Colorado Teen Motor Vehicle Conference

July 17, 2009

www.iihs.org

Insurance Institute for Highway Safety (IIHS)

- Nonprofit, independent research and communications organization
- IIHS mission to save lives, prevent injuries, and reduce property damage in crashes
- Research goal to determine what works and what doesn't to improve highway safety
- Funded by automobile insurance companies

Graduated Driver Licensing (GDL)

- Seeks to increase amount of supervised practice driving
- Keeps young drivers out of hazardous situations initially
- Limits when and with whom teenagers can drive, once licensed
- Often has the effect of delaying licensure

Example graduated licensing laws

Learner's phase

- Minimum of 6 months beginning no sooner than 16
- Minimum of 30 hours of supervised driving, certified by parents

Intermediate phase

- Nighttime driving restriction starting no later than 9 or 10 pm
- Passenger restriction allowing no more than 1 young passenger

Minimum age eligible for full license

- At least 1 year after start of intermediate phase, preferably age 18

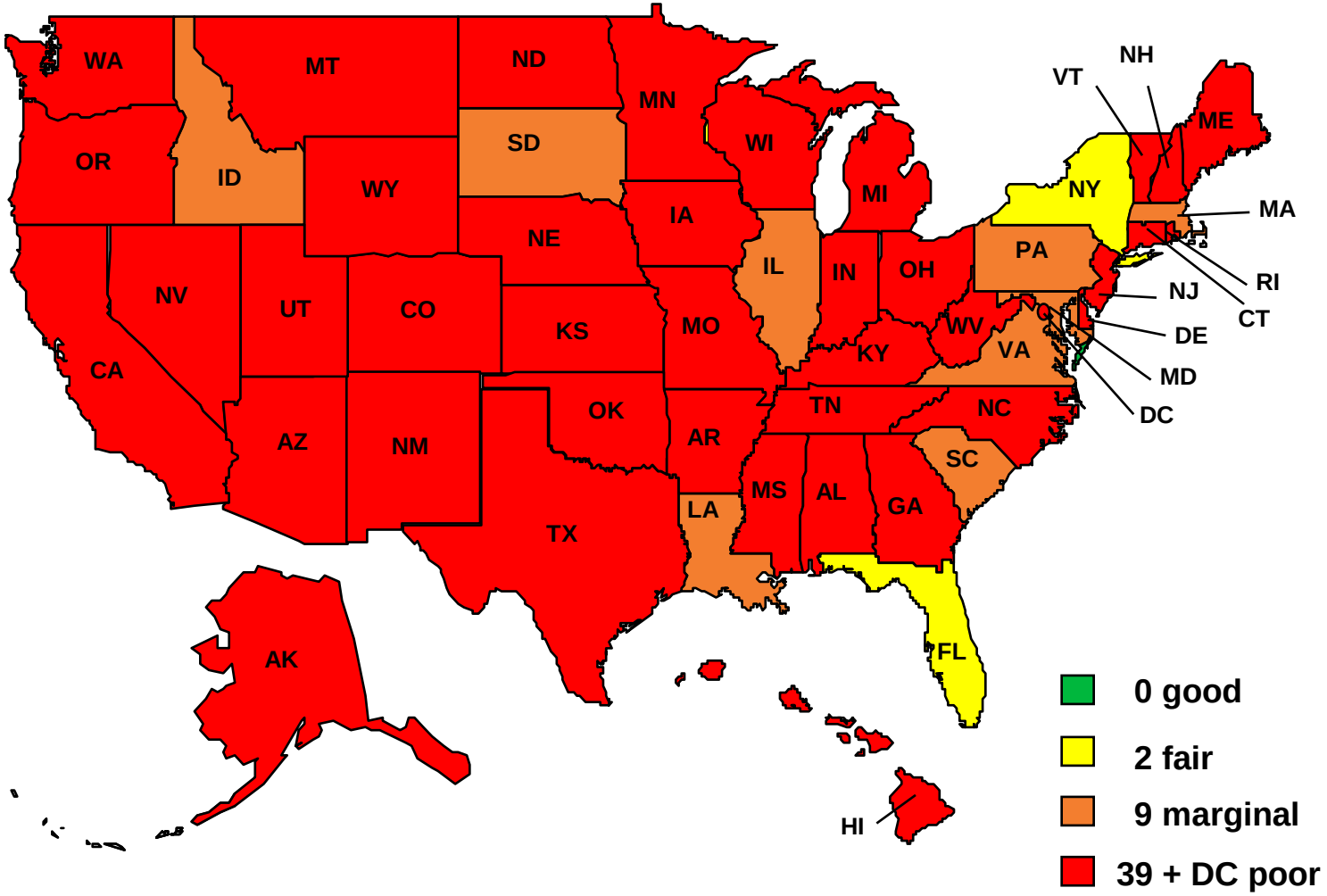
IIHS rating system

G F M P

learner's phase	intermediate phase
entry age	entry age
holding period	nighttime driving restriction
supervised driving certification	passenger restriction
	duration of restrictions

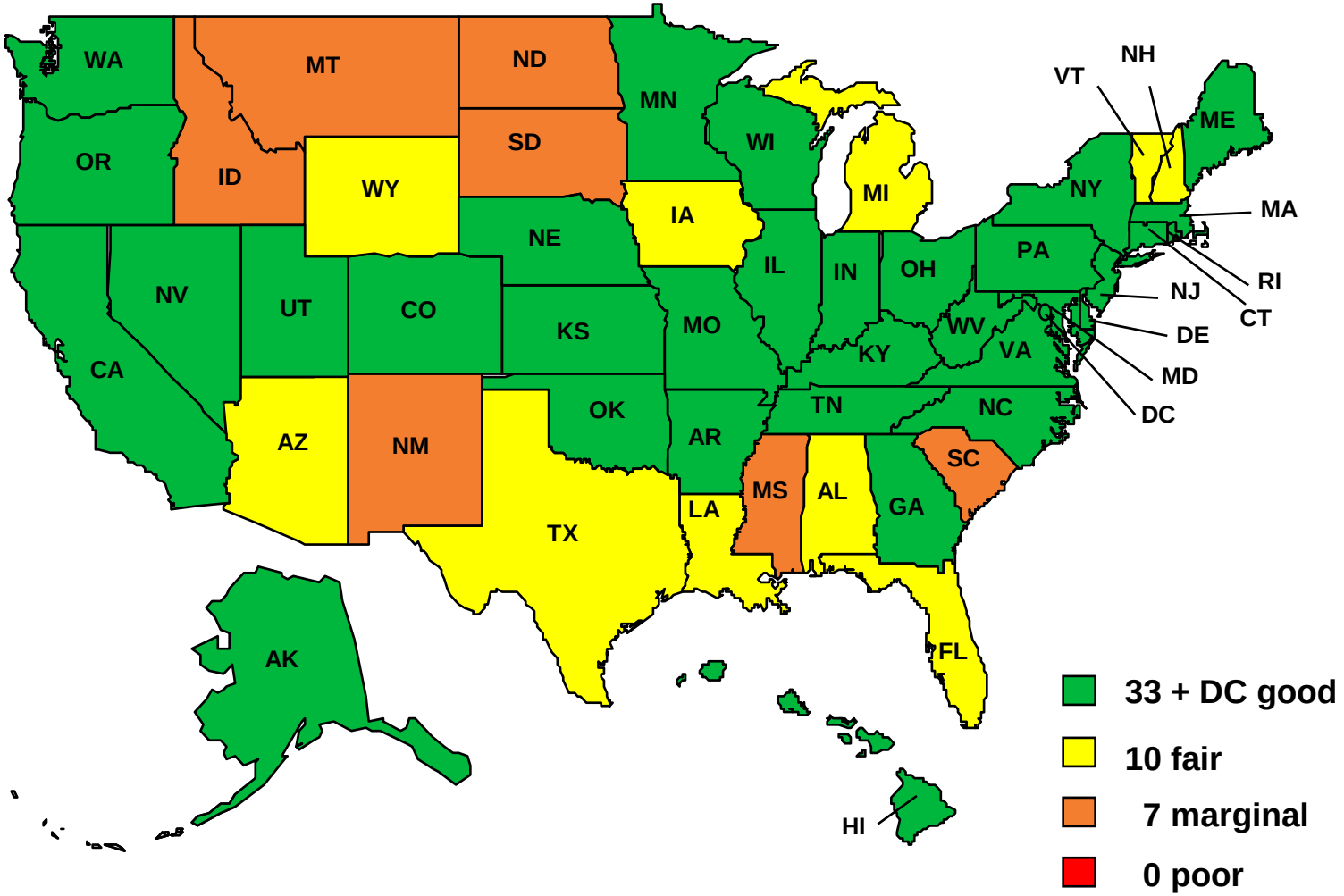
IIHS ratings of graduated licensing laws

July 1996, using current rating system



IIHS ratings of graduated licensing laws

July 2009



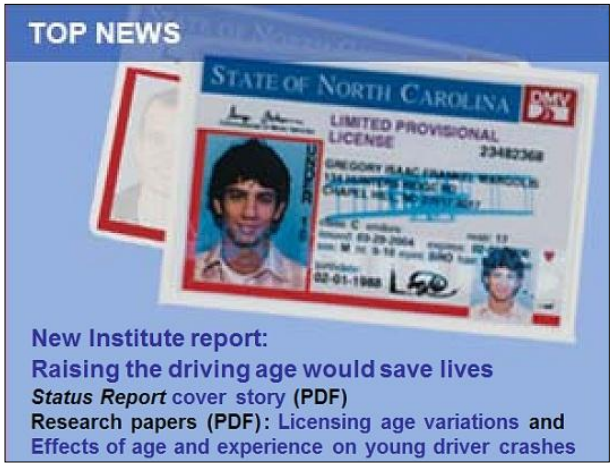
Licensing requirements in 1995 vs. 2009

July 2009

	number of states + DC	
	1995	2009
minimum learner's age 16 or older	8	8 + DC
learner's permit for at least 6 months	0	46 + DC
30 or more hours of certified driving	0	38 + DC
night driving restriction once licensed	9	48 + DC
passenger restriction once licensed	0	42 + DC

Effects of US graduated licensing programs

	age groups	crash reductions
Florida	15-17	9%
Iowa	16-17	25-30%
Michigan	16	29%
North Carolina	16	23%
Ohio	16-17	23%
Wisconsin	16	14%

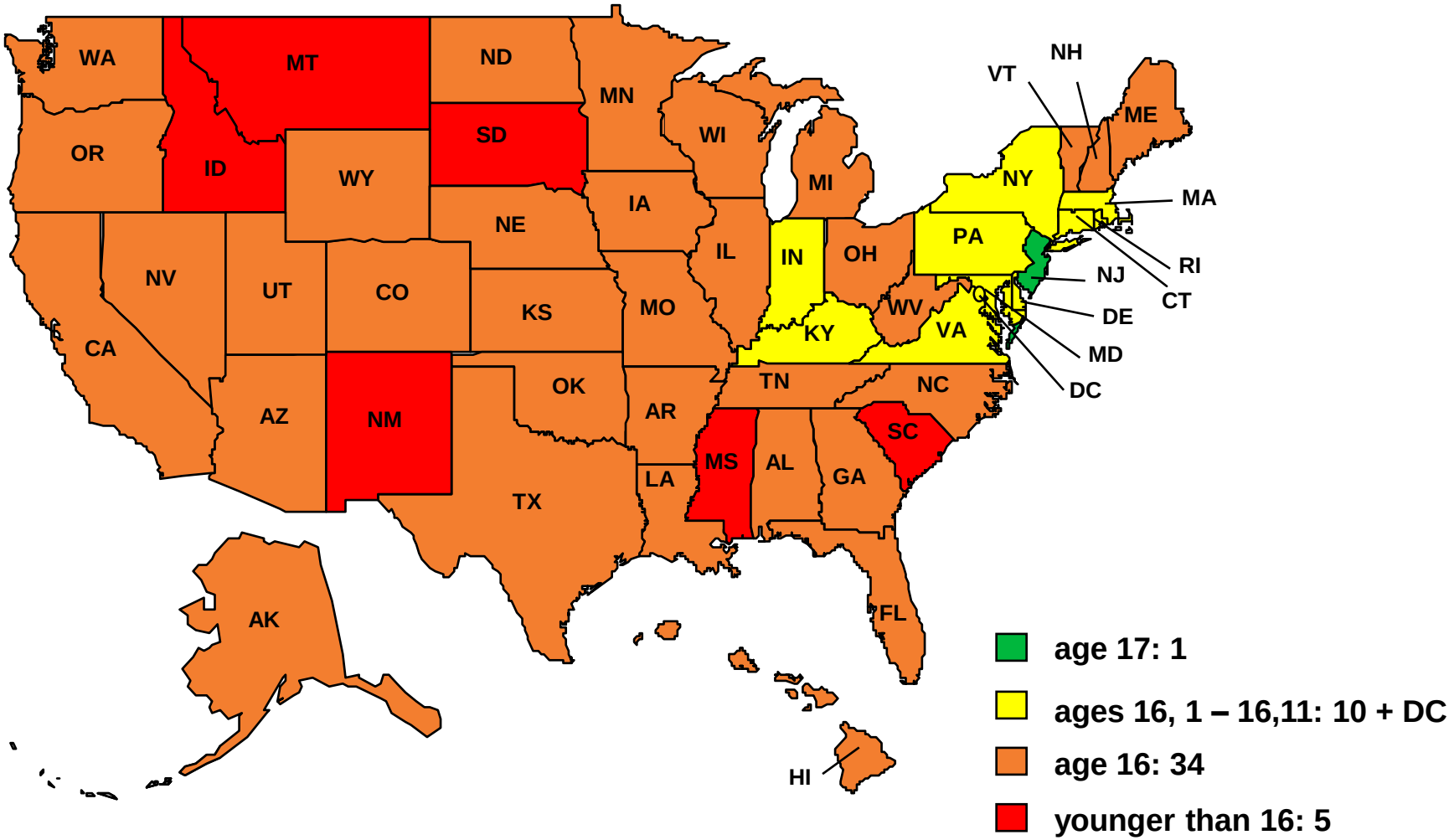


Special issue: teen driving age

September 9, 2008

Minimum intermediate licensing age

July 2009



Teenage fatal crash rates in New Jersey (license at 17) and Connecticut (license at 16)

Drivers in fatal crashes per 100,000 population, 1992-96

age	New Jersey	Connecticut
16	4.4	20.7
17	32.3	31.1
16-17	18.2	25.9

Special issue: teen drivers

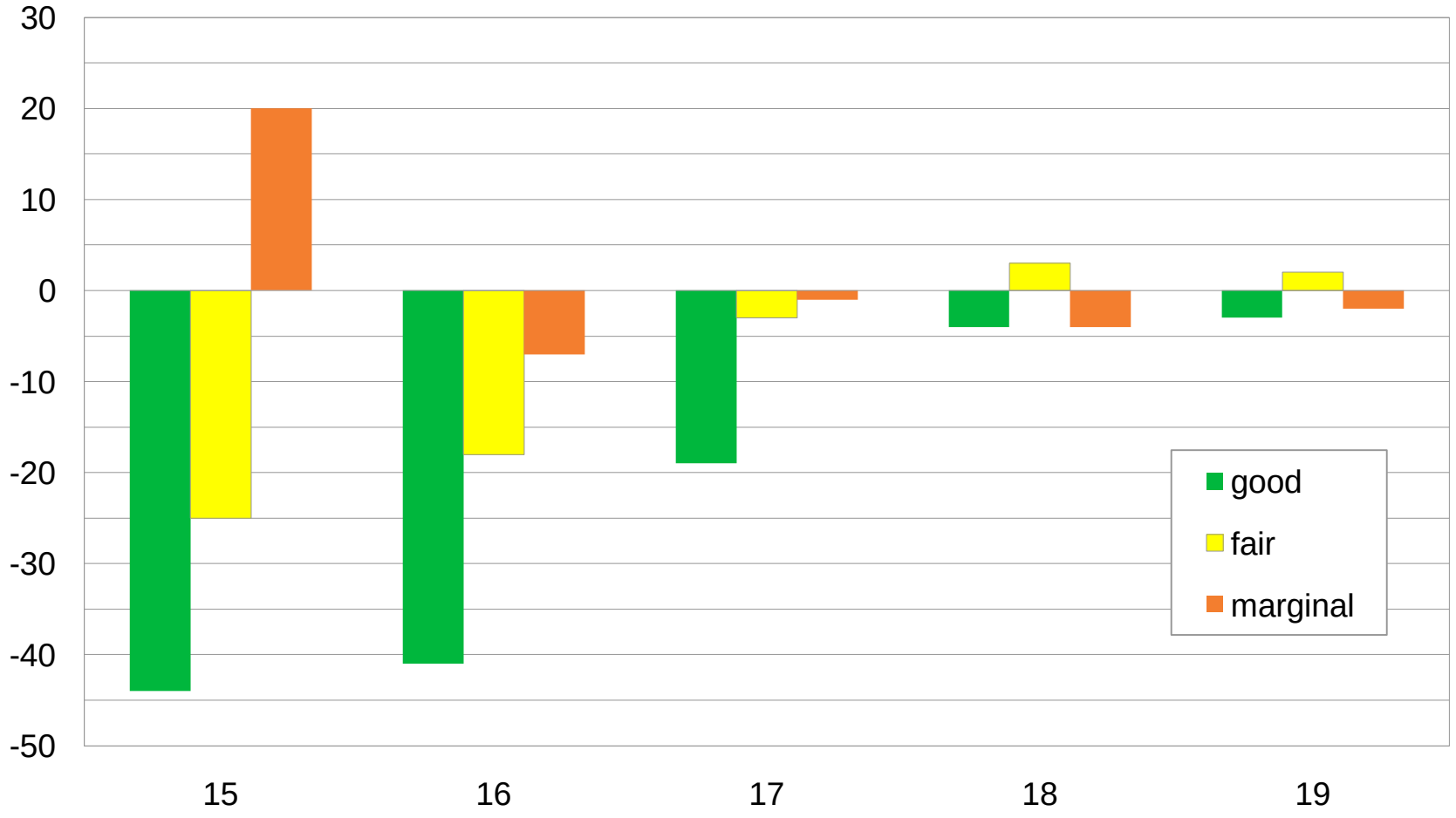
May 7, 2009

National study of effects of graduated licensing on fatal crash rates

- Examined overall IIHS ratings of teenage licensing laws and specific provisions
- Examined per population fatal crashes of teenage drivers (ages 15-17)
- Quarterly state-level data during 1996-2007
  - Fatal crash rate per population of teenagers
  - Fatal crash rate of drivers ages 30-59 accounted for state crash trends, etc.

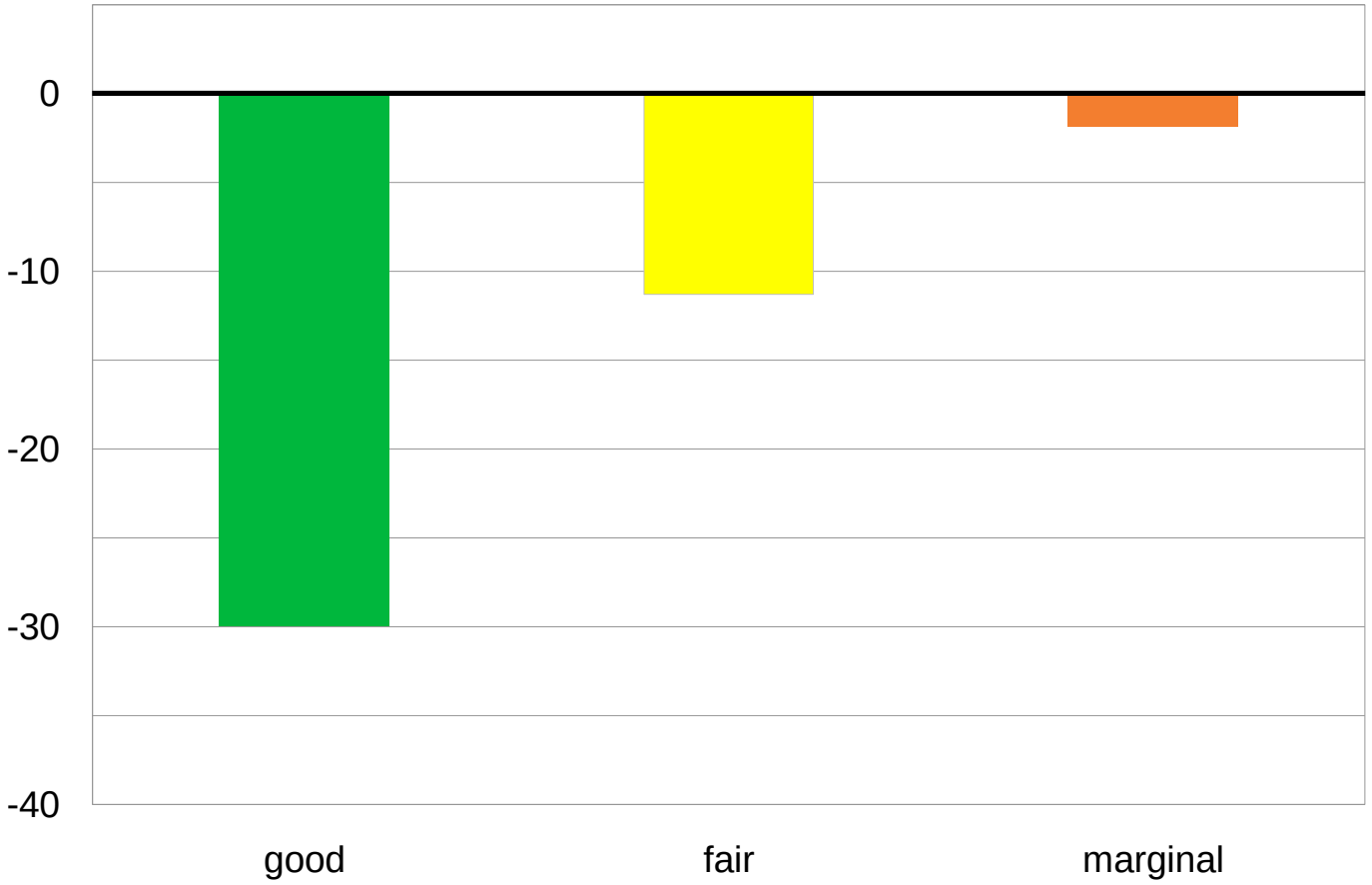
Percent change in fatal crashes of 15-19 year-olds per population for good, fair, or marginal rating

Compared with poor rating, 1996-2007



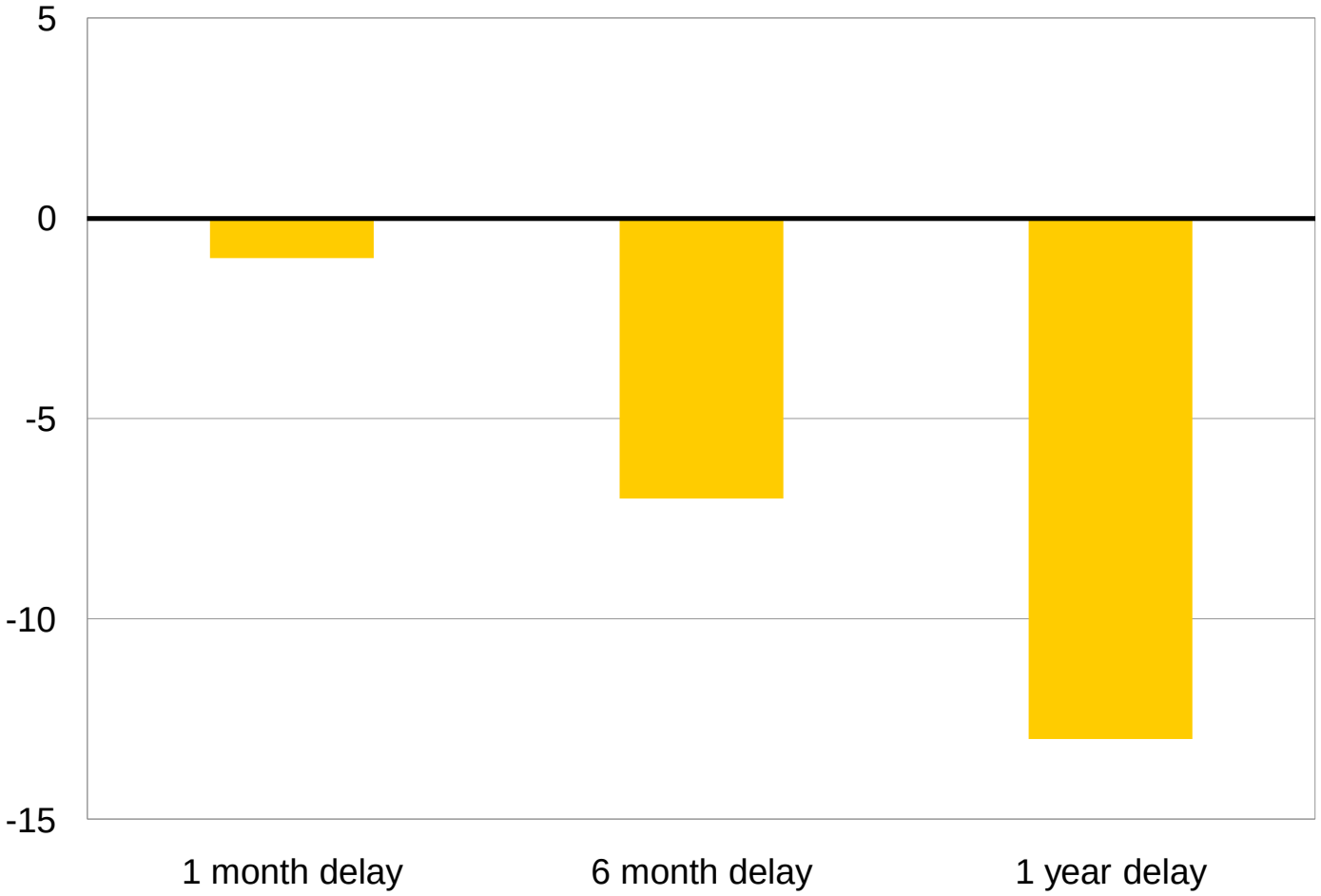
Percent change in fatal crashes of 15-17 year-olds per population for good, fair, or marginal rating

Compared with poor rating, 1996-2007



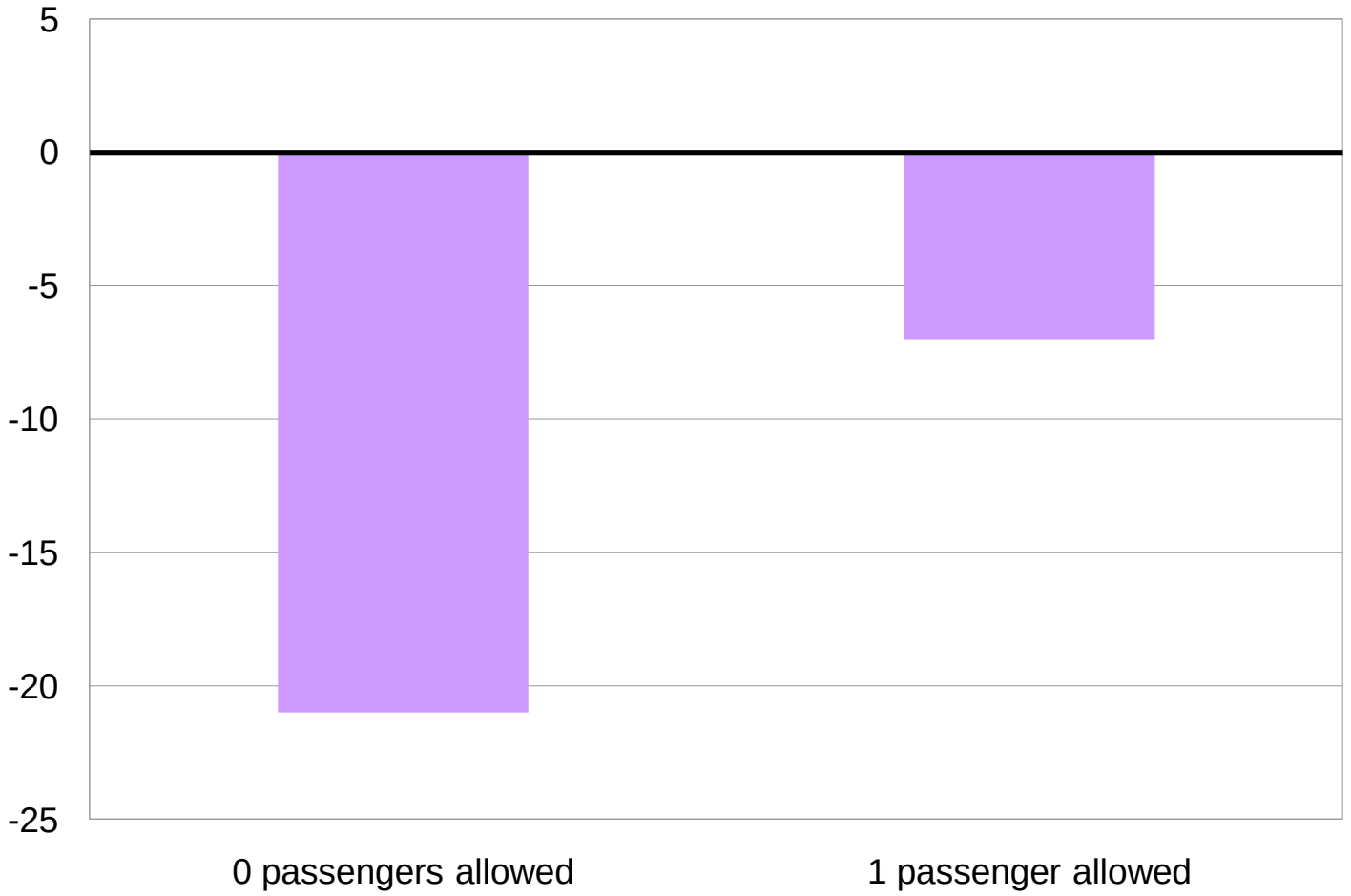
Effects of delaying age of licensure

Percent change in fatal crashes of 15-17 year-olds per population, 1996-2007



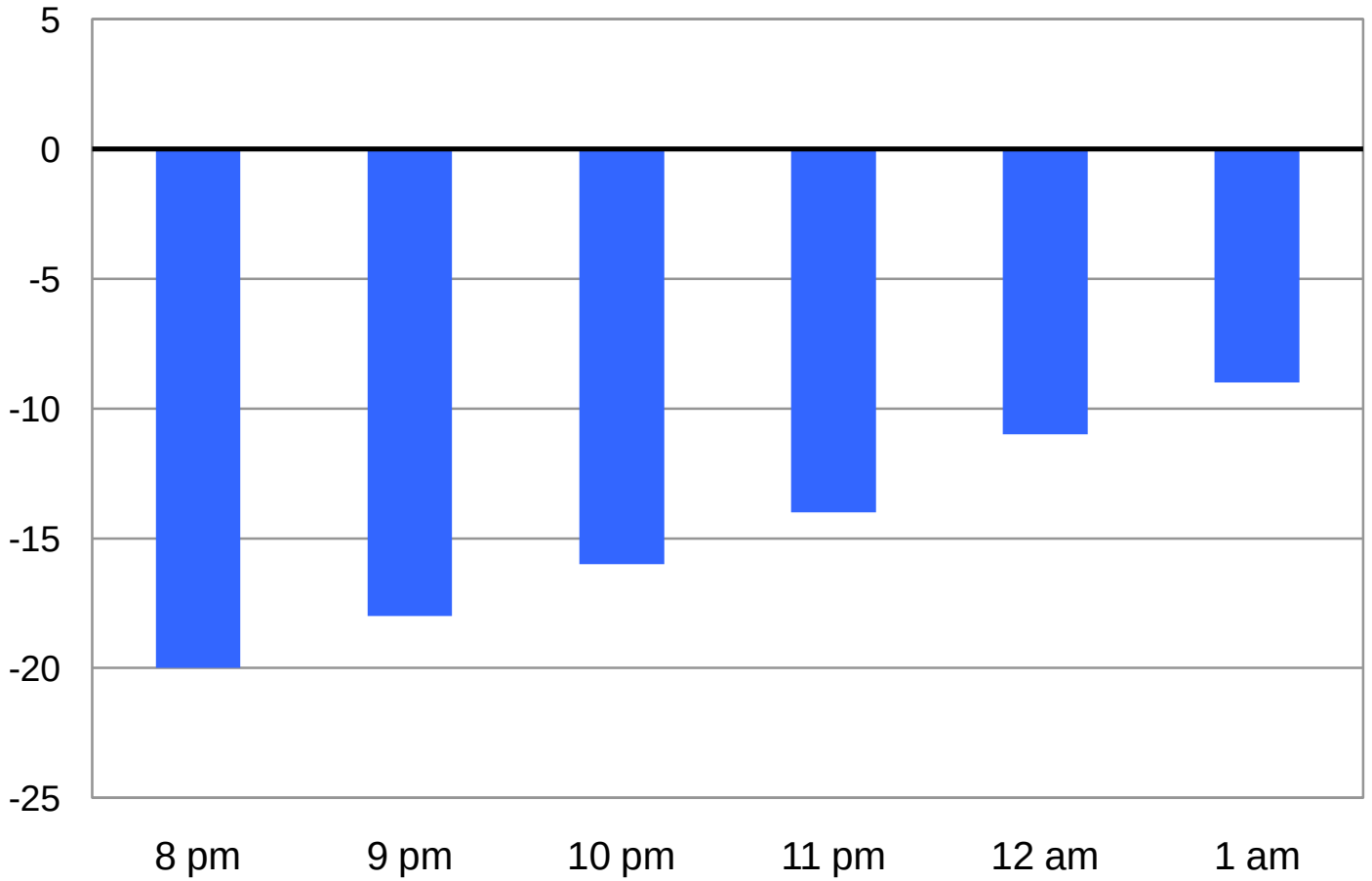
Effects of passenger restrictions

Percent change in fatal crashes of 15-17 year-olds per population, compared with allowing 2 or more passengers, 1996-2007



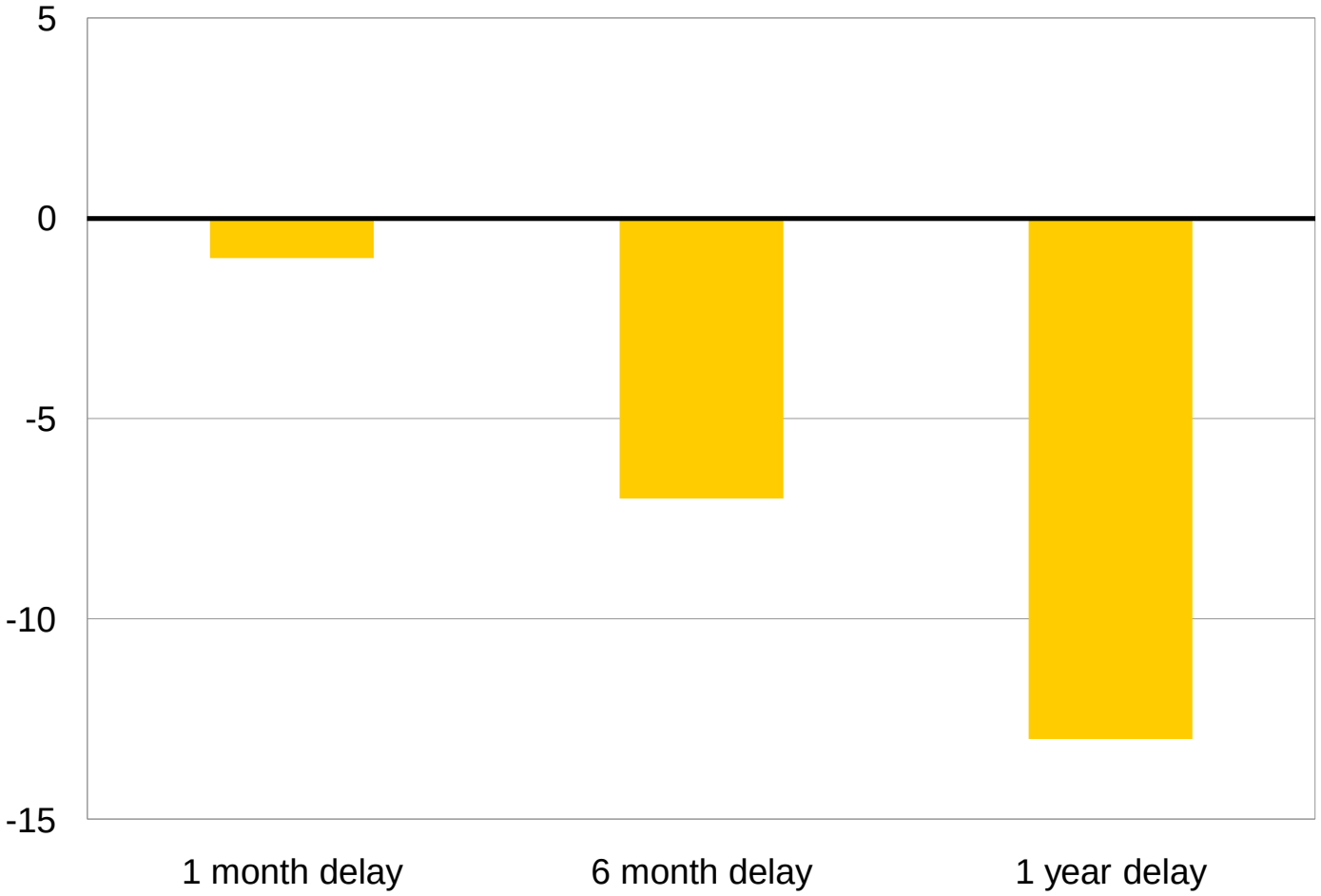
Effects of nighttime driving restrictions

Percent change in fatal crashes of 15-17 year-olds per population, 1996-2007



Effects of delaying age of permit

Percent change in fatal crashes of 15-17 year-olds per population, 1996-2007



Conclusions

- IIHS ratings of young driver licensing laws line up well with fatal crash experience
- Individual components of laws are beneficial
  - 1 year licensing age delay, 1 year permit age delay, and strong nighttime and passenger restrictions on beginning drivers have substantial benefits
  - After the effects of any related delay in licensure were accounted for, an increase in the minimum learner's permit holding period showed no effect on fatal crash rates
  - An increase in required practice driving hours did not appear to have an independent effect on fatal crash rates

Highway Loss Data Institute graduated licensing study

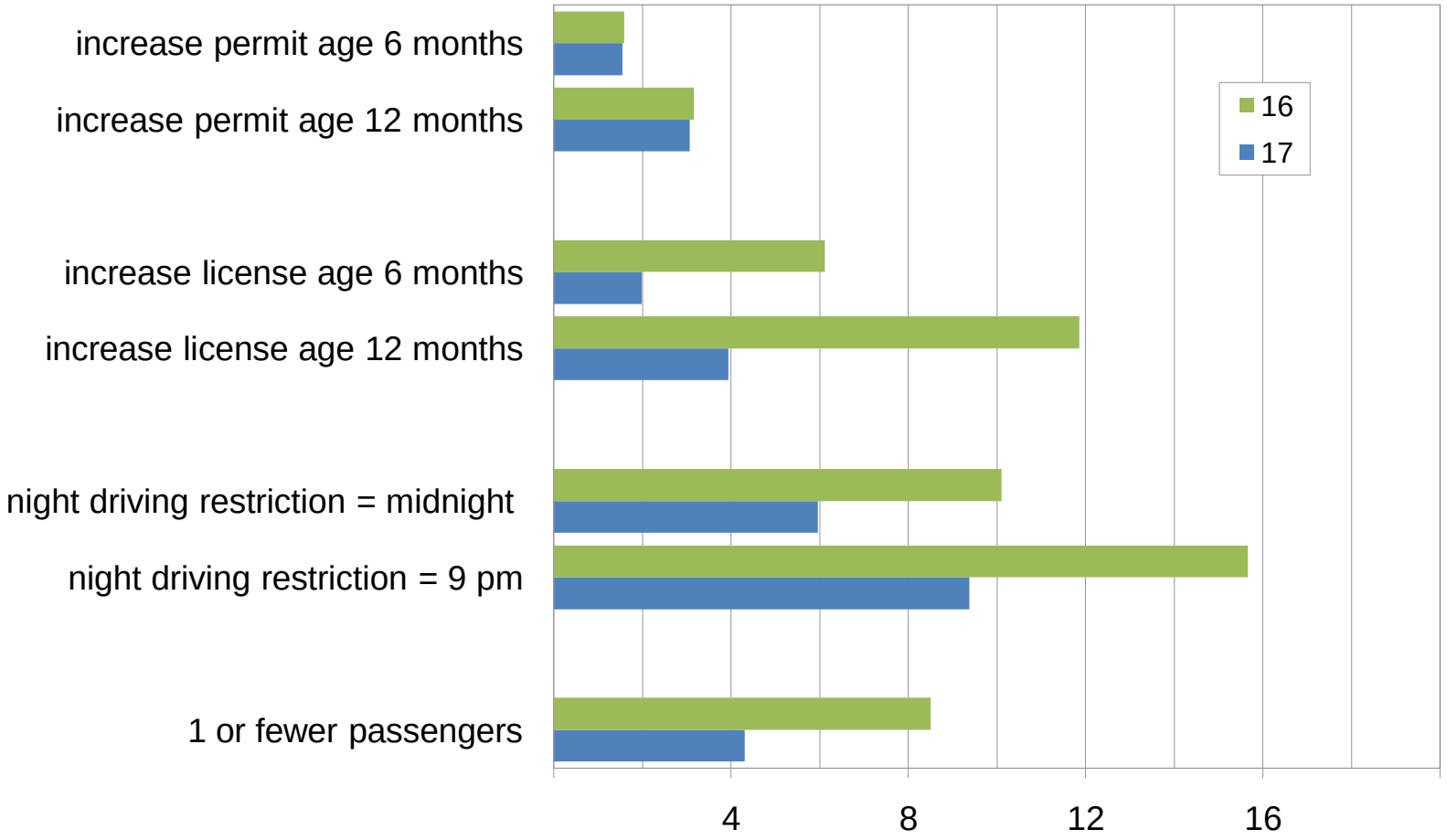
- Data include licensed drivers only; permit stage drivers not present
- All states except New Jersey and Massachusetts
- Vehicles up to 3 years old during calendar years 1996-2006
- Collision claim frequencies by state and year for rated drivers 16-17
- Claim frequencies for ages 35-55 used as a covariate to control for state collision trends, etc.

Predicted percent reduction in collision claim frequencies

16-17 year-olds, by graduated licensing law rating

Predicted percent reduction in collision claim frequencies

Rated drivers 16-17 years old, by graduated licensing law component



Current Colorado laws versus potential improvements

	current Colorado laws	potential improvement
minimum learner's permit age	15	16
minimum intermediate license age	16	16,6
hours of certified driving	50	no change
night driving restriction once licensed	midnight	9 or 10 pm
teen passengers allowed once licensed	0	no change

Percent reduction in 16-year-old drivers' fatal crashes per capita for potential changes in Colorado laws

minimum permit age of 16 versus 15	20
minimum intermediate license age of 16,6 versus 16	10
night restriction of 10 pm versus midnight	8
night restriction of 9 pm versus midnight	12
combined effect of minimum permit age 16; minimum intermediate license age 16,6; and 10 pm night restriction	34

Young drivers and cellphones

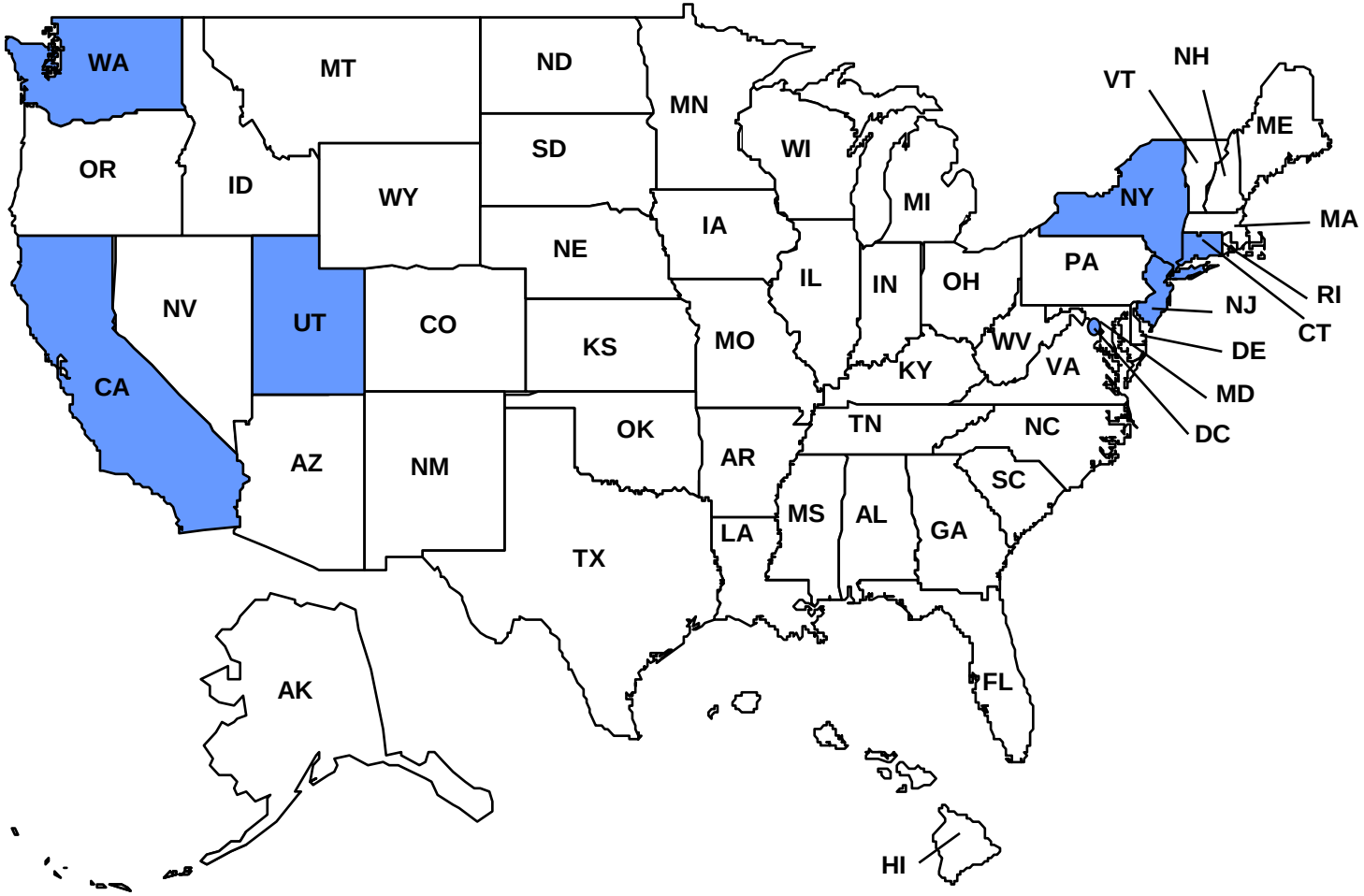
It starts young!

Cell phones and crash risk

- Police crash reports do not reliably document drivers' phone use
- Two controlled studies link talking on a phone directly to involvement in a crash
  - Crash-involved driver cellphone use verified from phone billing records
  - Canadian study found 4-fold increased risk of property-damage crashes when talking on phone
  - Study of Australian drivers found 4-fold increased risk of injury crash when talking on phone

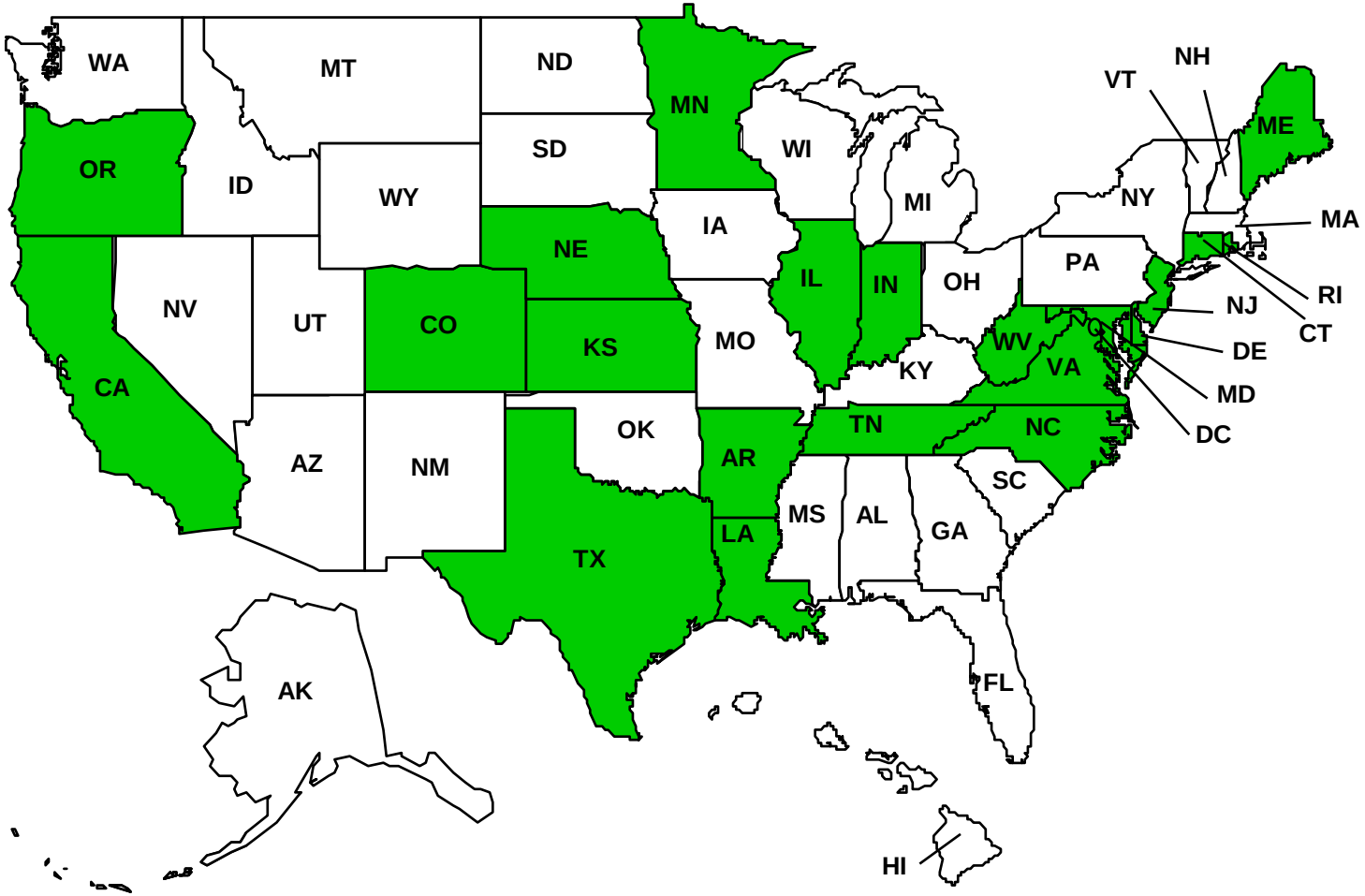
Statewide bans on hand-held phones

July 2009



Cellphone bans for teenage drivers

July 2009

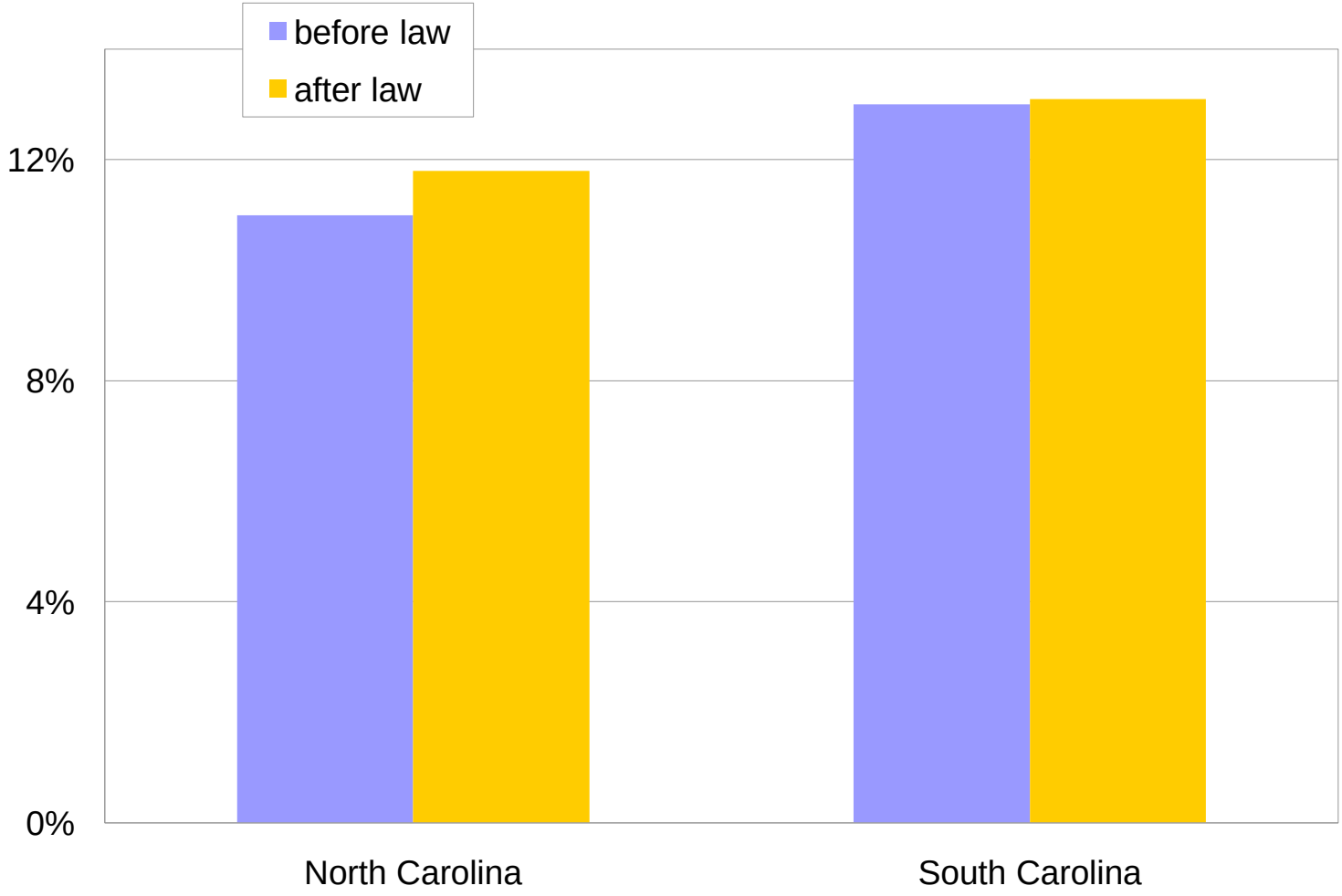


North Carolina's cellphone restriction for teen drivers

Effective December 1, 2006

- Prohibits use of any telecommunications device including text messaging by drivers younger than 18
- Levies $25 fine and 6-month delay before advancing to next licensing level
- Excludes calls for emergencies or to parents, guardians, or spouses

Teenage drivers observed using cellphones as they left school at the end of the day



Parents' and teenagers' views about cellphone law and parental restrictions

After law

	teenagers	parents
know about law	64%	39%
approve of law	74%	95%
believe law being enforced fairly often/a lot	22%	13%
if teenager has cellphone, parent restricts teenager's phone use while driving	66%	88%

Conclusions

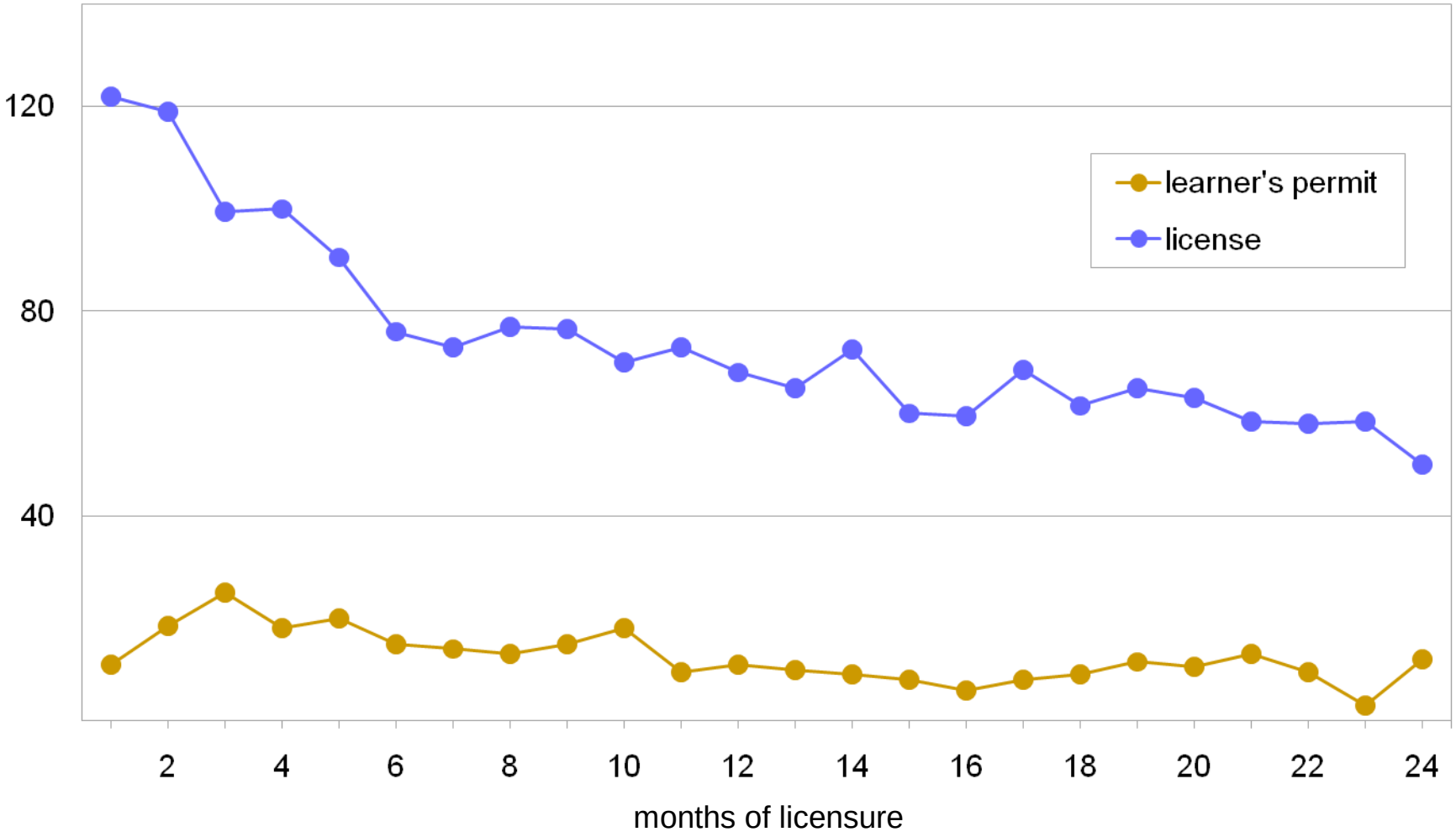
- Cellphone use increases crash risk, and the risk is similar for hand-held and hands-free phones
- Laws targeting teenage drivers' phone use are difficult for police officers to enforce
- Parents also may find cellphone restrictions harder to enforce than nighttime driving or other restrictions
- Primary enforcement laws applying to all phones and all drivers make most sense, based on evidence
- Passage of laws is the first step, but compliance will likely be low without publicized enforcement
- Effects of laws on crashes unknown

Special issue: teen drivers

May 7, 2009

Crashes by license status and months of licensure

Per 10,000 learner/licensed drivers



Percent of parents willing to use in-vehicle monitoring devices

3-state survey, 2006

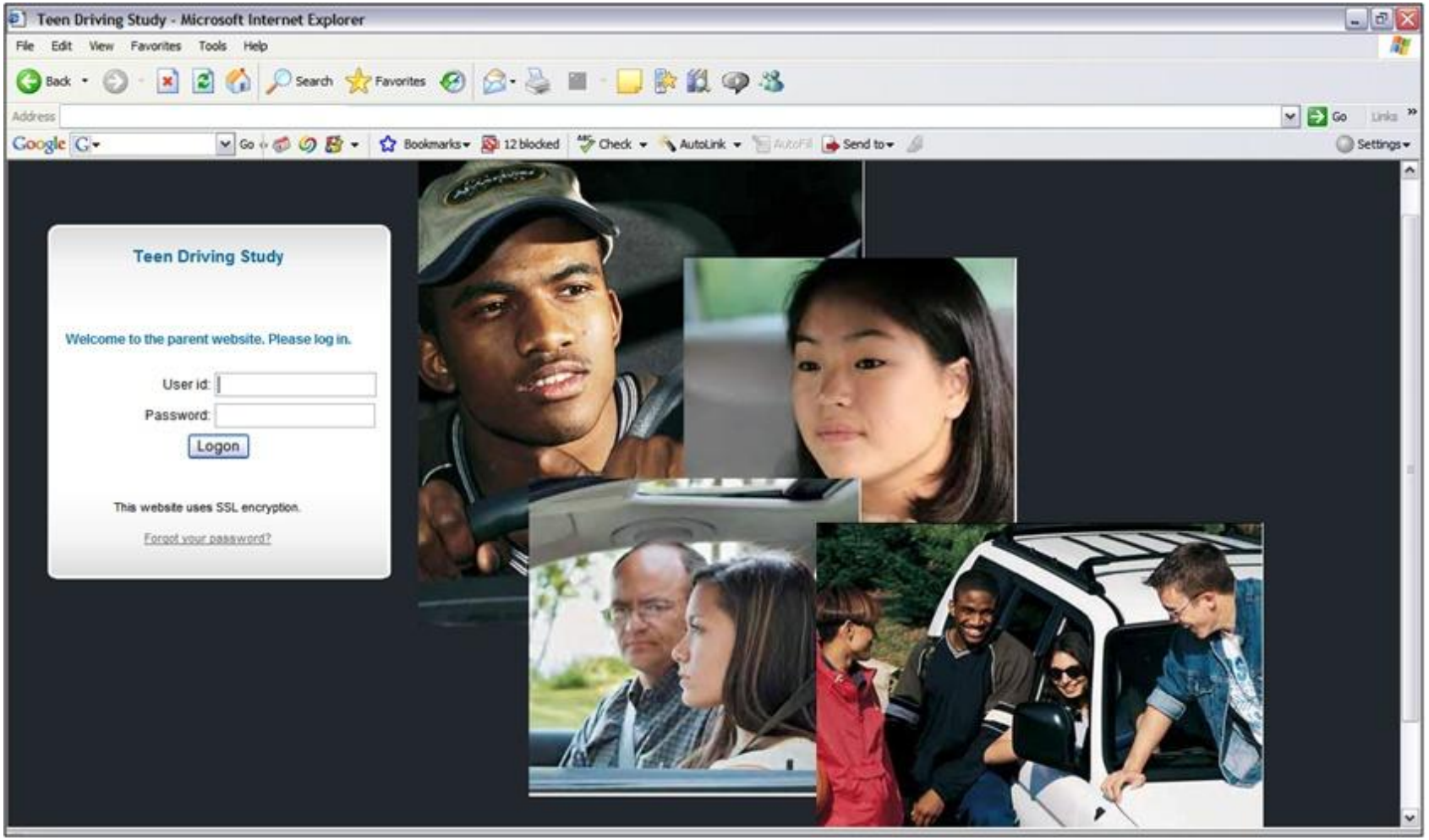
	video camera	computer chip	cellphone GPS
Would consider using	32	51	48
If no, why not?			
trust teen	62	69	63
invasion of privacy	33	6	26
won't improve driving	4	21	12
expense	19	3	16

Technology

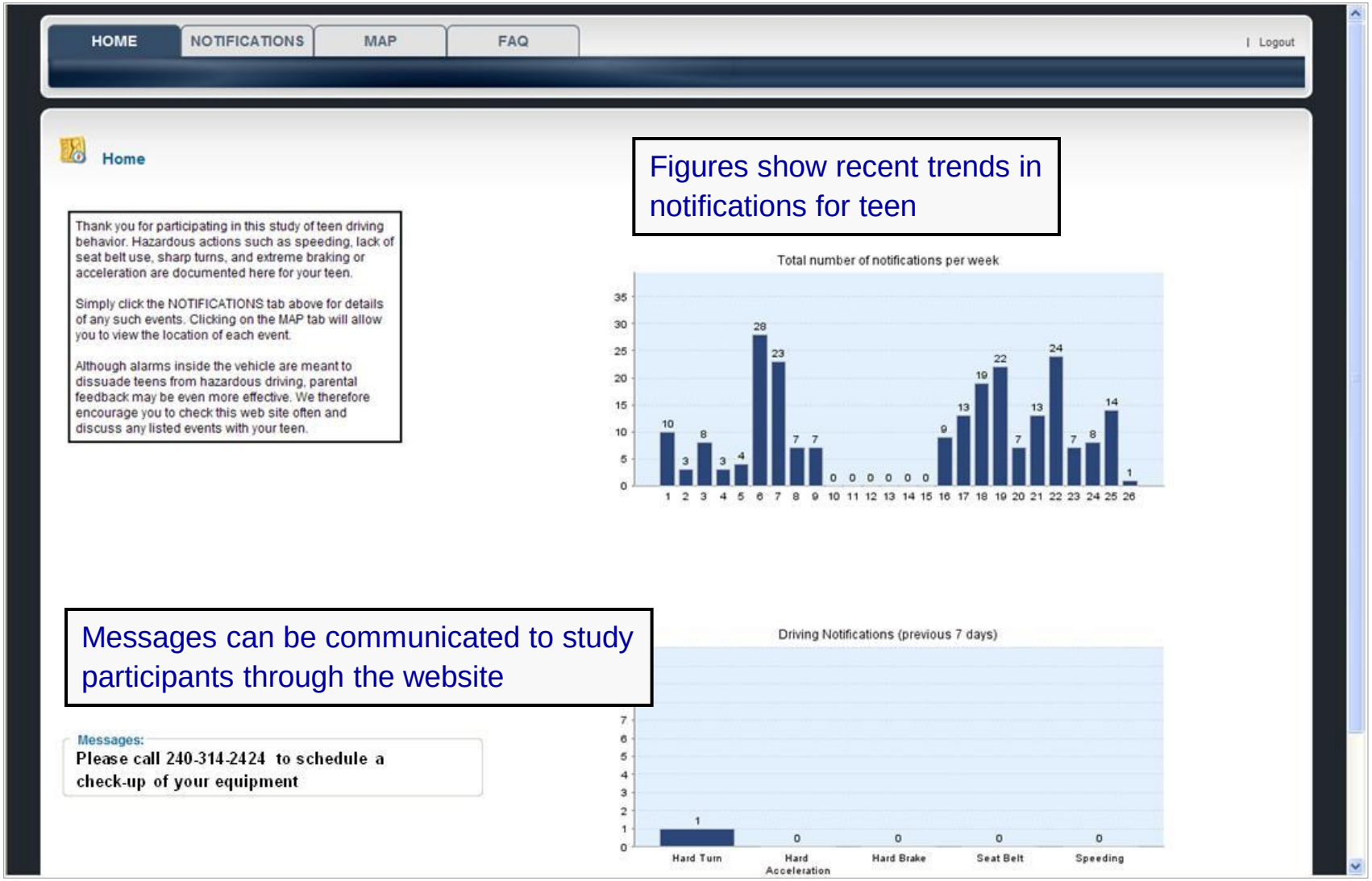
- Shoebox-size black box in vehicle cargo area, GPS, satellite modem, and small speaker box beneath dashboard
- Records location and miles driven
- Detects
  - All sudden braking and all sudden acceleration (longitudinal deceleration/acceleration more than 0.5 g)
  - Driver not using belt
  - Speed 2.5 mph faster than limit
  - Speed more than 10 mph faster than limit

www.teendriverstudy.com

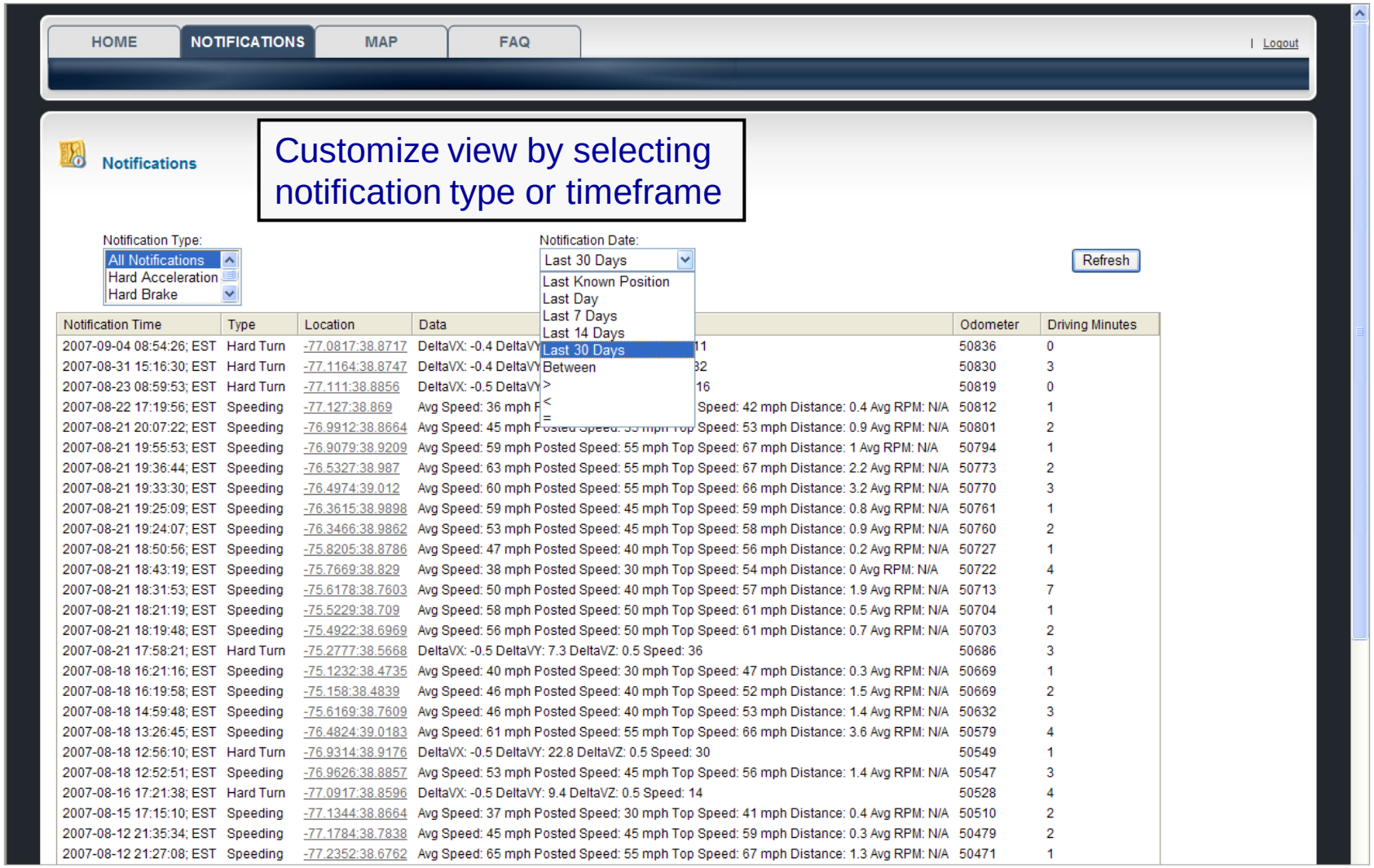
Website with secure login, personal ID, and password



Homepage shows recent trends in notifications

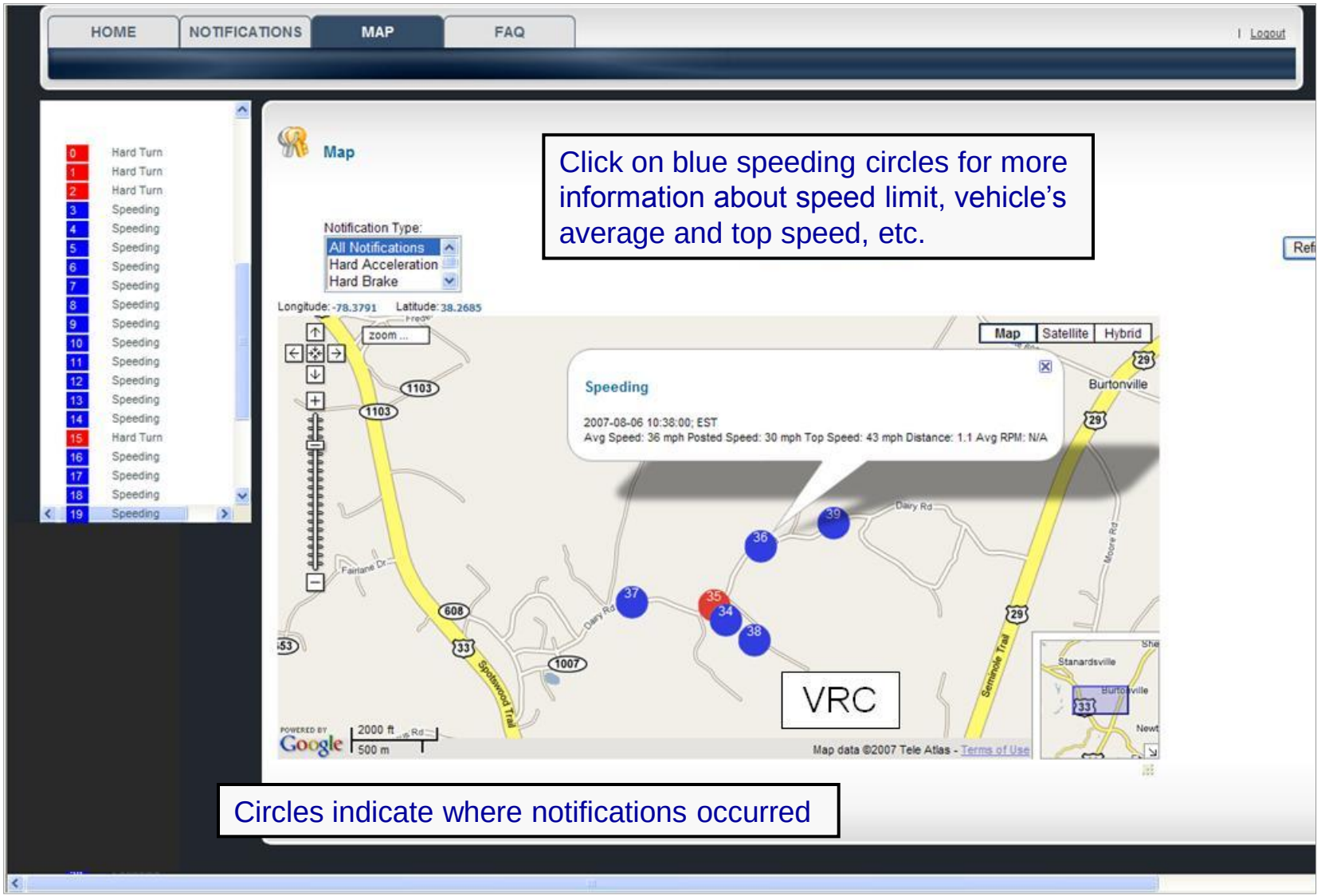


Notification of events where vehicle exceeded criteria for speeding, sudden acceleration, etc.



Notification Time	Type	Location	Data	Odometer	Driving Minutes
2007-09-04 08:54:26; EST	Hard Turn	-77.0817:38.8717	DeltaVX: -0.4 DeltaVY	50836	0
2007-08-31 15:16:30; EST	Hard Turn	-77.1164:38.8747	DeltaVX: -0.4 DeltaVY	50830	3
2007-08-23 08:59:53; EST	Hard Turn	-77.111:38.8856	DeltaVX: -0.5 DeltaVY	50819	0
2007-08-22 17:19:56; EST	Speeding	-77.127:38.869	Avg Speed: 36 mph P Speed: 42 mph Distance: 0.4 Avg RPM: N/A	50812	1
2007-08-21 20:07:22; EST	Speeding	-76.9912:38.8664	Avg Speed: 45 mph P Speed: 53 mph Distance: 0.9 Avg RPM: N/A	50801	2
2007-08-21 19:55:53; EST	Speeding	-76.9079:38.9209	Avg Speed: 59 mph Posted Speed: 55 mph Top Speed: 67 mph Distance: 1 Avg RPM: N/A	50794	1
2007-08-21 19:36:44; EST	Speeding	-76.5327:38.987	Avg Speed: 63 mph Posted Speed: 55 mph Top Speed: 67 mph Distance: 2.2 Avg RPM: N/A	50773	2
2007-08-21 19:33:30; EST	Speeding	-76.4974:39.012	Avg Speed: 60 mph Posted Speed: 55 mph Top Speed: 66 mph Distance: 3.2 Avg RPM: N/A	50770	3
2007-08-21 19:25:09; EST	Speeding	-76.3615:38.9898	Avg Speed: 59 mph Posted Speed: 45 mph Top Speed: 59 mph Distance: 0.8 Avg RPM: N/A	50761	1
2007-08-21 19:24:07; EST	Speeding	-76.3466:38.9862	Avg Speed: 53 mph Posted Speed: 45 mph Top Speed: 58 mph Distance: 0.9 Avg RPM: N/A	50760	2
2007-08-21 18:50:56; EST	Speeding	-75.8205:38.8786	Avg Speed: 47 mph Posted Speed: 40 mph Top Speed: 56 mph Distance: 0.2 Avg RPM: N/A	50727	1
2007-08-21 18:43:19; EST	Speeding	-75.7669:38.829	Avg Speed: 38 mph Posted Speed: 30 mph Top Speed: 54 mph Distance: 0 Avg RPM: N/A	50722	4
2007-08-21 18:31:53; EST	Speeding	-75.6178:38.7603	Avg Speed: 50 mph Posted Speed: 40 mph Top Speed: 57 mph Distance: 1.9 Avg RPM: N/A	50713	7
2007-08-21 18:21:19; EST	Speeding	-75.5229:38.709	Avg Speed: 58 mph Posted Speed: 50 mph Top Speed: 61 mph Distance: 0.5 Avg RPM: N/A	50704	1
2007-08-21 18:19:48; EST	Speeding	-75.4922:38.6969	Avg Speed: 56 mph Posted Speed: 50 mph Top Speed: 61 mph Distance: 0.7 Avg RPM: N/A	50703	2
2007-08-21 17:58:21; EST	Hard Turn	-75.2777:38.5668	DeltaVX: -0.5 DeltaVY: 7.3 DeltaVZ: 0.5 Speed: 36	50686	3
2007-08-18 16:21:16; EST	Speeding	-75.1232:38.4735	Avg Speed: 40 mph Posted Speed: 30 mph Top Speed: 47 mph Distance: 0.3 Avg RPM: N/A	50669	1
2007-08-18 16:19:58; EST	Speeding	-75.158:38.4839	Avg Speed: 46 mph Posted Speed: 40 mph Top Speed: 52 mph Distance: 1.5 Avg RPM: N/A	50669	2
2007-08-18 14:59:48; EST	Speeding	-75.6169:38.7609	Avg Speed: 46 mph Posted Speed: 40 mph Top Speed: 53 mph Distance: 1.4 Avg RPM: N/A	50632	3
2007-08-18 13:26:45; EST	Speeding	-76.4824:39.0183	Avg Speed: 61 mph Posted Speed: 55 mph Top Speed: 66 mph Distance: 3.6 Avg RPM: N/A	50579	4
2007-08-18 12:56:10; EST	Hard Turn	-76.9314:38.9176	DeltaVX: -0.5 DeltaVY: 22.8 DeltaVZ: 0.5 Speed: 30	50549	1
2007-08-18 12:52:51; EST	Speeding	-76.9626:38.8857	Avg Speed: 53 mph Posted Speed: 45 mph Top Speed: 56 mph Distance: 1.4 Avg RPM: N/A	50547	3
2007-08-16 17:21:38; EST	Hard Turn	-77.0917:38.8596	DeltaVX: -0.5 DeltaVY: 9.4 DeltaVZ: 0.5 Speed: 14	50528	4
2007-08-15 17:15:10; EST	Speeding	-77.1344:38.8664	Avg Speed: 37 mph Posted Speed: 30 mph Top Speed: 41 mph Distance: 0.4 Avg RPM: N/A	50510	2
2007-08-12 21:35:34; EST	Speeding	-77.1784:38.7838	Avg Speed: 45 mph Posted Speed: 45 mph Top Speed: 59 mph Distance: 0.3 Avg RPM: N/A	50479	2
2007-08-12 21:27:08; EST	Speeding	-77.2352:38.6762	Avg Speed: 65 mph Posted Speed: 55 mph Top Speed: 67 mph Distance: 1.3 Avg RPM: N/A	50471	1

Map shows locations of notifications



Study design

- Random assignment of 85 families to study and control groups
- Vehicle monitoring: 2 weeks baseline, 20 weeks alerts and website, 2 weeks post-treatment
- Before/after changes in driving behavior in study groups relative to control group
- Interviewed teenagers and parents after study about device and website use, perceived effects on behavior, attitudes, etc.

Four study groups with in-vehicle monitoring system

- Alerts driver and immediately notifies website
- Alerts driver and 20 seconds later notifies website if behavior not corrected
- Notifies website but no in-vehicle alert
- Control group with monitoring but no alert or notification

Interest level

- Recruitment proceeded very slowly initially
  - After several months of PTA presentations, advertisements in local papers, and recruitment at state DMVs, only a few teens had enrolled
  - Recruitment picked up with $500 payment and letters to newly licensed Virginia teenagers
- After enrolling, most parents accessed the website infrequently
  - After initiating an email “report card,” parents accessed the website even less frequently
  - However, report cards appeared important for final results

Effectiveness

- Among control teen drivers (no alerts, no website)
  - Belt use tended to decrease over the 20 weeks of monitoring, but was never low (fewer than 10 percent of miles were driven unbelted)
  - Both speeding and sudden accelerations/decelerations increased
- Belt use also was high in the other groups, and increased to virtually 100 percent of miles during the 20 week study
- Speeding and sudden acceleration/deceleration were more difficult to change
  - No experimental group affected both speeding and sudden acceleration to a significant extent
  - The group with the most consistently good results received in-vehicle alerts with the opportunity to correct their behavior before website notification and the parents received report cards

Percent of teens who reacted in various ways to in-vehicle alerts

alerts changed the way they drove	86
some alerts undeserved	88
alerts distracted them from driving safely	31
did something to drown out alerts	64

Percent of parents who reacted in various ways to website information

ever checked website	97
checked website regularly	70
checked website less in last month than in first	78
experienced difficulties using website	43
said device/website helped them talk to their teens about driving behavior	97

Did you drive more safely because device was in your vehicle?

Teen survey

	yes	no
alert and web	95%	5%
alert then web	75%	25%
web only	81%	19%
control	35%	65%
total	72%	28%

Overall views about system

- Parents thought the most effective system would be an in-vehicle alert with immediate website notification; teens preferred conditional notification
- Virtually all parents would recommend this or a similar device to other parents of teen drivers

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Dedicated to reducing deaths, injuries, and property damage on the highway