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# CONTRIBUTING FACTORS TO NATIONAL AND REGIONAL CRASH PATTERNS

ILLINOIS TRAFFIC ENGINEERING AND SAFETY CONFERENCE

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# AGENDA

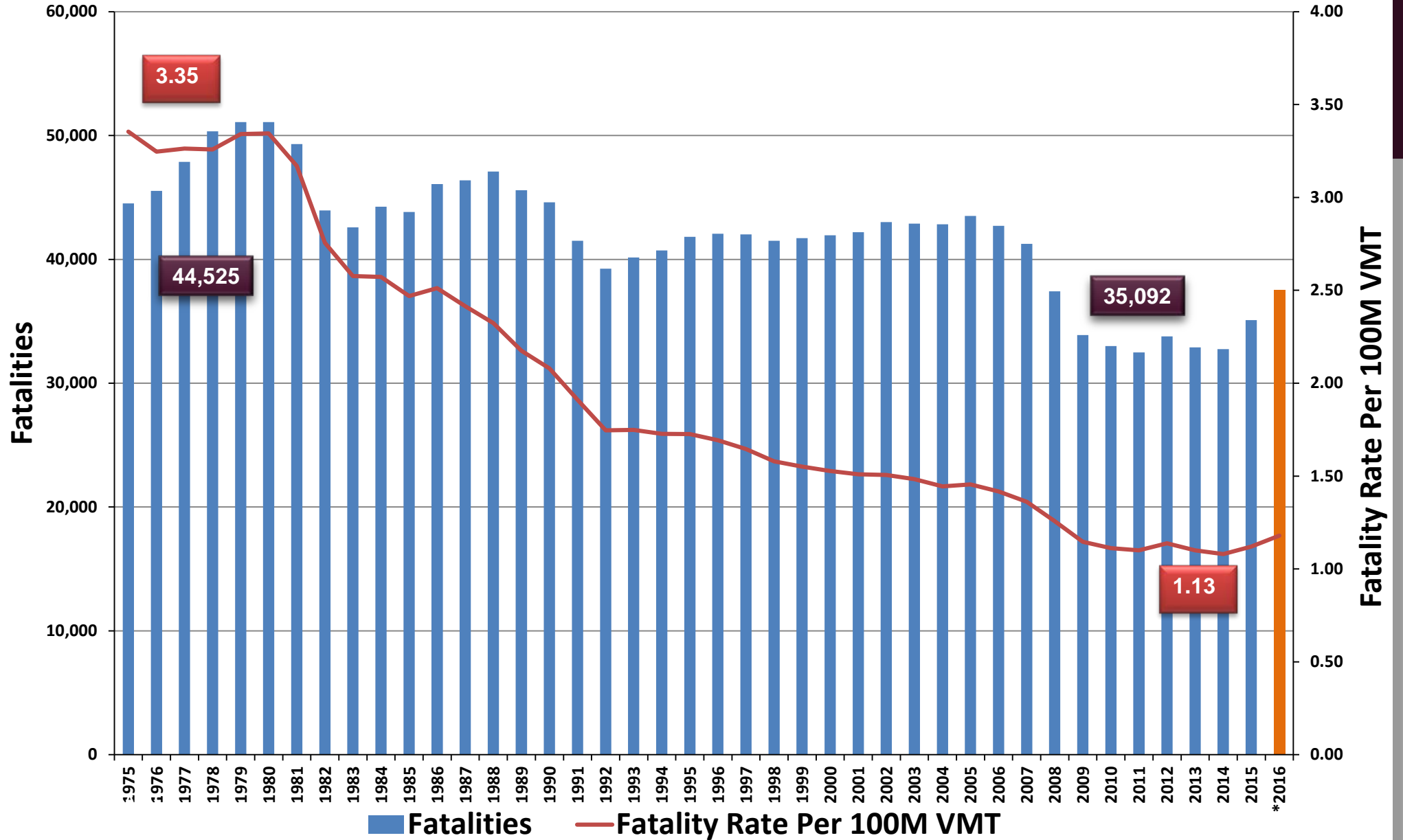
- **National Fatality Trends**
- **Illinois Fatality Trends**
- **Contributing Factors to Increasing Traffic Deaths**



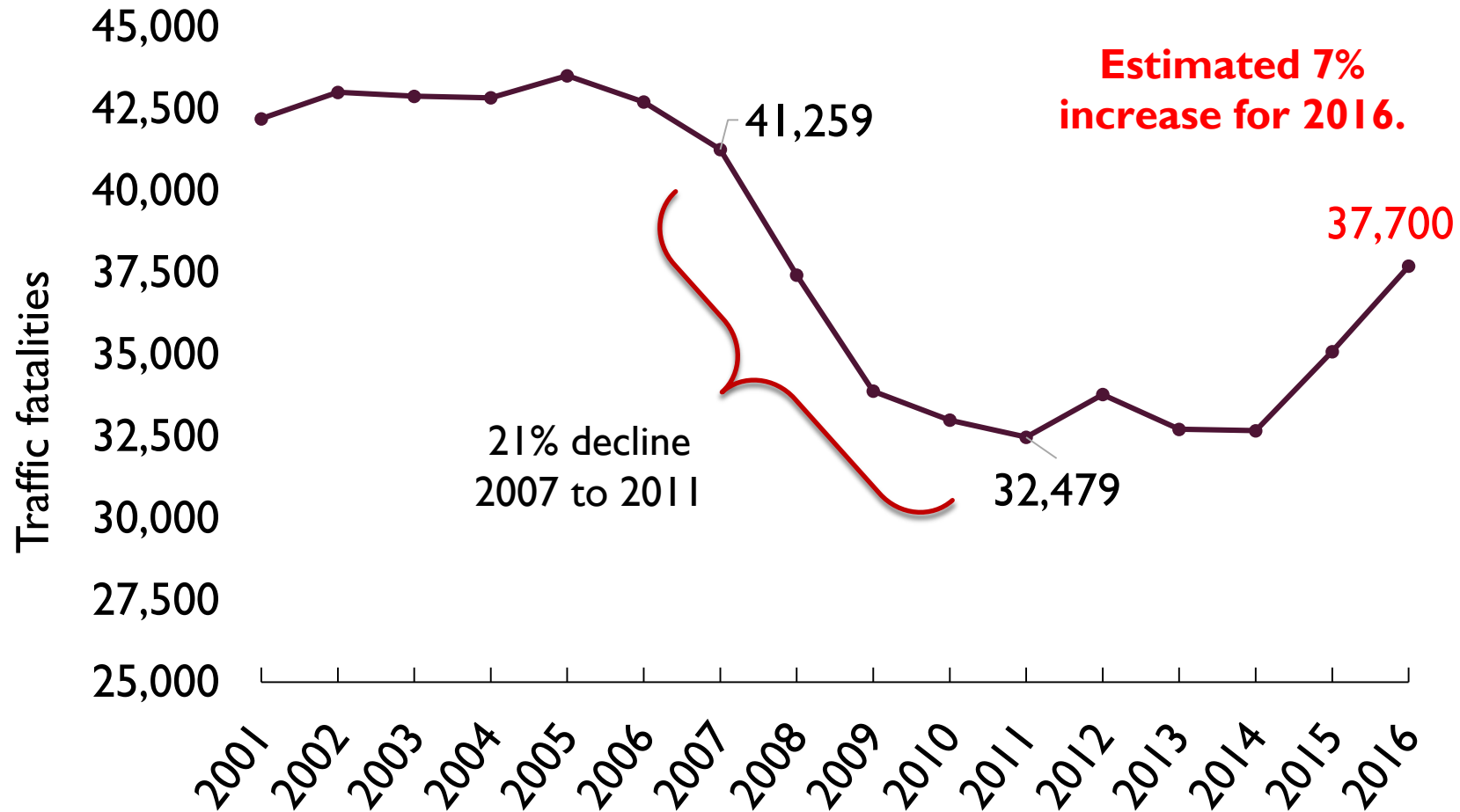
- NATIONAL SAFETY TRENDS



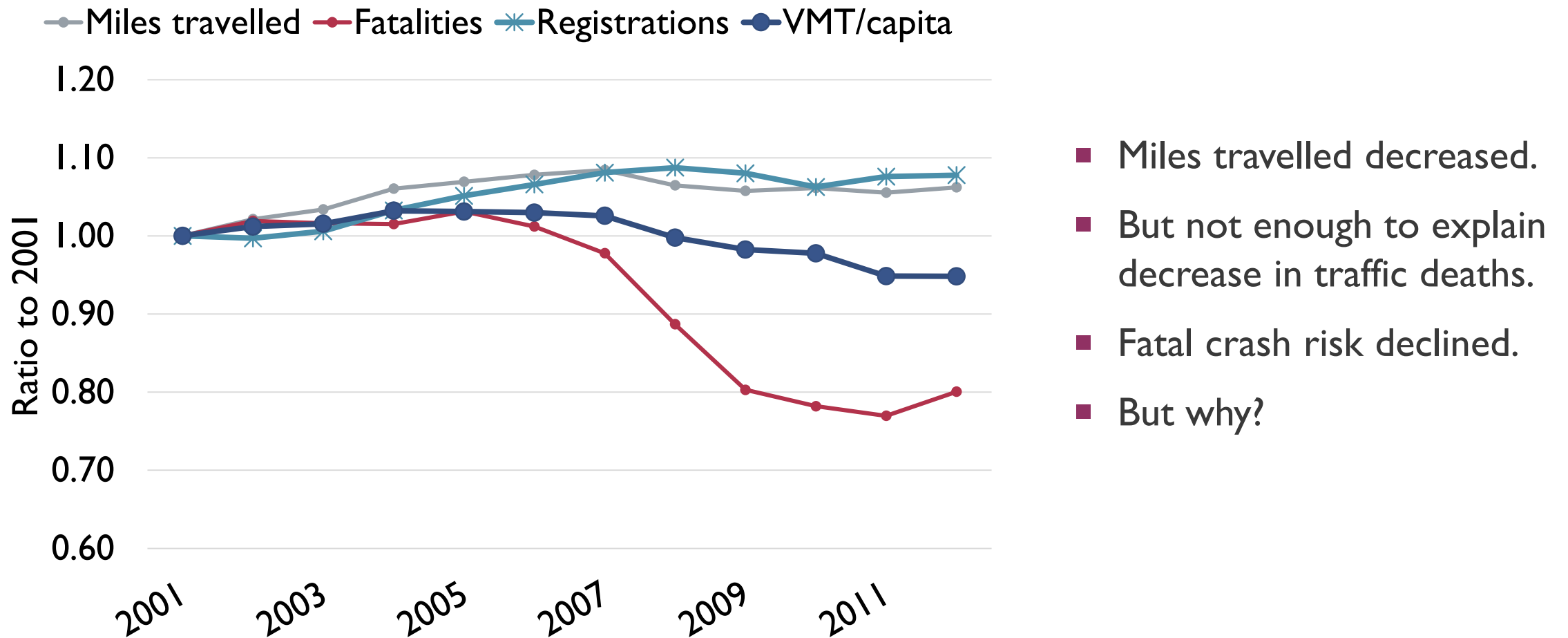
### Fatalities and Fatality Rates, 1975-2015



# PAST: WHAT DID THE GREAT RECESSION TELL US ABOUT TRAFFIC SAFETY?



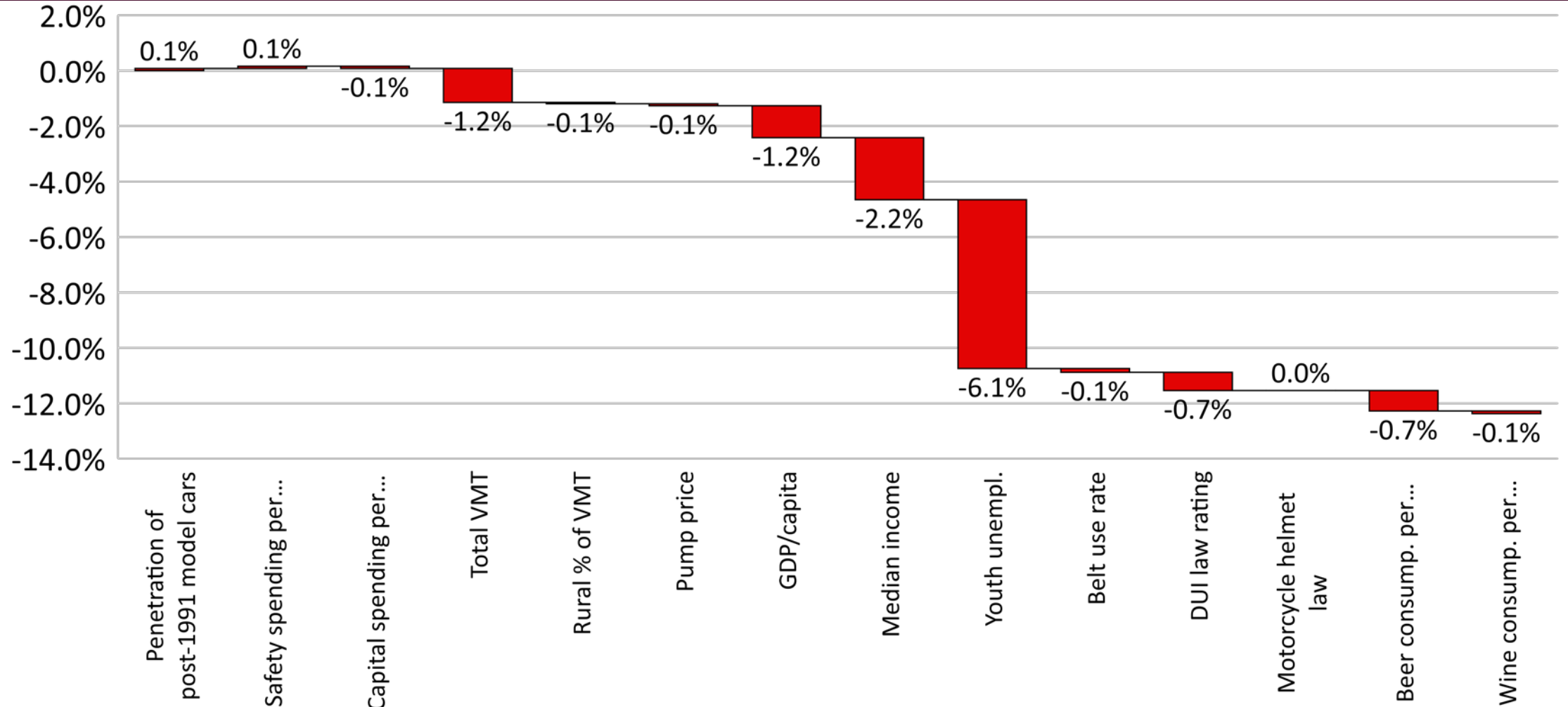
# TRAFFIC FATALITIES = RISK × EXPOSURE



## BROAD RANGE OF VEHICLE, DRIVER, ENVIRONMENT, & ECONOMIC FACTORS CONSIDERED

- Safety belt laws & use rates
- ESC, crashworthy vehicles in the fleet
- Motorcycle helmet laws & use rates
- Child restraint laws.
- Cell phone & texting laws; observed usage rates.
- DUI laws (BAC, fines, suspension, etc.)
- State expenditures on
  - Capital improvements
  - Maintenance
  - Admin/Research/Planning
  - Law enforcement & safety ed.
  - HSIP projects
- Fuel price & fuel tax
- Alcohol consumption per capita, for beer, wine, spirits.
- Economic measures
  - GDP per capita
  - Median income
  - Labor force
  - Employment size & rate, by age & sex
  - Unemployment size & rate, by age & sex
- Exposure measures:
  - VMT, by road type & by vehicle type
  - Vehicle registrations by type
  - Population by age group
  - Road miles, by type

# ECONOMIC FACTORS WERE PRIMARY IN DRIVING THE 2007-2011 DECLINE



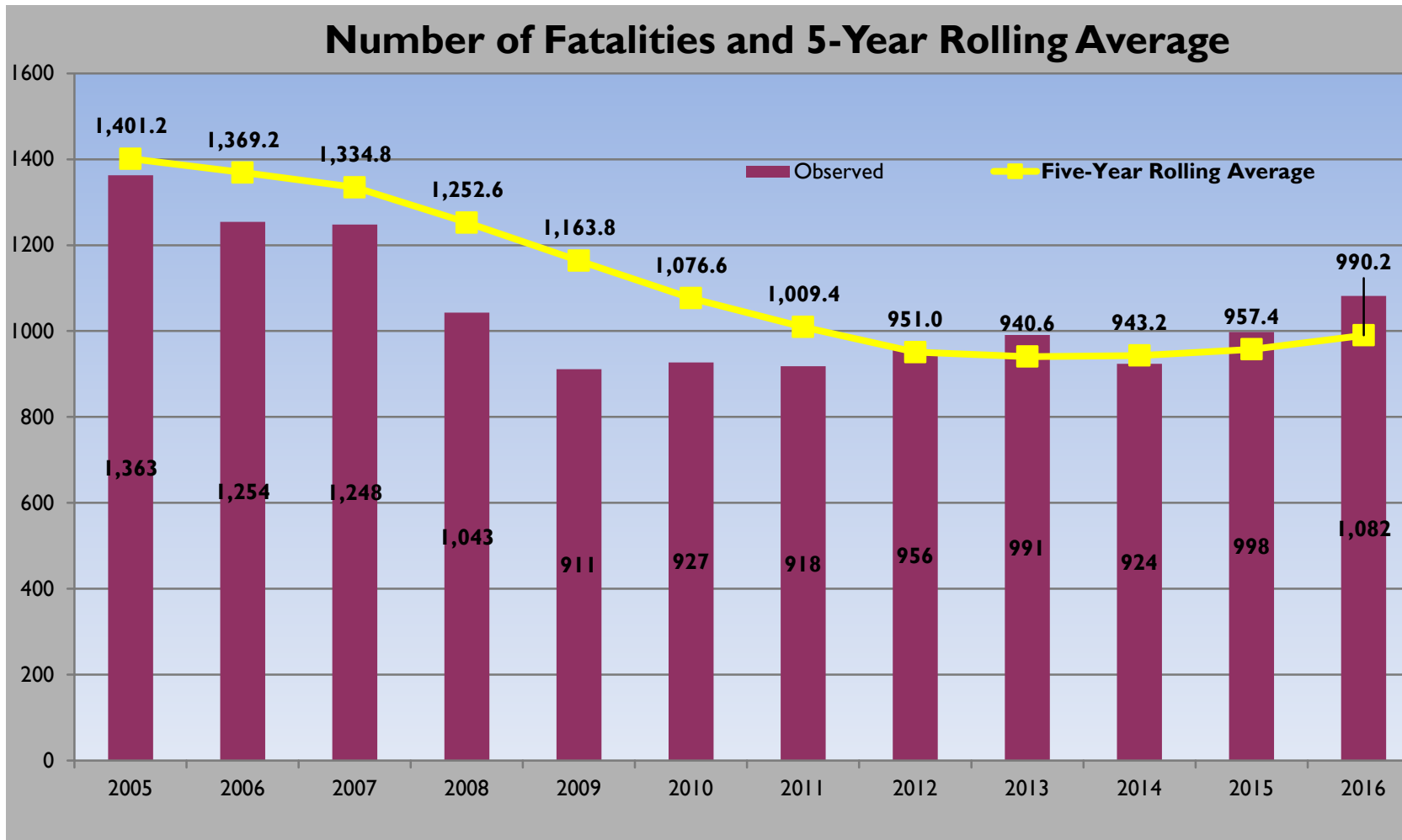




- ILLINOIS SAFETY TRENDS

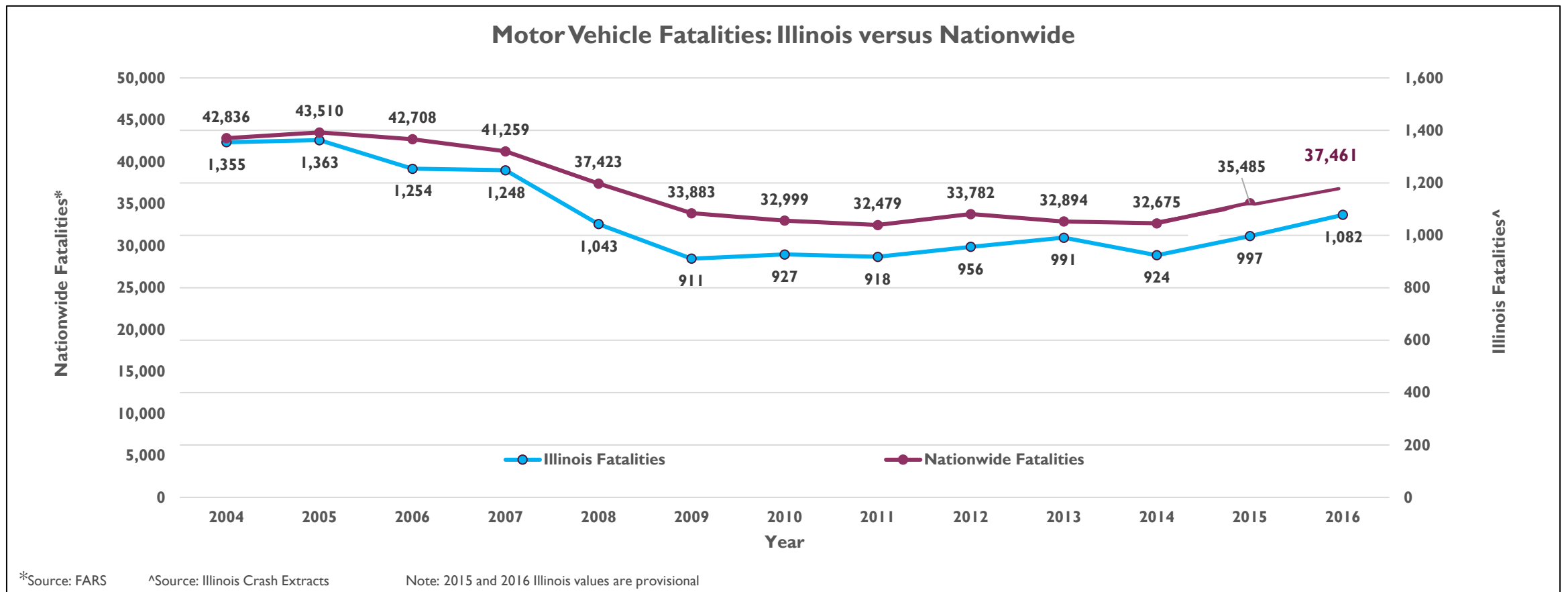


# ILLINOIS TREND NUMBER OF FATALITIES

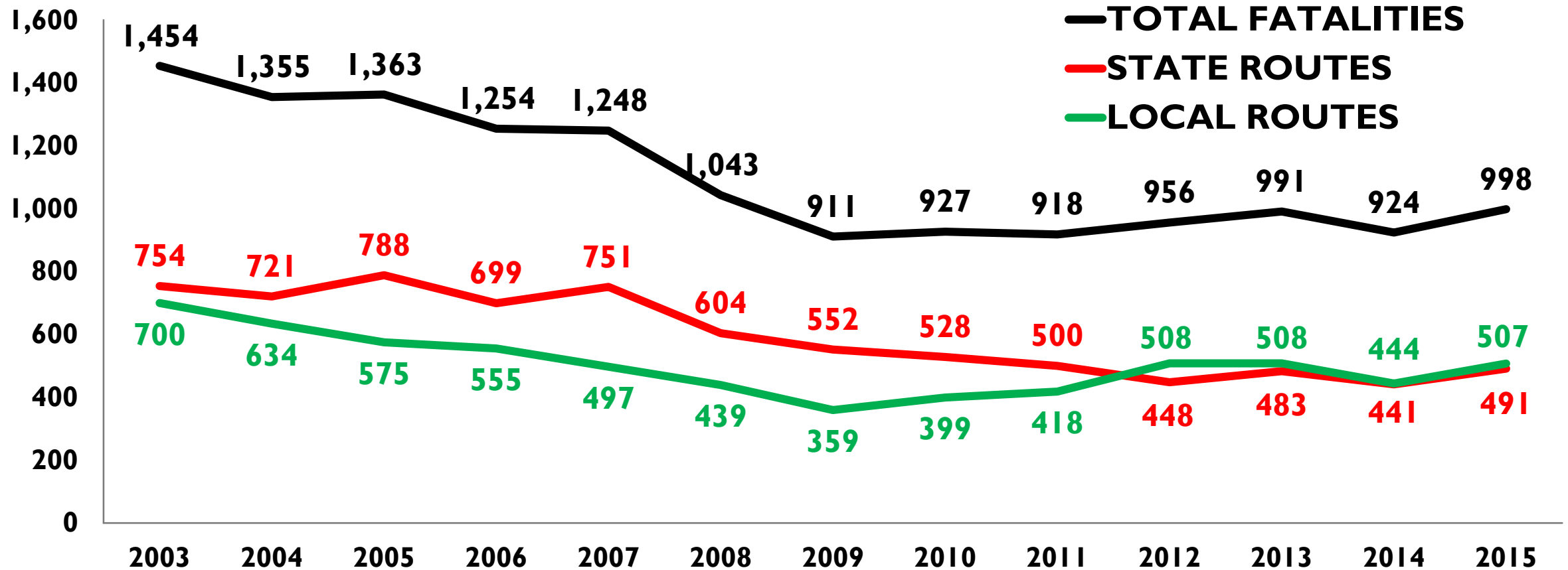


- Almost 34% decrease from 2005 to 2011
- Almost 18% percent increase between 2011 and 2016
- 21 fatalities higher than this time last year

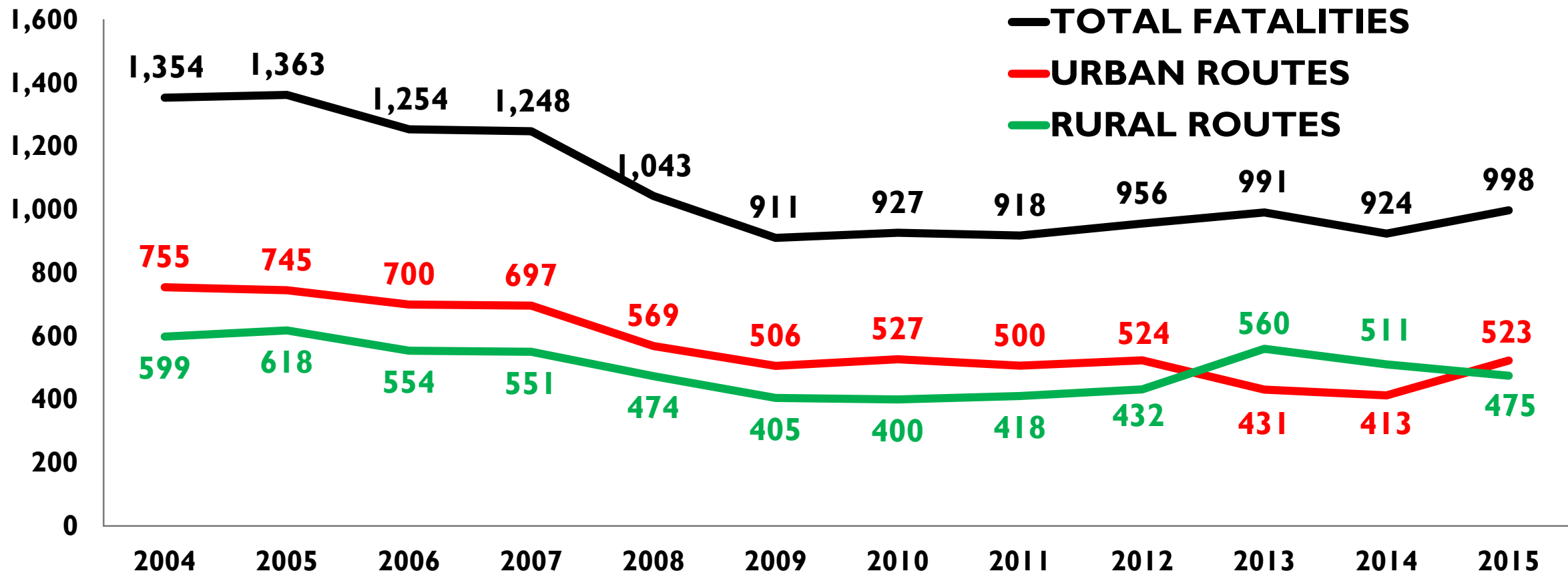
# ILLINOIS TREND NUMBER OF FATALITIES



# ILLINOIS TREND NUMBER OF FATALITIES: STATE VS LOCAL



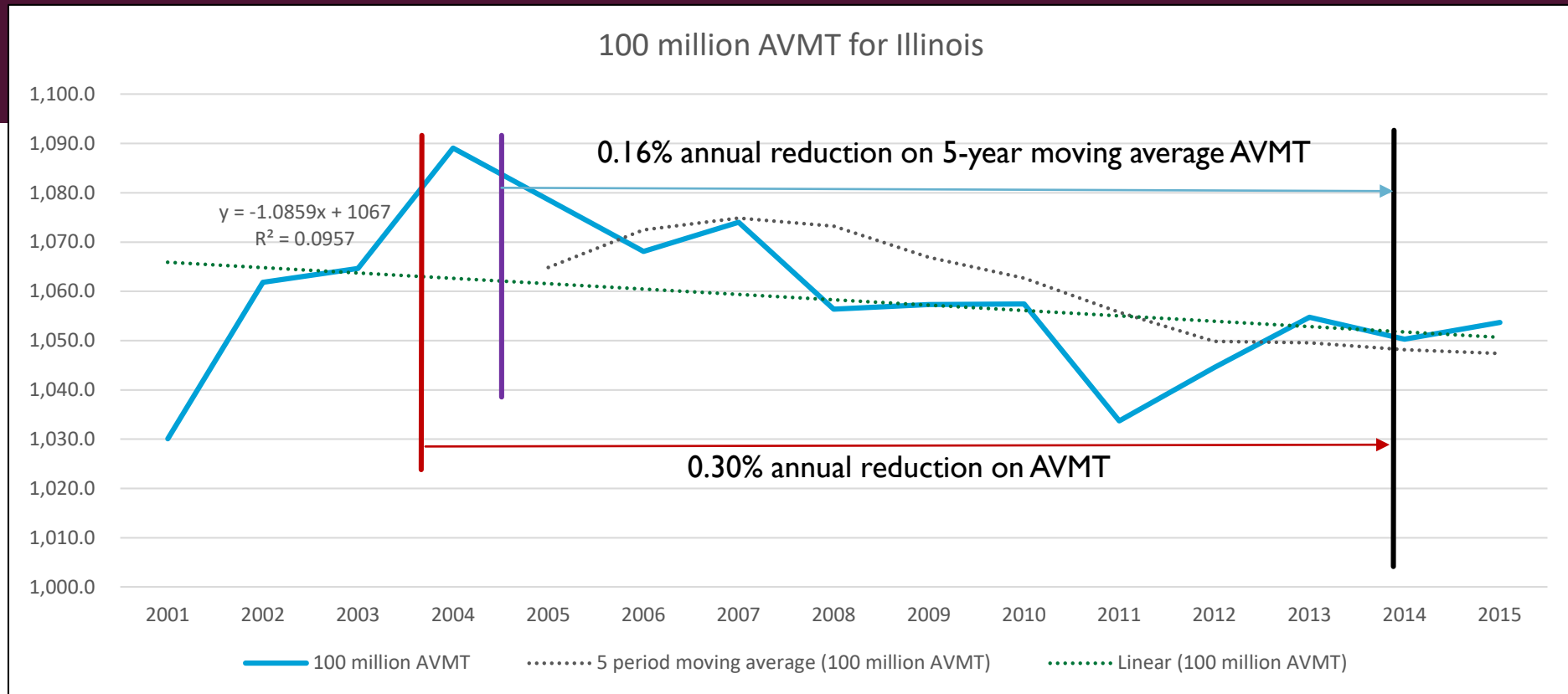
# ILLINOIS TREND NUMBER OF FATALITIES: URBAN VS RURAL



- 
- Vehicle miles of travel
  - Population (by age group)
  - Weather
  - Economy (unemployment rate)
  - Gas price
  - Crude Oil Price (national scale)
  - Funding for 4 E
  - Implementation approach

## INFLUENTIAL FACTORS

# ILLINOIS ANNUAL VEHICLE MILES TRAVELED (AVMT)



Note: The 100 million AVMT values were calculated with the daily vehicle miles traveled (DVMT) values from Illinois Travel Statistics.

$$AVMT = \sum DVMT * \text{Number of Days}$$

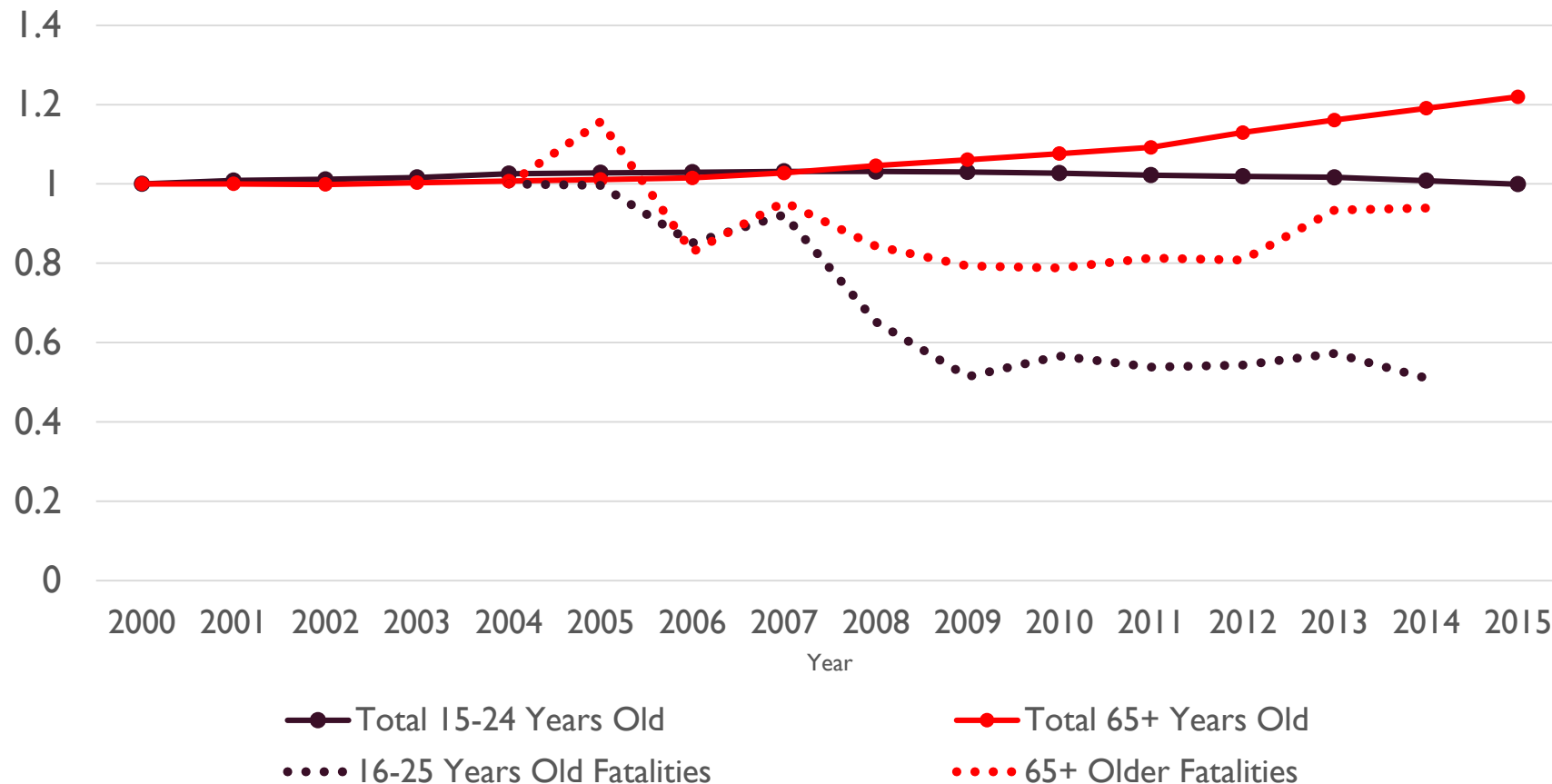
The **AVMT trend** increases 0.16% annually from 2001 to 2015 and increases 0.32% annually from 2014 to 2015.

The **AVMT trend** decreases 0.30% annually from 2004 to 2015.

The **AVMT moving average trend** decreases 0.16% annually from 2005 to 2015.

# ILLINOIS POPULATION AND NUMBER OF FATALITIES -OLDER AND YOUNGER

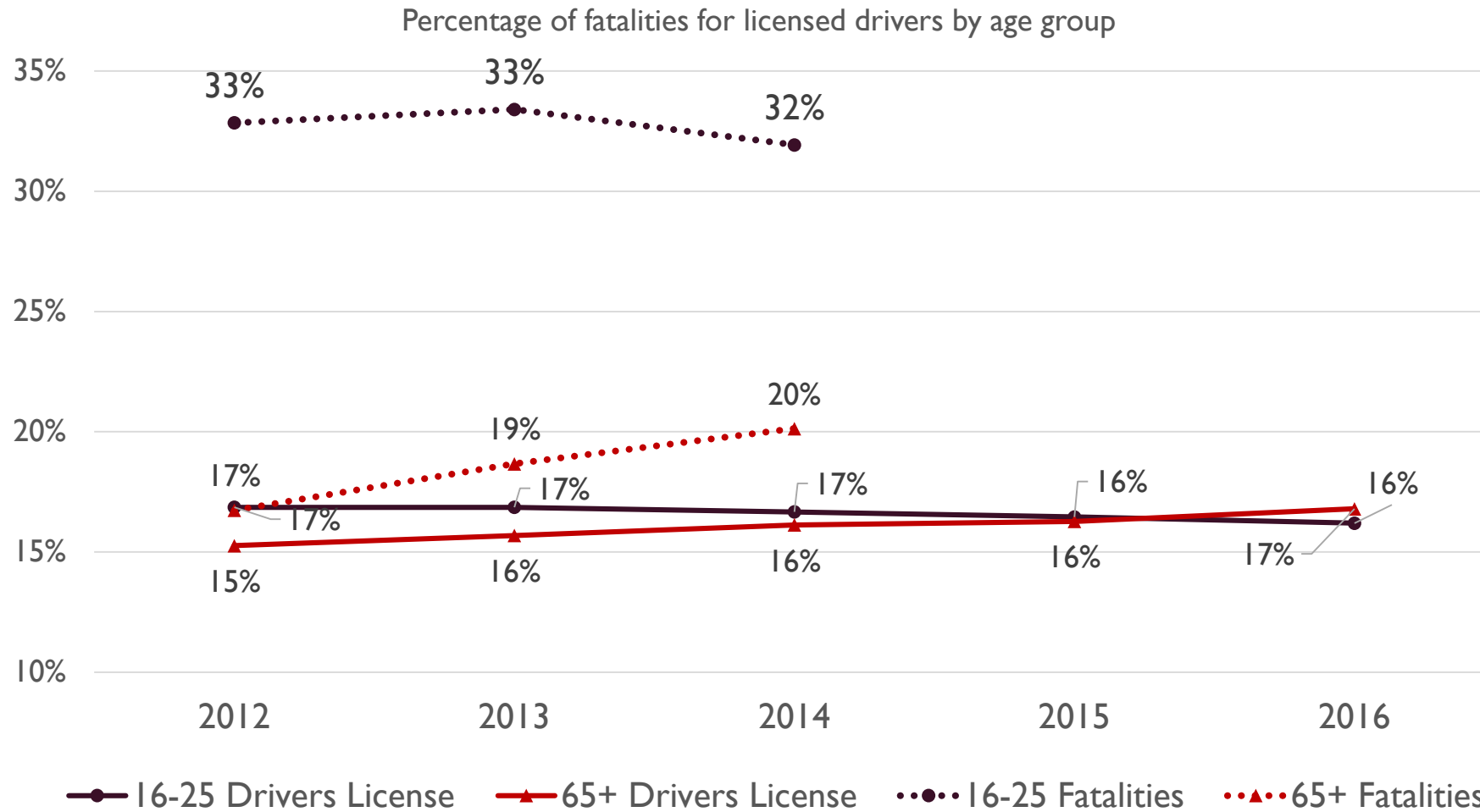
Indexed population for different age groups



Note: 2000 to 2015 fatalities from FARs and 2015 is provisional from the Illinois Department of Transportation. Population data were collected from the United States Census Bureau, <https://www.census.gov/topics/population.html>



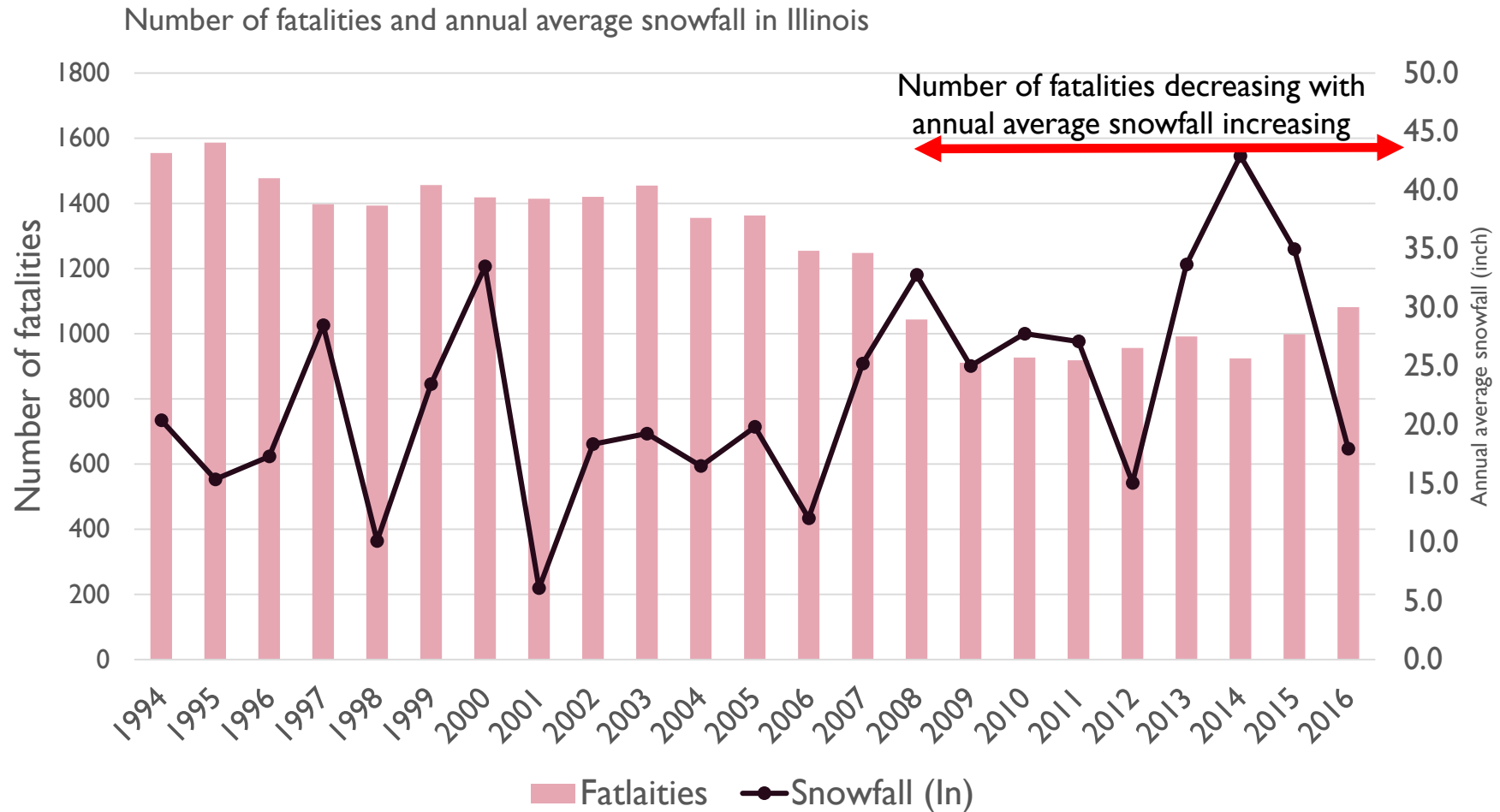
# ILLINOIS LICENSED DRIVERS AND NUMBER OF FATALITIES -OLDER AND YOUNGER



Note: The numbers of fatalities for 1994-2015 are from the Fatality Analysis Reporting System (FARS) Encyclopedia; the 2016 number of fatalities is based on the IDOT provisional data. Data for licensed drivers by age group were provided by Illinois Secretary of State.

# ILLINOIS WEATHER AND NUMBER OF FATALITIES

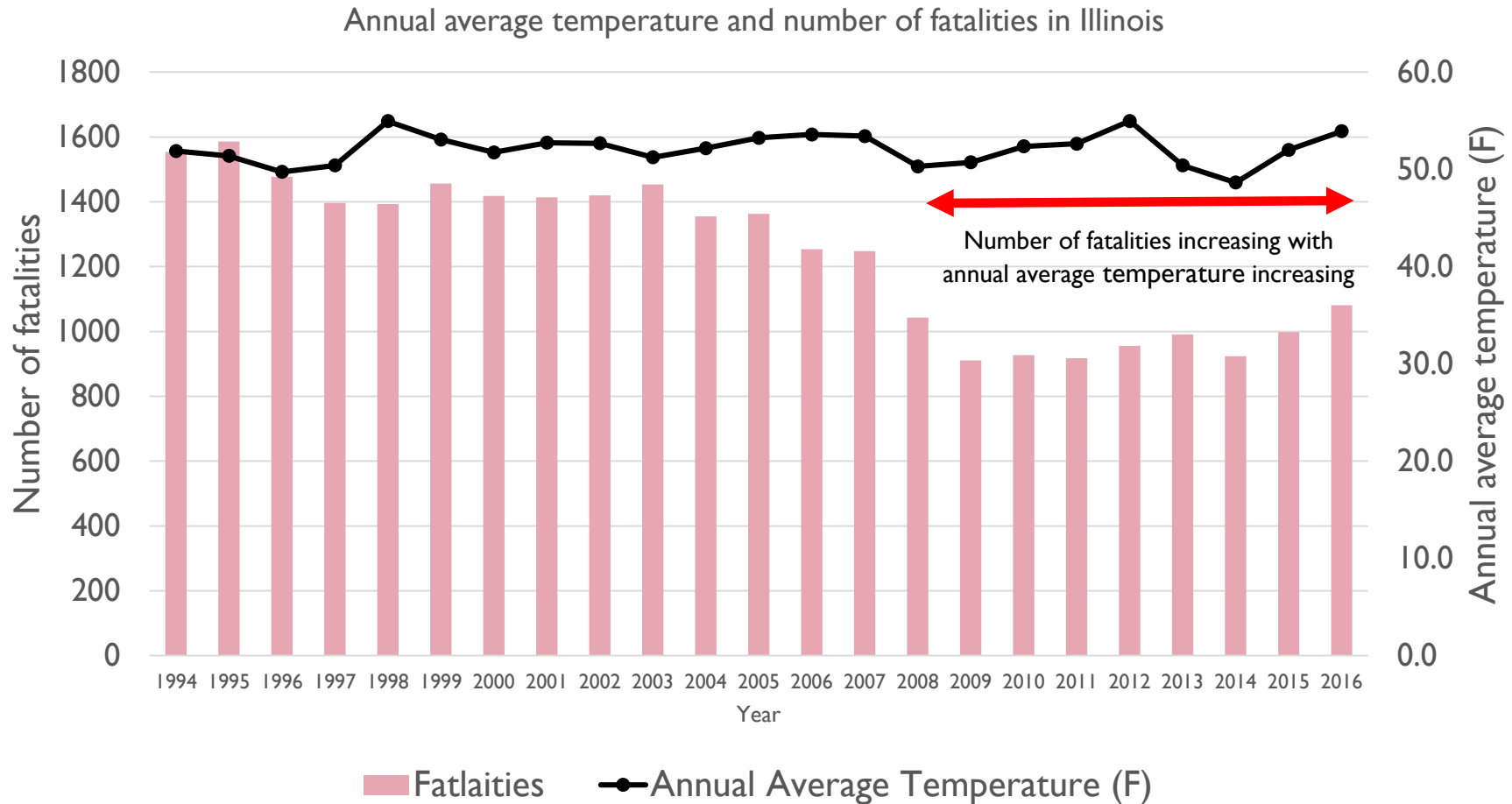
## -SNOWFALL



Note: The numbers of fatalities for 1994-2015 are from the Fatality Analysis Reporting System (FARS) Encyclopedia; the 2016 number of fatalities is based on the IDOT provisional data. Weather data were obtained from the National Oceanic and Atmospheric Administration – NOAA, <http://www.noaa.gov/weather>.

# ILLINOIS WEATHER AND NUMBER OF FATALITIES

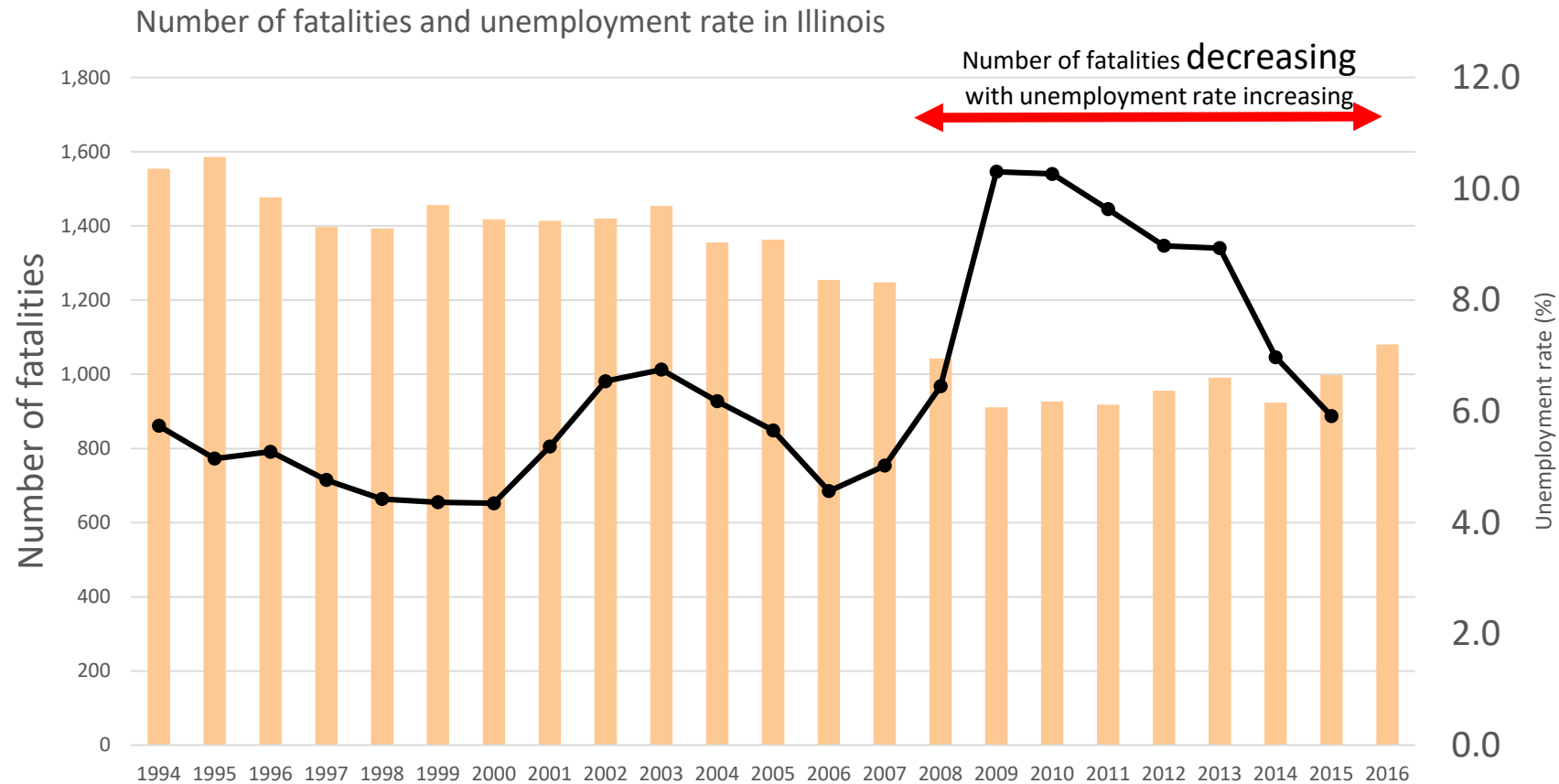
## -TEMPERATURE



Note: The numbers of fatalities for 1994-2015 are from the Fatality Analysis Reporting System (FARS) Encyclopedia; the 2016 number of fatalities is based on the IDOT provisional data. Weather data were obtained from the National Oceanic and Atmospheric Administration – NOAA, <http://www.noaa.gov/weather>.

# ILLINOIS ECONOMY AND NUMBER OF FATALITIES

## -UNEMPLOYMENT RATE

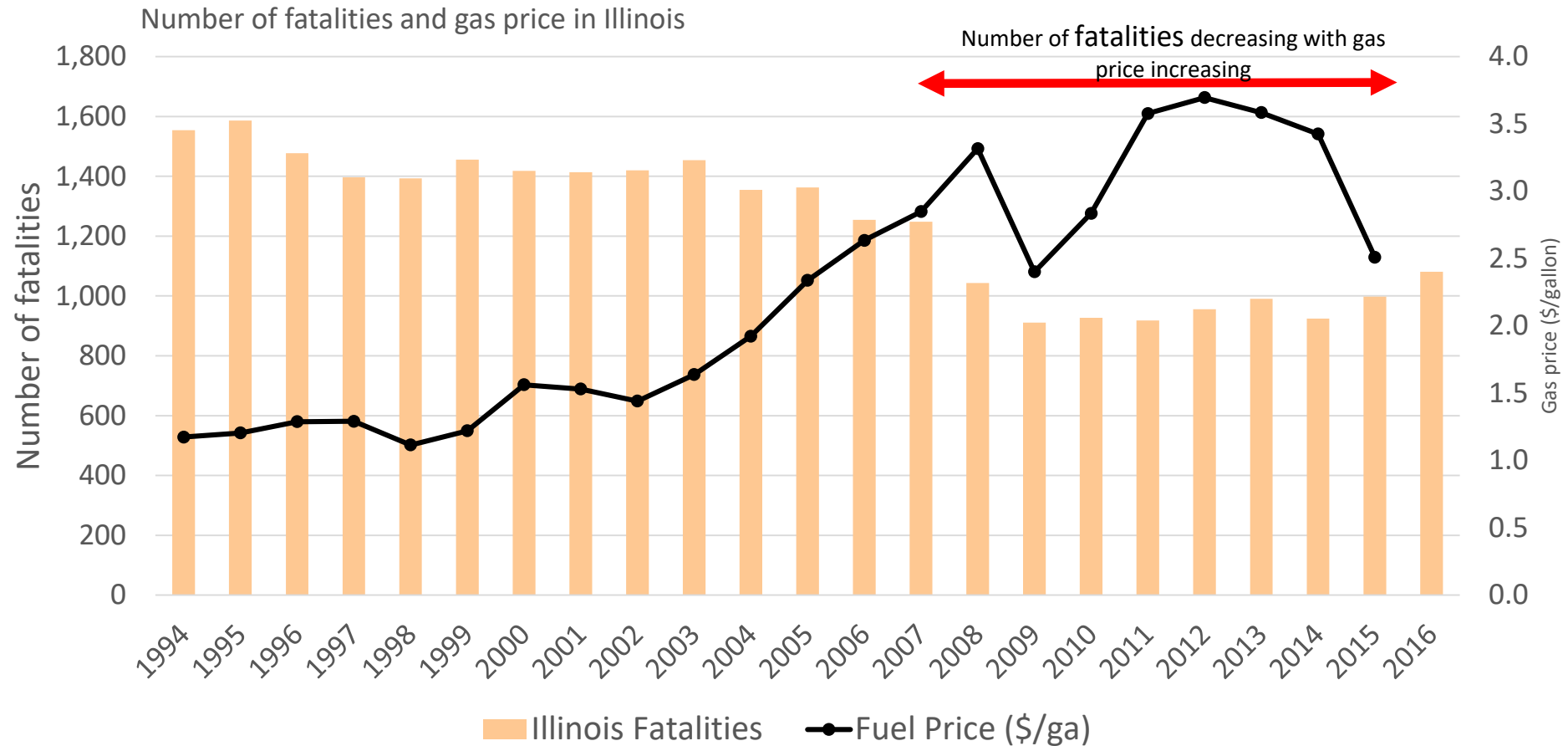


Illinois Fatalities

Note: The numbers of fatalities for 1994-2015 are from Fatality Analysis Reporting System (FARS) Encyclopedia, <https://www-fars.nhtsa.dot.gov/States/StatesCrashesAndAllVictims.aspx>. The 2016 number of fatalities is based on the IDOT provisional data. The unemployment rates are from the Bureau of Labor Statistics, <https://data.bls.gov/timeseries/LASST170000000000003>.

# ILLINOIS ECONOMY AND NUMBER OF FATALITIES

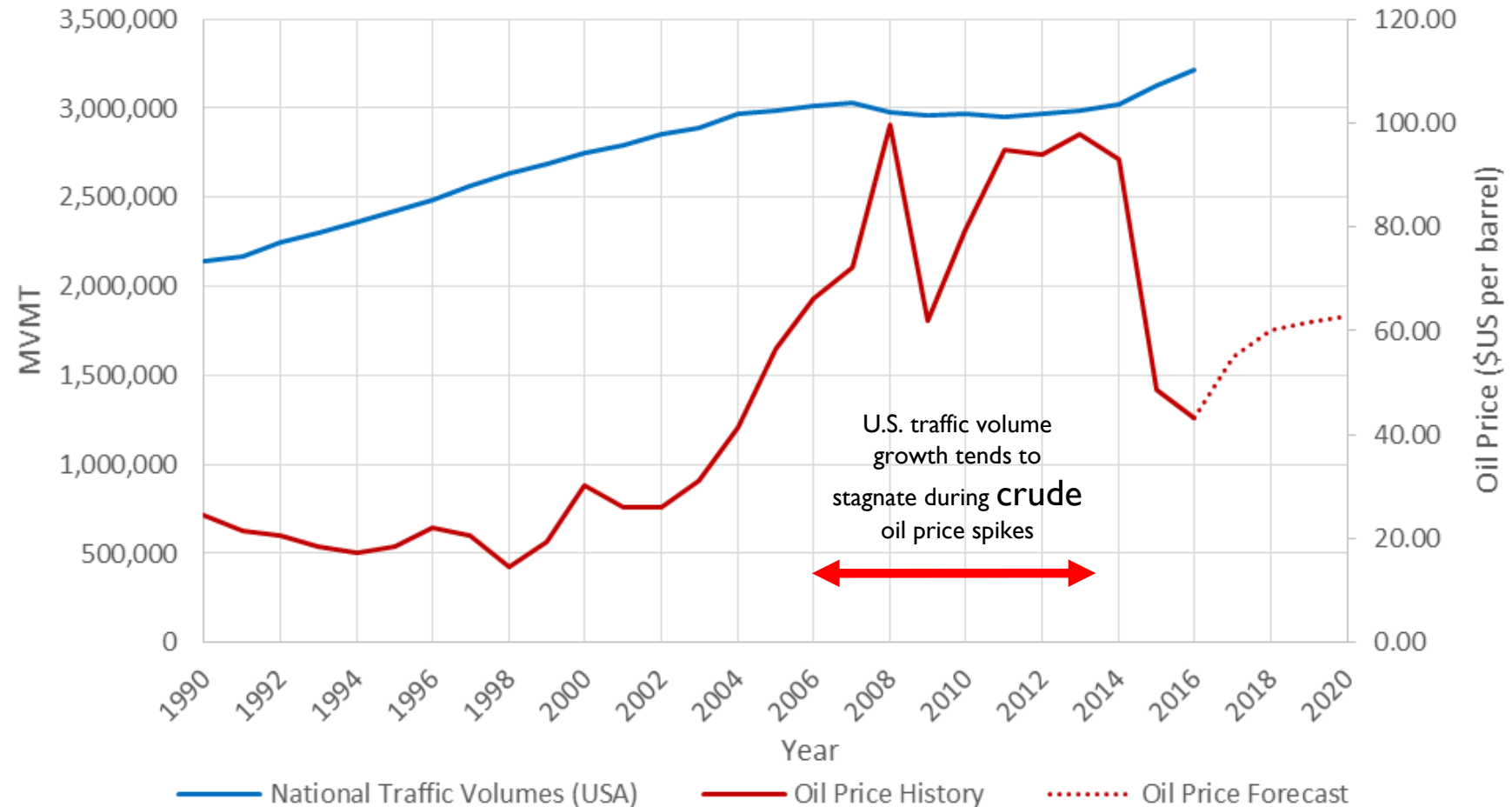
## -GAS PRICE



Note: The numbers of fatalities for 1994-2015 are from Fatality Analysis Reporting System (FARS) Encyclopedia, <https://www-fars.nhtsa.dot.gov/States/StatesCrashesAndAllVictims.aspx>. The 2016 number of fatalities is based on the IDOT provisional data. Gas prices are from the Bureau of Transportation Statistics, [https://www.rita.dot.gov/bts/sites/rita.dot.gov/bts/files/publications/state\\_transportation\\_statistics/state\\_transportation\\_statistics\\_2013/index.html/chapter6/table6\\_11](https://www.rita.dot.gov/bts/sites/rita.dot.gov/bts/files/publications/state_transportation_statistics/state_transportation_statistics_2013/index.html/chapter6/table6_11).

# CRUDE OIL PRICES AND NATIONAL TRAFFIC VOLUMES

Crude Oil Price vs. U.S. National Traffic Volumes

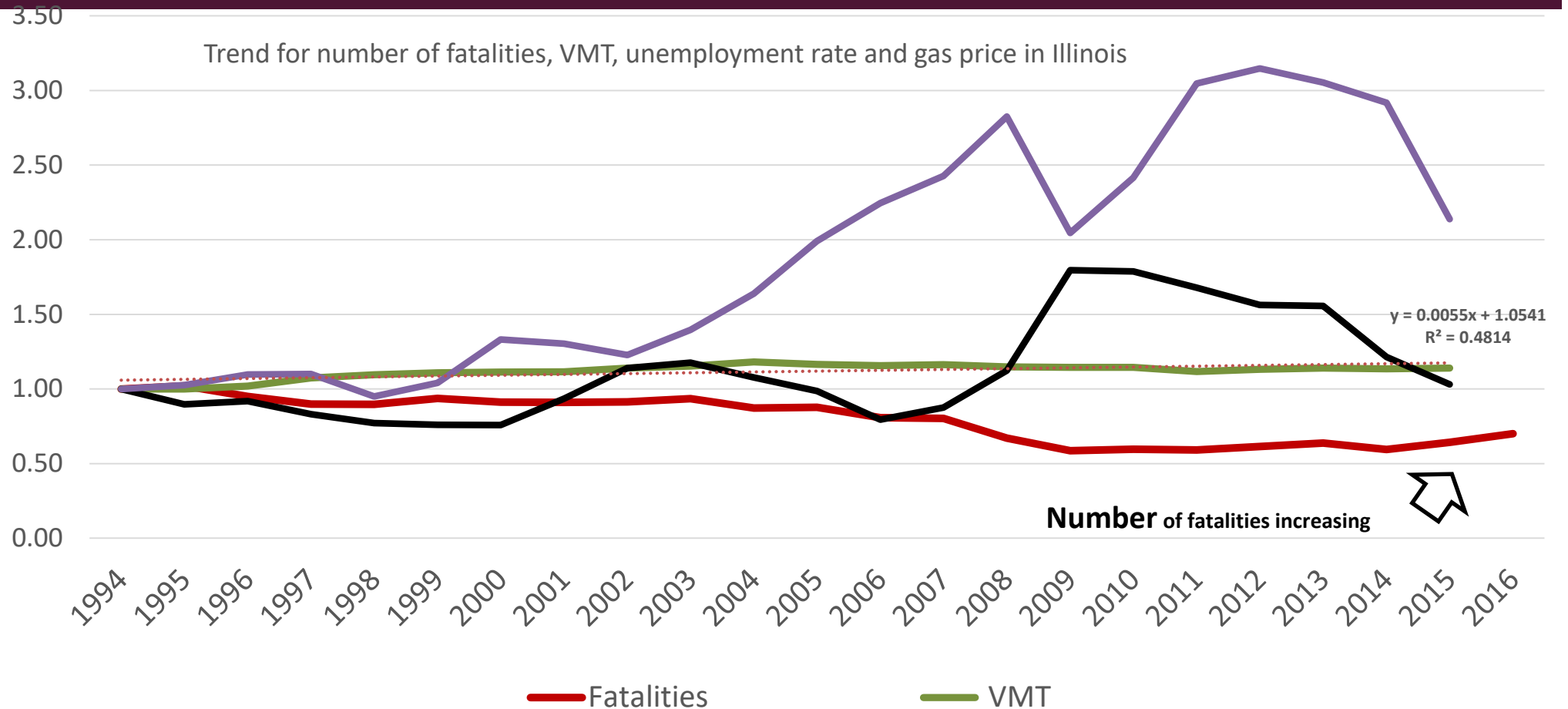


Sources:

- Oil Price History: U.S. Energy Information Administration/Federal Reserve Bank of St. Louis (<https://fred.stlouisfed.org/series/DCOILWTICO/downloaddata>)
- Oil Price Forecast: Knoema (<https://knoema.com/yxptpab/crude-oil-price-forecast-long-term-2017-to-2030-data-and-charts>)
- National Traffic Volumes: U.S. Bureau of Transportation Statistics ([https://www.rita.dot.gov/bts/sites/rita.dot.gov/bts/files/publications/national\\_transportation\\_statistics/index.html](https://www.rita.dot.gov/bts/sites/rita.dot.gov/bts/files/publications/national_transportation_statistics/index.html))

# ILLINOIS ECONOMY AND NUMBER OF FATALITIES

## -UNEMPLOYMENT RATE, VEHICLE MILE TRAVELED AND GAS PRICE



Note: The numbers of fatalities for 1994-2015 are from Fatality Analysis Reporting System (FARS) Encyclopedia, <https://www-fars.nhtsa.dot.gov/States/StatesCrashesAndAllVictims.aspx>. The 2016 number of fatalities is based on the IDOT provisional data. Gas prices are from the Bureau of Transportation Statistics, [https://www.rita.dot.gov/bts/sites/rita.dot.gov/bts/files/publications/state\\_transportation\\_statistics/state\\_transportation\\_statistics\\_2013/index.html/chapter6/table6\\_11](https://www.rita.dot.gov/bts/sites/rita.dot.gov/bts/files/publications/state_transportation_statistics/state_transportation_statistics_2013/index.html/chapter6/table6_11). Unemployment rates are from the Bureau of Labor Statistics, <https://data.bls.gov/timeseries/LASST170000000000003>. The vehicle miles traveled (VMT) numbers for 1994-2015 are from Highway Performance Monitoring System HPMS, (<https://www.fhwa.dot.gov/policyinformation/statistics/2015/vm2.cfm>).

# ILLINOIS FUNDING FOR 4E -ENFORCEMENT

- Local law enforcement efforts related to NHTSA grant funding shows total citations declining by 55% from 2009 to 2014 and a 65% reduction in impaired driving citations from 2009 to 2014

Year	Hours	Total Citations	Citation Type			
			Total Alcohol/Drug-Related Citations	Total Occupant Restraint Violations	Total Speeding Citations	Other Citations
2008		293,401	9,208	113,674	102,609	67,910
	194,760.5	100.0%	3.1%	38.7%	35.0%	23.1%
2009		289,496	13,287	104,279	100,167	71,768
	175,219.0	100.0%	4.6%	36.0%	34.6%	24.8%
2010		201,898	9,208	77,151	44,511	76,123
	170,173.3	100.0%	4.6%	38.3%	22.1%	37.7%
2011		166,318	9,208	66,511	22,533	68,215
	158,186.0	100.0%	5.5%	39.9%	13.5%	41.0%
2012		150,197	2,119	51,117	22,533	60,164
	141,946.8	100.0%	1.4%	33.9%	14.9%	40.1%
2013		117,288	5,119	54,456	20,550	47,539
	106,966.0	100.0%	4.4%	46.4%	17.5%	40.5%
2014		131,258	4,615	51,117	19,910	55,616
	117,462.8	100.0%	3.5%	38.9%	15.2%	42.4%





# ILLINOIS IMPLEMENTATION FOR 4E

## -EDUCATION, EMERGENCY SERVICES AND ENGINEERING

### ■ Education

- Influenced by Illinois state budget and NHTSA resources
- Should be fairly consistent funding and implementation over the target setting period

### ■ Emergency services

- Advances in technology may have a positive impact
- Should be fairly consistent funding and implementation over the target setting period

### ■ Engineering

- Fixing America's Surface Transportation Act (FAST) signed in December 2015
- Should be fairly consistent funding over the target setting period
- Changes on HSIP or other transportation infrastructure investments will not likely be reflected over the target setting period (2015) but may have an impact on 2018 fatalities

# MOST IMPROVEMENTS IN TRAFFIC SAFETY ARE INCREMENTAL AND ARE EXPRESSED GRADUALLY OVER TIME

- Long-term downward pressure on traffic fatalities:
  - Vehicle: e.g., penetration of crashworthy designs, crash avoidance technologies such as electronic stability control.
  - Driver: e.g., graduated driver license, increased use of safety belts, enforcement, safety campaigns to change behavior.
  - Environment: e.g., improved roadway design, barriers, signs, guardrails, rumble strips.
- Economic changes can effect substantial changes in driver behavior over the short term.
  - Less travel by risky drivers
  - Less travel in risky environments

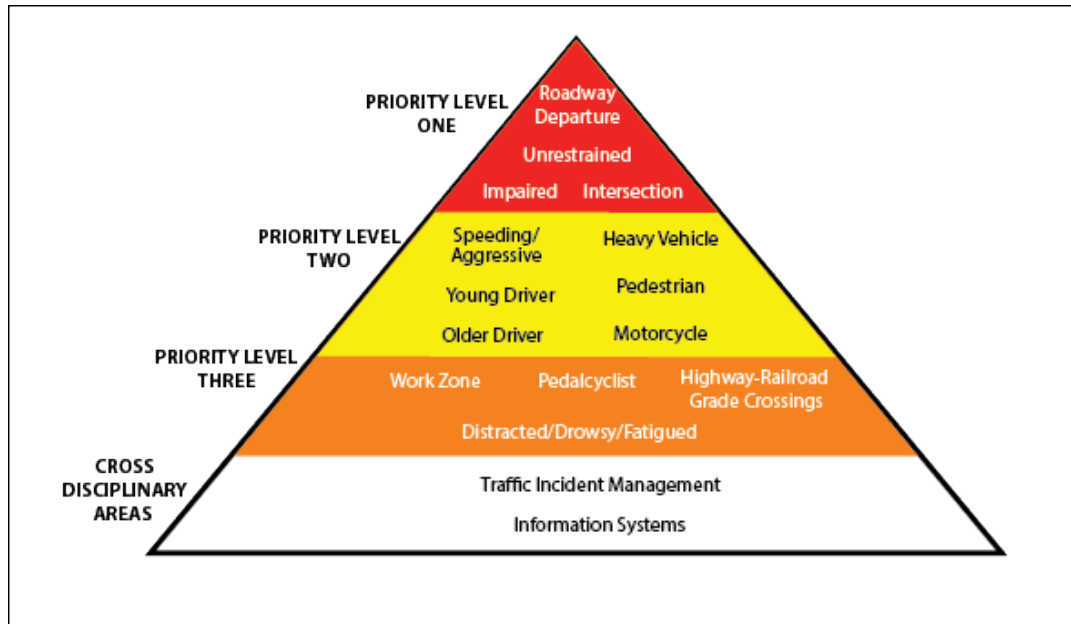
- 
- Executive Partnerships
  - Resources development and sharing
  - Collaboration on initiatives and programs

**STATE SOLUTIONS**

# ILLINOIS STRATEGIC HIGHWAY SAFETY PLAN

## EMPHASIS AREAS (EAS)

- Priority Level One Emphasis Areas (EAs) represent fatalities of 25% or greater (based on 2010 to 2014 data)



Priority Level	Emphasis Areas	Fatalities	A-Injuries	Fatalities and A-Injuries
<b>PRIORITY LEVEL 1</b>	Roadway Departure	2,483	19,279	21,762
	Impaired Driver	2,088	8,331	10,419
	Unrestrained Occupants	1,377	5,041	6,418
	Intersection Related	1,178	26,397	27,575
<b>PRIORITY LEVEL 2</b>	Speeding/Aggressive Driver	1,108	12,884	13,992
	Older Driver	848	9,593	10,441
	Young Driver	694	12,240	12,934
	Motorcycle	694	5,271	5,965
	Heavy Vehicle	672	4,426	5,098
	Pedestrian	641	4,525	5,166
<b>PRIORITY LEVEL 3</b>	Pedalcyclist	137	2,047	2,184
	Work Zone	133	980	1,113
	Distracted/Fatigued/Drowsy Driver	123	3,264	3,387
	Highway-Railroad Grade Crossings	45	54	99
<b>CROSS DISCIPLINARY AREAS</b>	Traffic Incident Management			
	Information Systems			

Note:

Emphasis Area categories are not mutually exclusive, meaning a single crash may overlap multiple Emphasis Area statistics. Hence, the sum of Fatalities and A-injuries for all Emphasis Area categories may be greater than the total frequency for Illinois.

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