

Quantifying Tire-related Deaths and Injuries in U.S. Motor Vehicles

PRESENTED TO
the National Transportation Safety Board
Tire Safety Symposium

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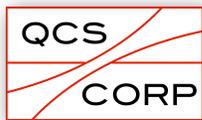
December 9, 2014



Single Vehicle Crash

1996 Ford Explorer in a Rollover Crash with Incapacitating Injuries, October, 2012

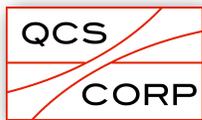
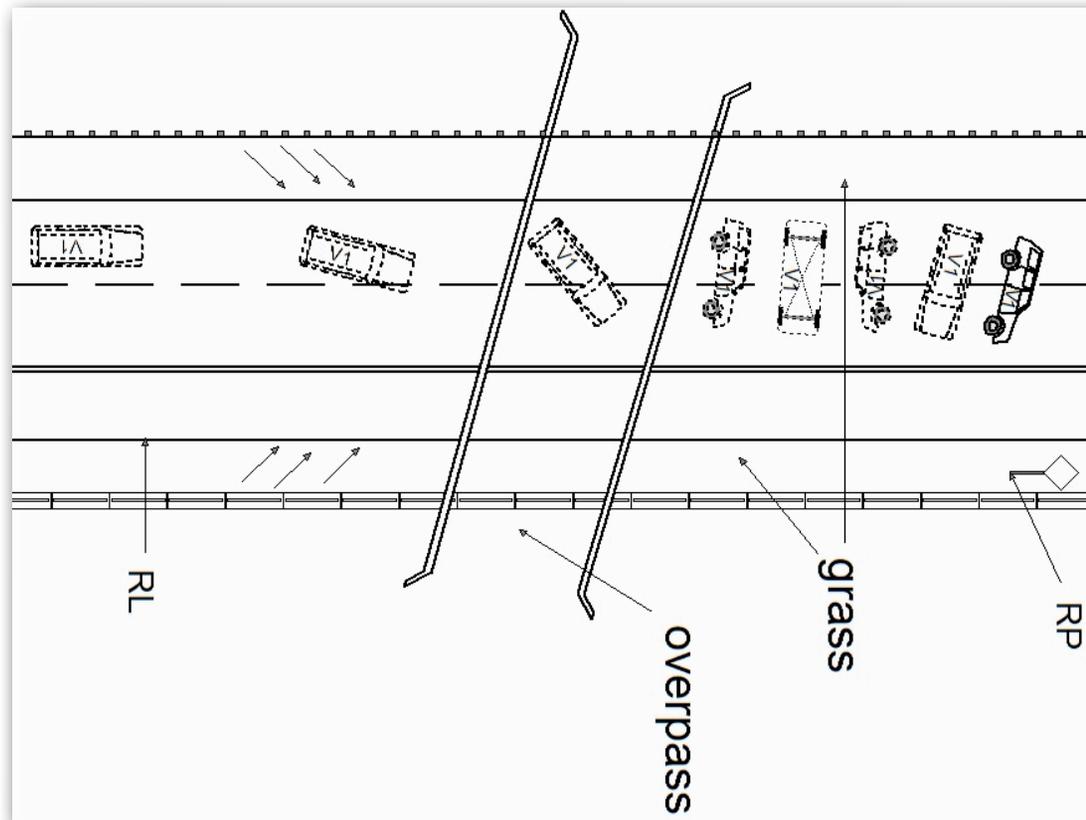
NASS/CDS Case 2012-49-186



Source: NHTSA, National Automotive Sampling System, CDS XML Case Viewer
<<http://www-nass.nhtsa.dot.gov/nass/cds/SearchForm.aspx>>

Single Vehicle Crash

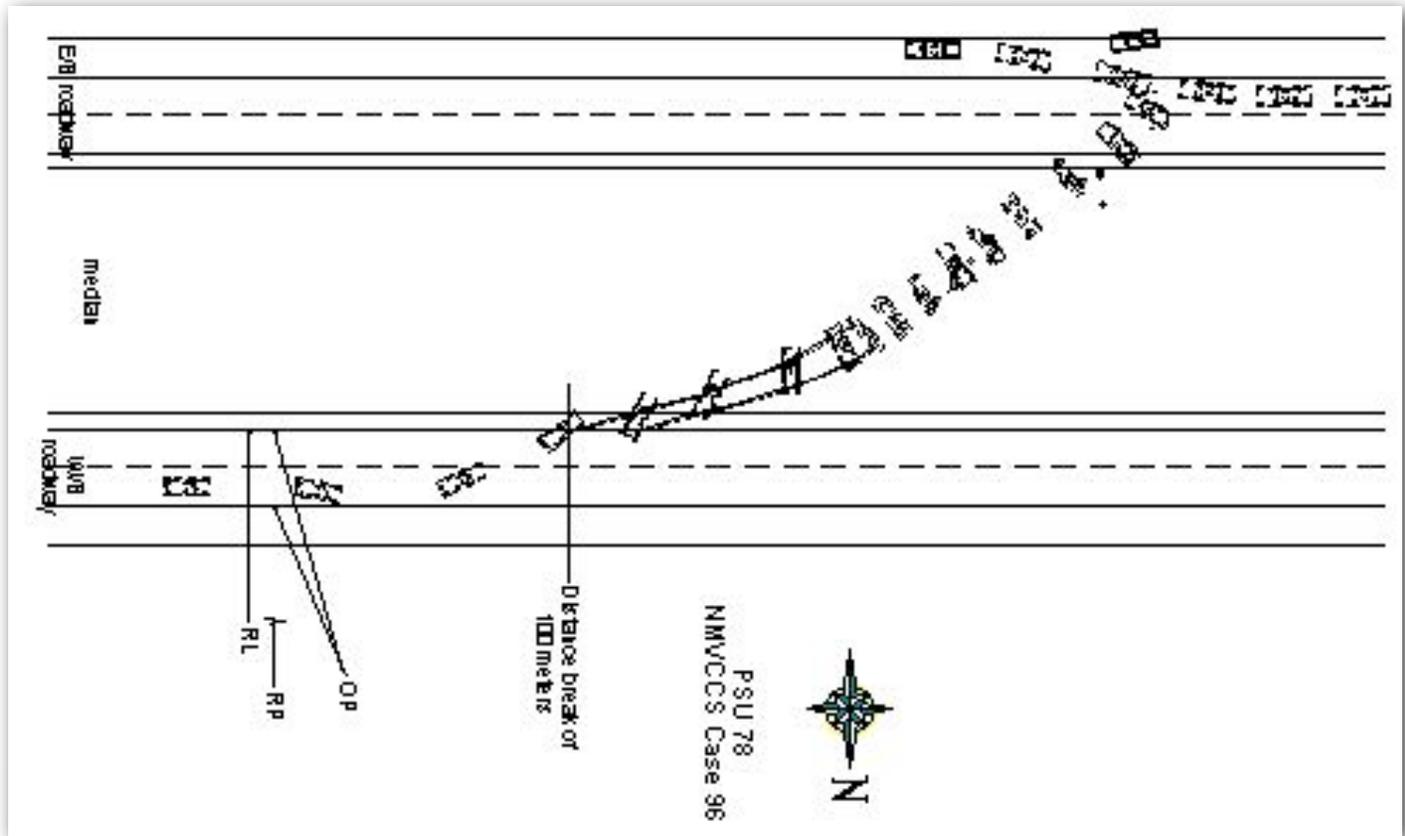
1996 Ford Explorer in a Rollover Crash with Incapacitating Injuries, October, 2012 NASS/CDS Case 2012-49-186



Source: NHTSA, National Automotive Sampling System, CDS XML Case Viewer
<<http://www-nass.nhtsa.dot.gov/nass/cds/SearchForm.aspx>>

Multi-vehicle Crash

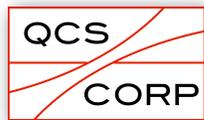
NMVCSS Case 2006-78-96



Source: NHTSA, National Motor Vehicle Crash Causation Survey Case Viewer
<<http://www-nass.nhtsa.dot.gov/nass/nmvccs/SearchForm.aspx>>

Tire-related Fatal Crash Involving Pedalcyclist FARS Case 2010-190247-1

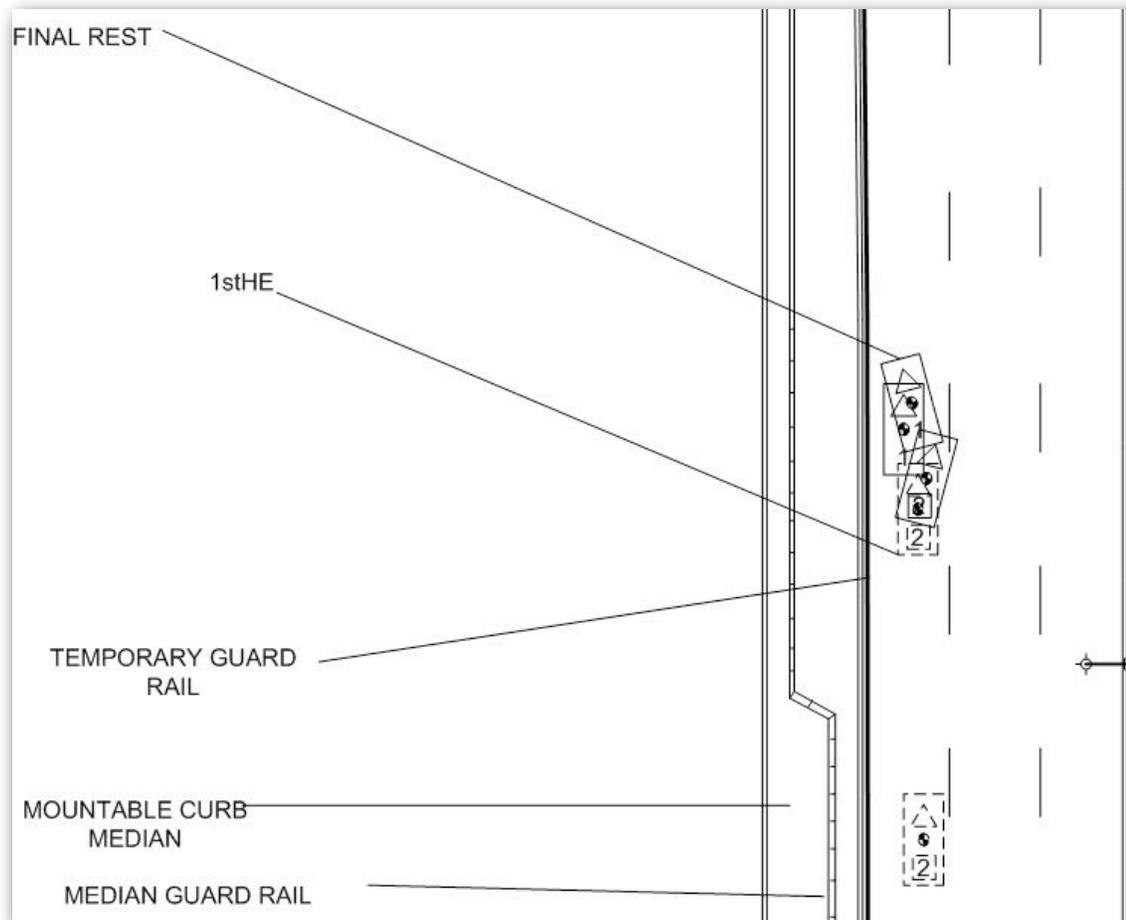
Calendar Year	ST_CASE	VEH_NO	Field	Code
2010	190247	1	VE_FORMS	1
2010	190247	1	VE_TOTAL	1
2010	190247	1	Vehicle DEATHS	0
2010	190247	1	Sequence 1	Equipment Failure (blown tire, brake failure, etc)
2010	190247	1	Sequence 2	Pedalcyclist
2010	190247	1	Sequence 3	Ran Off Roadway - Right
2010	190247	1	Sequence 4	Ditch
2010	190247	1	Sequence 5	Rollover/Overturn
2010	190247	1	FATALS	1



Source: QCS Corp. abstract of FARS, 2010

Tire Failure Precedes Crash

NASS/CDS Case 1998-3-043



Source: NHTSA, National Automotive Sampling System, CDS XML Case Viewer
<<http://www-nass.nhtsa.dot.gov/nass/cds/SearchForm.aspx>>

State Accident Data About Tire-related Crashes

Important Usage Issue:

Coverage and quality of tire-related data on police accident report forms are highly dependent on form design and the workflow of computerized data collection systems



State Accident Data About Tire-related Crashes



State Accident Data About Tire-related Crashes

STATE	LICENSED DRIVERS IN 2012	FATALITIES IN 2012	FATALITY RATE PER 10K LICENSED DRIVERS IN 2012	FATALITIES INVOLVING LIGHT PASSENGER VEHICLES IN TIRE-RELATED CRASHES 2010-2012
Michigan	7,019,000	938	1.34	4
Wisconsin	4,057,000	615	1.52	30



Source: Traffic Safety Facts, 2012
 Tire-related fatalities compiled by QCS Corp., see below for methodology

Wisconsin
Motor Vehicle
Accident
Report Form,
2007



Vehicle Factors

<p style="text-align: center; margin: 0;">Unit Number</p> <table style="width: 100%; text-align: center; border-collapse: collapse;"> <tr> <td style="border: 1px solid orange; border-radius: 50%; padding: 2px;">1</td> <td style="border: 1px solid orange; border-radius: 50%; padding: 2px;">2</td> <td style="border: 1px solid orange; border-radius: 50%; padding: 2px;">3</td> <td style="border: 1px solid orange; border-radius: 50%; padding: 2px;">4</td> <td style="border: 1px solid orange; border-radius: 50%; padding: 2px;">5</td> </tr> <tr> <td style="border: 1px solid orange; border-radius: 50%; padding: 2px;">6</td> <td style="border: 1px solid orange; border-radius: 50%; padding: 2px;">7</td> <td style="border: 1px solid orange; border-radius: 50%; padding: 2px;">8</td> <td style="border: 1px solid orange; border-radius: 50%; padding: 2px;">9</td> <td style="border: 1px solid orange; border-radius: 50%; padding: 2px;">10</td> </tr> </table> <p style="text-align: center; margin-top: 5px;"><input type="radio"/> N/A</p>	1	2	3	4	5	6	7	8	9	10	123	<p style="text-align: center; margin: 0;">Unit Number</p> <table style="width: 100%; text-align: center; border-collapse: collapse;"> <tr> <td style="border: 1px solid orange; border-radius: 50%; padding: 2px;">1</td> <td style="border: 1px solid orange; border-radius: 50%; padding: 2px;">2</td> <td style="border: 1px solid orange; border-radius: 50%; padding: 2px;">3</td> <td style="border: 1px solid orange; border-radius: 50%; padding: 2px;">4</td> <td style="border: 1px solid orange; border-radius: 50%; padding: 2px;">5</td> </tr> <tr> <td style="border: 1px solid orange; border-radius: 50%; padding: 2px;">6</td> <td style="border: 1px solid orange; border-radius: 50%; padding: 2px;">7</td> <td style="border: 1px solid orange; border-radius: 50%; padding: 2px;">8</td> <td style="border: 1px solid orange; border-radius: 50%; padding: 2px;">9</td> <td style="border: 1px solid orange; border-radius: 50%; padding: 2px;">10</td> </tr> </table> <p style="text-align: center; margin-top: 5px;"><input type="radio"/> N/A</p>	1	2	3	4	5	6	7	8	9	10
1	2	3	4	5																		
6	7	8	9	10																		
1	2	3	4	5																		
6	7	8	9	10																		

1	Brake System	1
2	Tires	2
3	Steering System	3
4	Turn Signals	4
5	Head Lamps	5
6	Stop Lamps	6
7	Tail Lamps	7
8	Disabled in Prior Accident	8
9	Other Disabled	9
10	Mirrors	10
11	Suspension System	11
12	Other	12

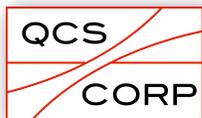
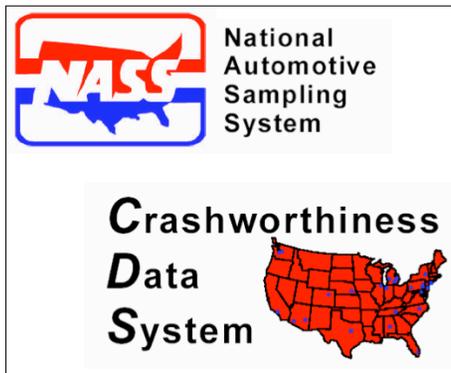
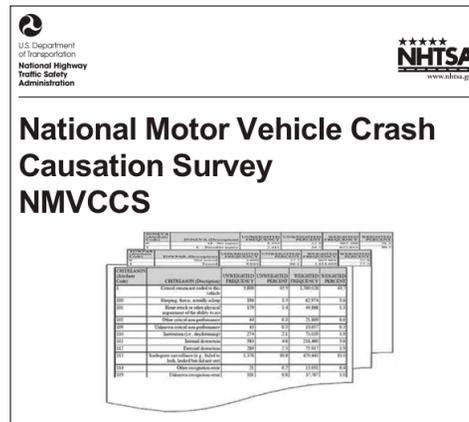
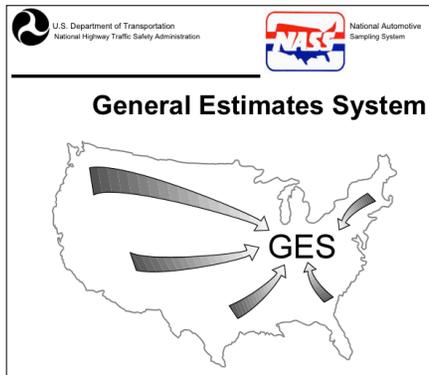
Michigan Traffic Crash Report Form, 2004



Crash Diagram and Remarks

A large grid area for drawing a crash diagram and writing remarks. The grid is composed of orange lines on a white background. In the top-left corner of the grid, there is a circular icon containing an upward-pointing arrow and the word "North".

Tire-related Casualty Data from Crashes Initially Reported to Police:



Data Source: National Motor Vehicle Crash Causation Survey (NMVCCS)

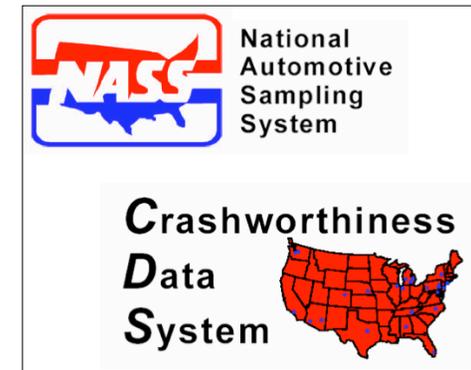
“...of the estimated 3,889,770 vehicles involved in the NMVVCS crashes, 5 percent experienced tire problems in the pre-crash phase.” (Nearly 200,000 vehicles)



Source: NHTSA, 2012, "Tire-Related Factors in the Pre-Crash Phase", p. vi

National Automotive Sampling System Crashworthiness Data System Estimate Cited to Support Halt in Tire Aging Rulemaking:

“...light vehicle tires are performing better on the road as reflected in [NHTSA’s] most recent crash data ... from 2007 through 2010 ... a 50 percent reduction in fatalities (386 to 195)...”



Source: “Tire Aging: A Summary of NHTSA’s Work”, p. 5, p. 4

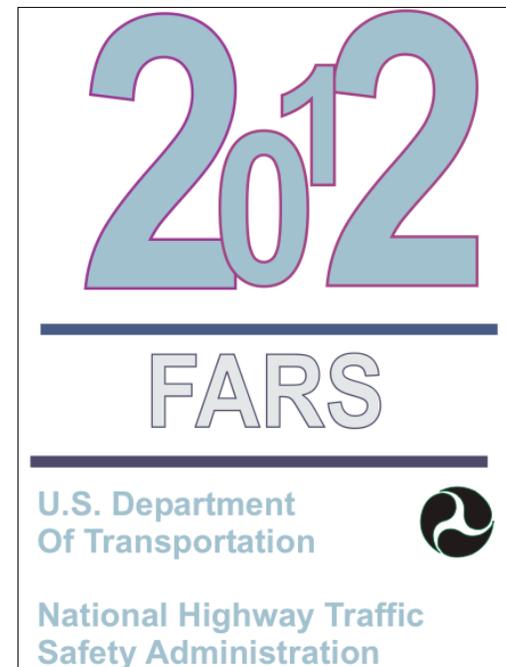
Data Source: Fatality Analysis Reporting System (FARS)

Census of all crashes in US resulting in deaths within 30 days on trafficways customarily open to the public

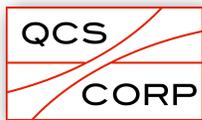
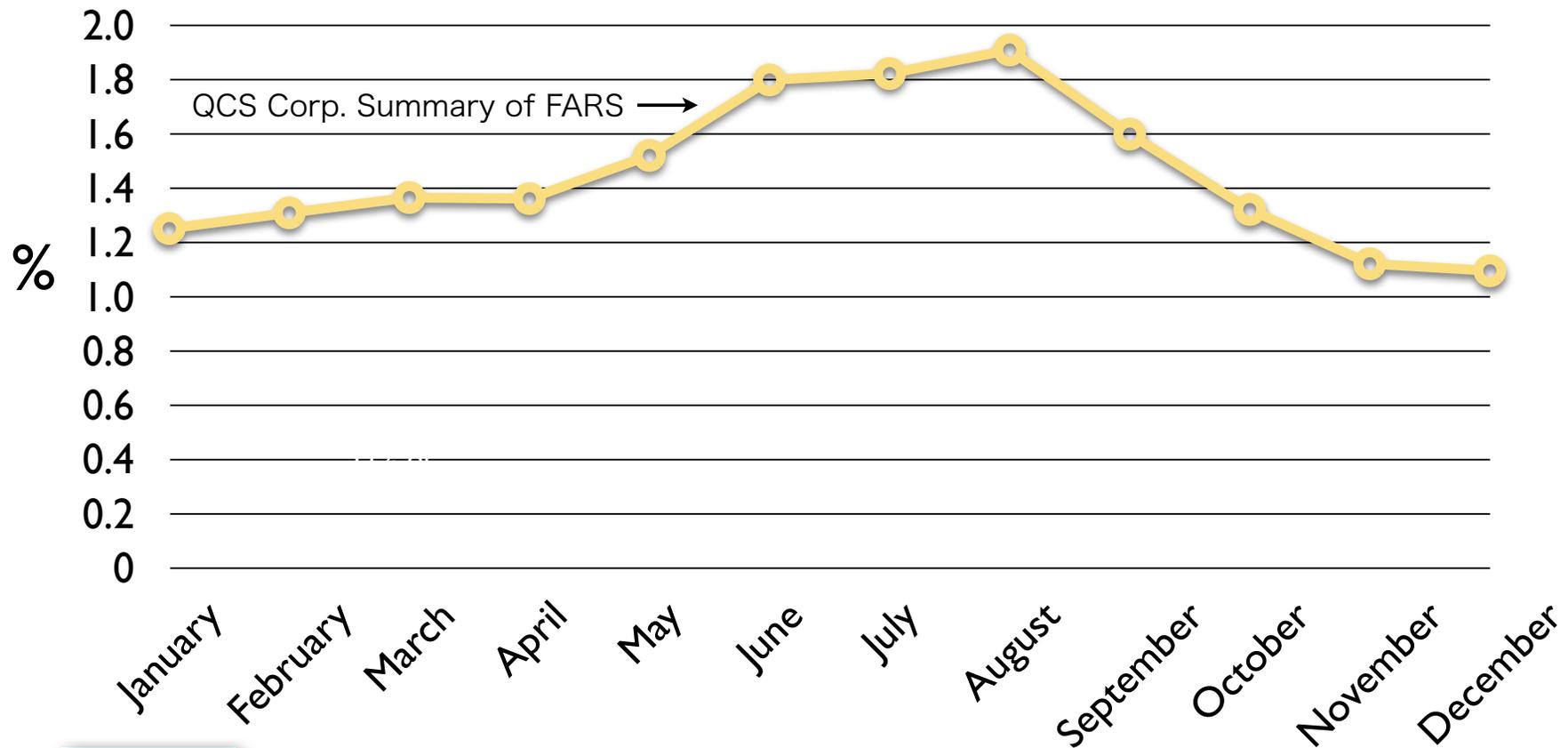
Records factors coded from police-accident reports related to tires



Which Dataset Should We Use to Quantify Tire-related Crash Deaths?



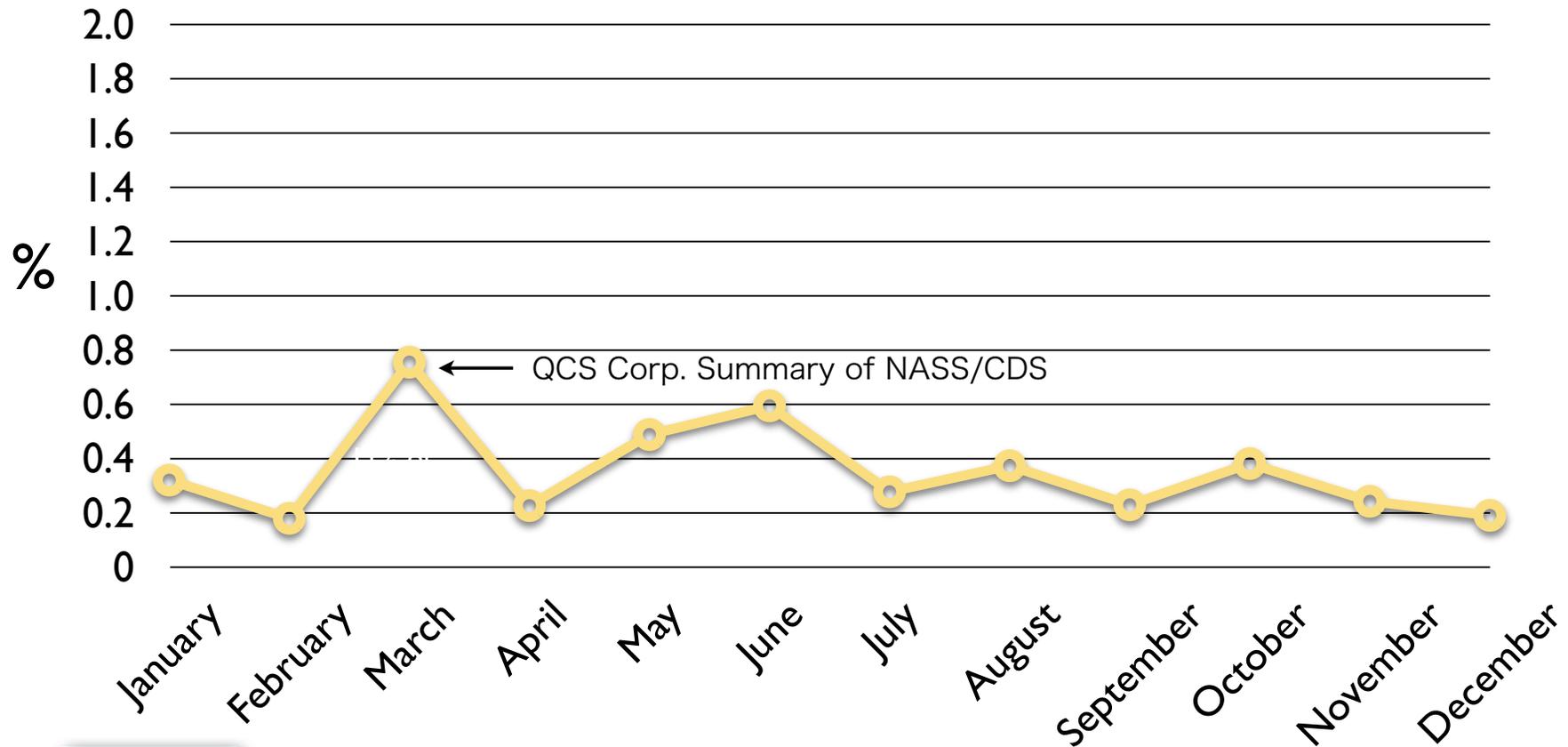
Percentage of Light Passenger Vehicles with Occupant Fatality That Have Tire-related Issues by Month of Year, Calendar Years 1982-2009, Model Years 1980-2010



Source: QCS Corp. summary of FARS, VINs decoded by VINDICATOR

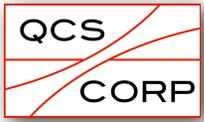
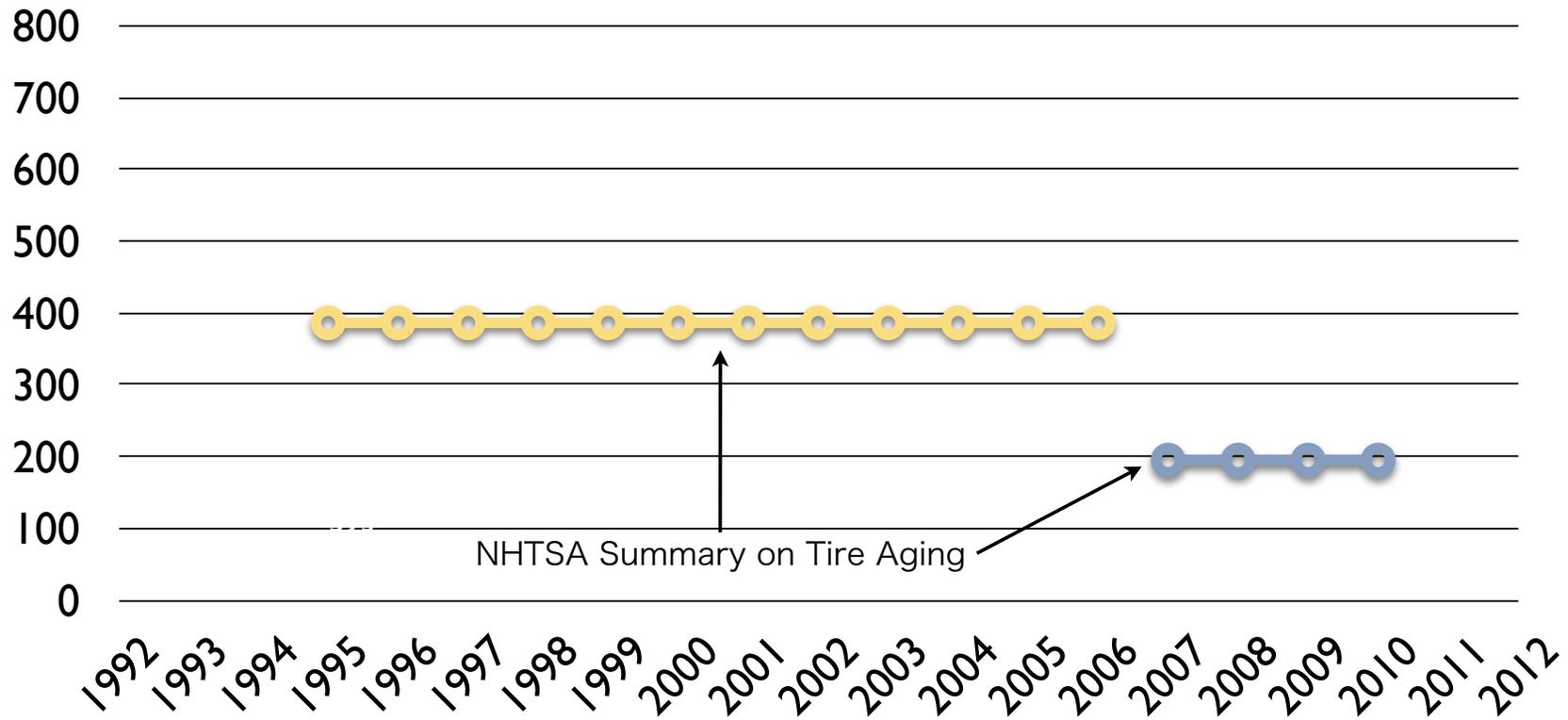
Note: Minimum population size for any month is 40,319

Weighted Percentage of Light Passenger Vehicles
That Have Tire-related Issues by Month of Year,
Calendar Years 1992-2012
Based on Critical Pre-crash Events Related to Tires



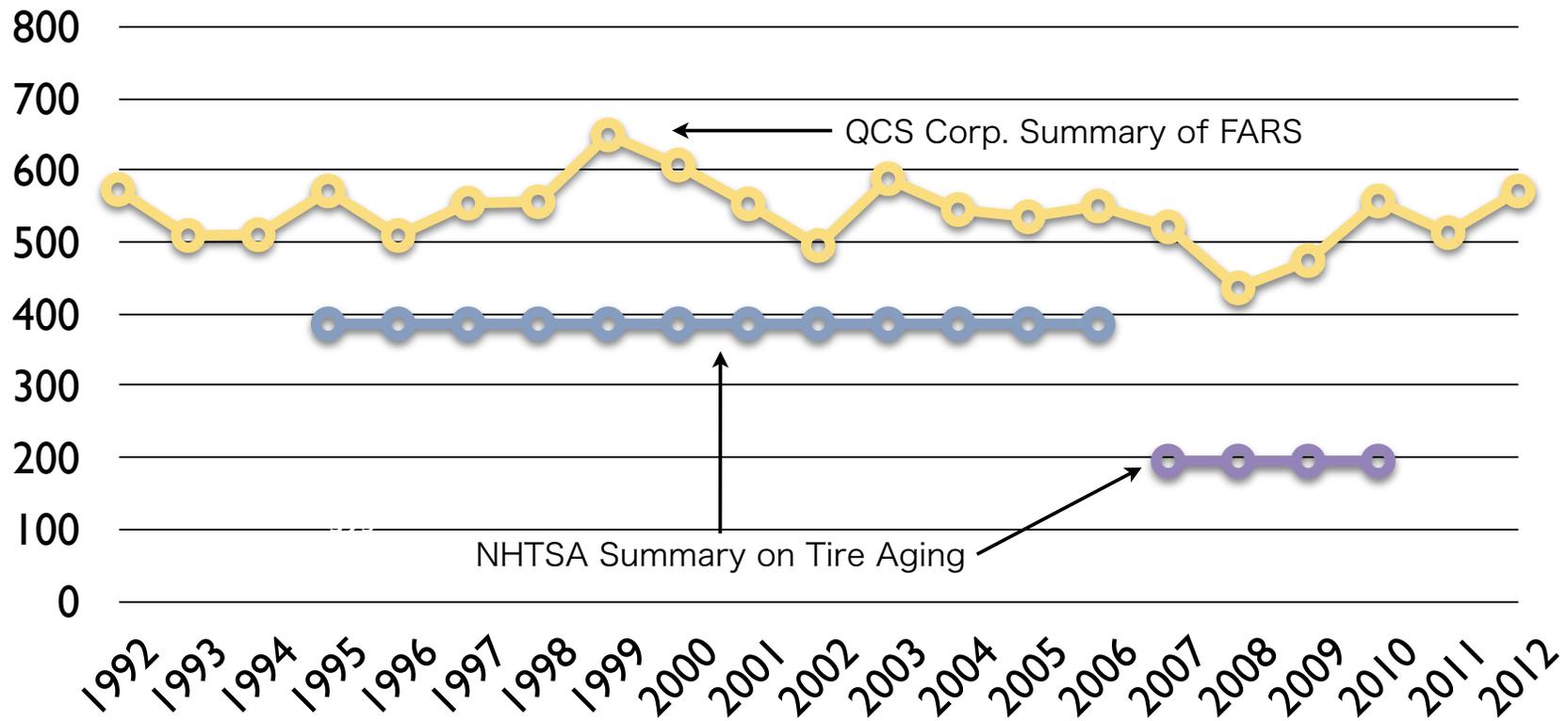
Source: QCS Corp. summary of NASS/CDS, 1992-2012
Note: Minimum unweighted sample size for any month is 12,526

NHTSA's Summary of Annualized Average Fatalities Involving Light Passenger Vehicles "in Tire Crashes," Calendar Years 1995-2010



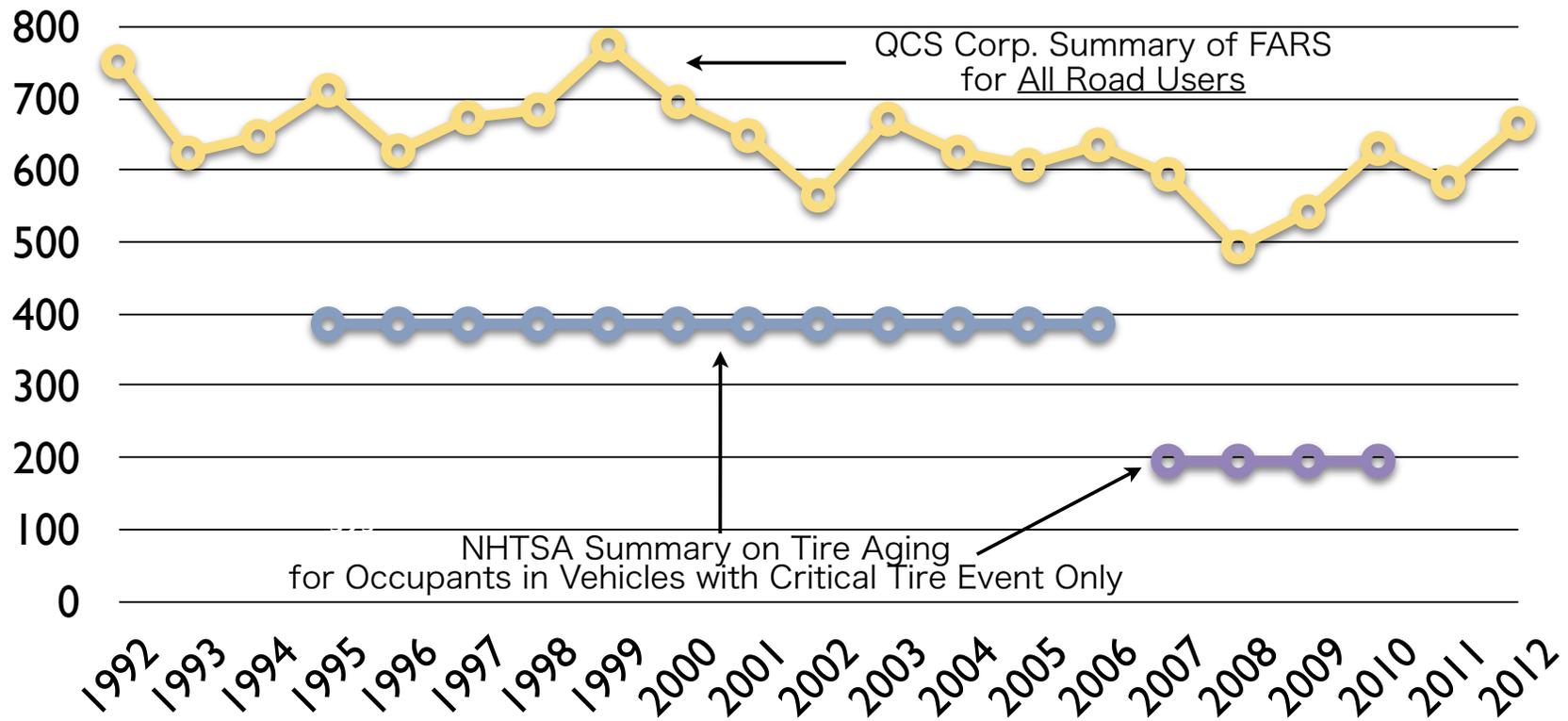
Source: NHTSA, 2014, "TIRE AGING: A Summary of NHTSA's Work, p. 13

Occupant Fatalities in Light Passenger Vehicles with Tire-related Issues, Calendar Years 1992-2012



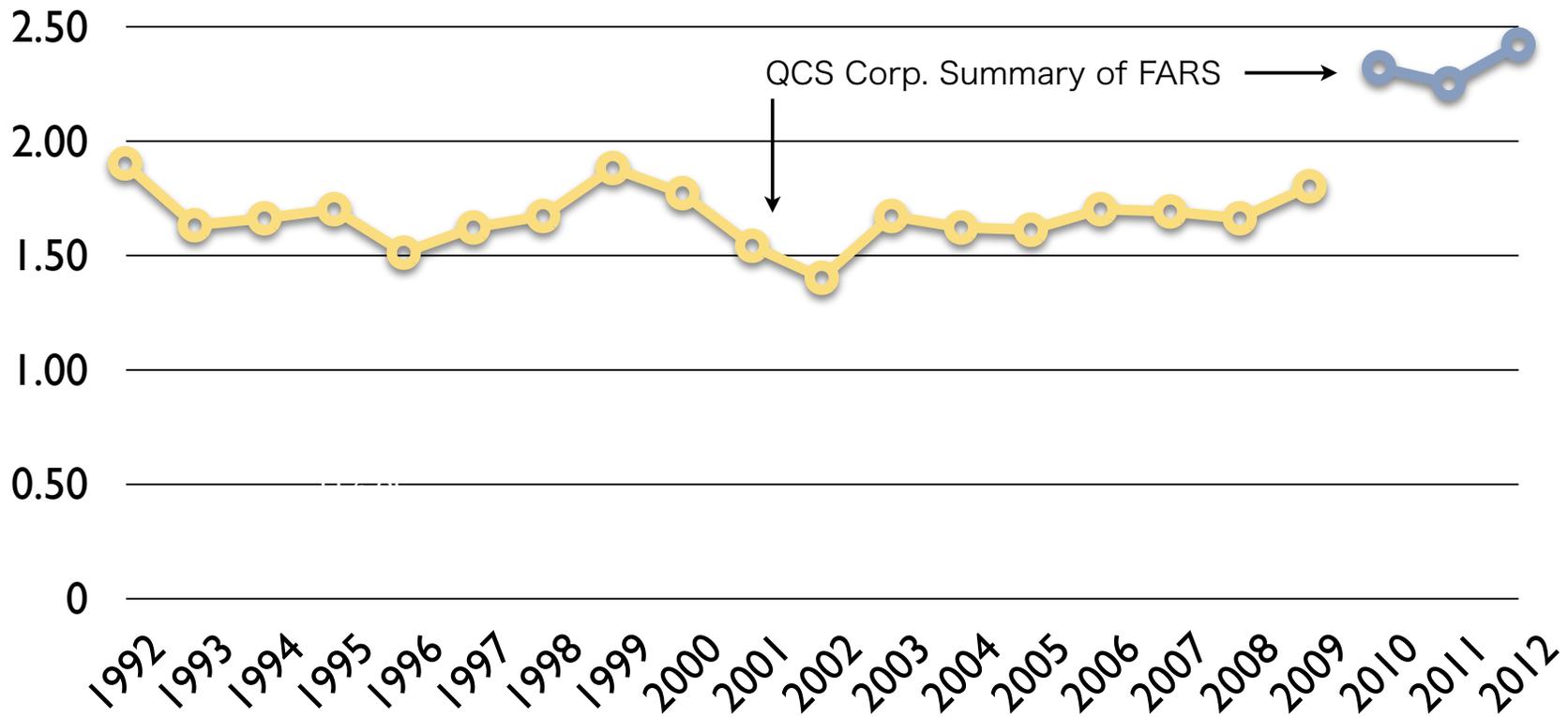
Note: Vehicle type classified from police-reported body type.
Source: QCS Corp. summary of FARS and NHTSA, 2014, "TIRE AGING: A Summary of NHTSA's Work," p. 13

Fatalities in Crashes Involving Light Passenger Vehicles with Tire-related Issues, Calendar Years 1992-2012



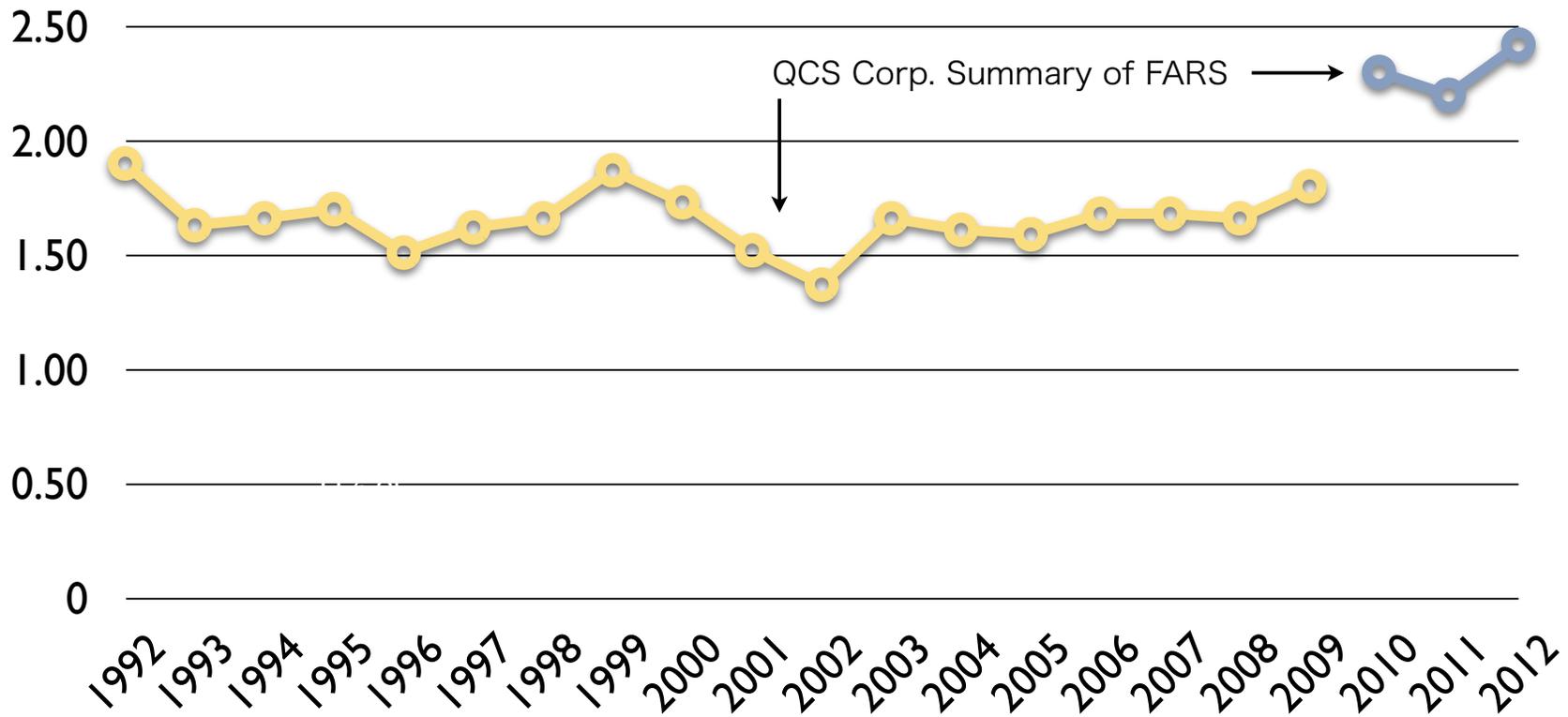
Note: Counts all deaths in crash; vehicle type classified from police-reported body type.
 Source: QCS Corp. summary of FARS and NHTSA, 2014, "TIRE AGING: A Summary of NHTSA's Work," p. 13

Percentage of Light Passenger Vehicles with Occupant Fatality That Have Tire-related Issues by Calendar Year 1992-2012



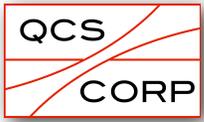
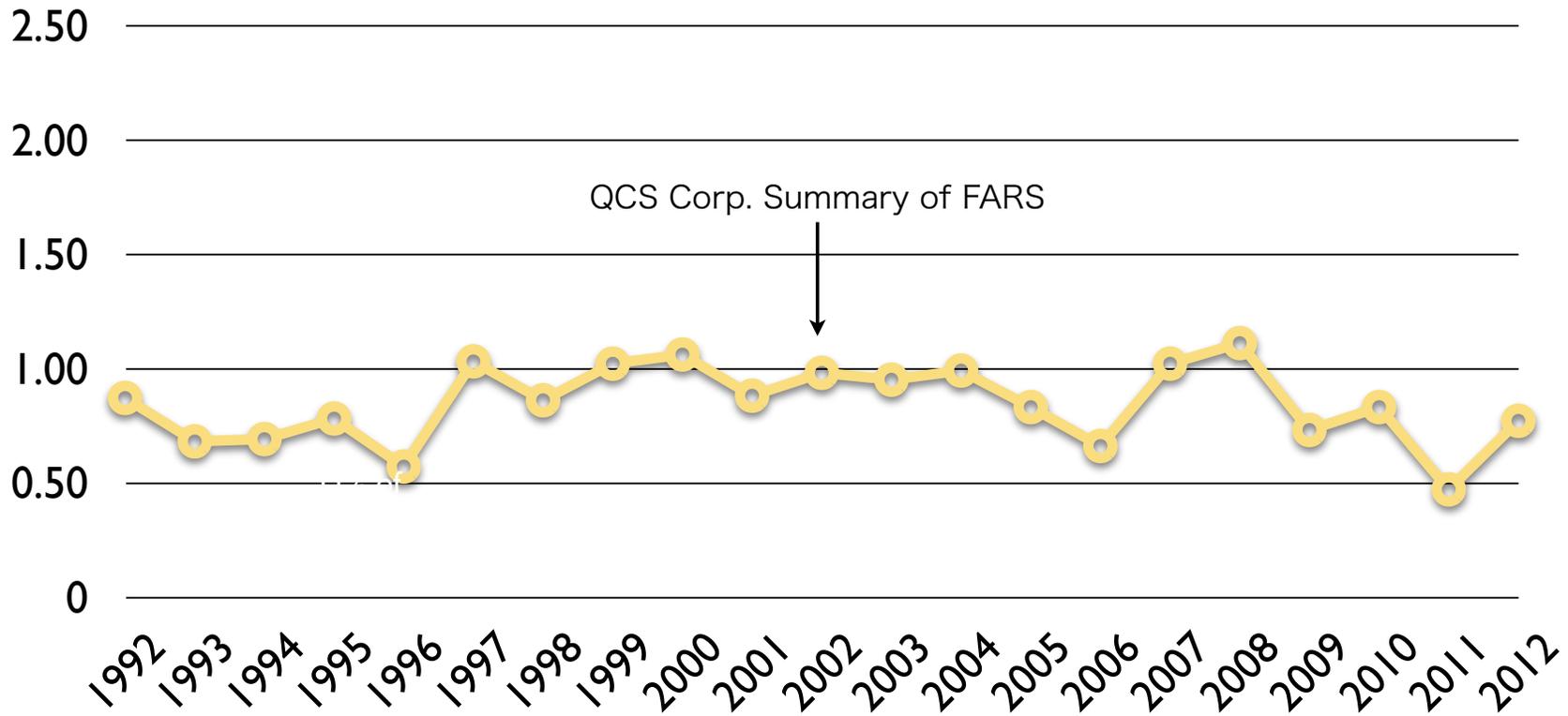
Note: Vehicle type classified from police-reported body type.
Source: QCS Corp. summary of FARS

Percentage of Light Passenger Vehicles with Occupant Fatality That Have Tire-related Issues by Calendar Year 1992-2012 (Using Methodology Unchanged Since 1996)



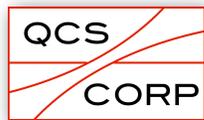
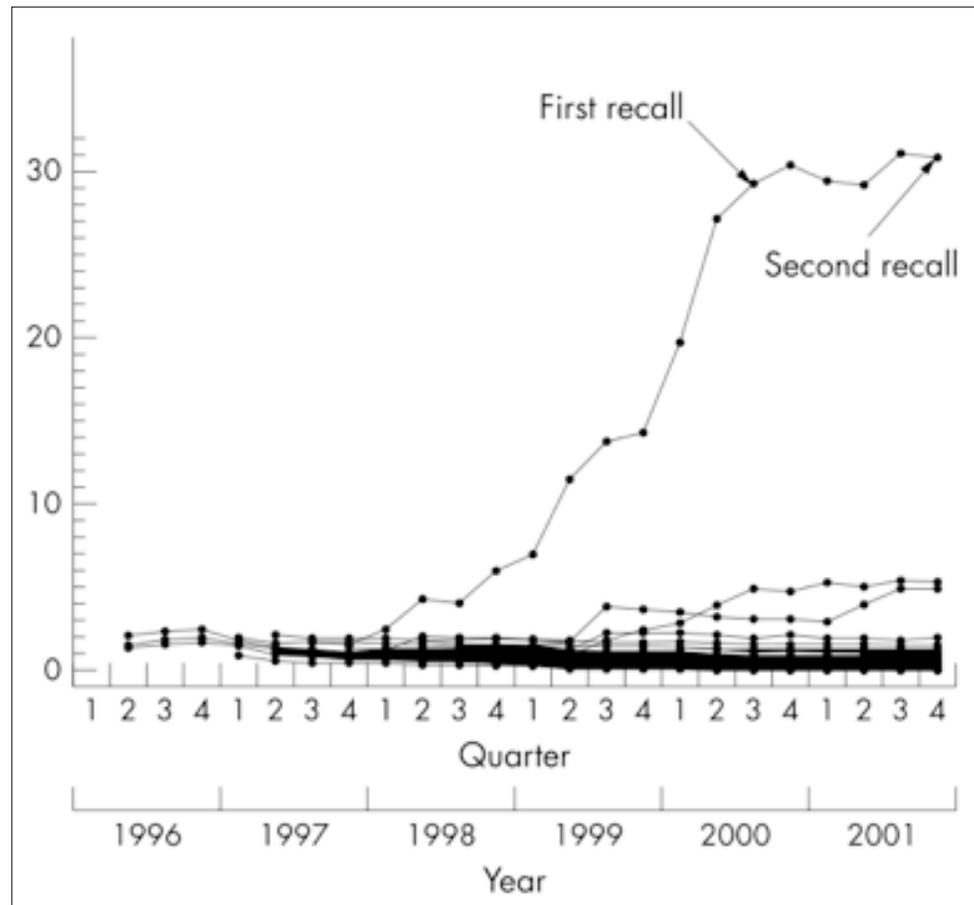
Note: Vehicle type classified from police-reported body type.
Source: QCS Corp. summary of FARS

Percentage of Light Passenger Vehicles with Occupant Fatality
 That Have Tire-related Issues by Calendar Year
 1992-2012 (Using Methodology Unchanged Since 1996)
 2 or Fewer Estimated Years in Service (= CY - MY)



Note: Vehicle type classified from police-reported body type.
 Source: QCS Corp. summary of FARS

FARS is a Vital Tool for Surveillance of Tire-related Crash Fatalities



FARS is a Vital Tool for Surveillance of Tire-related Crash Fatalities

For more information:

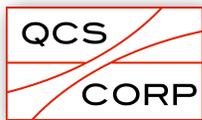
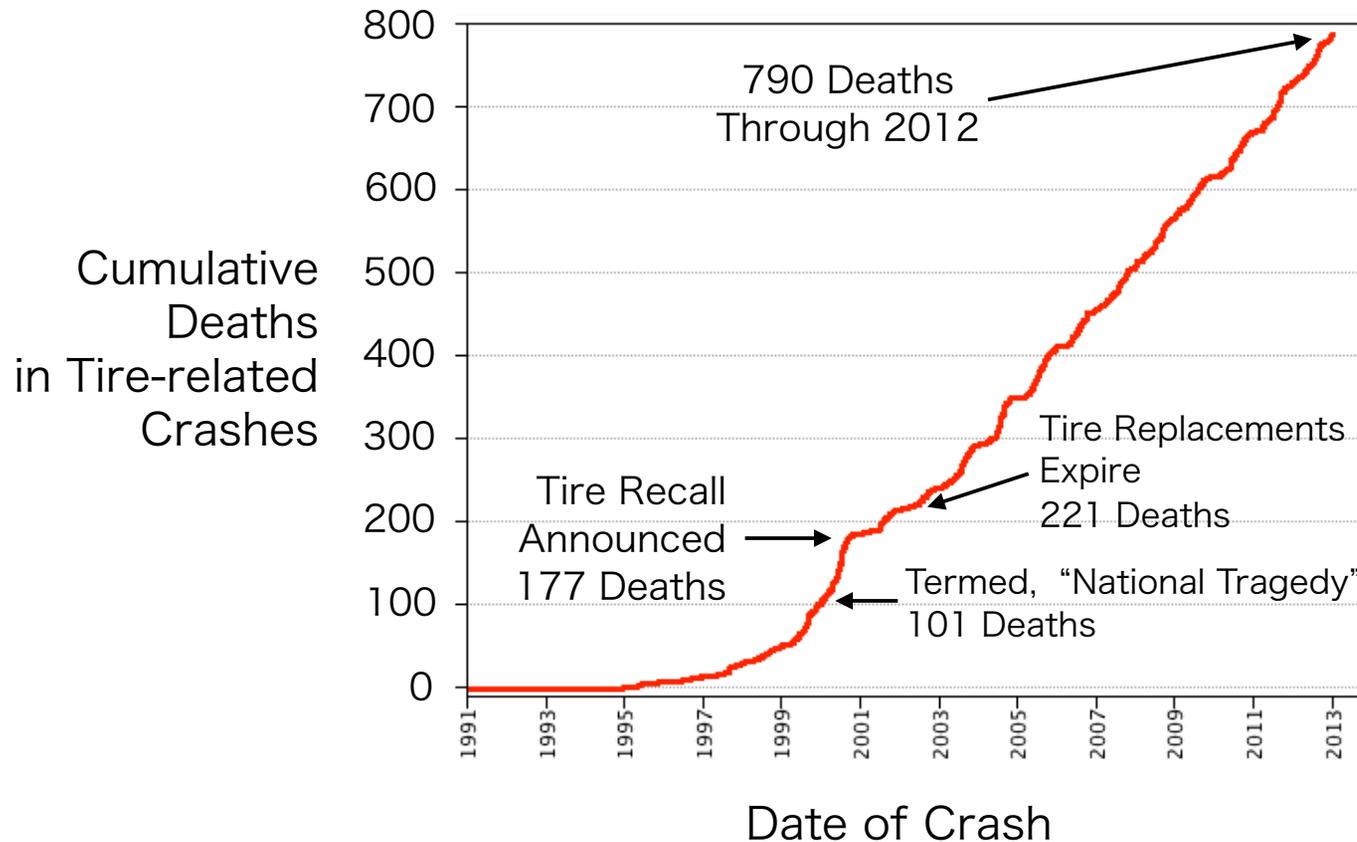
R. A. Whitfield and Alice K. Whitfield,

"Improving Surveillance for Injuries Associated
with Potential Motor Vehicle Safety Defects."

Injury Prevention, April 2004, 10:88-92.



FARS Shows That Tire Recalls Slowed Tire-related Fatalities in Ford Explorer Crashes – But Only Temporarily!



Source: QCS Corp. summary of FARS, 1991-2012

Note: Ford Explorers include MY 1991-2001 Ford Explorers, MY 2001-2003 Ford Explorer Sports, MY 1997-2001 Mercury Mountaineers and MY 1991-1994 Mazda Navajos

This research was supported by
The Safety Institute,
a non-profit organization dedicated to injury
prevention and product safety

The screenshot displays the website for The Safety Institute. At the top left is the organization's logo, a circular emblem with two hands holding a heart, surrounded by the text 'THE SAFETY INSTITUTE' and 'ADVOCACY - SURVIVOR NETWORK - EDUCATION - RESEARCH - GRANT MAKING'. To the right, a yellow banner reads 'The Safety Institute launches VEHICLE SAFETY WATCH LIST'. Below this, a dark red banner states 'The Safety Institute releases STUDY QUESTIONING THE SAFETY OF GUARDRAIL END TERMINALS'. A 'DONATE NOW' button and a 'CLICK & PLEDGE' button are visible, along with social media icons for Facebook, Twitter, and LinkedIn. A navigation bar includes links for Home, Who We Are, What We Do, Get Involved, Blog, Contact, Donate, and Vehicle Safety Watch List. The main content area features a large yellow banner with the text 'The Safety Institute launches Vehicle Safety Watch List Analytics and NHTSA Enforcement Monitoring Program'. Below this, a grey box contains the text 'These resources will be publicly accessible to anyone who wants to understand:' followed by a bulleted list: 'Emerging safety problems', 'How the NHTSA's investigative choices correlate to safety problems reported by automakers and consumers', and 'How well NHTSA is enforcing the recall requirements'. A 'Learn More' button is positioned to the right of the list. Three images illustrate vehicle safety: a damaged white SUV, a car undergoing a crash test, and a car engulfed in flames.



Thank You

