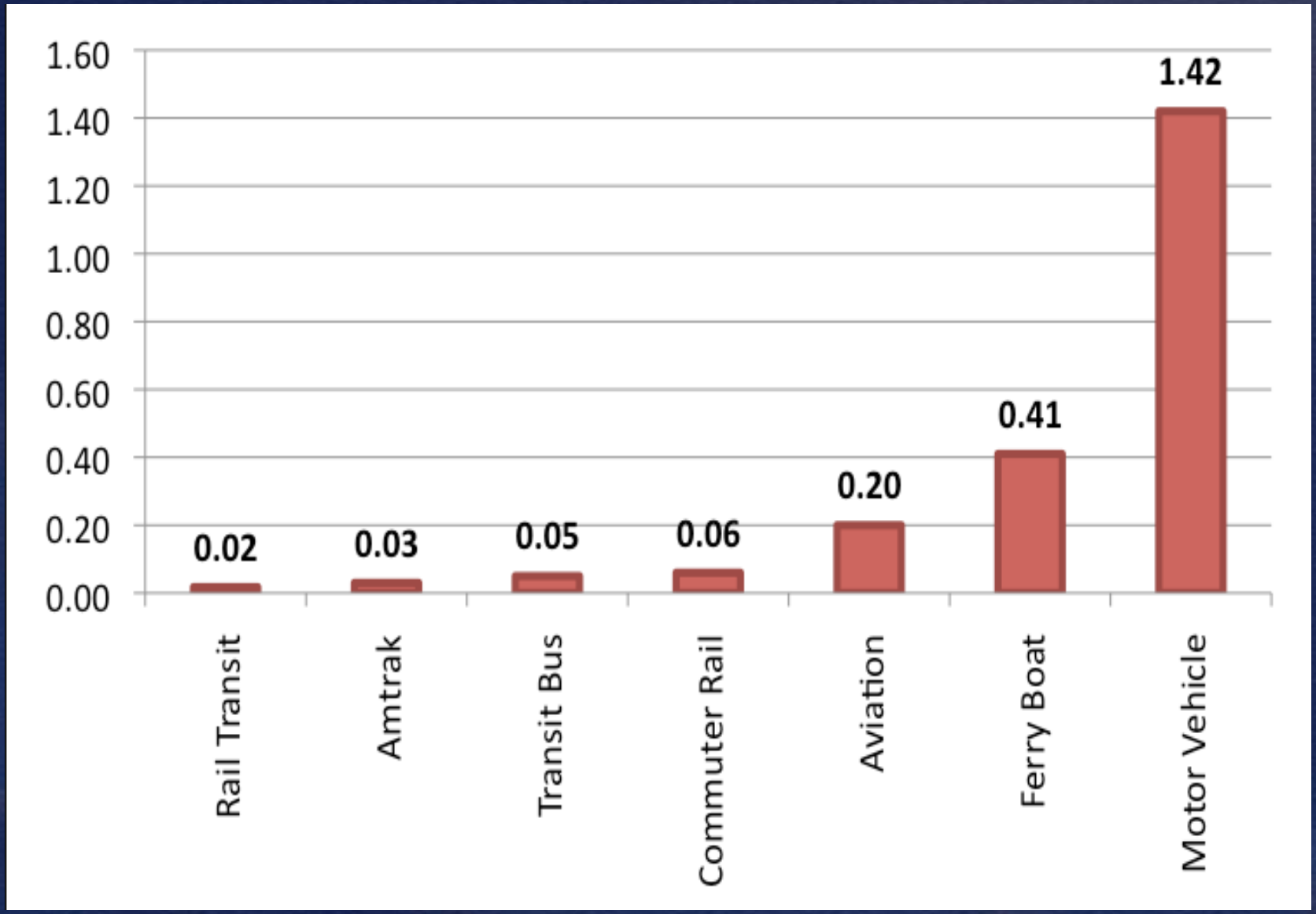
NTSB National Transportation Safety Board

American Public Transit Association

The Board Member's Role in System Safety

Transit Safety Record



Source: Federal Transit Administration, 2008

“Leaders should have a sense of vulnerability to actively question safety issues in the organization.”

Pamela McCombe
Director of Safety
Greater Cleveland Regional Transit Authority

WMATA

Fort Totten June 22, 2009

Description/Disclaimer:
This narrated animation displays the sequence of operation of Metro trains 112 and 214, before they collided near the Ft. Totten Metro Station on June 22, 2010. The animation begins as Train 112 leaves the Takoma Park Station, about two and a half minutes before the accident. When Train 214 reaches the faulty track circuit, it is not detected by the train control system. Except for two brief periods when the speed command goes briefly to zero, indicating intermittent function of the faulty circuit, the train control system transmits an errant speed command of 55 mph to Train 112 as Train 214 occupies the faulty track circuit.

The animation shows the operator applying the emergency braking approximately three seconds after she has a full view of Train 214 and ends with a photograph of the accident.

The top of the screen shows an overhead view of the two accident trains. The blue arrow represents Train 112 and the orange arrow represents Train 214. The yellow dots on the track separate each set of track circuit segments.

The middle section of the screen shows the elapsed time, the speed commands issued to each train by the train control system, and the actual speeds of each train.

The bottom of the screen depicts a three-dimensional view riding along with the striking train, up to the point that it collided with the stopped train.

This accident reconstruction was based on information obtained from the Train 214 event recorders. The motion of Train 112 was derived from a simulation based on speed commands that the train received from the signal system, the design characteristics of the metro trains, and other evidence. The accident occurred on track owned and maintained by WMATA, and approximately 1 1/4 miles of track are shown in the animation. The accident occurred in daylight conditions; weather and visibility at the time of the accident are not shown.

Probable Cause

- Failure of the track circuit modules that caused the automatic train control system to lose detection of train 214 and thus transmit speed commands to train 112 up the point of impact

- WMATA's failure to ensure that an enhanced track circuit verification test was institutionalized and use system-wide after the 2005 Rosslyn near collisions, which would have identified the faulty track circuit before the Fort Totten accident.

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Contributing to the Accident

- WMATA's lack of a safety culture
- WMATA's failure to effectively maintain and monitor performance of the ATC system
- GRS/Alstom failure to provide a maintenance plan to detect spurious signals that could cause a malfunction
- Ineffective oversight by WMATA Board of Directors
- Ineffective oversight by TOC and its lack of safety oversight authority
- FTA's lack of statutory authority to provide Federal safety oversight

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Woodley Park Nov. 3, 2004

West Falls Church Nov. 29, 2009

Your Role as Leaders

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Your Role as Leaders

- Set the tone for safety. Make it a priority.

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Your Role as Leaders

- Set the tone for safety. Make it a priority.
- Ask the difficult questions. Make people uncomfortable.

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Your Role as Leaders

- Set the tone for safety. Make it a priority.
- Ask the difficult questions. Make people uncomfortable.
- Have a sense of vulnerability. Own your responsibility.

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Questions You Should Ask

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1. What are the safety performance metrics?

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2. What is the safety reporting structure?

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3. Does your organization operate under a Safety Management System?

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1. What are the safety performance metrics?
2. What is the safety reporting structure?
3. Does your organization operate under a Safety Management System?
4. What is the safety culture?

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The Biggest Question

Are you

comfortable

with accountability?

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“The Buck Stops Here”

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Questions?