Healthy Living Options at 16 U.S. Truck Stops

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National Institute for Occupational Safety and Health (NIOSH)

With partial funding from Federal Motor Carrier Safety Administration (FMCSA)

Expanding Research Partnerships
Concurrent Session 1, Session B, 2:00PM-3:30PM on June 21

Outline

I. **Background**

II. **Truck Stop Amenity Conduct and Methods**

III. **Truck Stop Amenity Results**

IV. **Future Directions**

Research published in September 2016, titled, A Pilot Study of Healthy Living Options at 16 Truck Stops Across the United States in American Journal of Health Promotion

Photo source: https://www.nytimes.com/2017/05/22/us/trucking-jobs.html?hp&action=click&pgtype=Homepage&clickSource=story-heading&module=second-column-region&region=top-news&WT.nav=top-news&_r=0

Challenge

- Truck drivers spend long periods of time at truck stops, loading docks, terminals, and rest areas
- These environments provide little opportunity for healthy food and exercise

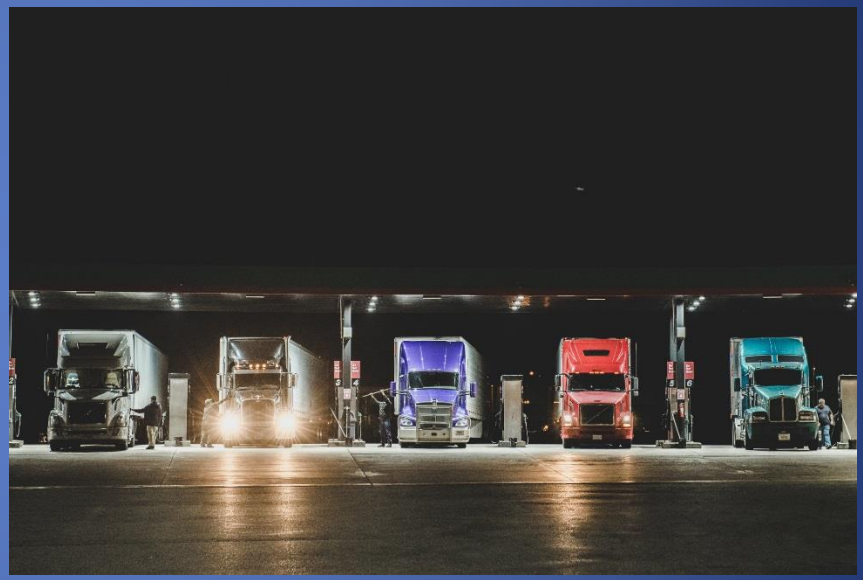
Background from the NIOSH National Survey of U.S. Long-Haul Truck Driver Health and Injury

- 44% of truck drivers spend 1 to 6 nights at home based each month
- 18% of truck drivers spend no nights at home based each month
- 23% of drivers are over weight
- 69% of drivers are obese
- 27% of truck drivers have no physical activity

*Sieber et. al. 2014 American Journal of Industrial Medicine. 57:615–626

Amenity Checklist Objectives

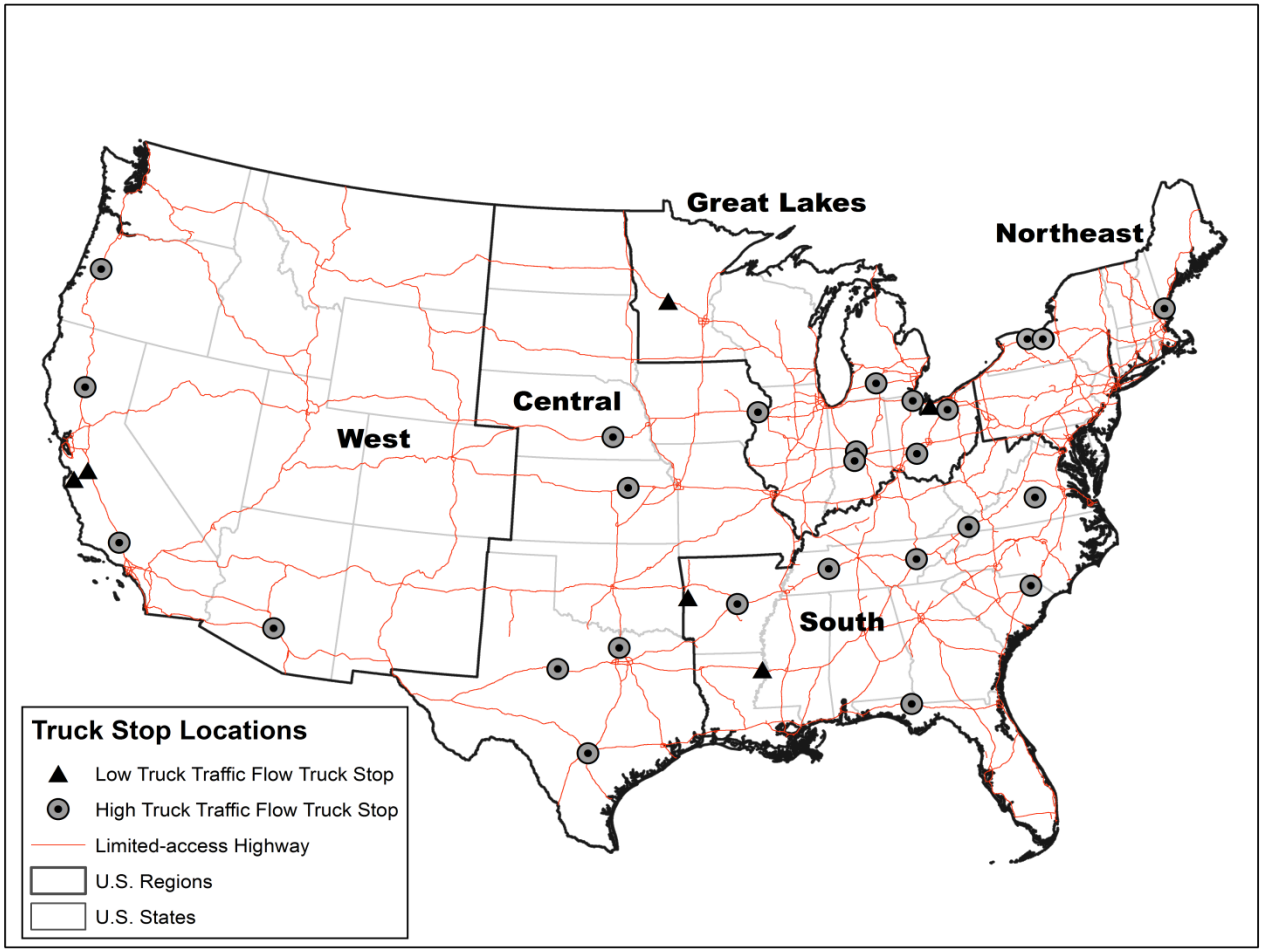
- To better understand the truck stop environment
- Determine resources available to truck drivers that may contribute to emotion and physical well-being



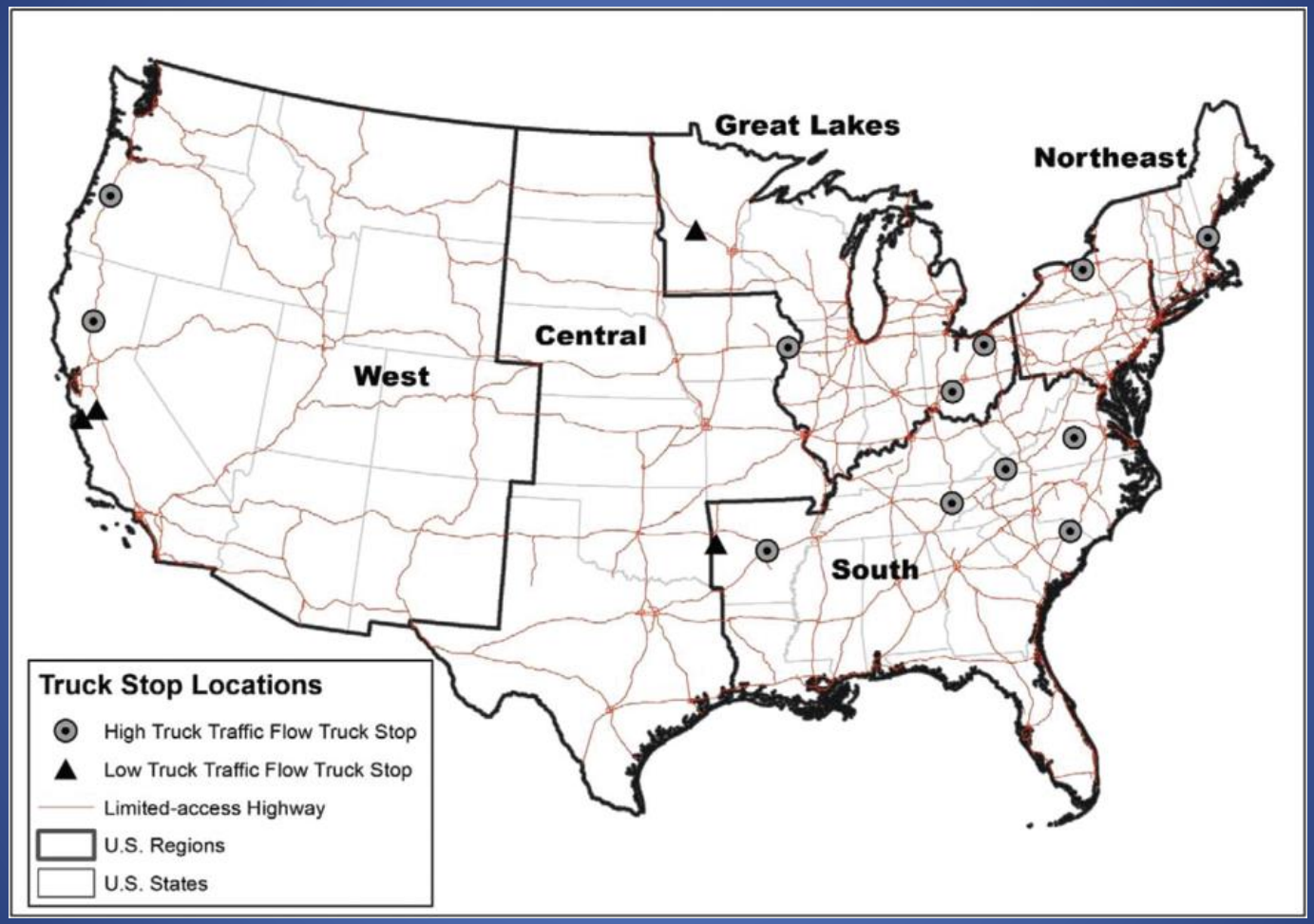
NIOSH LHTD Truck Stop Selection

- High flow and low flow highway segments
  - High-flow (12,500 or more trucks/day)
  - Low-flow (less than 12,500 trucks/day)
- Random sample in 5 geographic regions
- Truck stops requirements
  - 5 paved parking spots
  - Dining area
- 32 truck stops were selected

NIOSH LHTDS Truck Stop Locations



Subset Truck Stop Amenity Locations



Truck Stop Amenity Checklist Survey Plan

- Conducted in conjunction with the national long haul truck driver survey (LHTDS)
- Data collection
  - 16 of the 32 truck stops
  - 12 states
  - Conducted October-December 2010

Truck Stop Amenity Checklist

- Checklist components
  - Truck stop amenities
  - Restaurant and convenience store healthy food options
  - Energy product options

Truck Stop Amenity Checklist

Truck stop amenities

- Indoor
  - Restaurant (table service)
  - Fast Food (no table service)
  - Arcade
  - Lounge
  - Movie Theater
  - Load Database
  - Health Clinic
  - Designated Exercise Area
- Outdoor
  - Well-lit Parking Area
  - Walking Path
  - Accessible Medical Clinic
  - Personal Care Center
  - Truck Hook-ups (APU)
  - Accessible Grocery

Truck Stop Amenity Checklist

- Restaurant and/or fast food healthy food options
  - Salmon
  - Fresh Salads [excl. iceberg lettuce; can include fish (oily or lean) or low fat meat]
  - White-Meat Poultry
  - Fish (excl. salmon)
  - Shellfish
  - Low Fat/Low Sugar Vegetarian Dishes (excl. white rice and white potatoes)
- Low fat meat is defined as meat that is naturally lean (white-meat poultry or shellfish) and cooked with little or no oil (baked / broiled / steamed / poached)

Truck Stop Amenity Checklist

- Convenience store healthy food options
  - Fresh Fruit
  - Fresh Vegetables
  - Frozen/Canned/Dried Fruit (no added sugar or fat)
  - Frozen/Canned/Dried Vegetables (3g or less fat and 140mg or less sodium per serving)
  - Frozen/Canned Entrees (3g or less fat and 140mg or less sodium per serving)
  - Low fat/low sodium prepared snacks (3g or less fat and 140mg or less sodium per serving)

Truck Stop Amenity Checklist Components

Energy product options

- Number of different products available
- Ammo
- Hype
- Rockstar Punched Guava
- 5150 Juice
- Jolt Energy
- Fixx Extreme
- DynaPep
- Sudafed
- Caffeine Pills

HEALTHY LIVING OPTIONS AT TRUCK STOPS RESULTS

Department of Health and Human Services
Centers for Disease Control and Prevention
National Institute for Occupational Safety and Health

Truck Stop Amenities

Amenity	Number of Stops	Percent
Connectivity		
Wi-Fi	13	81%
Nutrition		
Full Service Restaurant	11	69%
Fast Food	9	56%
Accessible Grocery	2	13%
Healthcare	1	6%
Safety		
Parking Area Well Lit	10	63%
Physical Activity		
Walking Path	3	19%
Exercise Area	0	0%

Restaurant Healthy Food Options

Food Option	Number of Stops	Percent
Healthy Protein	15	94%
White Meat Poultry	14	88%
Salmon	6	38%
Fish (excl. salmon)	8	50%
Healthy Vegetable Dish	12	75%
Fresh Salad (excl. iceberg)	9	56%
Both Healthy Protein and Vegetable Dish	12	75%
No Healthy Option	1	9%

Convenience Store Healthy Food Options

Food Option	Number of Stops	Percent
Low Fat/Low Sodium Prepared Snacks*	7	44%
Fresh/Processed Fruit*	12	75%
Fresh Fruit	8	50%
Fresh Vegetable	1	6%
Both Healthy Fruit and Vegetable	1	6%
No Healthy Option	3	19%

*3g or less fat and 140mg or less sodium per serving

Medical Access

- 94% did not have health care clinic access
- Implications
  - Delay urgent care
  - Self medicate
  - Delay preventative care
  - 80% do not receive the flu shot

Food Options

- 38% of truck stops did not carry fresh vegetables in the restaurant or convenience store
- Implications
  - Drivers cannot consistently choose healthy food options
  - 23% of drivers are over weight
  - 69% of drivers are obese

Safety

- 60% poor lighting
- 94% did not limit parking access to trucks only
- No designated exercise areas
- Implications
  - Increased pedestrian struck by risk
  - Increased sleep disturbance
  - 27% of truck drivers have no physical activity including work activities

Conclusions

- Long-haul truck drivers spend multiple nights away from home and “live” at truck stops
- Truck stops visited did not provide adequate access to healthy food or exercise options
- Few truck stop industry leaders have made efforts to improve availability and accessibility of healthy food at restaurants and exercise options at the truck stop facilities
- More needs to be done to provide truck drivers with access to fruits, vegetables, and exercise opportunities

Strengths and Limitations

- Strengths:
  - Conducted in conjunction with a nationally representative population-based sample
  - Standardized checklist based on well defined FDA product labeling
- Limitations:
  - Cross-sectional design
  - Small sample size
  - Subject to observer bias

Future directions

- More needs to be done to
  - Determine the correlation between driver tenure, obesity, and diet
  - Evaluate dietary solutions for truck drivers to reduce obesity
  - Evaluate exercise solutions to increase truck driver physical fitness
  - Evaluate truck stop environmental solutions to improve truck driver safety and sleep quality

Acknowledgements

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LHTDS Project Products

- NIOSH Science Blog:

www.cdc.gov/niosh/blog/nsb111907_truck.html

- Transportation, Warehousing, and Utilities Sector Program Page:

www.cdc.gov/niosh/programs/twu/

- Motor vehicle safety page:

www.cdc.gov/niosh/topics/motorvehicle/

- Twitter account: @NIOSHTransport

LONG HAUL TRUCK DRIVER SURVEY RESULTS

Long Haul Truck Driver Survey Objectives

- Provide baseline data about long-haul truck drivers' health and safety, including prevalence of selected health conditions and risk factors.
- Describe prevalence of risk factors associated with poor health and safety outcomes within the long-haul truck driver population.
- Provide information to drivers, the trucking industry, and the transportation research community that will guide health and safety promotion, interventions, and future research needs.

LHTDS Self-Reported Risk Factors

	Truck Drivers	2010 NHIS
Self-reported Risk Factor	National Prevalence (%)	National Prevalence (%)
Hypertension	26	24
High cholesterol	22	N.A.
Body Mass Index (BMI)		
Overweight (25 <= BMI < 30)	23*	35
Obese (BMI >= 30)	69*	31
Morbid Obesity (BMI >= 40)	17*	7
No moderate or vigorous physical activity for 30 min.	27	N.A.
Current cigarette smoker	51*	19
Heart disease	4*	7
Diabetes	14*	7

*P<0.01 compared to NHIS.

[1] Estimates are sex- and age-adjusted to the year 2010 working population.

LHTDS Self-Reported Health Care Coverage

	Truck Drivers	2010 NHIS
Self-reported Health Care Coverage	National Prevalence[1] (%)	National Prevalence[1] (%)
Perceived health status:		
Excellent, very good, or good	84*	94
Fair or poor	17*	6
Not covered by health insurance or health care plan	38*	17
Delayed or did not receive needed health care in 12 months	18	10
Did not receive flu shot in last 12 months	80*	67

*P<0.01 compared to NHIS.

[1] Estimates are sex- and age-adjusted to the year 2010 working population.

Delivery schedules linked to job satisfaction, opinions on safety regulations, and behaviors of regulation compliance

NIOSH Survey of U.S. Long-Haul Truck Driver Health and Injury

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The NIOSH Expanding Research Partnerships Conference, June 21-23, 2017, Denver, CO

Truck driver safety statistics

In 2014

3,500

Fatal crashes involving large trucks

55,710

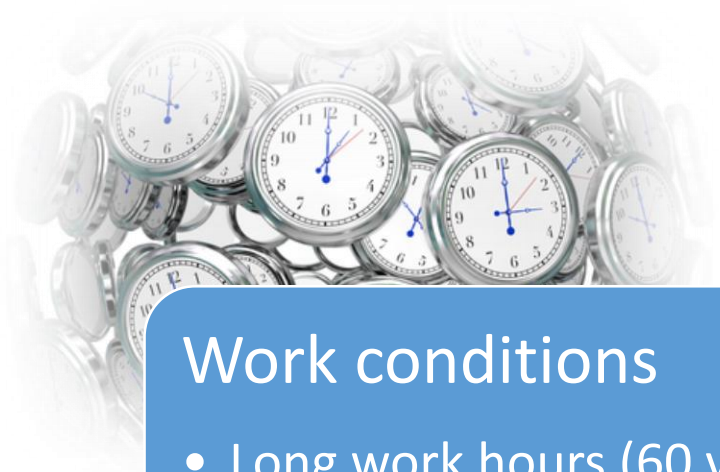
Occupational nonfatal injuries

761

Heavy Truck driver Occupational fatalities

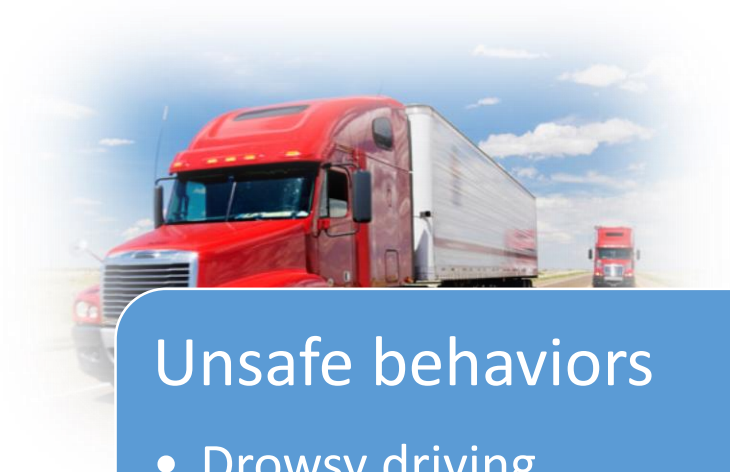
FMCSA. 2016. 2016 Pocket Guide to Large Truck and Bus Statistics; BLS. 2016. CFOI OII.

Work conditions & safety



Work conditions

- Long work hours (60 vs, 42)
- Irregular work schedule
- Away from home
- Paid by the miles



Unsafe behaviors

- Drowsy driving
- Speeding*
- Hours of Service (HOS) regulation noncompliance

HOS regulates the number of hours a truck driver may drive per day and the total number of hours he/she may work per day and per week.

- Speeding is defined as driving => 10 mph over the speed limit
- Sieber et al., 2014; Chen et al., 2015

Research question: delivery schedule and safety

Reported unrealistically tight delivery schedules

- **16%** reported often
- **58%** reported sometimes

?

Opinions

- ***22%*** think HOS would NOT improve safety AT ALL
- ***13%*** think increasing of speed limit would improve safety VERY MUCH

?

Behaviors of noncompliance

- ***10%*** reported HOS being often violated
- ***5%*** reported often speeding

Objective 1

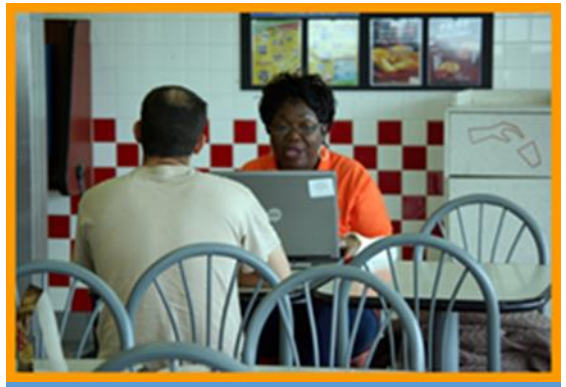
Driver perceived unrealistically tight delivery schedule

- Job satisfaction
- Opinions on safety regulations
- Behaviors of regulations noncompliance

Objective 2

- The NIOSH survey also collected data on drivers' opinions on their safety needs

Survey methods and study population



National Survey of Long-Haul Truck Driver Health and Injury

Sieber et al., 2014. AJIM

- A nationally representative sample of 1,265 long-haul truck drivers (LHTDs) at 32 truck stops across U.S.
- LHTDs eligible for the survey
  - Had driven a heavy truck for at least 12 months
  - Spend at least one night away from home during each delivery run

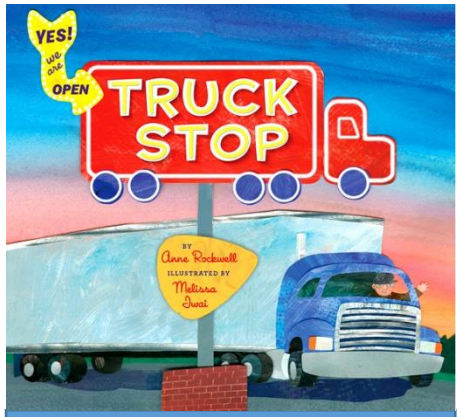
Data on drivers' opinions on safety

1. Build more truck stops/parking area
2. Strictly enforce traffic laws on car and truck drivers equally
3. Pay drivers by the hour for loading and unloading time
4. Equalize the car and truck maximum speed limit on interstate highways
5. Designate truck only lanes on interstate highways
6. Strictly enforce the hours-of-service (HOS) regulations
7. Pay drivers by the hour for driving time
8. Require a short rest break after 4 hours continuous driving
9. Increase the current maximum speed limit on interstate highways by 10 miles per hour
10. Require speed governors for all large trucks
11. Decrease the current maximum speed limit on interstate highways by 10 miles per hour

- Eleven safety related activities were selected
- Drivers were asked to rate how well each activity would improve truck safety using a Likert scale

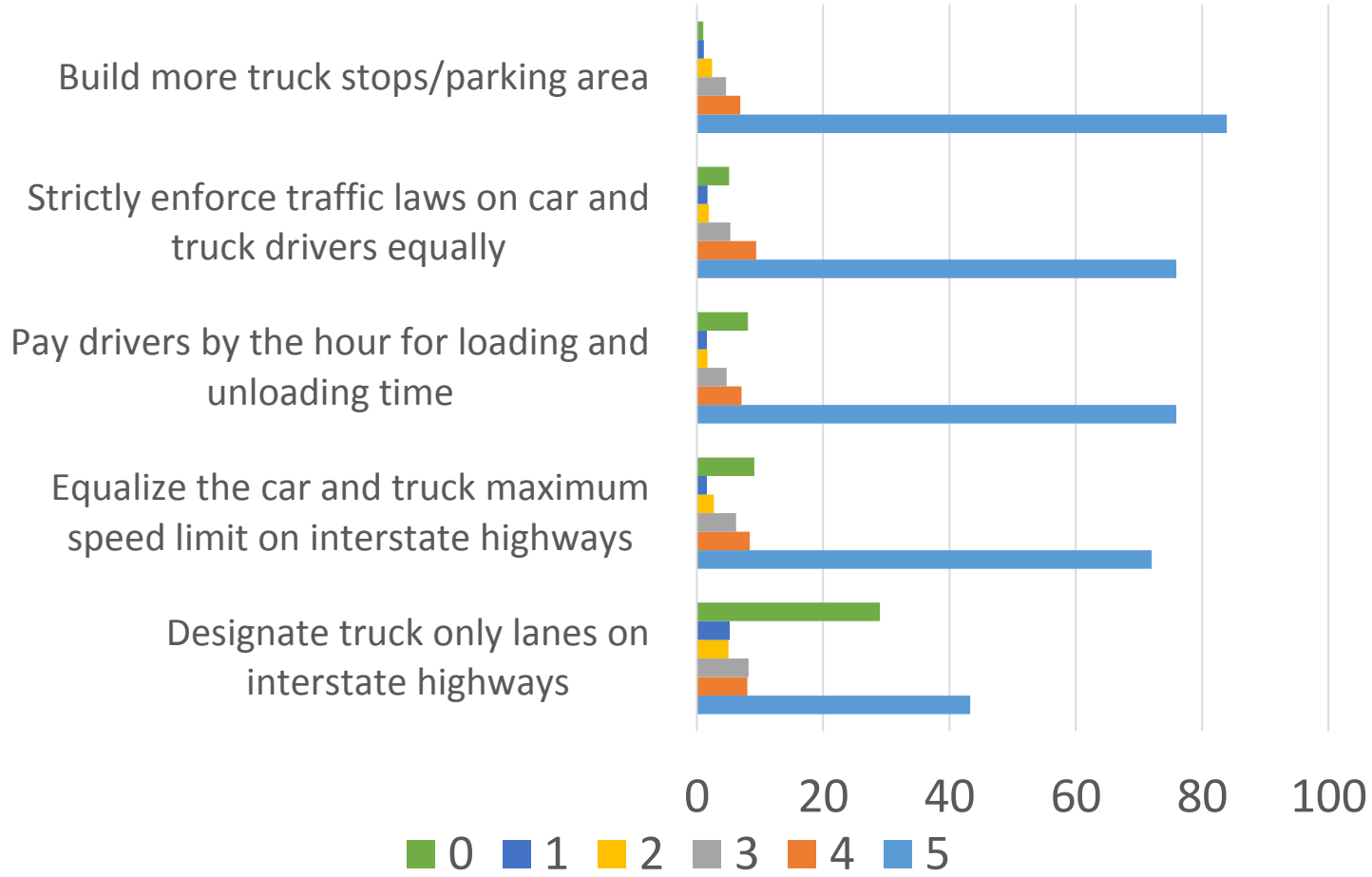
0	1	2	3	4	5
Not at all					Very much
Would not			Would		

Top 5 safety needs identified by the most LHTDs

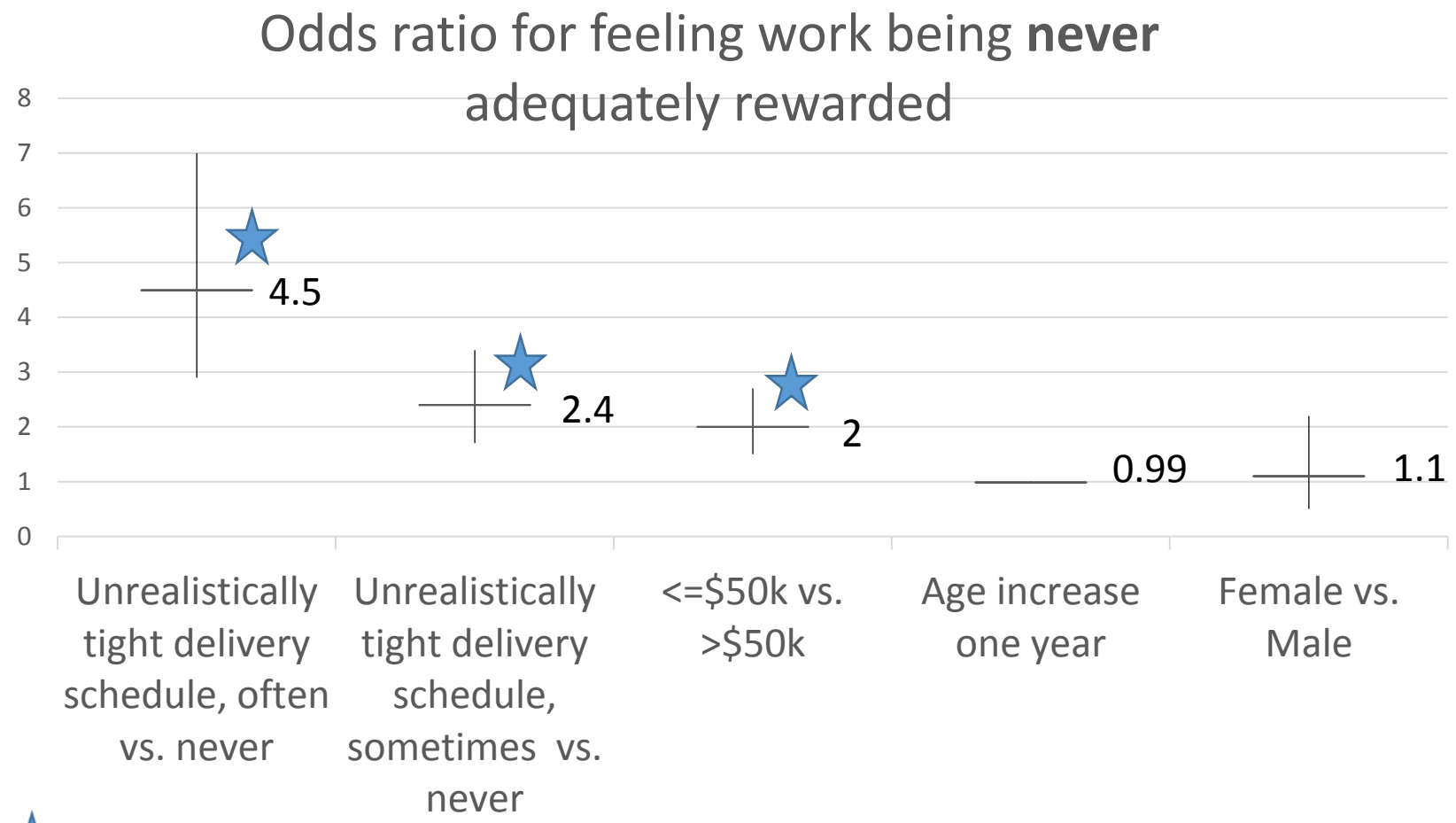


Build more truck stops/parking area is the top safety need

identified by the most LHTDs among 11 safety related activities

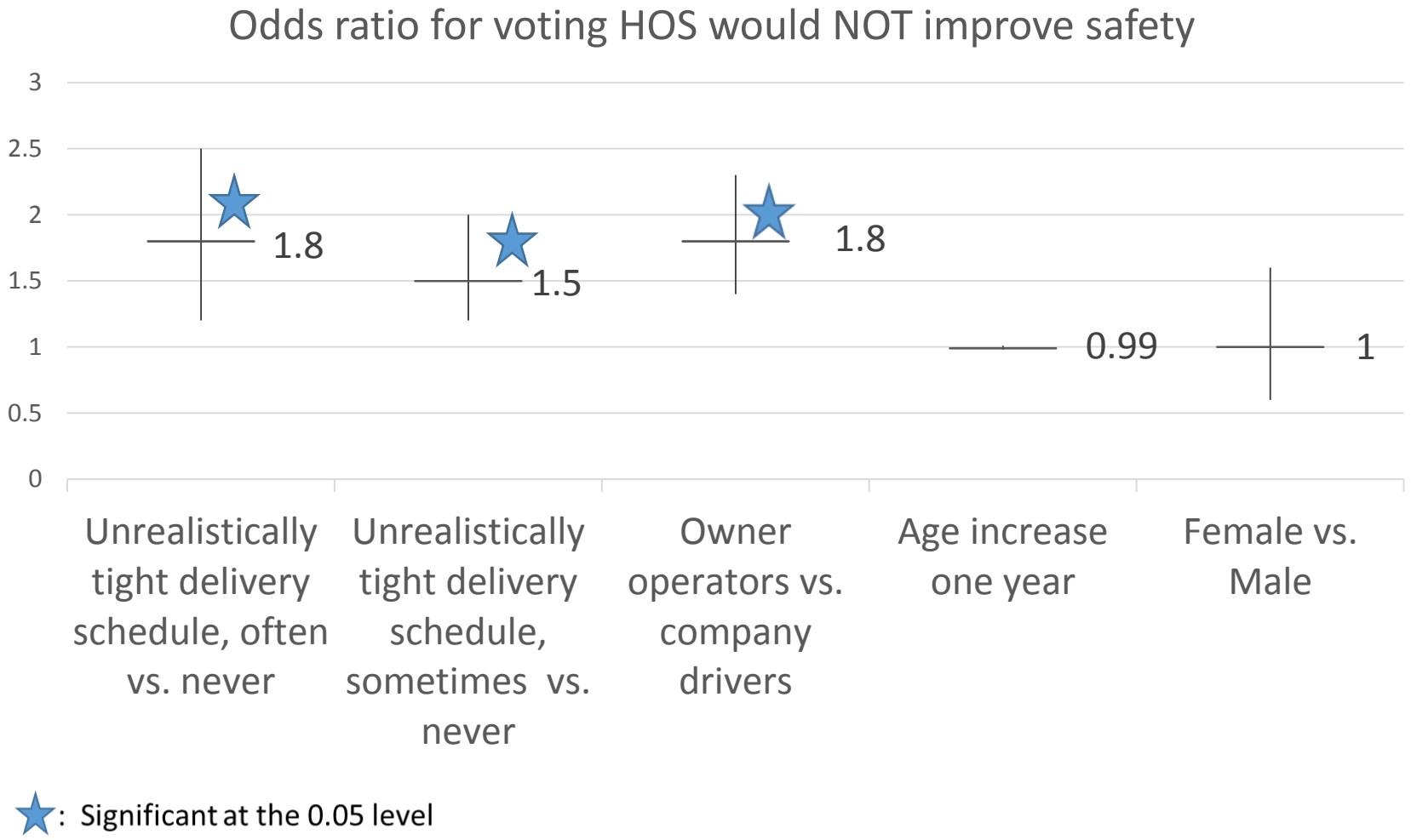


Factors associated with job satisfaction

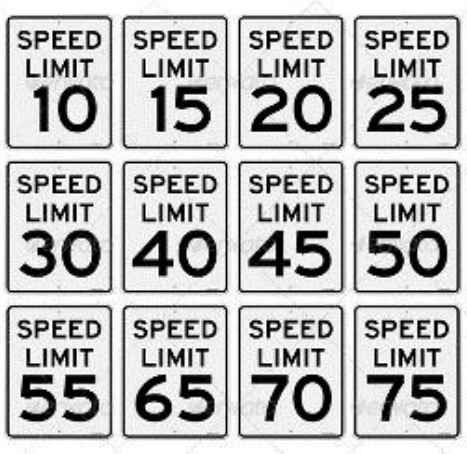


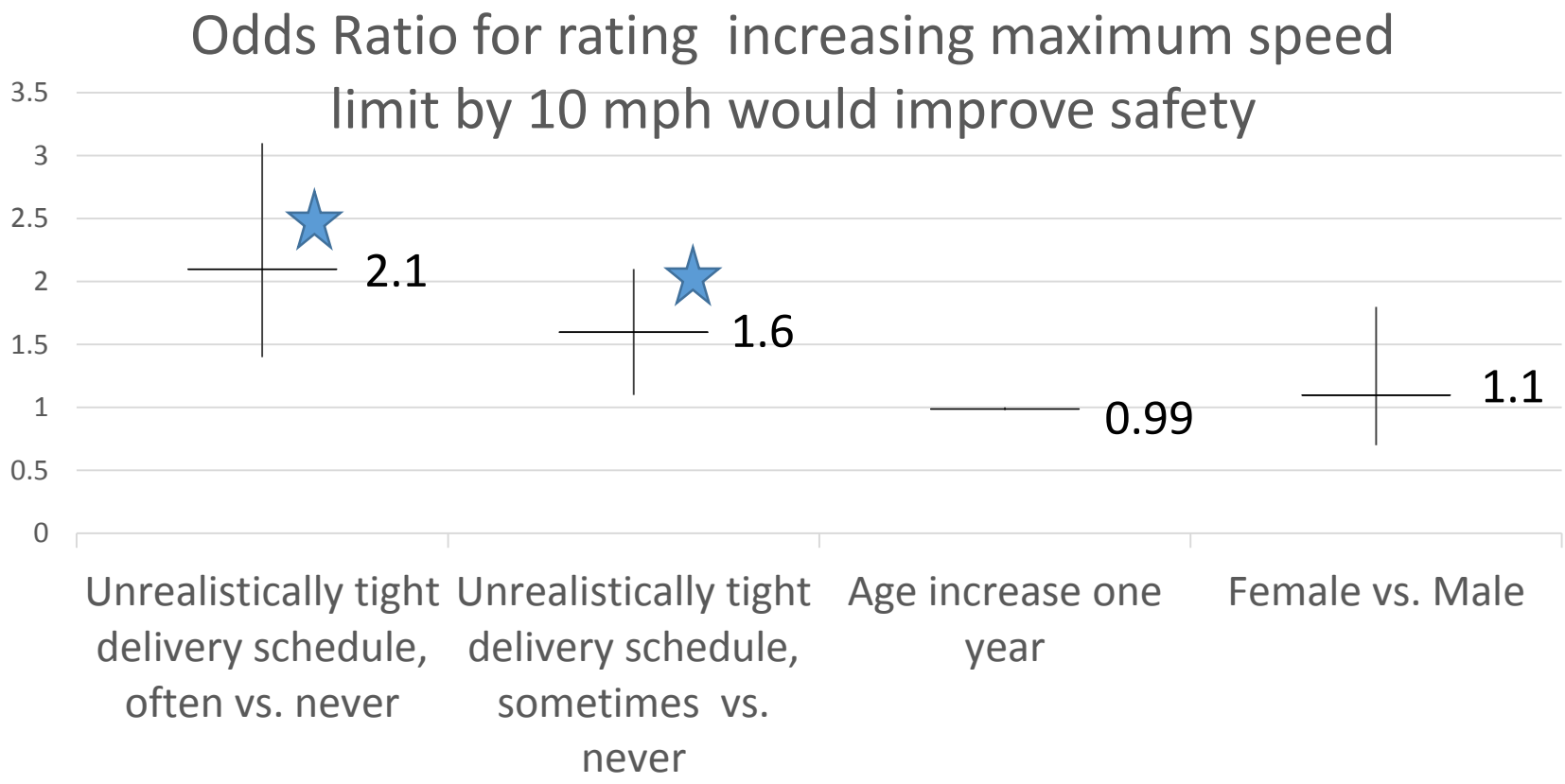
★: Significant at the 0.05 level

Factors associated with driver opinion on HOS regulations



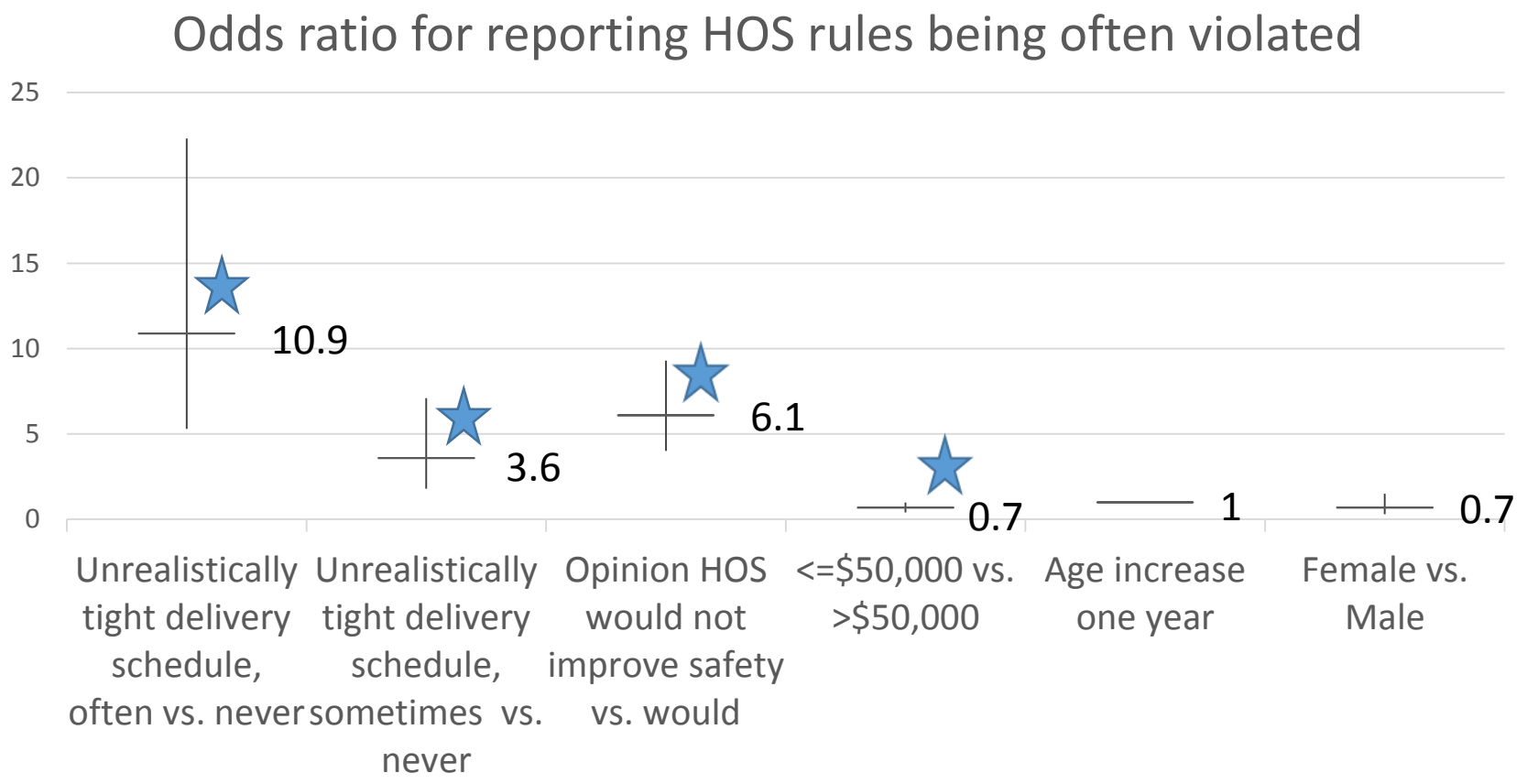
Factors associated with driver opinion on speed limit





★: Significant at the 0.05 level

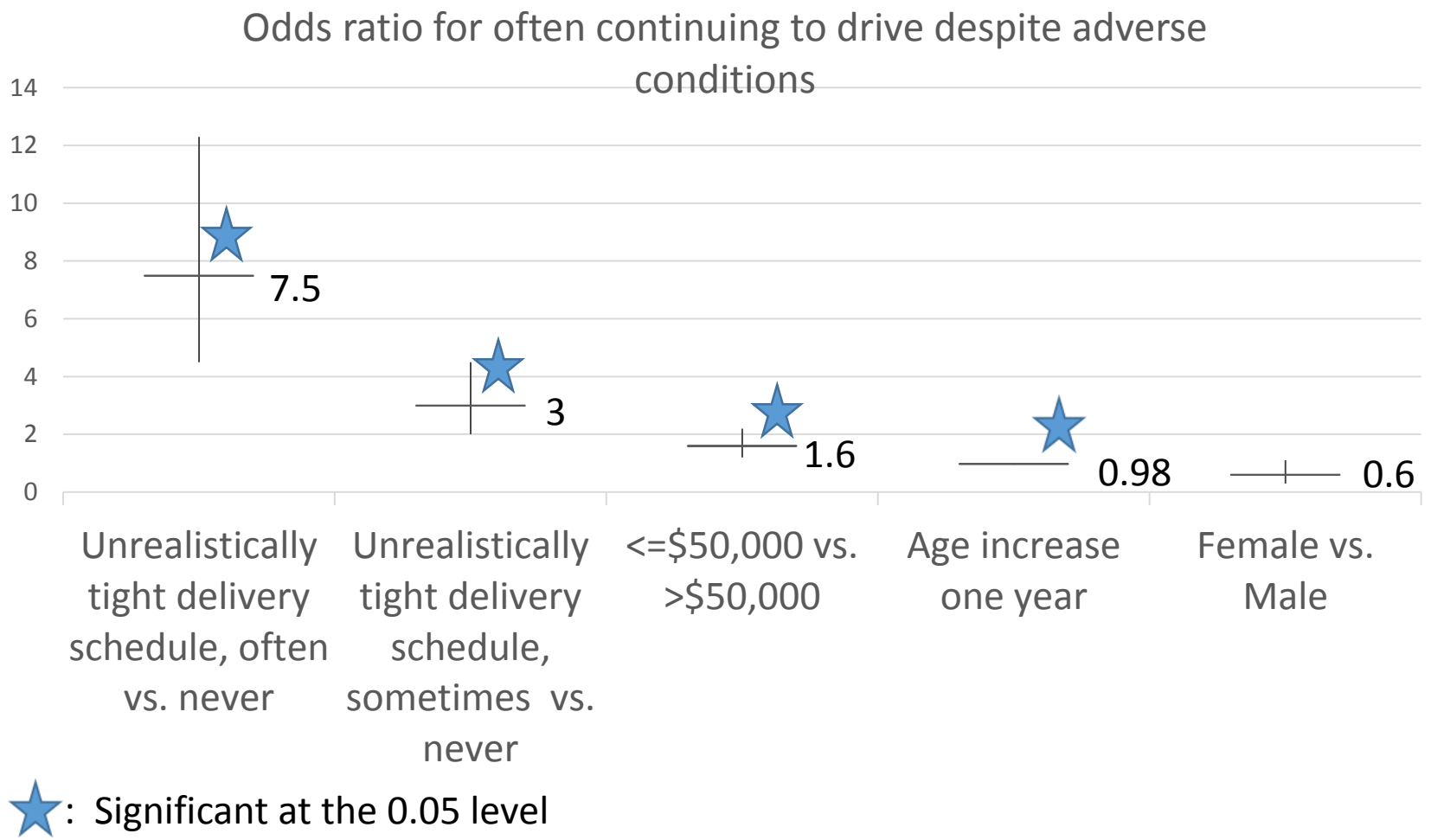
Factors associated with behavior of HOS noncompliance



★: Significant at the 0.05 level

Factors associated with driver continuing to drive despite adverse conditions

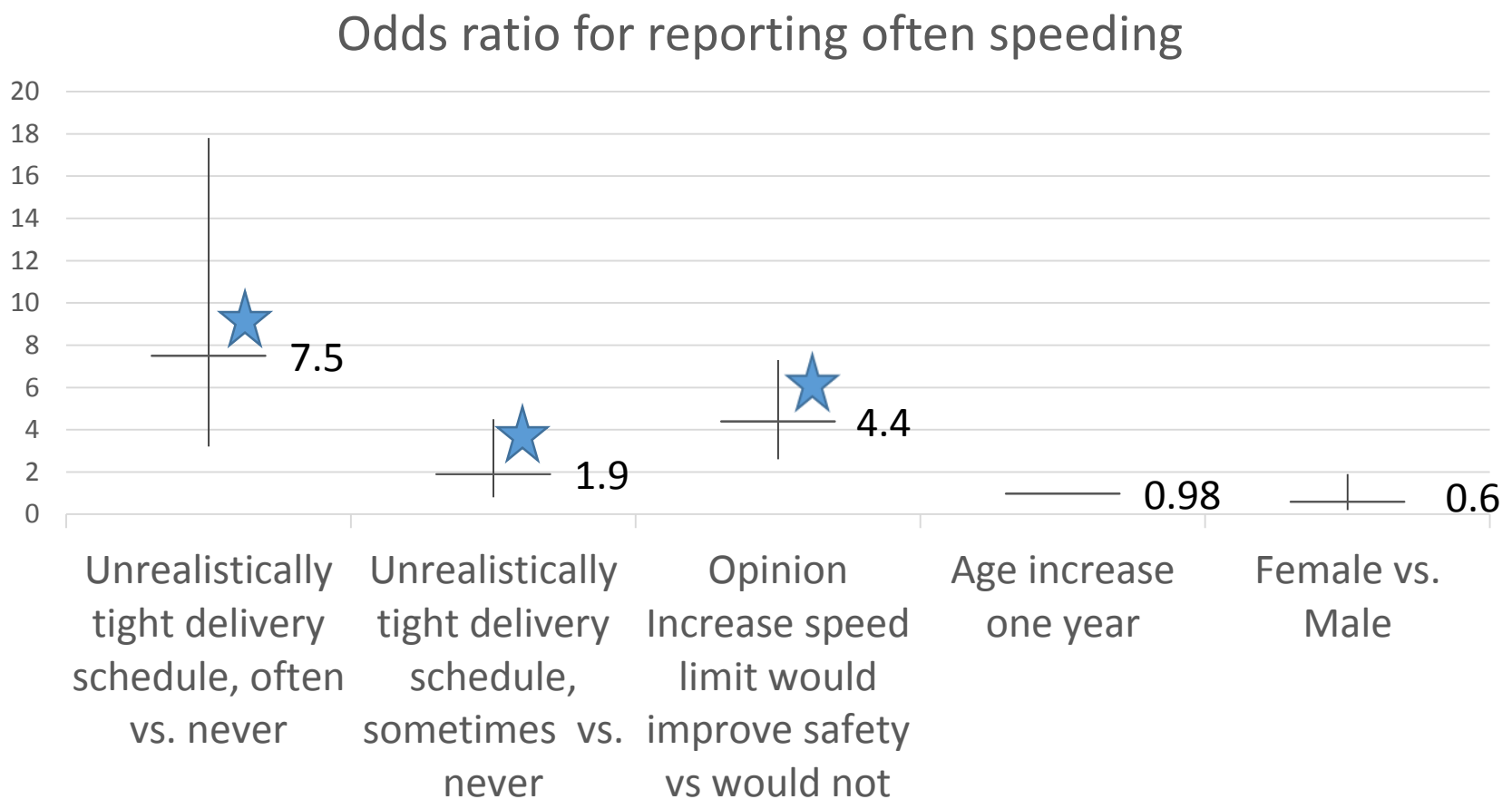
Adverse conditions include fatigue, bad weather, or heavy traffic



★: Significant at the 0.05 level

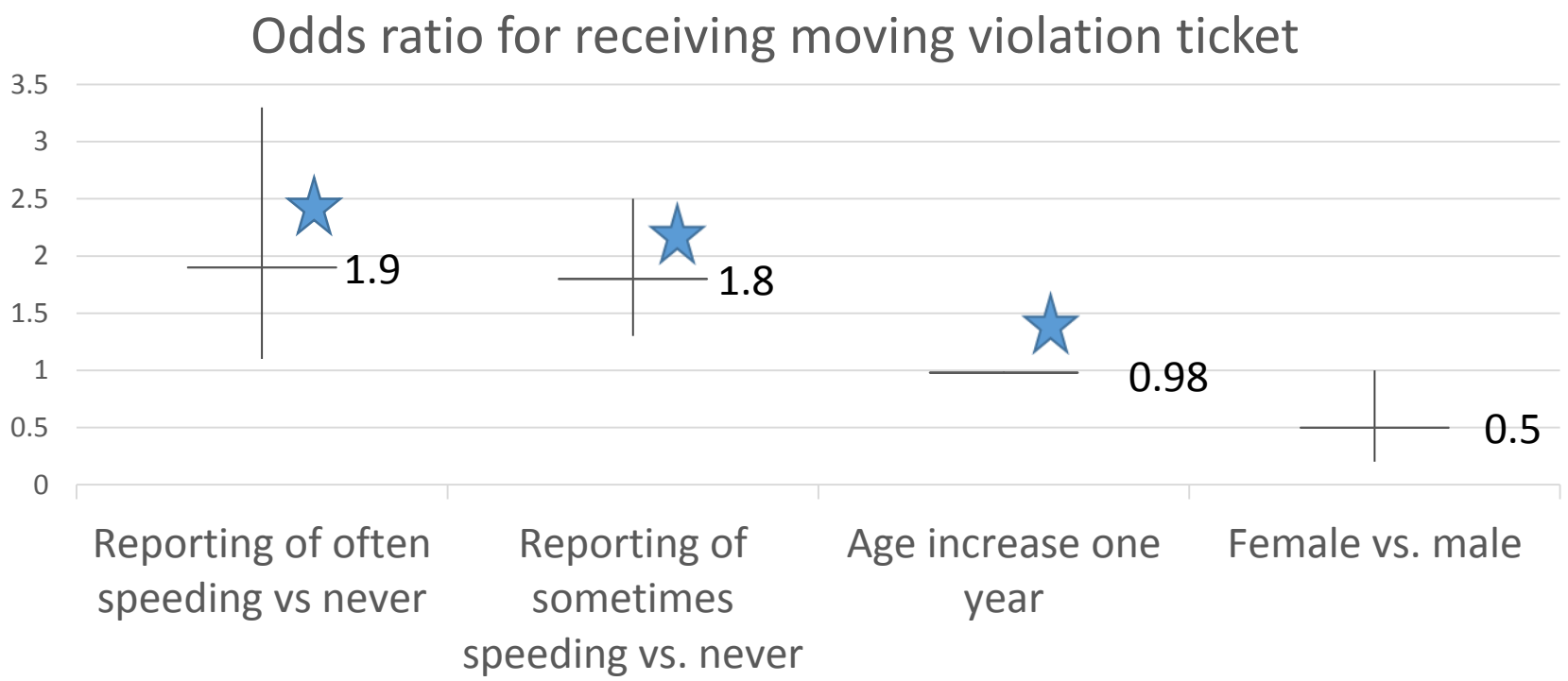
Factors associated with driver speeding behavior

Speeding is defined as driving =>10 mph than speed limit



★: Significant at the 0.05 level.

Factors associated with receiving moving violation ticket in the previous 12 months



★: Significant at the 0.05 level.

Quantified the interactions among

- **16%** reported often
- **58%** reported sometimes

Unrealistically tight delivery schedules

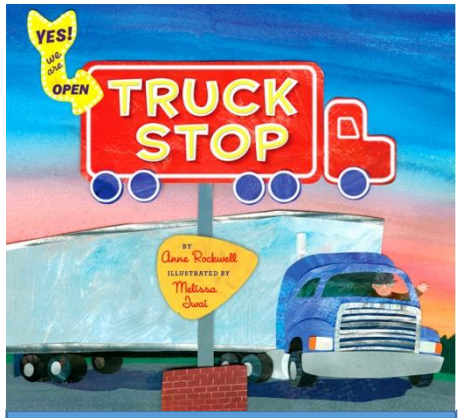
Opinions

- Job dissatisfaction
- ***22%*** think HOS would NOT improve safety AT ALL
- ***13%*** think increasing of speed limit would improve safety VERY MUCH

- HOS, ***10%*** reported HOS being often violated
- ***5%*** reported often speeding

Behaviors of noncompliance

Ranked safety needs from drivers' perspective



Build more truck stops/parking area is the top safety need

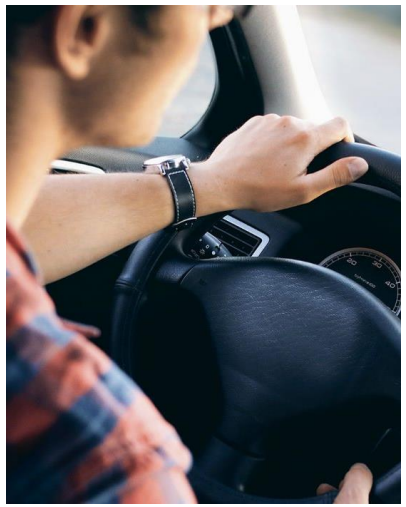
identified by the most LHTDs among 11 safety related activities

- Ranked the 11 safety needs by the number of LHTDs who voted it would improve truck safety

Earnings, job satisfaction, and safety

- High annual income linked to high level of job satisfaction
- Results of the association between Income and safety related behaviors were mixed
  - <=$50,000 were less likely to report HOS being often violated
  - <=$50,000 were more likely to report continuing to drive despite fatigue, bad weather or heavy traffic because they must deliver or pick up a load at a given time

Age impact



Younger drivers were more likely to report:

- continuing driving despite adverse conditions (such as fatigue, bad weather, or heavy traffic)
- receiving moving violation tickets in the previous 12 months than older drivers

Implication for prevention

Carriers can	Schedule reasonable delivery time
	Promote safety culture in which drivers can say no
	Provide training on safety benefits of sleep hygiene, HOS, and speed limit
	Additional training & supervision for young drivers
Drivers can	Understand the safety benefits of sleep hygiene, HOS, and speed limit
State & private partners can	Build more truck stops/parking area
	Provide education on safety benefits of sleep hygiene, HOS, and speed limit

Limitations

- Sampling bias
- Interview bias: recall, social desirability, and human error
- Causality could not be determined
- Regrouping of the Likert scale is arbitrary

Strengths

EXPANDED RESEARCH PARTNERSHIP

- Multi-division, DSHEFS, DART, RHD, and DSR
- Multi agencies, NIOSH, FMCSA, ATRI, Teamsters, OOIDA, academia, etc.
- The survey design and instrument were products of input from a stakeholder meeting and focus group discussions with LHTDs
- Data collected are relevant to U.S. LHTD safety

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