



# Railroad Safety Advisory Committee

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## Dark Territory Working Group Update

### Presentation to The 44<sup>th</sup> Railroad Safety Advisory Committee Meeting

May 20, 2011  
Washington, DC

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# Dark Territory Task



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## Rail Safety Improvement Act of 2008 Requirement

### Sec. 406. Development and Use of Rail Safety Technology in Dark Territory

**Purpose:** To prescribe **standards, guidance, regulations, or orders** governing the development, use, and implementation of rail safety technology in dark territory

Task presented On September 23, 2010 in Washington, DC

- **Task No.:** 10-02



# RSAC Task Statement

## Description

- Review the **existing** signal and train control **regulations** and determine their application to the use of safety technologies in dark territory
- Review **other existing federal regulations** that are associated with the use of advanced technology and may provide additional insight/direction
- Assist FRA in **developing/identifying additional** appropriate/applicable **standards, guidance, regulations, or orders** responsive to the legislative mandate
- Help to ensure the **appropriate** and **safe development and use** of safety technologies in dark territories
- Help to determine a reasonable method for **safety technology inventory** and system awareness by FRA.

Review what we already have for conventional systems

Review what we already have for advanced technology

Develop new

Ensure adherence

Keep track



# First DT WG Meeting

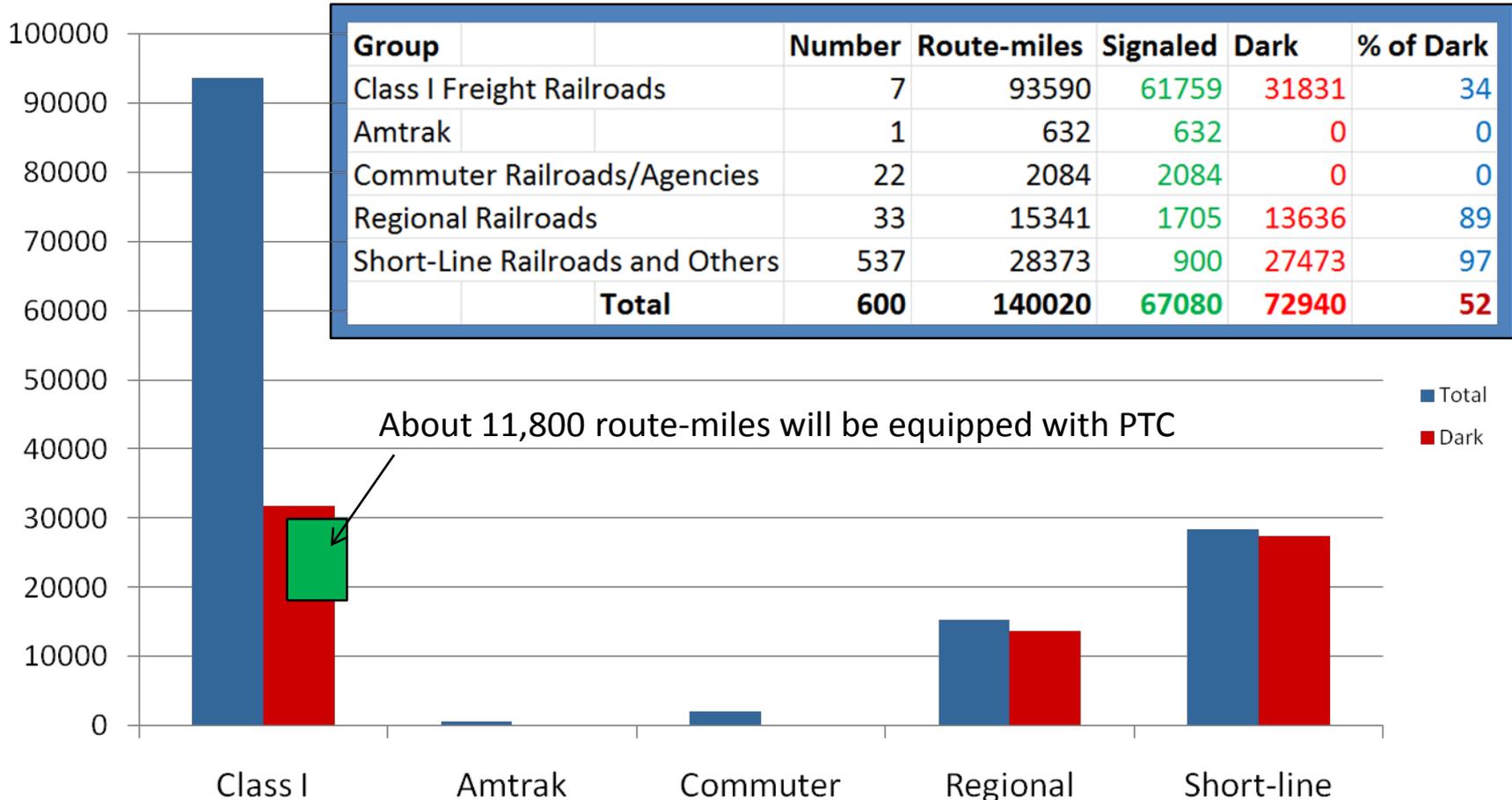
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**Falls Church, Virginia  
March 3 & 4, 2011**

## **Topics presented:**

- Discussed the Congressional mandate.
  - Held a general discussion on the areas of interest.
  - Had a quick look at dark territory statistics including accidents.
  - Identified types of the technology that exists in DT.
  - Discussed some of the appropriate technologies to mitigate identified safety issues.
  - Reviewed some technologies through vendor presentations.
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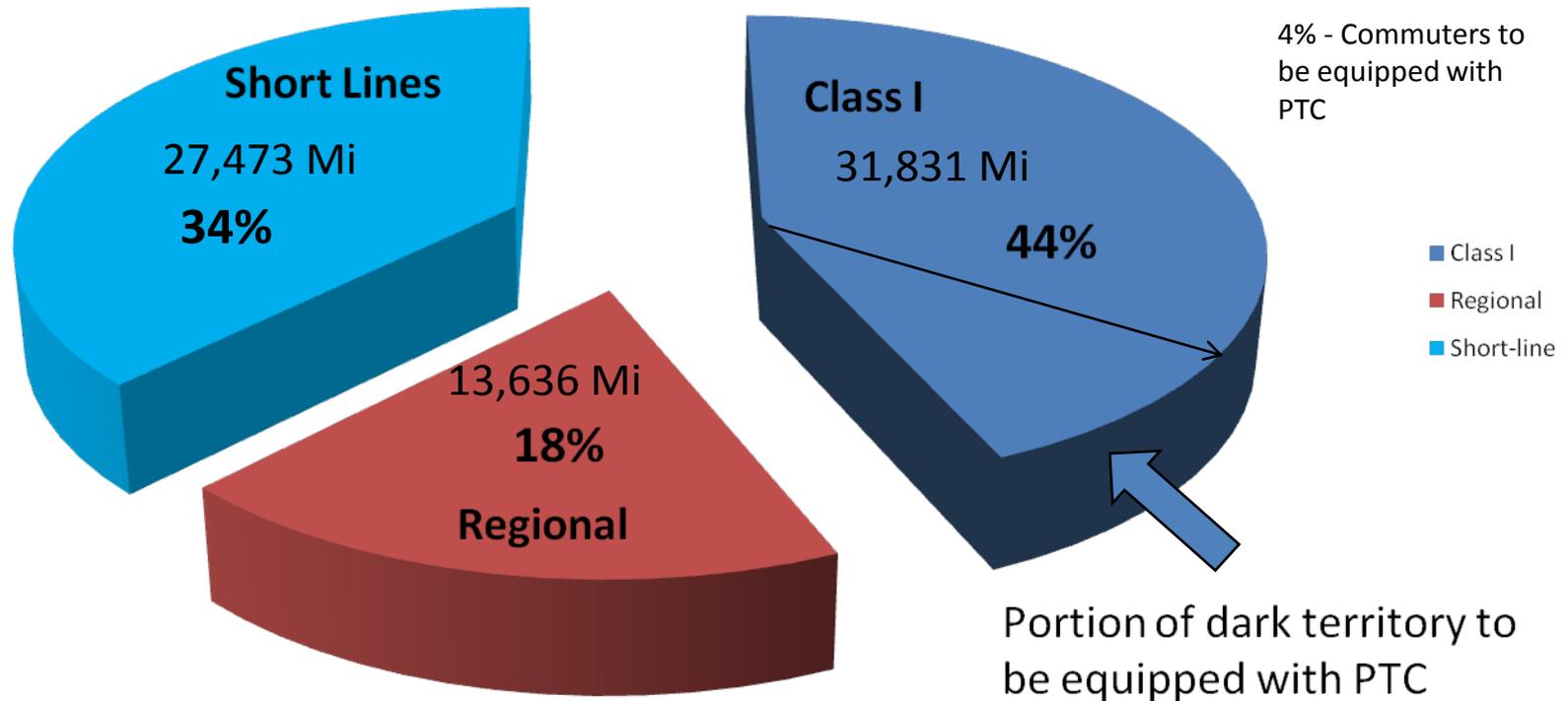
# Portion of Dark Territory on U.S. Railroads



**Total: 140,020 route miles**  
**Dark Territory: 72,940 route-miles (52%)**

# Route-Mileage in Dark Territory

Entities to be affected by regulatory and/or non-regulatory safety measures



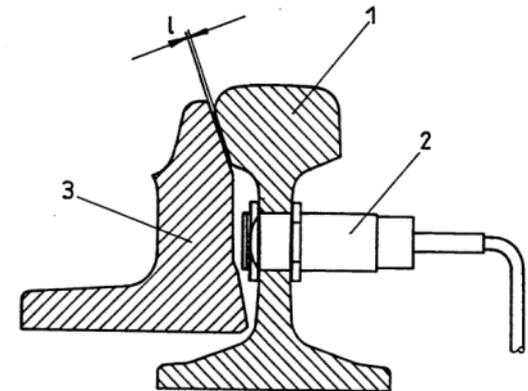
11,800 route-miles of DT to be equipped with PTC constitutes 16% of all DT route-miles

# Power Assisted Switch (PAS) Signals/Indicators



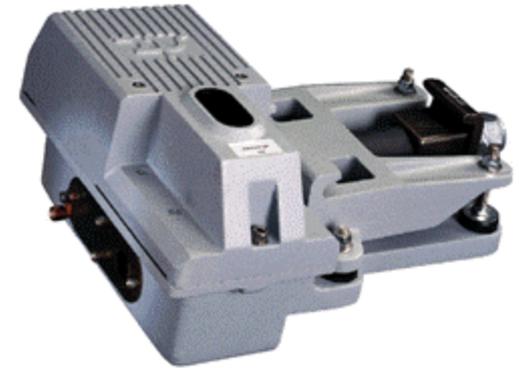
# Switch Position Monitoring Devices or Indicators

- Use of devices to monitor NOT throw or move switches
- Use of technology to monitor switch point position
- Use of existing devices within Dark Territory
  - (Switch Circuit controllers)



# Unusual Contingency Detection Devices

- High-water detectors
- Slide Fence
- Land slide
- Special track condition detectors
- Bridge misalignment detectors
- Hot-Box detectors
- Dragging equipment detectors
- Impact wheel detectors
- Ultrasonic wheel testing





# First DT WG Meeting, cont.

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## Results (continued):

- Defined the scope – Main Tracks and Main Track passing sidings outside of yards.
- Agreed to use a data driven process.
- FRA has no preconceived notions.
- Concentrate first on existing/applied DT technology (1<sup>st</sup> Bucket) versus future DT Technology (2<sup>nd</sup> Bucket).
- Homework assigned to help understand the issues.
  - Inventory of Already Implemented DT Technology
  - Identify the Numbers of Technology Elements

# Two-Phase Approach

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## Current Use (1<sup>st</sup> bucket)

- Power-Assisted Switches
- Switch Position Monitoring
- Track Integrity Systems
- Unusual Contingency Detectors

## Future Use (2<sup>nd</sup> bucket)

- Voluntary Installation of Current Use Devices
- Potential Risk-Based Required Installations
- New or Novel Technologies



# Second DT WG Meeting



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**Washington, DC May 9-10, 2011**

## **Six Step Approach:**

1. Top level review of the Dark Territory Accident History.
2. Develop a prioritized list that identifies the most important issues.
3. Select the most important issues (current use bucket) for immediate consideration by the DT Working Group.
4. Form task force groups to fully explore the selected issues and develop a strategy to develop standards and improve safety.
5. Task force groups report findings to the full Working Group.
6. Working Group concurs with Strategy.



# Dark Territory Accident Statistics



## Class I, Main Lines

Railroad	Route miles		Route miles, %		Traffic Volume, Trillion GTM		Traffic Volume, %		Number of Accidents		Number of Accidents, %*		Accidents/ Trillions GTM		Ratio D/S	% of all Acc/Trill GTM Attrib. to DT
	Signaled	Dark	Signaled	Dark	Signaled	Dark	Signaled	Dark	Signaled	Dark	Signaled	Dark	Signaled	Dark		
#1	19614	6785	74.3	25.7	1,067,798	53.996	95.2	4.8	1349	283	82.7	17.3	1.26	5.24	4.15	80.6
#2	10426	5733	64.5	35.5	373,265	27.475	93.1	6.9	438	104	80.8	19.2	1.17	3.79	3.23	76.3
#3	11044	5951	65.0	35.0	520,687	56.638	90.2	9.8	562	189	74.8	25.2	1.08	3.34	3.09	75.6
#4	15271	7426	67.3	32.7	1,123,073	88.533	92.7	7.3	1045	247	80.9	19.1	0.93	2.79	3.00	75.0
#5	1062	1665	38.9	61.1	36,69	15.75	70.0	30.0	94	89	51.4	48.6	2.56	5.65	2.21	68.8
#6	3353	3101	52.0	48.0	91,99	15.719	85.4	14.6	134	43	75.7	24.3	1.46	2.74	1.88	65.3
#7	1102	974	53.1	46.9	27,379	18.221	60.0	40.0	53	19	73.6	26.4	1.94	1.04	0.54	35.0
<b>Total:</b>	<b>61872</b>	<b>31635</b>	<b>66.2</b>	<b>33.8</b>	<b>3,240,882</b>	<b>276.332</b>	<b>92.1</b>	<b>7.9</b>	<b>3675</b>	<b>974</b>	<b>79.1</b>	<b>20.9</b>	<b>1.13</b>	<b>3.52</b>	<b>3.11</b>	<b>75.7</b>

\*Data on accidents is given for a 6 year period from 2003 to 2008

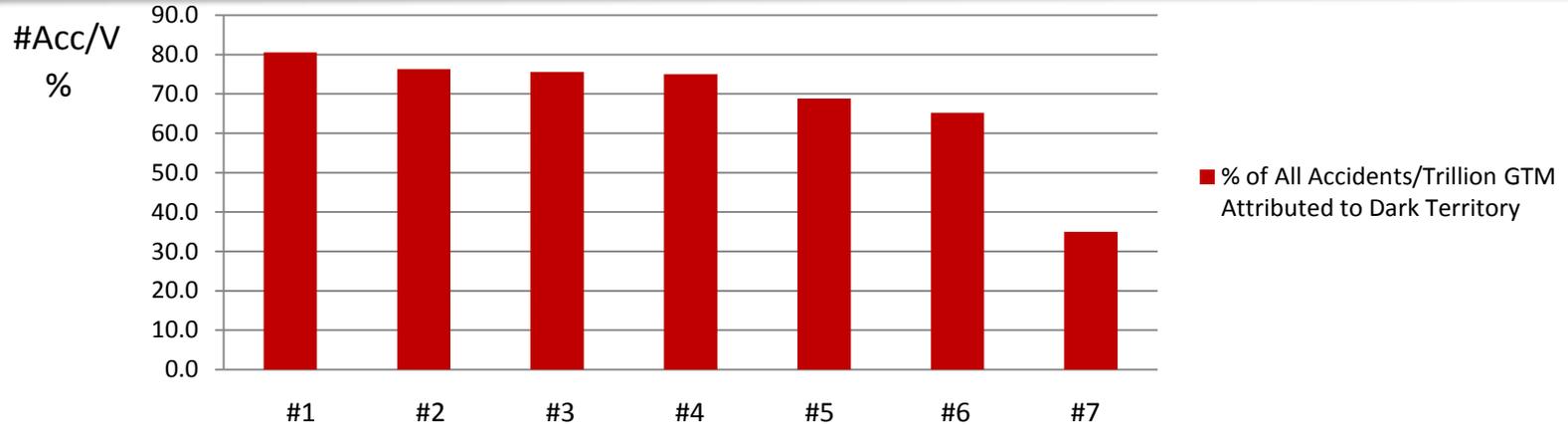


# Dark Territory Accident Statistics

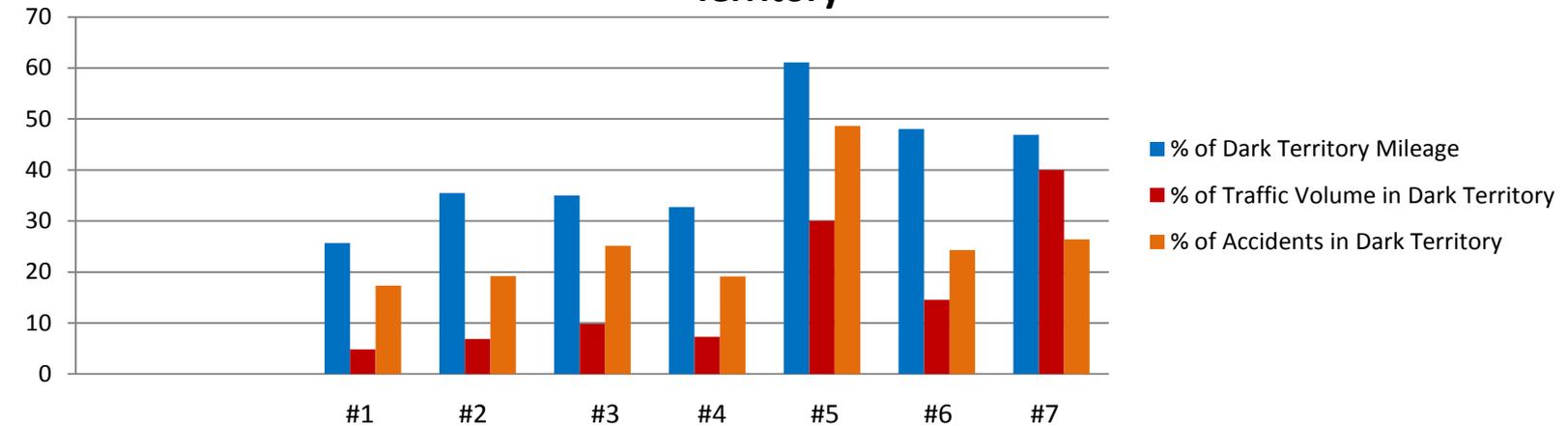
## Class I, Main Lines



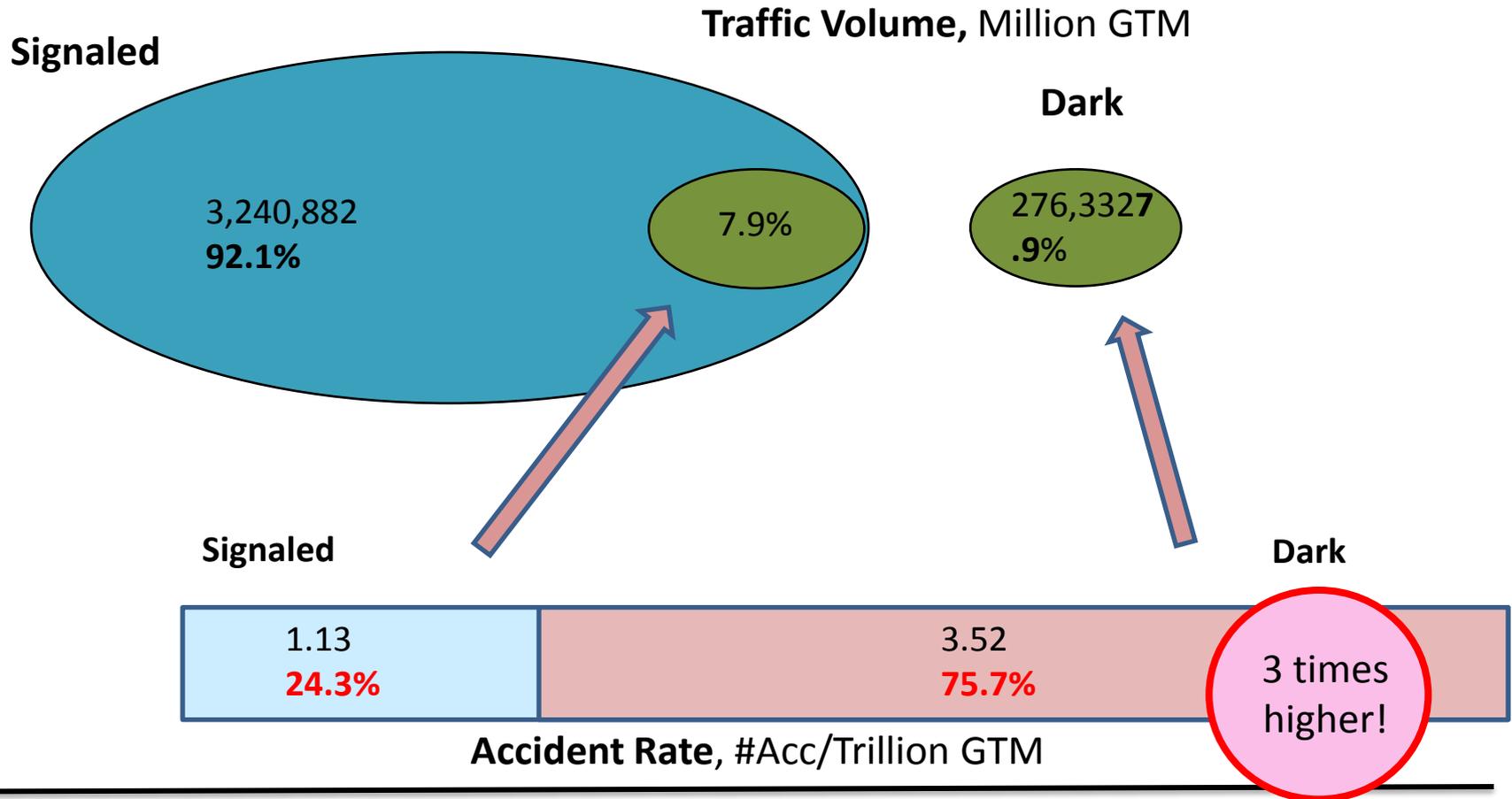
### % of All Accidents/Trillion GTM Attributed to Dark Territory



### Percentage of Route Miles, Traffic Volume, and Accidents in Dark Territory

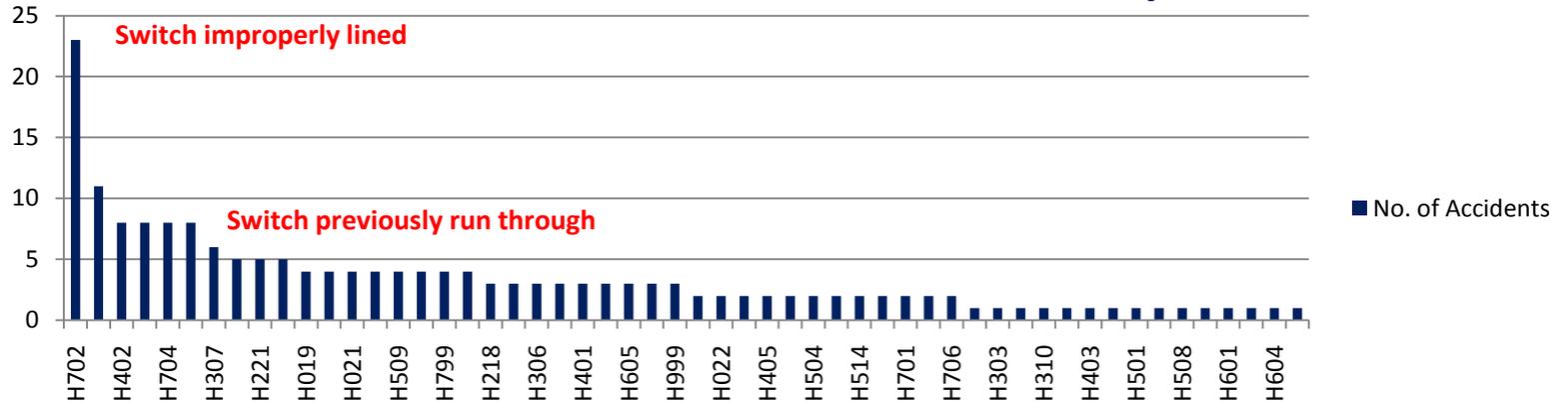


# Accidents per Traffic Volume Rate for Class 1s

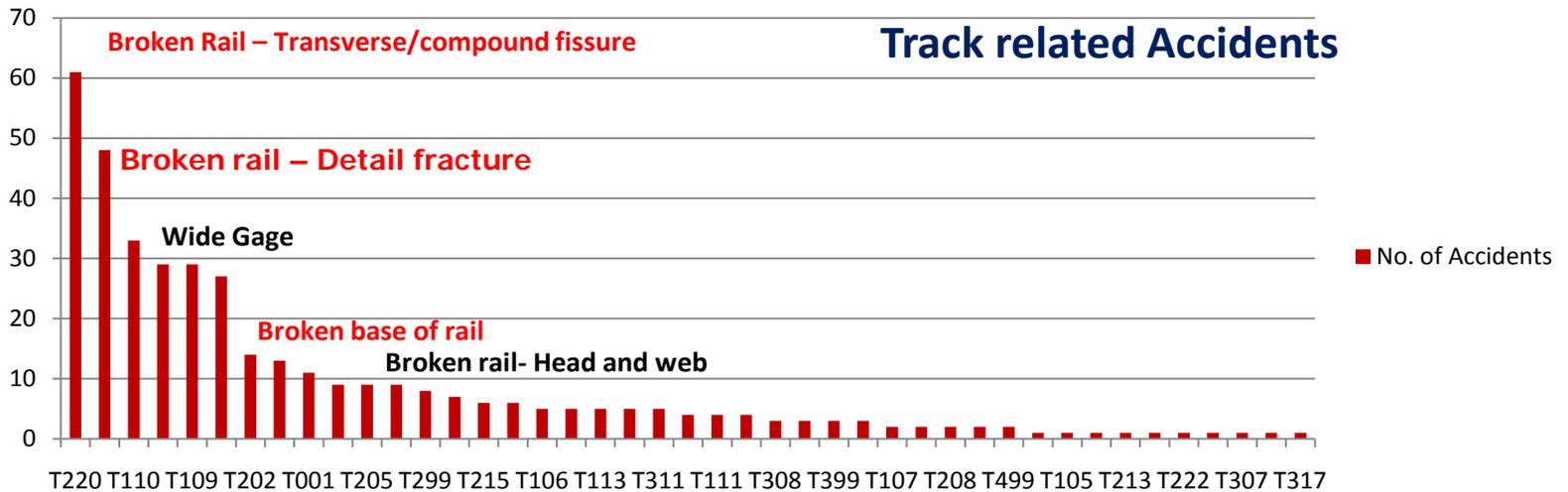


# Cause of Accidents in DT (2003-2008)

## Accidents Caused by Human Factors

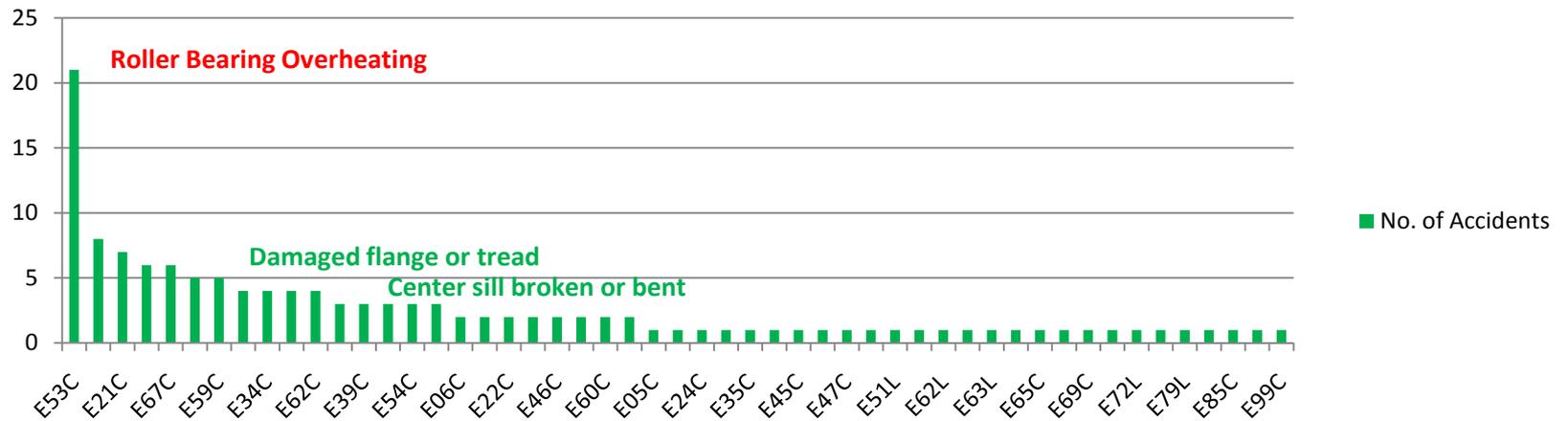


## Track related Accidents



# Cause of Accidents in DT (2003-2008)

## Mechanical & Electrical



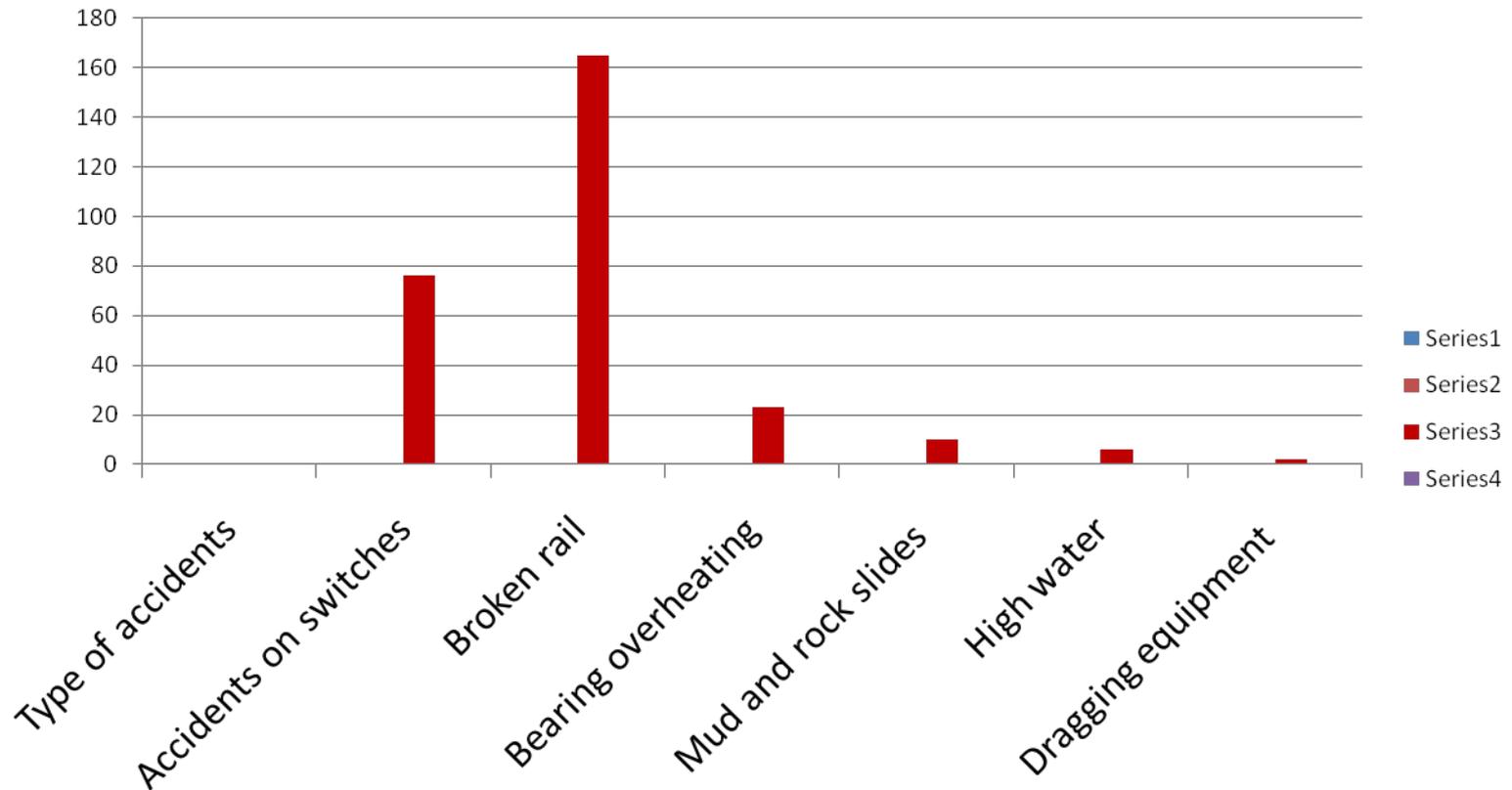


# Types of Accidents that Can be Reduced by the Existing Safety Technology



Type of accidents	Accidents Statistics	Safety technology to reduce accidents
Accidents on switches	76	Switch detectors, Power assisted switches
Broken rail	165	Track integrity warning systems
Bearing overheating	23	Hot box detectors
Mud and rock slides	10	Slide fences, etc.
High water	6	High water, Flood detectors
Dragging equipment	2	Dragging equipment detectors

# Statistics on Types of Accidents that Can be Reduced by the Existing Safety Technology





# Existing Technology Inventory in Dark Territory Provided by RSAC Members



	Class 1	Short Lines
• Hand operated switches	6526	4341
• Switch Point Monitored	13	227
• Power Operated Switches	167	75
• Track Integrity Systems	-- *	61
• Unusual Occurrence Detectors	203	61
• High Water Detectors	1	1
• Slide Fences	5	3
• RCL Zone Limiting Devices	1	0
• Car Counters	0	17
• Scour Detectors	9	0

\* Track integrity warning systems on Class 1 railroads only in PTC territory



# Phase I – Current Use Bucket



**Three primary topics seem to rise to the top**

## **1. Switches**

**Associated with the use and position of**

## **2. Track integrity**

**Broken rail**

## **3. Defective conditions**

**Both mechanical and wayside**



# What Safety Technologies May Address These Three Topics?

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## 1. Switches

**Switch position monitoring**

**Power-assisted switches**

## 2. Track integrity

**Broken rail detection systems**

## 3. Defective conditions

**Defect (hazard) detection systems**

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# Task Force Groups Formed

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**GROUP 1**

**Switches**

**GROUP 2**

**Track Integrity**

**GROUP 3**

**Defect Detectors**

Each group consists of representatives of:

**FRA  
LABOR  
CLASS Is  
SHORT LINES  
SUPPLIERS  
OTHERS**

# Six Steps

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1. Analyze Accident History 
  2. Develop a Prioritized List 
  3. Select Issues 
  4. Form Task Force Groups 
  5. Report Findings and Strategy
  6. Agree on Strategy
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# Railroad Safety Advisory Committee

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**Questions?**