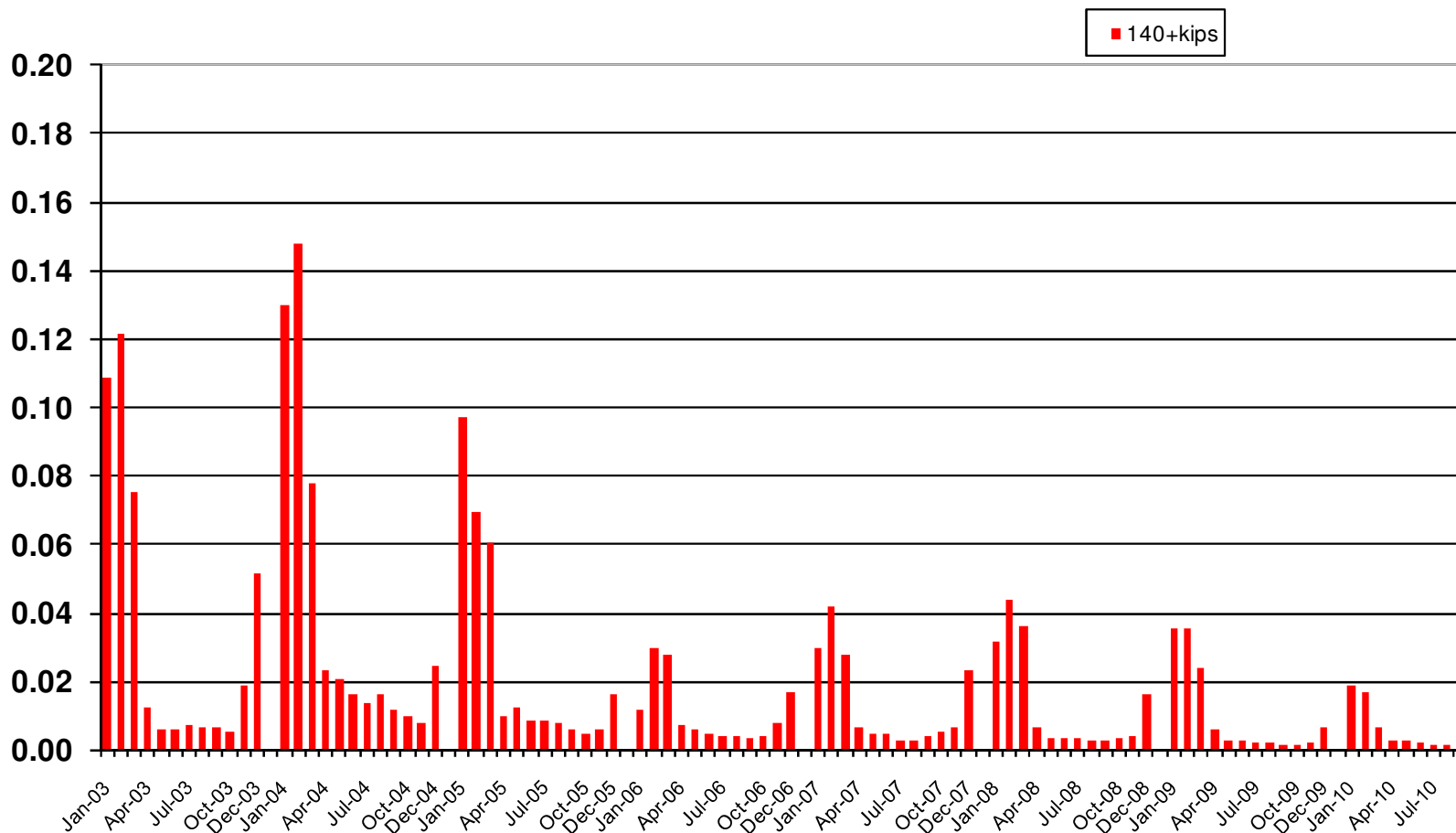
■ 90-140kips ■ 140+kips





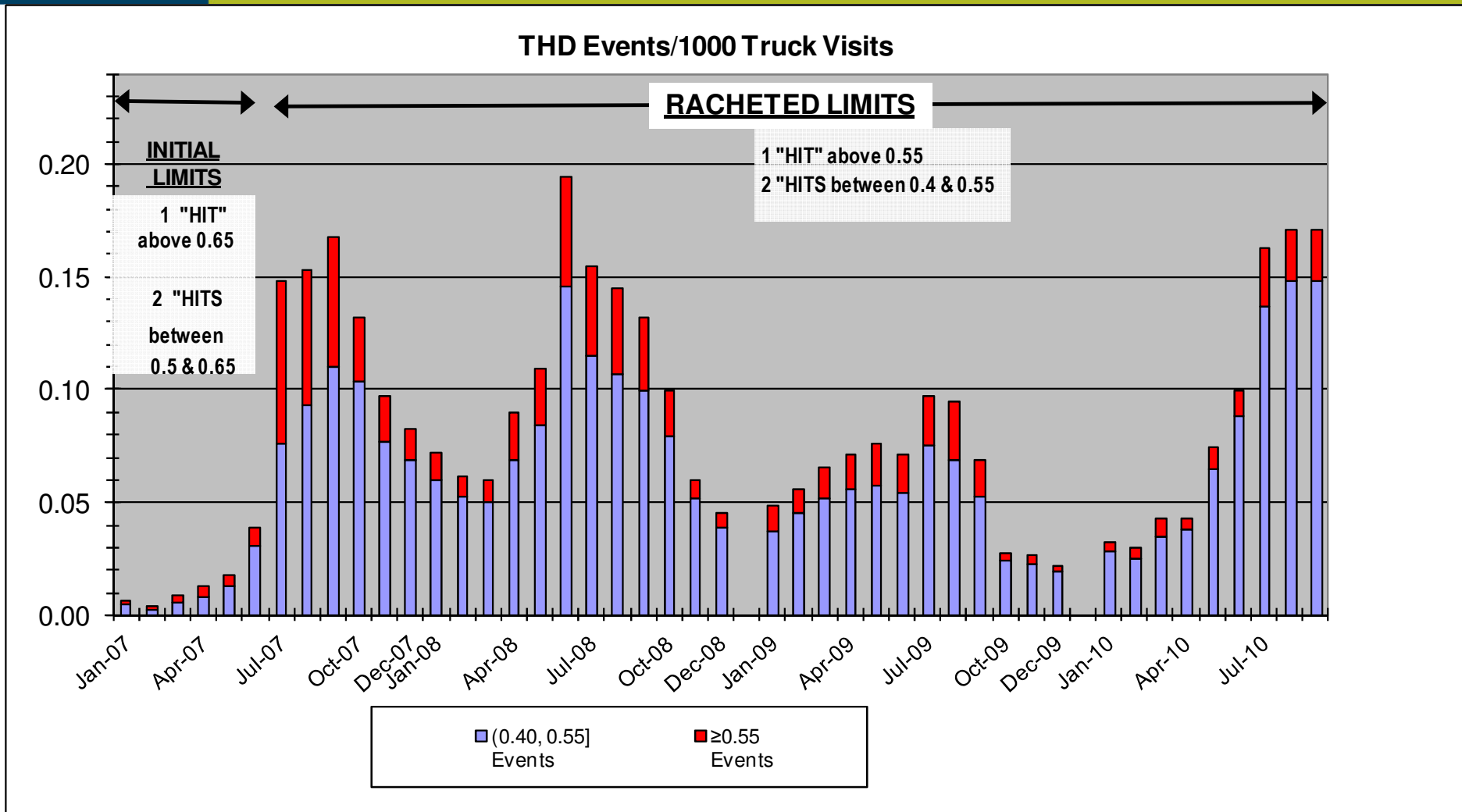
InteRRIS® THD Statistics Update

Wheel Impact Statistics
140 kip+ WILD Hits/1000 Wheels*





InteRRIS® THD Statistics Update





How Can I Find Out More?

ATSI Town Hall

October 21, 2010

Chicago, IL

Watch AAR Circulars for more information