



The Hazards and Human Factors of Slips, Trips, and Falls

(yep, it is still a problem)

What Are Slips, Trips and Falls?



Slip: A slip occurs when the foot unintentionally slides on a walking or working surface.



Trip: A trip occurs when the foot gets caught on an object or obstruction when walking.

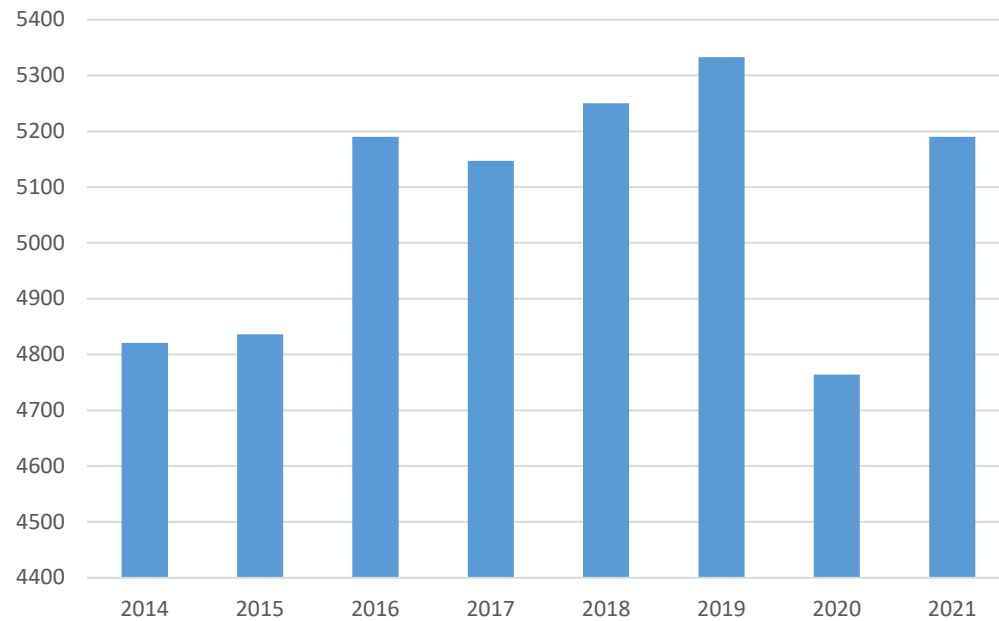


Falls: Slips and trips can lead to falls, as can other environmental hazards. Falls can occur to the same level or to a lower level.

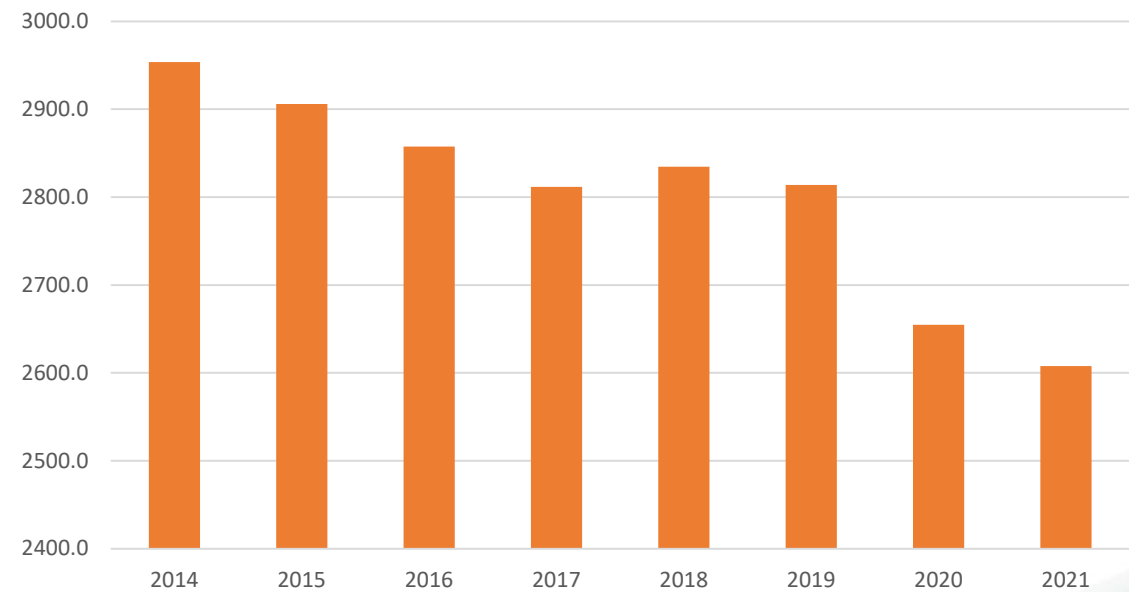


U.S. BUREAU OF LABOR STATISTICS

BLS – Fatal Occupational Injuries



BLS – Occupational Injuries and Illnesses
(thousands)

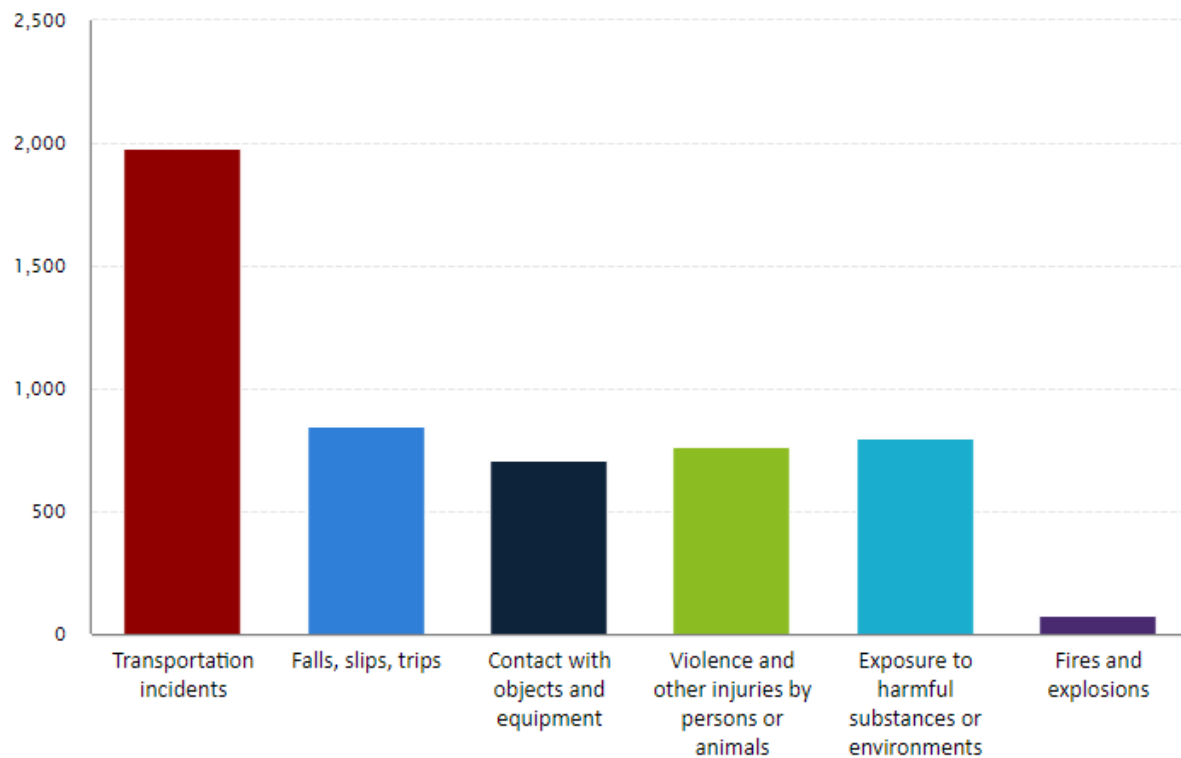




U.S. BUREAU OF LABOR STATISTICS

Fatal occupational injuries by event or exposure, 2021

Major categories



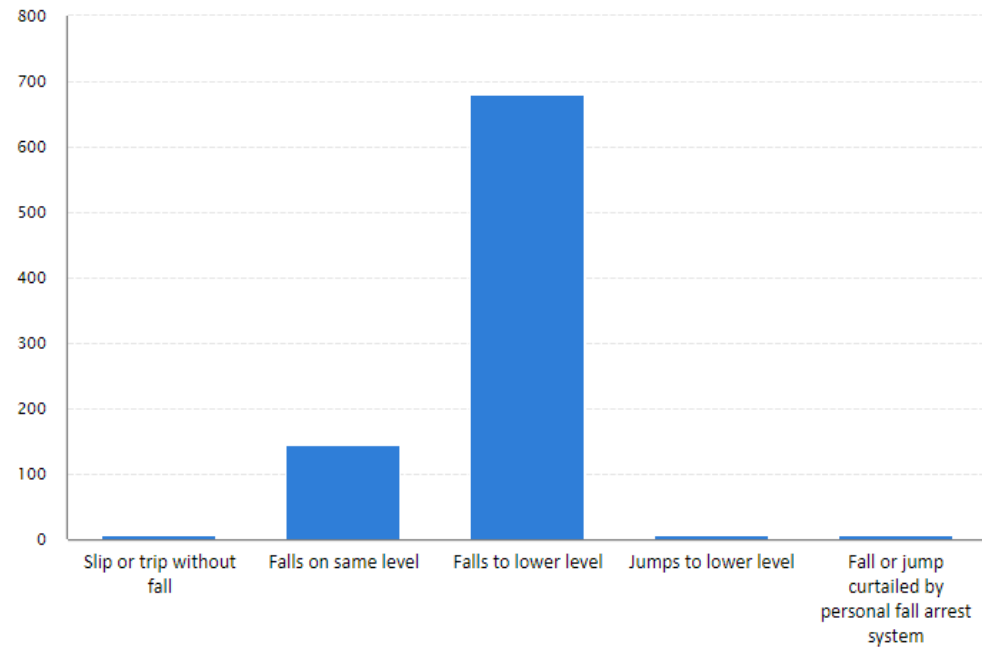
Click columns to drill down. Hover over chart to view data.
Source: U.S. Bureau of Labor Statistics.





Fatal occupational injuries by event or exposure, 2021

Falls, slips, trips

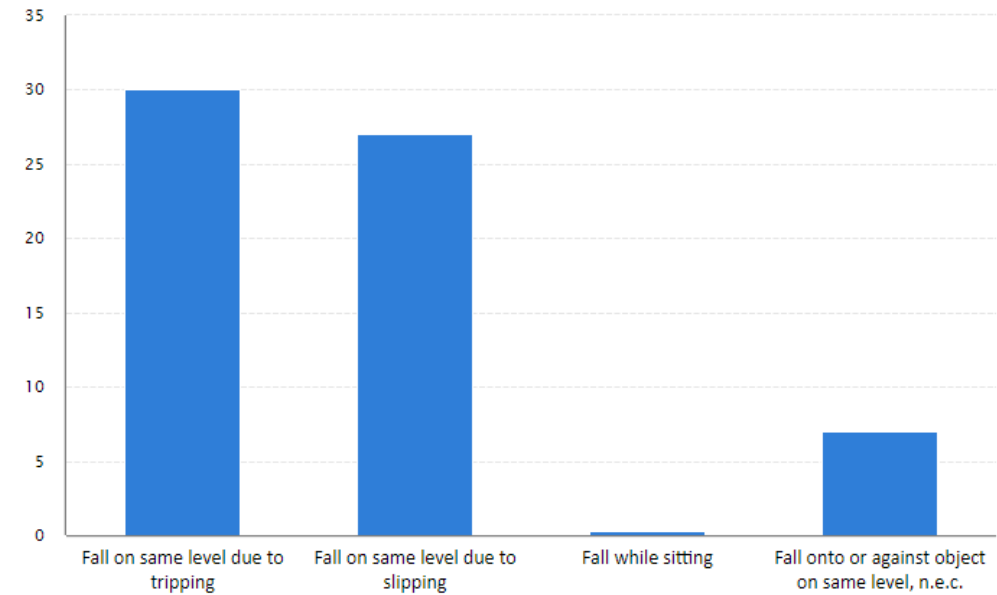


Click columns to drill down. Hover over chart to view data.
Source: U.S. Bureau of Labor Statistics.



Fatal occupational injuries by event or exposure, 2021

Falls on same level



Click columns to drill down. Hover over chart to view data.
Source: U.S. Bureau of Labor Statistics.





WISQARS Cost Of Injury

Injury Center > WISQARS > Cost of Injury Data



Number of Injuries and Associated Costs

[Export Data](#)

WISQARS - Data Filters

Data Year: 2021 **Injury Outcome:** Fatal **Intent:** Unintentional **Mechanism:** Fall **Geography:** United States **Sex:** Both Sexes **Age:** All Ages

[Change Selections](#)

Mechanism	Intent	Deaths	Medical Costs		Value of Statistical Life		Combined Costs	
			Total	Average	Total	Average	Total	Average
Fall	Unintentional	44,686	\$1.67 B	\$37,436	\$187.22 B	\$4.19 M	\$188.90 B	\$4.23 M

Mechanism	Intent	Hospitalizations	Medical Costs		Work Loss Costs		Quality of Life Loss Costs		Combined Costs	
			Total	Average	Total	Average	Total	Average	Total	Average
Fall	Unintentional (Includes undetermined)	1.41 M	\$75.84 B	\$53,889	\$11.13 B	\$7,906	\$295.22 B	\$209,768	\$382.19 B	\$271,562

Mechanism	Intent	ED Visits	Medical Costs		Work Loss Costs		Quality of Life Loss Costs		Combined Costs	
			Total	Average	Total	Average	Total	Average	Total	Average
Fall	Unintentional (Includes undetermined)	5.38 M	\$47.76 B	\$8,869	\$12.91 B	\$2,397	\$634.74 B	\$117,883	\$695.40 B	\$129,149

ED Visit – Treat and Release

<https://www.cdc.gov/injury/wisqars/index.html>



10 Leading Causes of Nonfatal Emergency Department Visits, United States 2021, All Injuries, Disposition: All Cases, Both Sexes, All Races, All Ages

■ Unintentional ■ Assault ■ Self-Harm

	< 1	1 to 4	5 to 9	10 to 14	15 to 24	25 to 34	35 to 44	45 to 54	55 to 64	65+	All Ages
1	Unintentional Fall 92,571	Unintentional Fall 484,149	Unintentional Fall 360,292	Unintentional Fall 276,261	Unintentional Fall 479,128	Unintentional Fall 464,937	Unintentional Fall 476,330	Unintentional Fall 557,659	Unintentional Fall 898,575	Unintentional Fall 2,890,680	Unintentional Fall 6,981,390
2	Unintentional Struck by /Against 18,061	Unintentional Struck by /Against 174,079	Unintentional Struck by /Against 183,724	Unintentional Struck by /Against 225,451	Unintentional Struck by /Against 475,604	Unintentional Motor Vehicle Occupant 443,535	Unintentional Other Specified 429,559	Unintentional Other Specified 297,736	Unintentional Other Specified 282,723	Unintentional Struck by /Against 240,923	Unintentional Struck by /Against 2,373,706
3	Unintentional Inhalation / Suffocation 9,487	Unintentional Foreign Body 103,591	Unintentional Cut/Pierce 66,370	Unintentional Overexertion 117,320	Unintentional Motor Vehicle Occupant 469,944	Unintentional Other Specified 442,314	Unintentional Poisoning 373,902	Unintentional Poisoning 288,515	Unintentional Poisoning 272,830	Unintentional Overexertion 177,663	Unintentional Motor Vehicle Occupant 1,876,520
4	Unintentional Foreign Body 7,643	Unintentional Bite: Other, including sting 60,009	Unintentional Foreign Body 49,119	Unintentional Cut/Pierce 79,256	Unintentional Overexertion 309,379	Unintentional Poisoning 399,918	Unintentional Motor Vehicle Occupant 297,755	Unintentional Struck by /Against 219,646	Unintentional Struck by /Against 196,598	Unintentional Motor Vehicle Occupant 166,277	Unintentional Other Specified 1,874,795
5	Unintentional Other Specified 6,426	Unintentional Cut/Pierce 52,014	Unintentional Bite: Other, including sting 44,321	Unintentional Pedal cyclist (bicycle, etc.) 42,062	Unintentional Cut/Pierce 303,685	Unintentional Struck by /Against 359,770	Unintentional Struck by /Against 279,850	Unintentional Motor Vehicle Occupant 213,252	Unintentional Motor Vehicle Occupant 194,520	Unintentional Cut/Pierce 145,056	Unintentional Poisoning 1,734,576
6	Unintentional Fire / Burn 6,365	Unintentional Overexertion 41,677	Unintentional Overexertion 34,838	Unintentional Motor Vehicle Occupant 37,715	Unintentional Other Specified 230,046	Unintentional Cut/Pierce 319,315	Unintentional Overexertion 251,692	Unintentional Overexertion 207,746	Unintentional Overexertion 181,130	Unintentional Poisoning 128,234	Unintentional Overexertion 1,612,781



10 Leading Causes of Unintentional Injury Death, United States

2020, Both Sexes, All Ages, All Races

	<1	1-4	5-9	10-14	15-24	25-34	35-44	45-54	55-64	65+	All Ages
1	Unintentional Suffocation 1,024	Unintentional Drowning 425	Unintentional Mv Traffic 319	Unintentional Mv Traffic 476	Unintentional Mv Traffic 6,741	Unintentional Poisoning 20,938	Unintentional Poisoning 21,943	Unintentional Poisoning 18,078	Unintentional Poisoning 15,030	Unintentional Fall 36,508	Unintentional Poisoning 87,404
2	Unintentional Mv Traffic 72	Unintentional Mv Traffic 284	Unintentional Drowning 117	Unintentional Drowning 91	Unintentional Poisoning 6,664	Unintentional Mv Traffic 7,929	Unintentional Mv Traffic 6,031	Unintentional Mv Traffic 5,421	Unintentional Mv Traffic 5,942	Unintentional Mv Traffic 7,480	Unintentional Fall 42,114
3	Unintentional Drowning 34	Unintentional Suffocation 118	Unintentional Fire/Flame 60	Unintentional Poisoning Unintentional Other Land Transport	Unintentional Drowning 593	Unintentional Drowning 611	Unintentional Fall 625	Unintentional Fall 1,282	Unintentional Fall 3,140	Unintentional Unspecified 4,839	Unintentional Mv Traffic 40,698
4	Unintentional Poisoning 17**	Unintentional Hot Object Or Substance 75	Unintentional Suffocation 38	52	Unintentional Other Land Transport 184	Unintentional Fall 359	Unintentional Drowning 568	Unintentional Drowning 569	Unintentional Suffocation 827	Unintentional Poisoning 4,618	Unintentional Suffocation 6,768
5	Unintentional Natural/Environment 15**	Unintentional Pedestrian, Other 54	Unintentional Other Land Transport 33	Unintentional Hot Object Or Substance 45	Unintentional Fall 152	Unintentional Suffocation 195	Unintentional Suffocation 273	Unintentional Suffocation 438	Unintentional Unspecified 664	Unintentional Suffocation 3,723	Unintentional Unspecified 6,265
6	Unintentional Fire/Flame Unintentional Unspecified	Unintentional Natural/Environment 43	Unintentional Firearm 22	Unintentional Suffocation 33	Unintentional Firearm 129	Unintentional Other Spec., Classifiable 181	Unintentional Hot Object Or Substance 238	Unintentional Unspecified 358	Unintentional Hot Object Or Substance 651	Unintentional Hot Object Or Substance 1,385	Unintentional Drowning 4,589
7	--	Unintentional Firearm 40	Unintentional Pedestrian, Other 18**	Unintentional Firearm 30	Unintentional Hot Object Or Substance 100	Unintentional Other Land Transport 175	Unintentional Other Spec., Classifiable 214	Unintentional Hot Object Or Substance 315	Unintentional Drowning 639	Unintentional Drowning 941	Unintentional Fire/Burn 3,036

<https://www.cdc.gov/injury/wisqars/LeadingCauses.html>



Claims Have Costly Consequences

\$7.5 Million Slip and Fall Broken Hip Injuries in Alabama

An Alabama man won \$7.5 million in a Walmart slip and fall injury claim when his foot got lodged in a pallet used to display watermelons. Walmart surveillance caught this incident on camera, and Walmart was found guilty of negligence and recklessness.

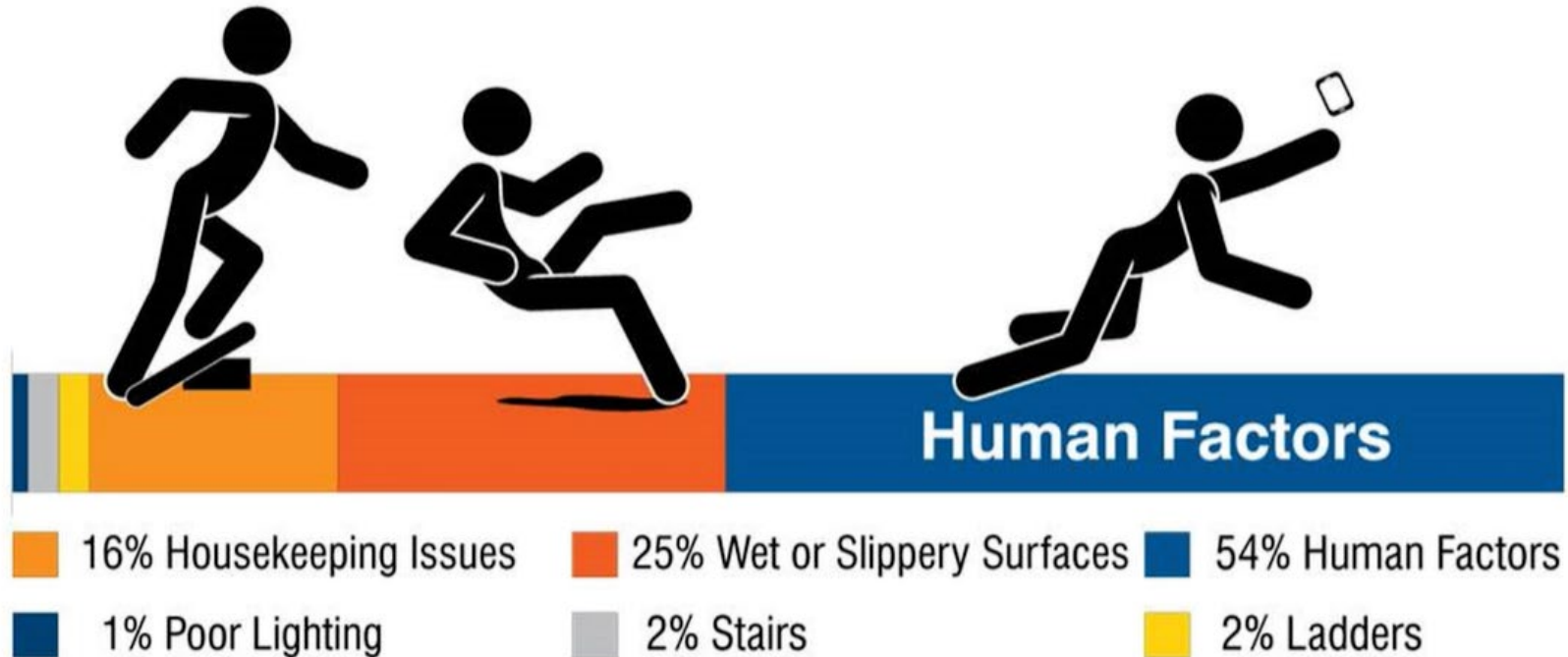
The largest settlement ever awarded in a slip and fall lawsuit was over 20 million dollars. This amount was awarded to the plaintiff, an elderly woman who suffered severe injuries after slipping on a wet tile floor in a hotel lobby. The case went to trial, and the jury found that the hotel had failed to warn its guests of the hazardous condition and was liable for her injuries.

\$10 MILLION FOR SLIPPING ON WET FLOOR AT GROCERY STORE

A woman slipped on a wet floor while shopping at a grocery store in Maryland. She suffered serious injuries, including broken bones and facial fractures, which required multiple surgeries. She sued the grocery store chain for negligence and was awarded \$10 million as compensation for her medical expenses, lost wages, pain & suffering.



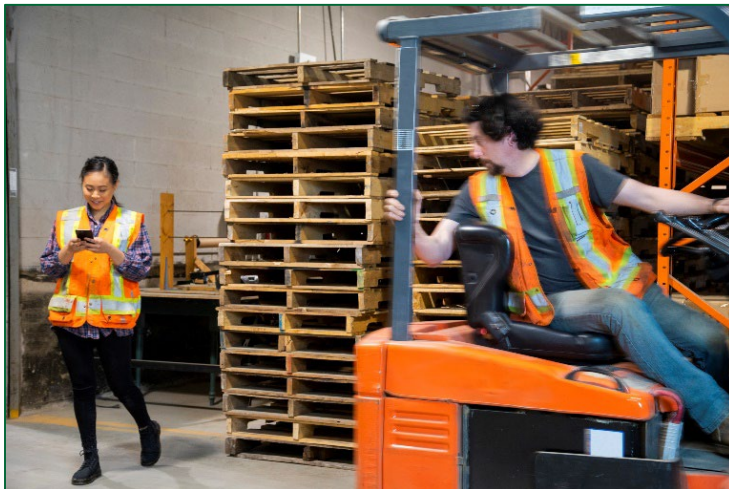
The Big 3



BLR. (2015). *Understanding how human factors affect slips, trips, and falls.*

Safestart – STF Balancing Human and Physical Causes

Human Factors



SLIP-RESISTANT SHOES REDUCE FOOD SERVICES WORKER SLIP INJURIES

Food services workers are exposed to slip hazards on the job. A study¹ with about 17,000 food services workers from 226 school districts across the United States, shows that using 5-star rated² slip-resistant shoes significantly reduced workers' compensation claims for slip injuries.



EMPLOYERS: PREVENT WORKER SLIP INJURIES BY PROVIDING 5-STAR RATED SLIP-RESISTANT SHOES.



Centers for Disease Control and Prevention
 National Institute for Occupational Safety and Health

¹Ballal, G. et al. (2019). Effectiveness of a 5-star rated slip-resistant shoe program in reducing slip-related injuries in food service workers: a cluster randomized trial. <http://www.cdc.gov/niosh/publications-and-products/5-star-shoes/>

²NIOSH. (2019). 5-STAR slip-resistant shoe program. <https://www.niosh.gov/publications-and-products/5-star-shoes/>

Mention of any company or product identified in the references does not constitute endorsement by the Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health.

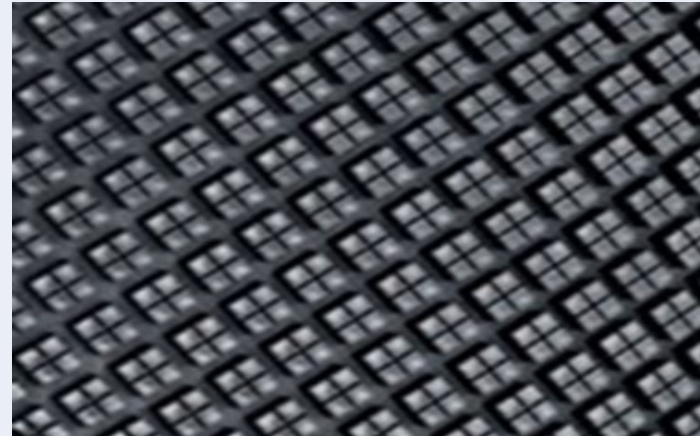
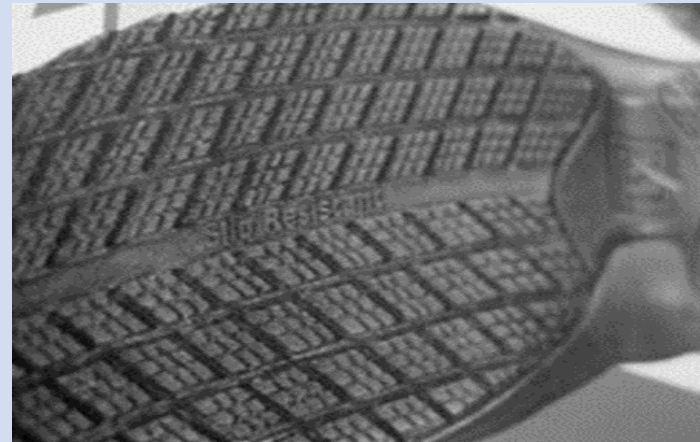


Supportive Footwear is Your Personal Foundation for Safety

Athletic Shoe Soles



Slip-Resistant Soles



Sidewalk Hazards



Parking Lot Hazards

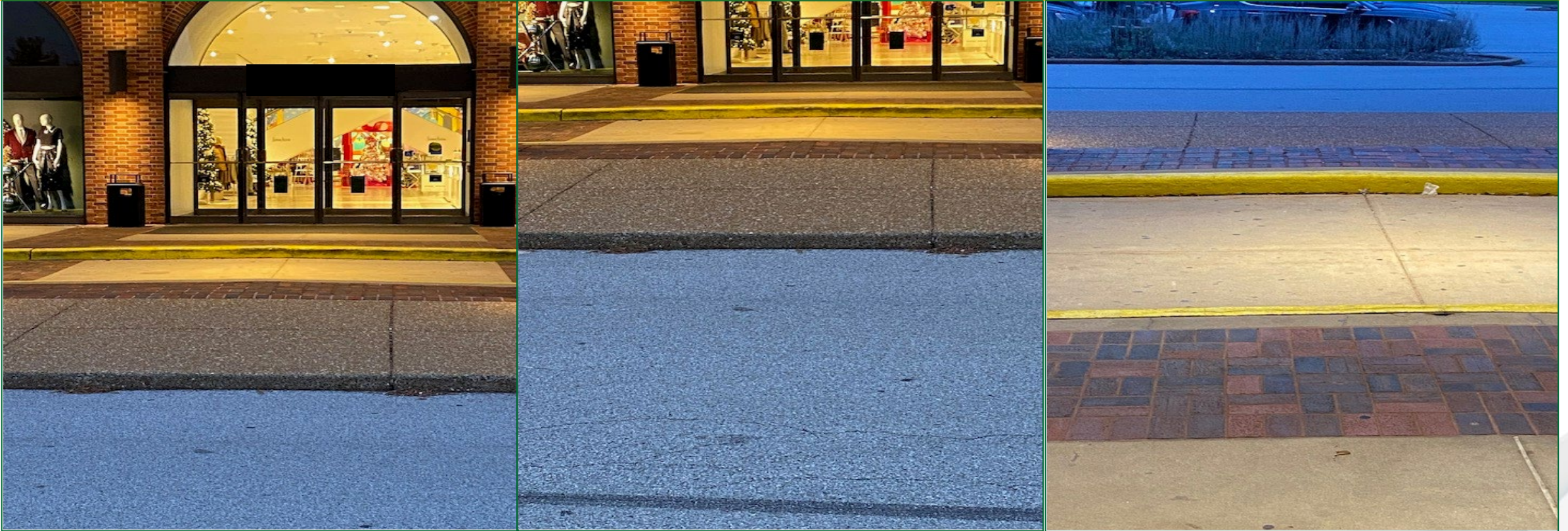


Ice Melt with Calcium Chloride, Magnesium Chloride, or Calcium Magnesium Acetate amongst most effective.



“Have the Foresight to Plan for Safest Design, but also Benefit from Hindsight”

3 Level Changes for Walking Path from Parking Lot to Entrance



Floor Mats That Absorb and Abrade – With Enough Walk-Off Length

Mats at entrances should have adequate length. May need more than one on rainy, snowy days. Prepare to exchange mats if they saturate.

This image shows a walk-off mat that seems to abrade well.

Mats that absorb are recommended in front of water fountains and ice machines.



Food Service Kitchen Floors

- Dry Mop
- Use Floor Squeegees
- Invest in Floor Degreaser
- Slip-Resistant Footwear is Essential



Downspouts, Water Runoff, and Drains

Downspouts can create slip hazards.



Ideally downspouts should feed directly into a drain.

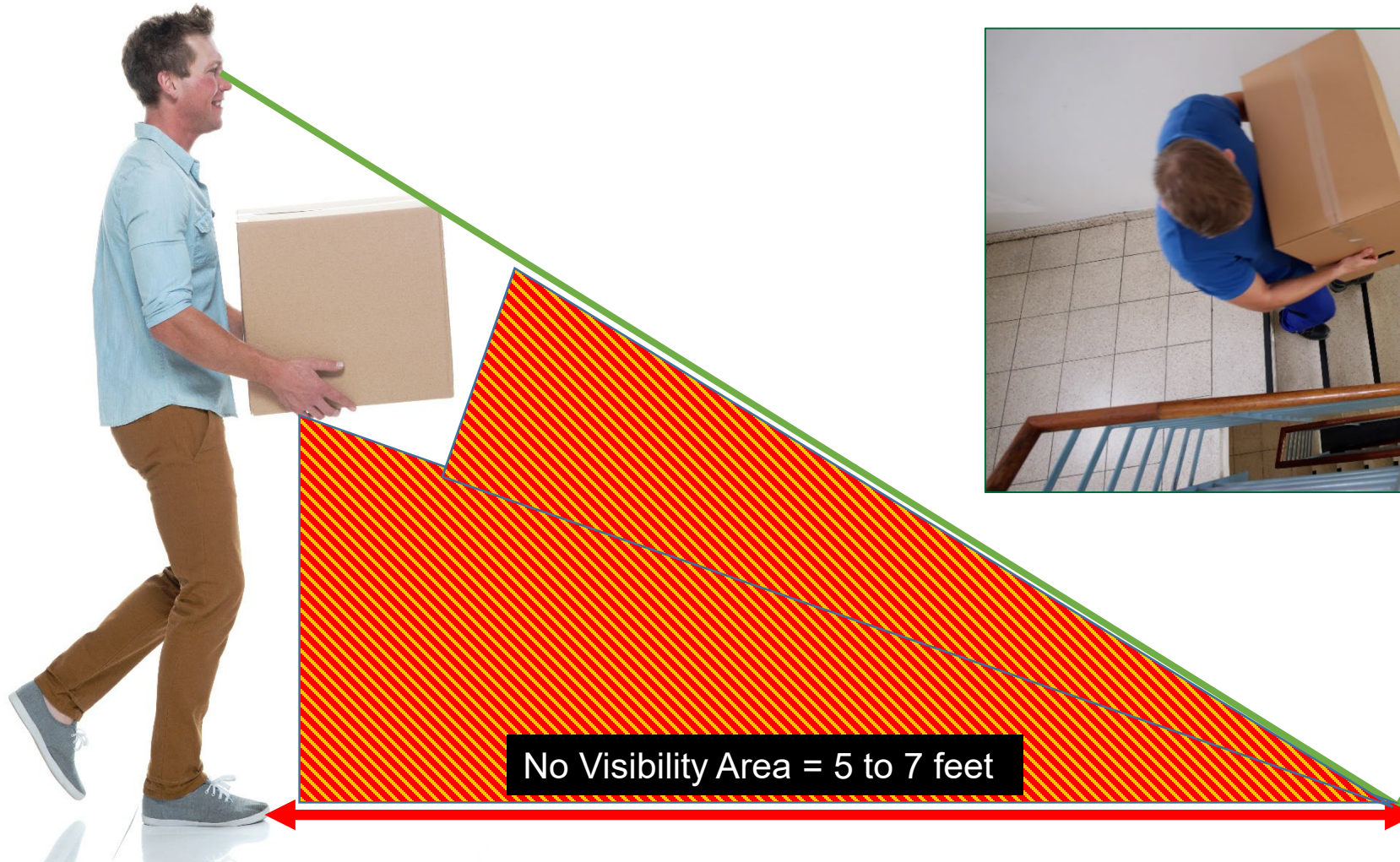


Clogged drains indoors or outdoors can create slip hazards.



Drains Should be Lowest Point of Floor/Ground Surface.

Carrying Objects, Visibility, and Slip/Trip/Falls

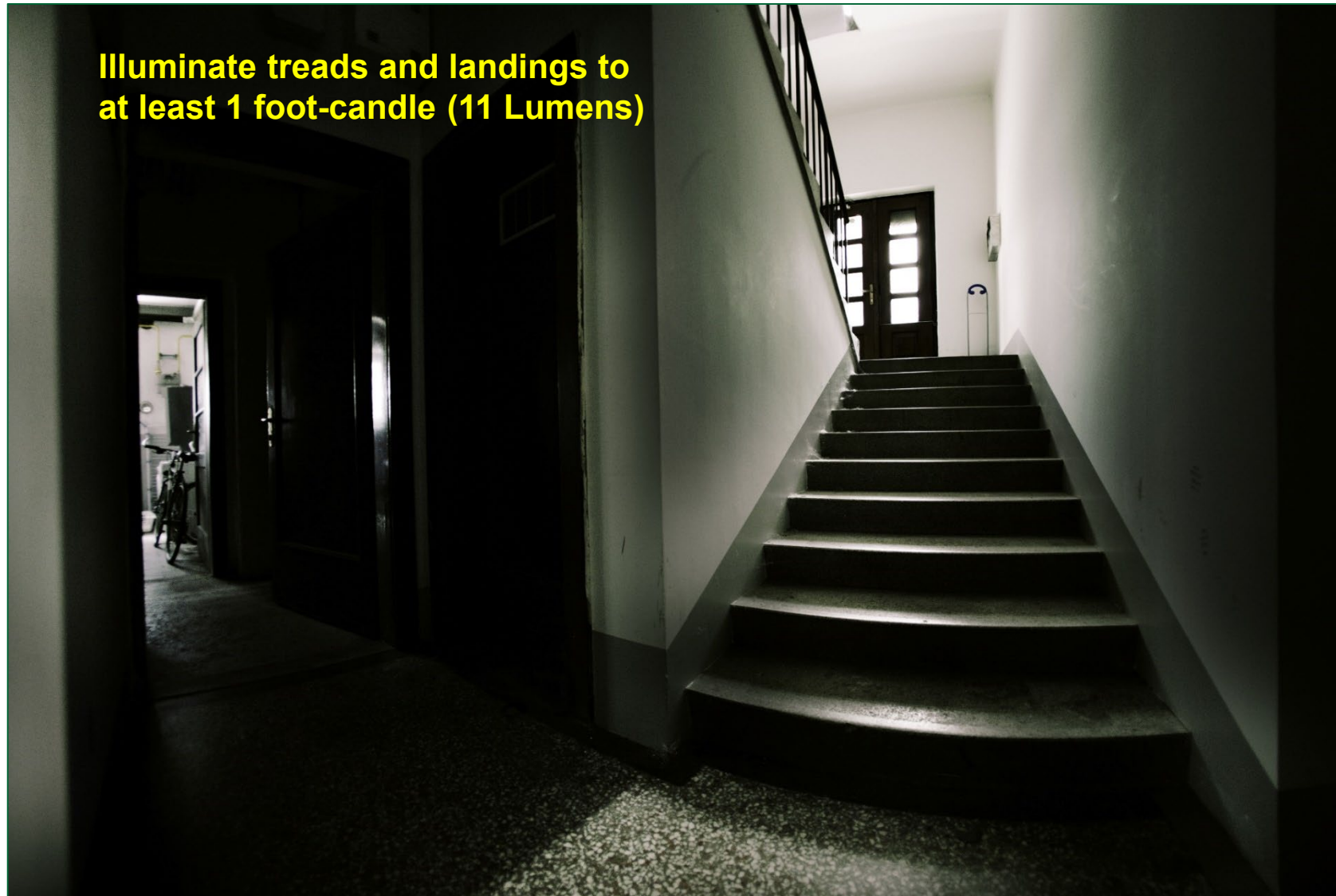


Prevention of Falls from Portable Ladders

- 4 to 1 Slope - for every 4 feet of height, the ladder feet are one foot from the base of the wall
- Stable ladder feet all resting on ground
- Non-slip rungs
- Secure top of ladder, 3 feet above landing (reference OSHA Standards, 1910.23, 1926.1053)
- Follow warnings of where not to stand
- Keep belly button between side rails
- Face ladder with climbing and working on ladder
- 3 points of contact



Stair Hazards – Heavy Shadows and No Handrail Use



Escalators and Rails Hazard Control Considerations



Guard Area between Escalator Rails and Rail Wall Panels.



Avoid placing furniture against guardrails. This can be considered an attractive nuisance.

Slip, Trip, and Fall Prevention Innovations

Floor treatments that change to a conspicuous color of liquid on floors. (Floor Treatments that increase the COF have become more common.)



Spill Detection Cameras



Robots that analyze slipperiness and walkability



Housekeeping: Equip, Train, and Reinforce

A Few Best Practices

- Wet floor signs
- Ice alert signs
- Pop-up tents to warn of spill or hazards
- Paper towels
- Dry mops, floor squeegees
- Cord covers
- Clean up spills quickly and monitor until cleaned up



Shared Responsibility



Company Responsibility	Personal Responsibility
Provide training	Actively participate in training
Properly maintain work site	Report maintenance/housekeeping issues
Develop policies and procedures	Follow policies and procedures
Invest in quality housekeeping products	Follow housekeeping requirements
Develop company safety culture	Participate in safety culture
Provide regular reminders on safe working habits	Analyze and improve safe working habits
Improve off-the-job safety	Apply lessons learned off the job

Thank
you



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