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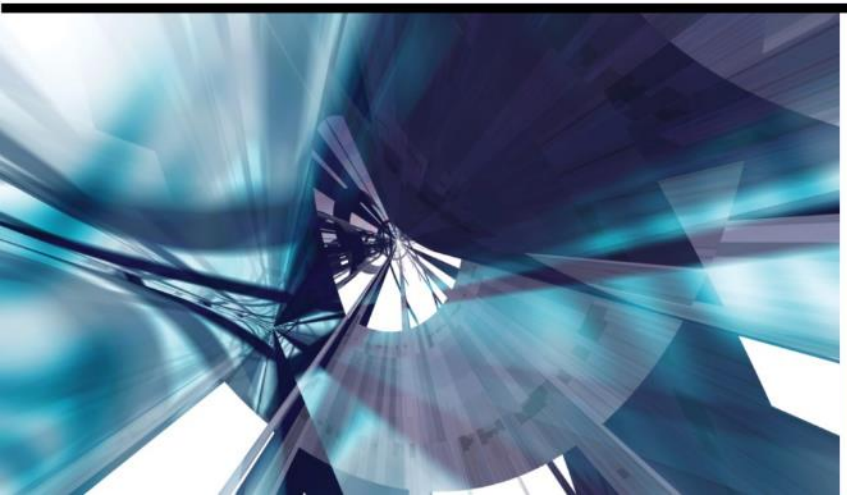
ASSET PROTECTION



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Preventing Slips, Trips and Falls: Strategies for Identifying and Reducing Risks

Fred Norton, Technical Director
Liberty Mutual Insurance

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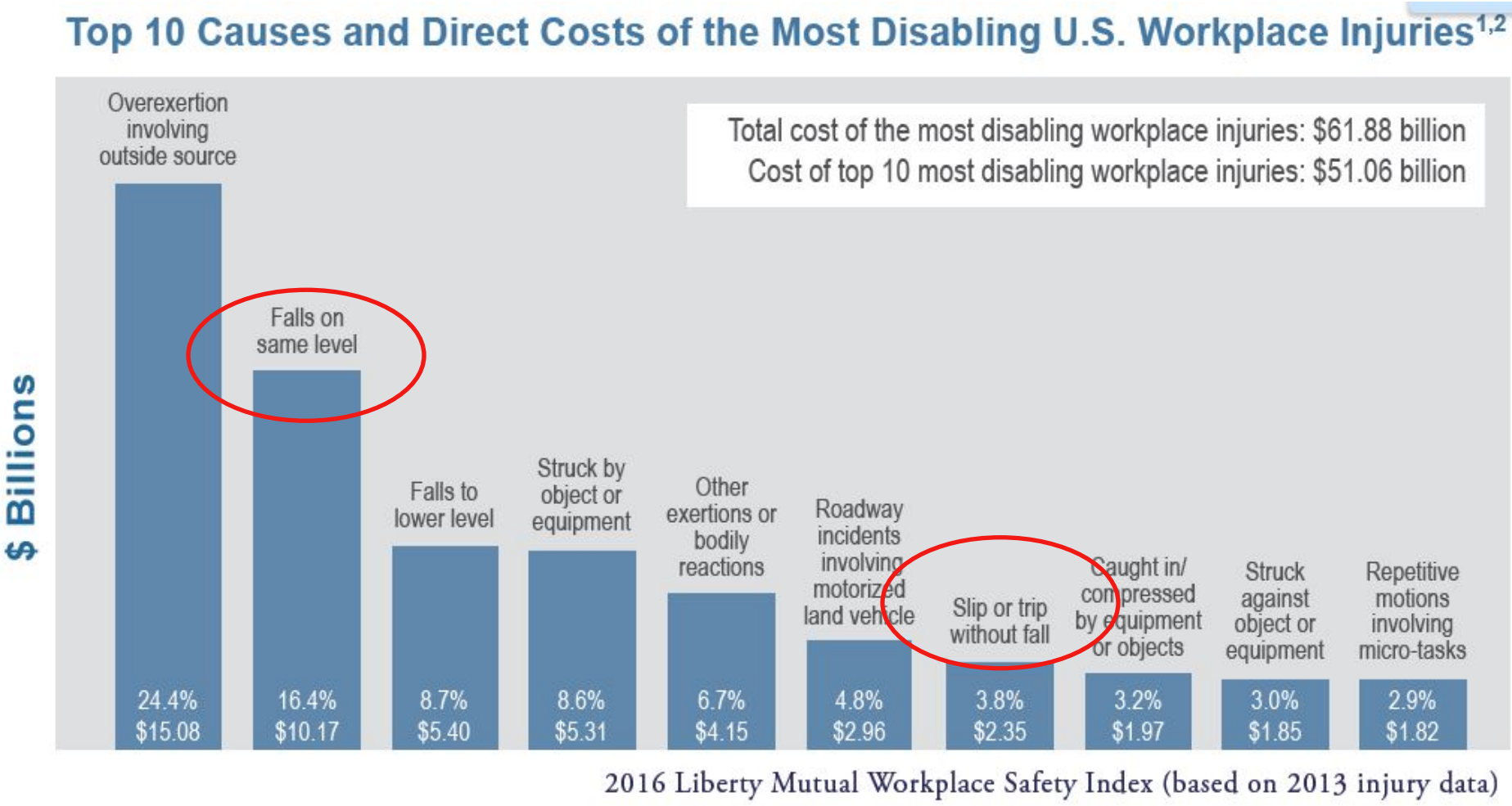
Objectives: Participants will be able to:

- Evaluate causes and contributing factors for fall incidents
- Define effective programs for housekeeping and floor cleaning.
- Outline design considerations to control common fall hazards
- Describe the components of a Fall Safety Management System that gets results for fall risk reduction

Slips, Trips and Falls
Leading Loss Driver for Insurance Costs

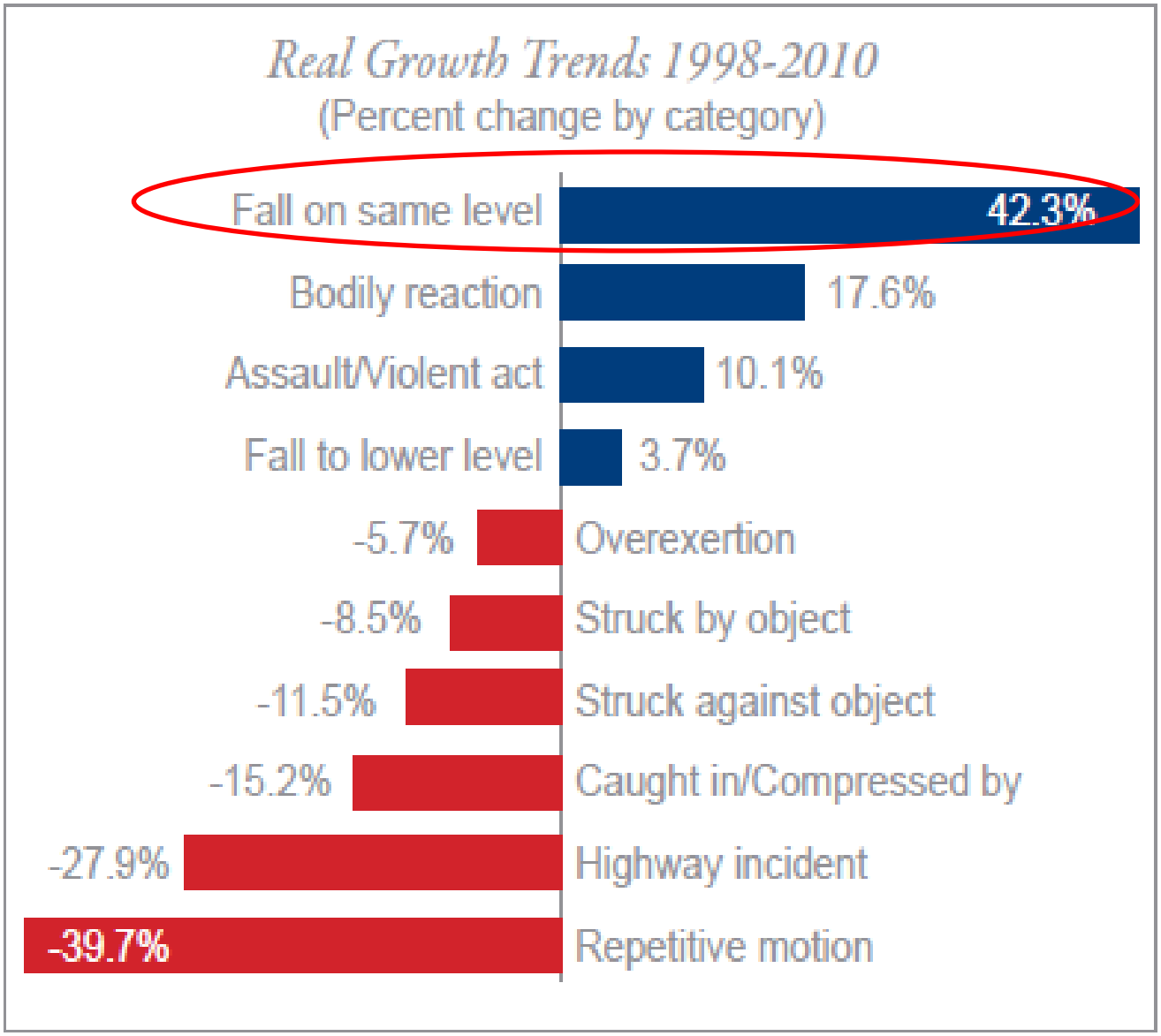
- Drive claim frequency and cost for premises General Liability (GL) claims
- Second leading cause of Workers Compensation (WC) disability claims
- Leading cause of serious injuries and death for over age 65

2016 Liberty Mutual Workplace Safety Index



www.libertymutualgroup.com/research

Real Growth 1998-2010 – Workplace Safety Index



Why Falls Persist?

- Exposure is universal
- Causes/contributing factors are varied
- Prevention often Reactive *not* Proactive
- Causes not well understood; often too much ‘blame’ on person
- Fall programs initiated but not sustained
- Some (many) slips and falls may not be reported when minor or embarrassing

Let’s Ask You

Where are most of your slip, trip and fall incidents?

1. Inside the facility
2. Outside on walkways and parking lots
3. Split about evenly between both inside and out

Causes of Slips, Trips and Falls
Liberty Mutual Research Institute for Safety

- Tribology
  - Friction and walkway surfaces
- Biomechanics of walking styles
  - Gait and adjustments
- Ergonomics
  - Aging
- Psychology
  - Distractions and transitions
  - Perceptions of slipperiness

Factors Impacting the Risk of Slipping

Walkway	• Type, surface roughness, friction/slip resistance, wear/condition
Footwear	• Type, wear/condition, cleanliness
Contaminants	• Type, amount
Person's walking	• Gait, balance, perception

Other Aspects of Walking and Risk of Slipping

- Tasks while walking
  - Carrying, pushing, pulling, etc.
- Distractions
- Lighting
- Other factors?
  - Obesity

SATURDAY, JUNE 20, 2015

Utah university creates texting lane on campus

By Lindsay Whitehurst
Associated Press

SALT LAKE CITY — One Utah university is giving students glued to their cellphones a place to call their own: a designated lane for texting while walking.

The neon green lanes painted on the stairs to the gym at Utah Valley University were intended as a lighthearted way to brighten up the space and get students' attention, spokeswoman Melinda Colton said Thursday.

And it worked. A picture of the lanes — which divide the stairs into sections for runners, walkers and texters — created widespread buzz

RICK BOWMER/ASSOCIATED PRESS

A Utah Valley University student stays in the "walk" lane Thursday on the stairs from the campus gym in Orem, Utah. A picture of the lanes has created social media buzz this week.

cultural reality in an age of ubiquitous cellphones.

"It's kind of funny. You

Geographic Television as part of a behavior experiment. The smartphone lanes

Lottery

WINNING NUMBERS
Daily 3 Afternoon: 3, 7, 6
Daily 3 Evening: 4, 4, 5
Daily 4: 5, 0, 1, 6
Fantasy 5: 4, 11, 19, 26, 3

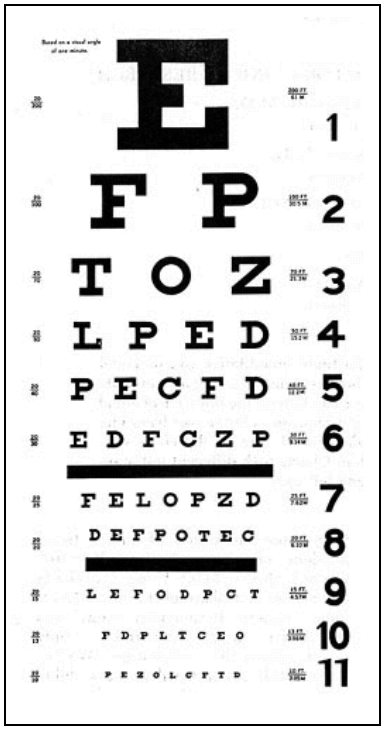
DAILY DERBY
1st: 1, Gold Rush
2nd: 7, Eureka
3rd: 3, Hot Shot
Race Time: 1:44.86

MEGA MILLIONS
Friday drawing: 4, 35, 36, 52, 68
Mega number: 8
Estimated jackpot: $44 millio

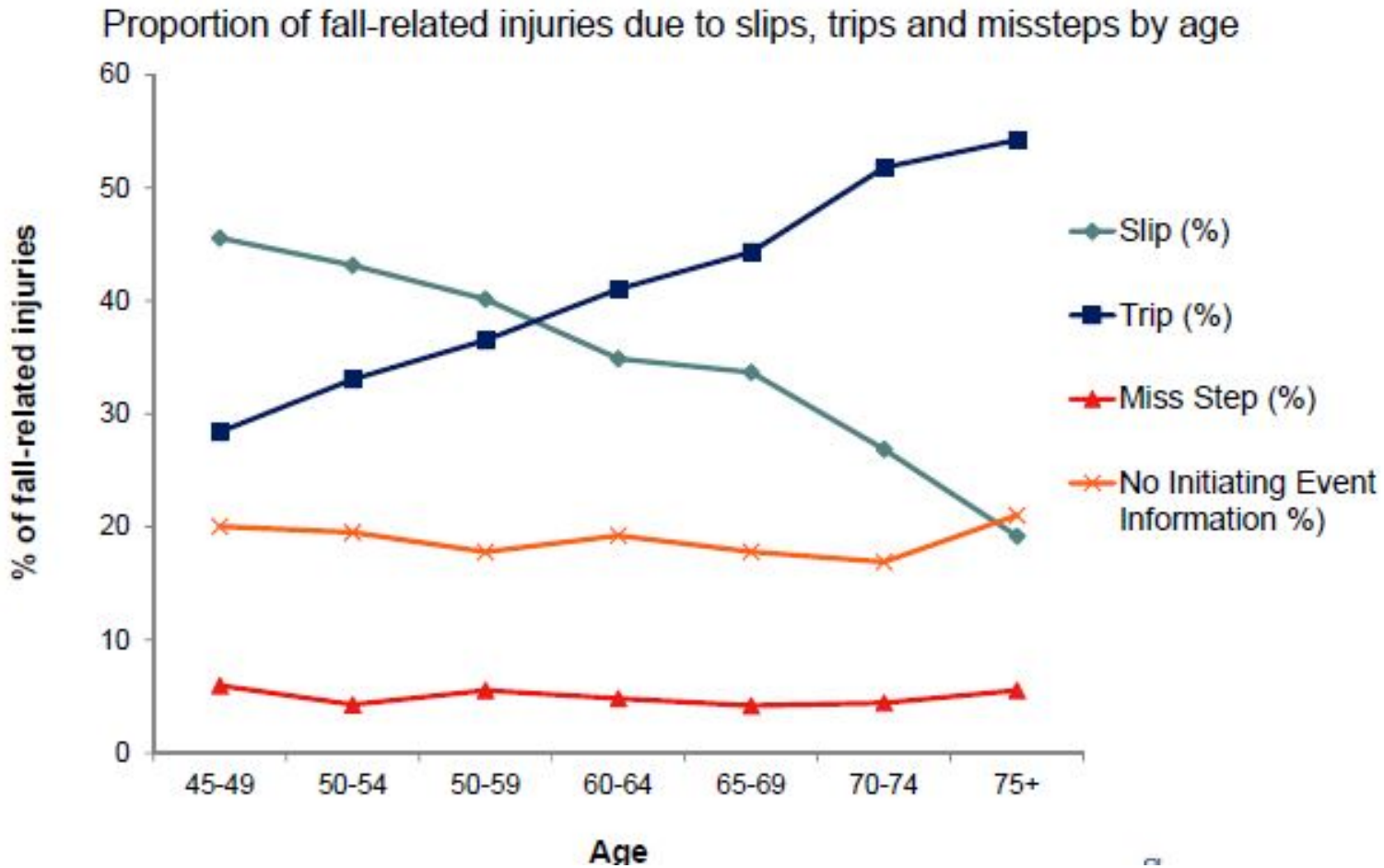
SUPER LOTTO PLU
Wednesday drawi
7, 20, 32, 33, 37
Mega number: 9
Saturday's estim
jackpot: $45 mil

Age, Vision and Slips, Trips & Falls

- Age related vision changes impact ability to detect STF hazards
  - Slower and less effective responses to glare and changes in light levels
- Not just vision changes:
  - Vestibular system changes (inner ear and balance)
  - Proprioceptive changes (sense of body position) and gait changes
- Recovery from slips diminished (more falls)
  - Strength, reaction time and balance
- Good news is that our decrement in abilities may be reduced with continued activity

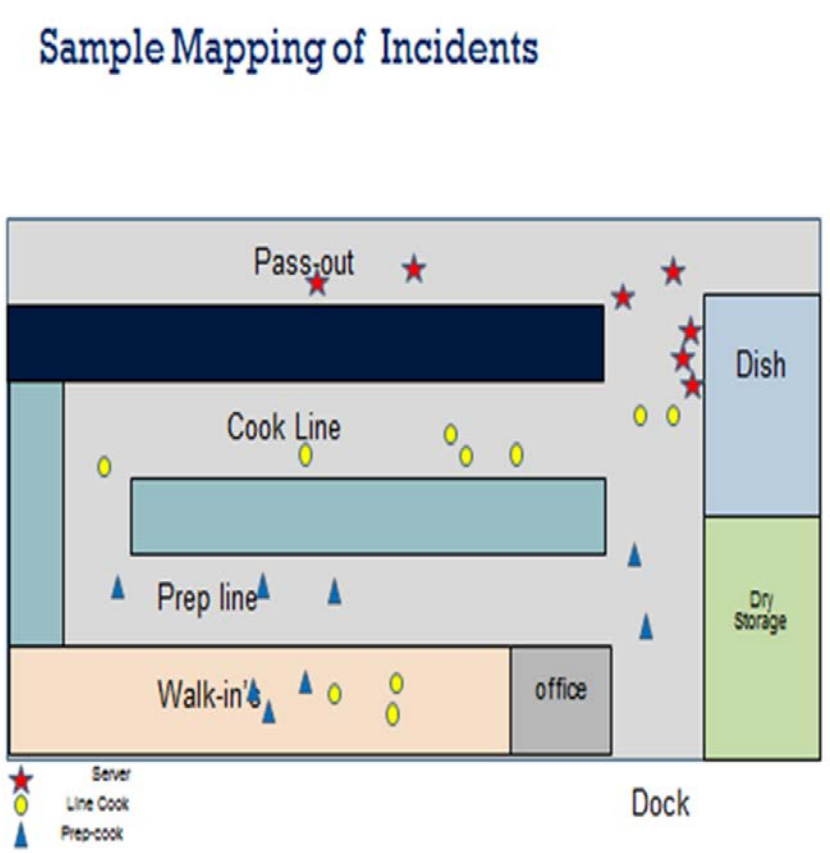


Tripping - With increasing age, the risk of falls and injuries from falls due to tripping increases
(Verma, et al., 2008)



Getting Started - Risk Assessment
Do You Know Your Falls 'History'?

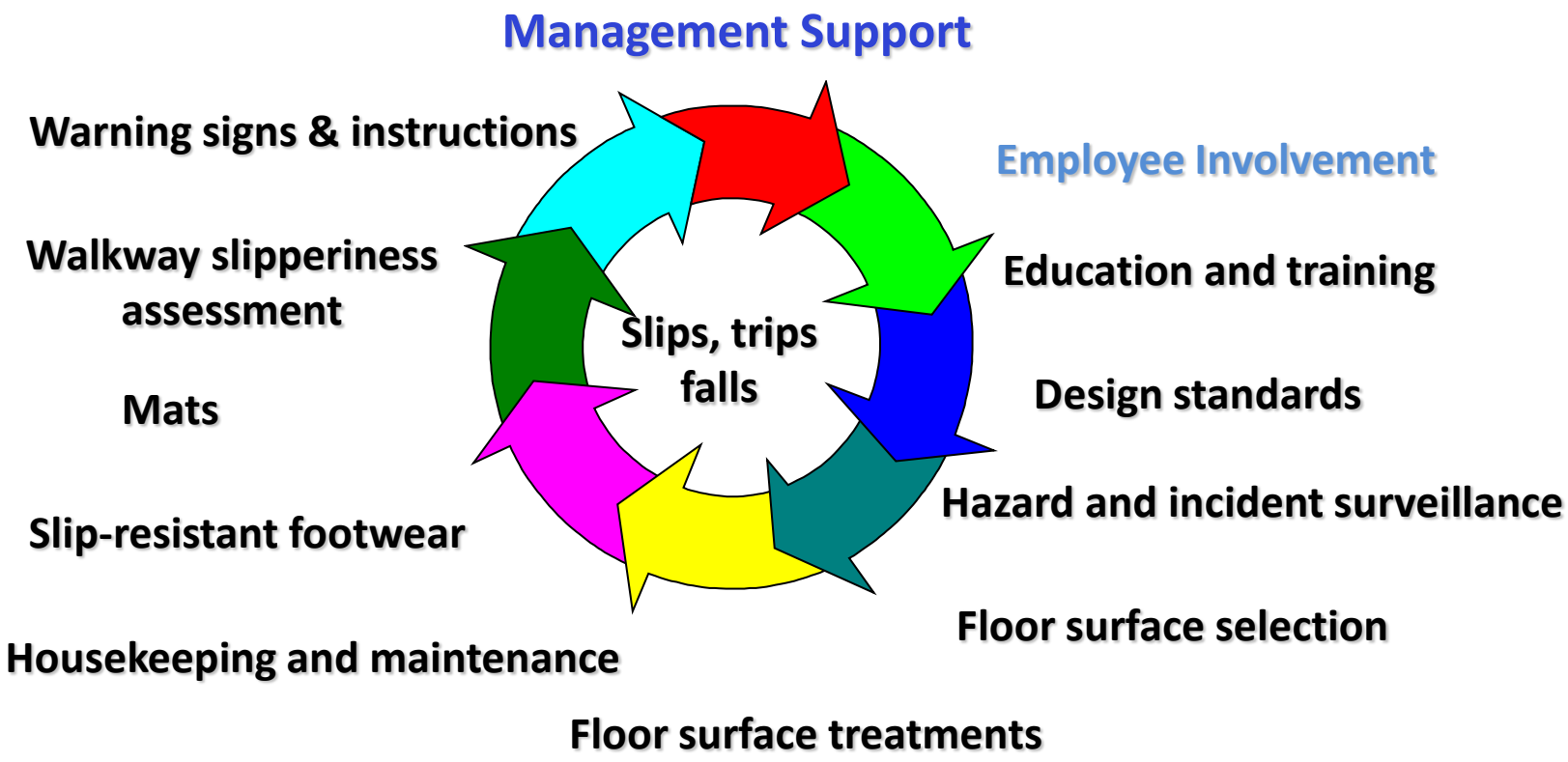
- Loss/claim analysis
  - Slips, trips, indoor, outdoor ?
  - Who, what, where, when, how, etc.
  - Location 'risk mapping'
- Workers report 'slippery' locations and 'near miss'
- Known industry 'hot spots'
  - Produce, entrances, etc.
  - Use info from existing inspections and surveys



Systems Analysis – Identifying Gaps

Walkway Surfaces	Design	Processes/ Operations	Worker Involvement
Slip resistance/ Surface roughness	Lighting	Containment at source	Footwear
Floor Care and Cleaning Procedures	Stairs/Steps	Spill Response	Prompt reporting/ Inspections

Fall Safety Management
Comprehensive and Systematic Process



Management Support and Direction

Strategic Plan (Written)

Resources and Budgeting

Process for setting priorities and targeting problem tasks/operations

Structure for Critical Controls (Expectations)

Vendors and Contractors

Periodic evaluation

Employee Involvement

- Hazard recognition and awareness
- Hazard (and slip) reporting
- Housekeeping
- Spill clean up (reporting)
- Responsibility for own actions

Walkway Surfaces and Slip Resistance

- **Slip resistance -** relative force that resists the tendency of the shoe or foot to slide along the walkway surface
- Related to a combination of factors including the walkway surface, the footwear bottom, and the presence of foreign materials between them.

(ASTM F1646 Standard Terminology Relating to Safety and Traction for Footwear)

Floor Surface Selection
Choose Material with Higher Slip Resistance

- Most people can walk with low risk of falls on surfaces with a coefficient of friction (COF) greater than 0.4, but 0.5 offers an additional safety factor* for “Slip-Resistant”
- Most dry, clean (uncontaminated) surfaces are “slip-resistant” (0.5 COF or higher)
- COF of .5 or higher doesn’t guarantee a “safe” floor
  - Slips/fall risk increases when walkway is wet and/or contaminated (water, ice, oil etc.)
  - Different slip meters will give different results that may not be comparable
  - May need a ‘threshold value’ for the specific type of slip meter used

* Miller, J. M. (1983). Slippery work surfaces: Towards a performance definition and quantitative coefficient of friction criteria. *Journal of Safety Research, 14,* 145–158.

Risk Controls for ‘Slippery’ Floor Surfaces

- Identify and address known slippery floors with floor treatments (or replacement)
  - Chemical etching for some flooring types
  - Abrasive floor treatments and coatings
  - Waxes, polishes
- Beware of limitations of manufacturers data
  - May not predict performance under wet or contaminated conditions
  - Durability an issue so monitor performance over time

Liberty Mutual Research Institute for Safety - Perception of Slipperiness

- Restaurant focused project on assessing slipperiness
- Workers' perceptions of slipperiness as leading measure of slip and fall risk
- Simple method for surveys

Courtney, T.K., Verma, S.K., Huang, Y.H., Chang, W.R., Lombardi, D.A., Brennan, M.J., and Perry, M.J. (2013). Perception of Slipperiness and Prospective Risk of Slipping at Work. *Occupational and Environmental Medicine*, 70(1), 35-40.

(www.libertymutualgroup.com/research)

Worker Perception of Slipperiness

- Workers rated slipperiness of 8 locations in each restaurant on a ‘typical day’.
- “A slip is simply a loss of traction of your foot-you can slip without falling”.
- 4 point Likert scale
  - 1 = ‘not slippery’
  - 2 = ‘a little slippery’
  - 3 = ‘more slippery’
  - 4 = ‘very slippery’

Research Results on Slipperiness Perception

Worker perceptions of slipperiness and subsequent rate of slipping strongly associated

Restaurant level - For each 1 point increase in perception score, the subsequent rate of slipping increased by 2.71

Area level (within each restaurant) - For each 1 point increase in perception score, the subsequent rate of slipping increased by 2.92

Adjustment for person time spent in each area- increased this to 3.88

Combination of perception and COF (coefficient of friction) measures could be a stronger risk assessment approach than either alone

Poll # 2

In this study of restaurant workers, which risk factors do you think had the highest impact on rates of slipping?

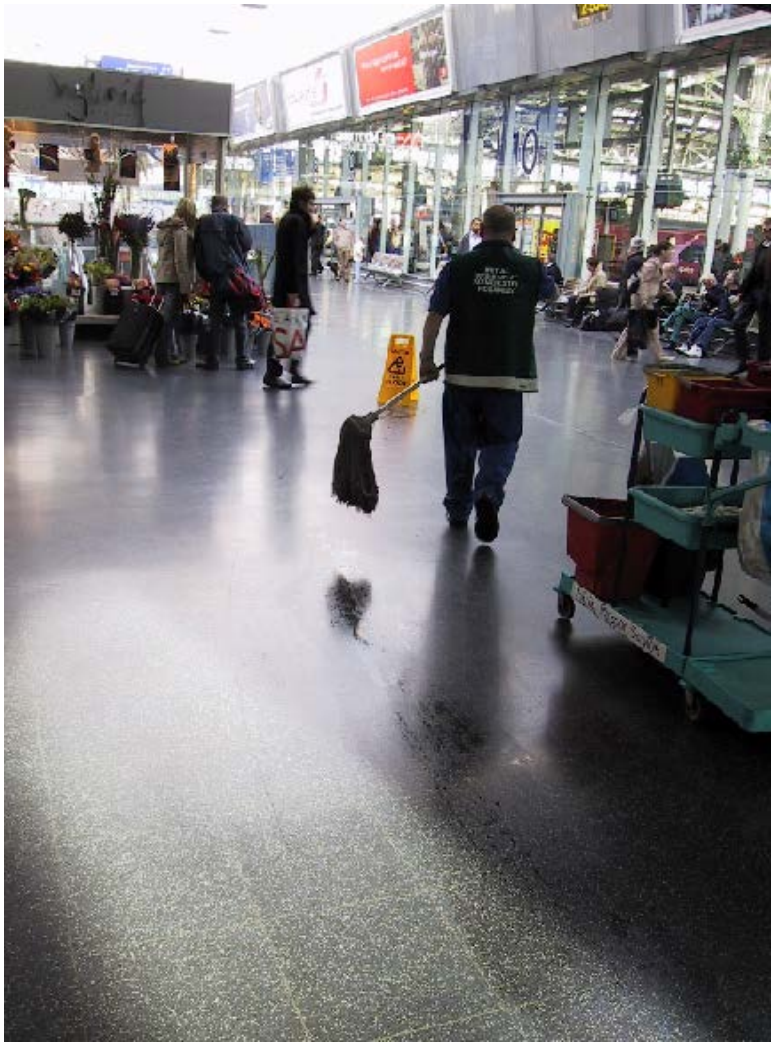
1. Rushing
2. Distraction
3. Walking on Contaminated Floors

Additional Research Findings

- Three risk factors significantly increased the rate of slipping:
  - Distraction by 1.7 times
  - Rushing by 2.9 times
  - Walking on a contaminated floor by 14.6 times

Verma, S.K., Lombardi, D.A., Chang, W.R.,Courtney, T.K., Huang, Y.H., Brennan, M.J., Mittleman, M.A., Ware, J.H., and Perry, M.J.,"Rushing, Distraction, Walking on Contaminated Floors and Risk of Slipping in Limited-Service Restaurants: A Case-Crossover Study," Occupational and Environmental Medicine, 2010

Floor Cleaning – Essential Controls



Common Floor Cleaning “Mistakes”

- No clean rinse used when recommended
- Rinse used when not recommended
- No mechanical agitation used (stiff brush) when needed
- Water not proper temperature for type of cleaner
  - Hot enough
  - Too hot
- Not properly cordoned off

Video Clip

Floor Cleaning and Slip Reduction: Liberty Mutual Research Institute for Safety

- 36 limited-service restaurants, 6 states
- 475 employees
- Includes floor cleaning practices and risk of slipping
- Participants report slip incidences each week over 12 weeks

Verma et al, Workers Experience of Slipping in US Limited Service Restaurants, Journal of Occupational and Environmental Hygiene, 7, pp. 491- 500, 2010

Poll # 3

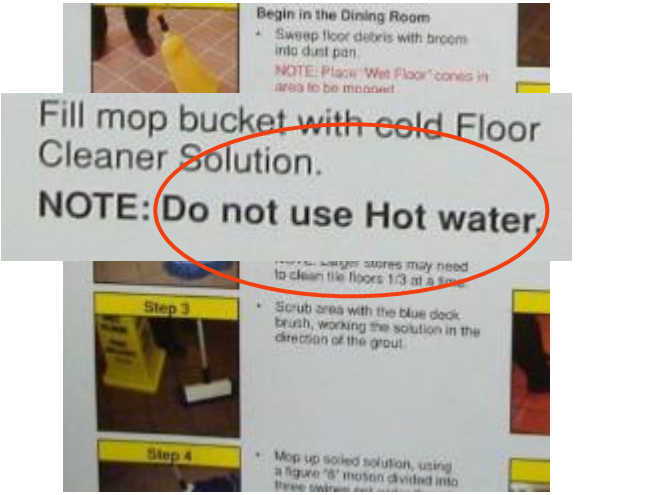
- Do you have formal, written floor cleaning procedures?
  1. Yes, formal written procedures
  2. Some procedures in place but not a formal written plan
  3. No plans in place
  4. Not sure

Floor Cleaning Practices (Verma)

- Right floor cleaning method defined as:
  - Use of proper floor cleaner for type of floor surface
  - Use of correct concentration of floor cleaner
  - Use of right type of cleaning equipment, and
  - Following cleaning protocol recommended by floor cleaner manufacturer

Water Temperature by Floor Cleaner

	Enzyme Based Floor Cleaner (25 Restaurants)		Non-Enzyme Based Floor Cleaner (11 Restaurants)	
Water Temp	**n**	**%**	**n**	**%**
Hot/Warm	89	61.8	57	98.3
Cold	52	36.1	1	1.7
Varies	1	0.7	0	0.0
Don't Know	2	1.4	0	0.0
Total	144	100.0	58	100.0



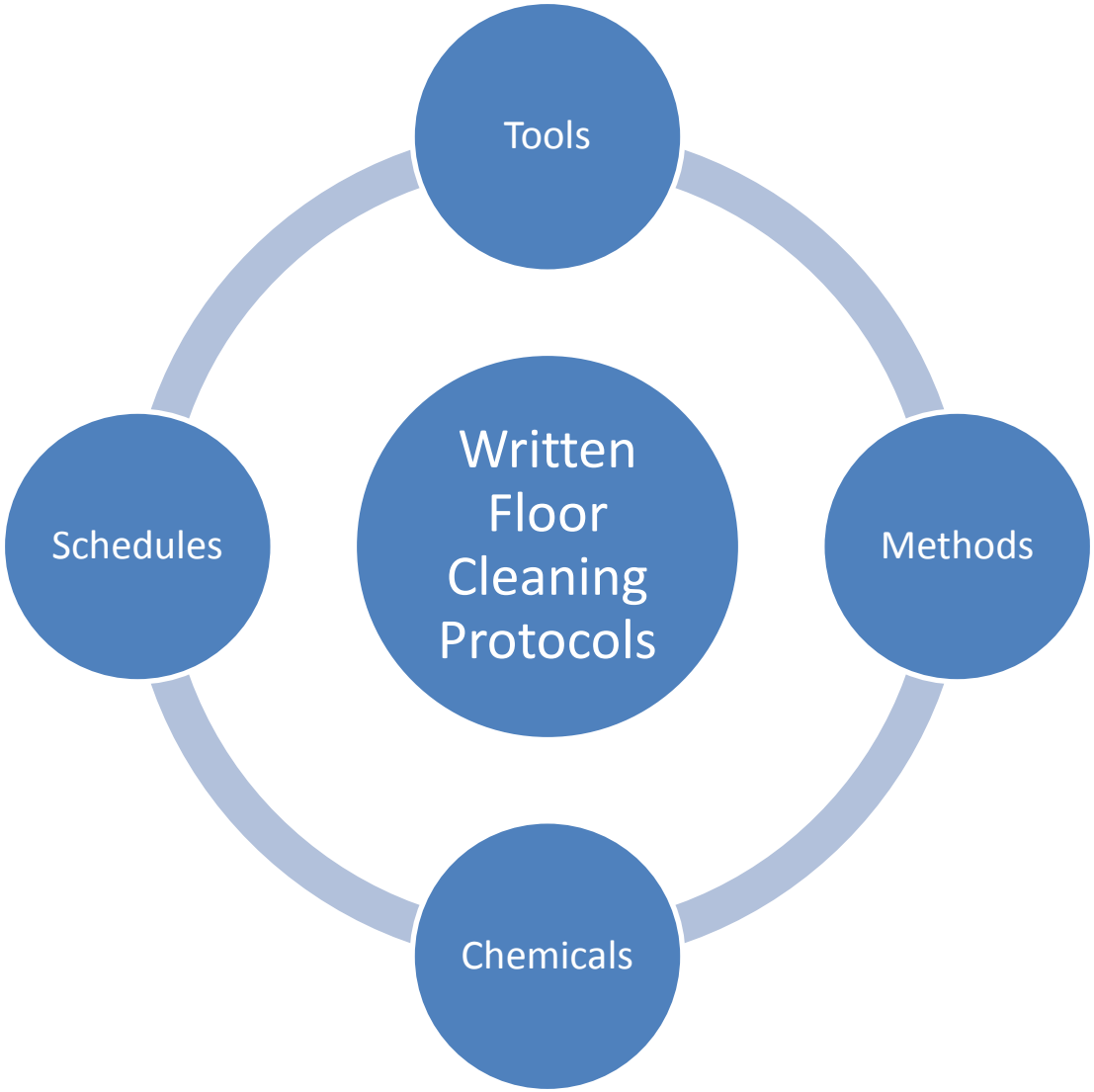
Information From the Study

- Managers and cleaning employees had inconsistent knowledge of cleaning protocol
- Cleaning method frequently not followed
  - Cleaning products used incorrectly (not following recommended procedures)
- High turnover of maintenance employees common
- Impact of dirty floors on slip incidences was significant

Slip and Fall Research Findings

- For every 0.1 increase in a kitchen floor's mean COF, there was a corresponding 21 percent decrease in slips reported by workers
- Slip-resistant Footwear: Slip resistant shoes reduced the rate of slipping by 54%

Comprehensive Approach Effective Floor Cleaning



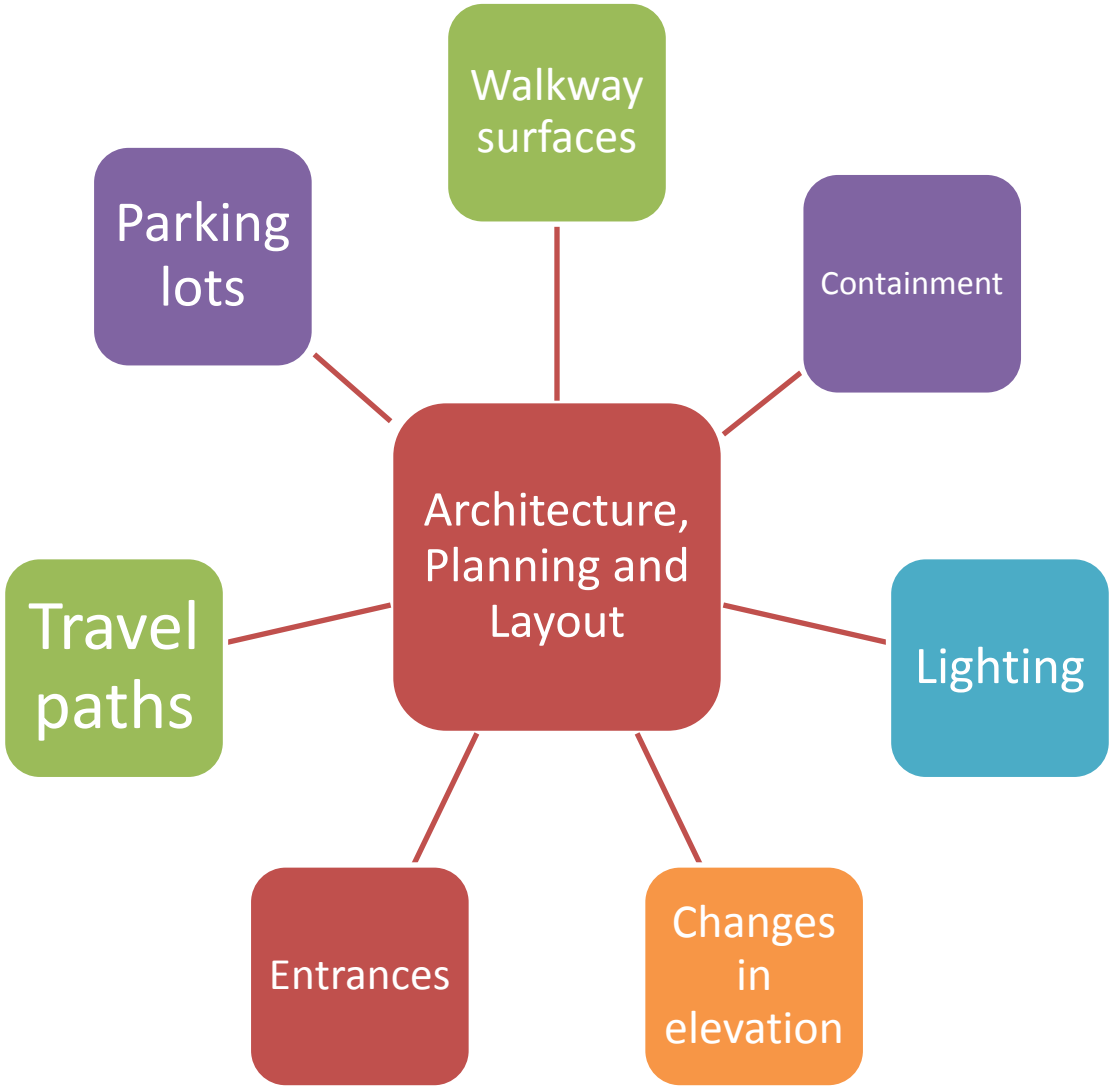
Spill Clean-Up Program

- Frequent inspections to identify and correct problems
- Engagement and training of employees
- Proper supplies available where needed
- Cordon off spill areas until clean and dry
- Common problem areas
  - Restrooms, produce, food service, fountains, etc.

Slip Resistant Footwear for Workers Reduce Risk When Clean and in Good Condition

- Slip resistance references
  - ASTM standards
  - SATRA - http://www.satra.co.uk/portal/
- Footwear Program
  - Selection, use, cleaning, replacing

Prevention Through Design Considerations to Reduce Risk



Design to Reduce Fall Hazards

- Potential contaminants are controlled at the SOURCE (by design)
  - Produce mist systems designed to minimize overspray
  - Freezers designed to minimize ice buildup
  - Ice machines designed with drainage and slip resistant surfaces
- Display standards consider STF hazards
- Minimize elevation changes and uneven surfaces
  - No more than ¼” but strive to eliminate (aging issues) any elevation change
  - Avoid single steps when possible

Building Entrances and Matting Systems

Can be a location where slips, trips and falls occur

- Steps, surface transitions, changes in slip-resistance

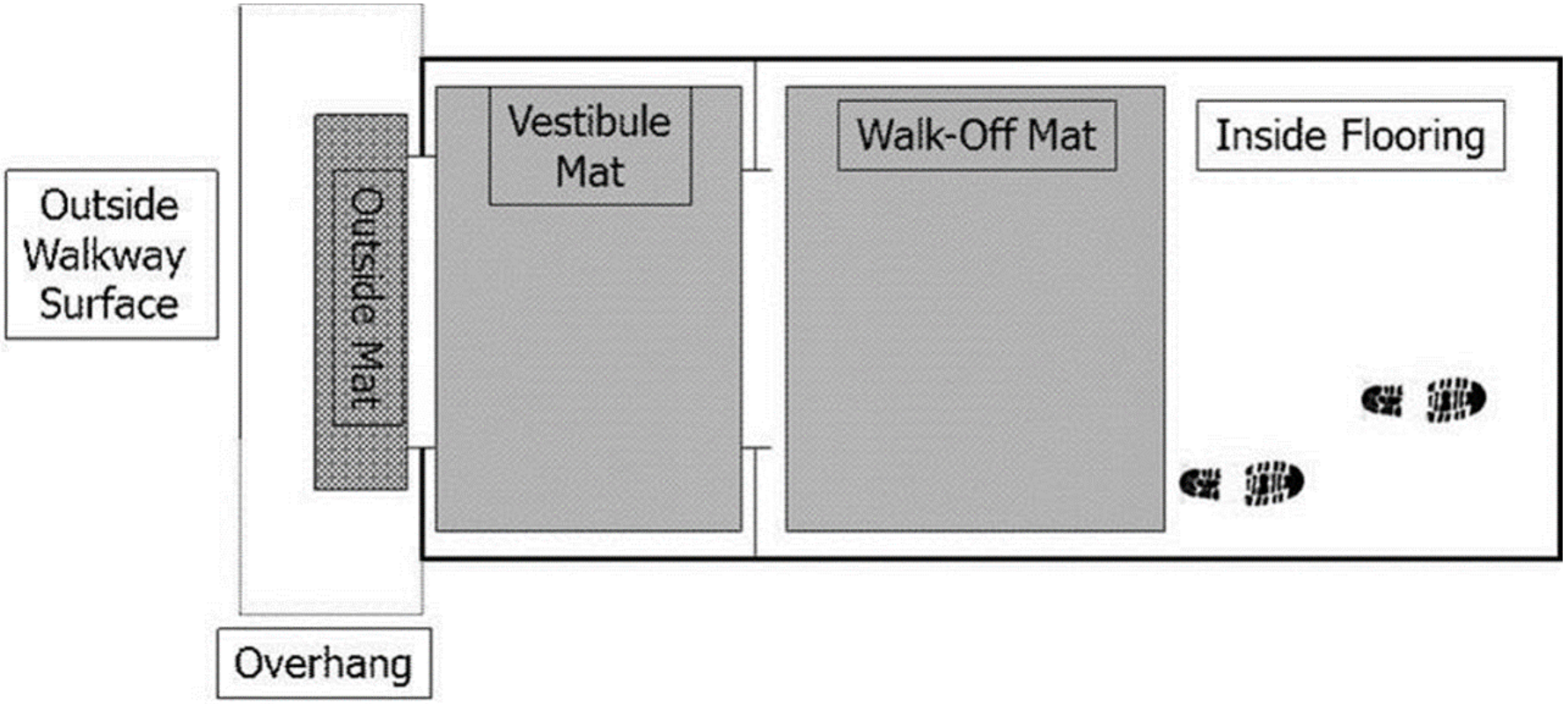
Critical control point to prevent outdoor contaminants from becoming indoor fall hazards

- Entrance design to reduce tracking moisture

Benefits of using mats at entrances

- Absorb water / contaminants, remove soils
- Provide slip-resistant surface
- Reduce floor maintenance and keep floors clean
- Reduce wear, protect finishes

Entrance Strategy - Slip/Fall Prevention



Resource for more information –
ANSI/ASSE A1264.2 – 2012 Provision of Slip Resistance on Walking Working Surfaces

Restroom Design

- Cleaning hands possible with no more than one step
- Sinks, towels and trash all in arms reach from standing position
- Reduces water and debris on the floor

Parking Lots and Outdoor Areas – Slips, Trips and Falls

- Common hazards include:
  - Tripping hazards of uneven or damaged surfaces
  - Steps/curbs
  - Weather including rain, ice/snow conditions
- Design to avoid risks
  - Ramps instead of steps
  - Barriers instead of ‘bumper stops’
  - Color coding for contrast
  - Weather control plans integrated into design

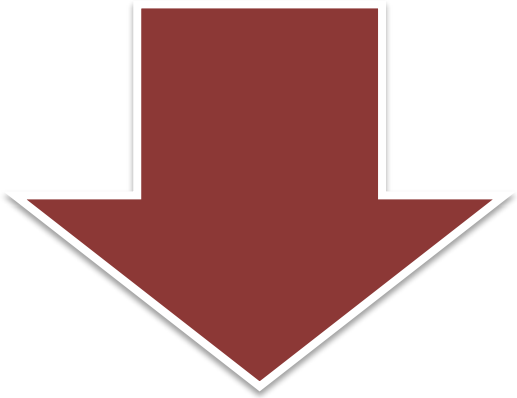
Best Practices Lighting/Illumination

- All walking surfaces (including outdoors and storage) have generous, even lighting
- Light sources arranged and diffused for adequate contrast to detect contaminants, transitions, and tripping hazards
- Contrasting colors are used at transitions/thresholds
- Motion-activated and/or infrared-activated considerations
- Lighting surveys for parking lots at night

"What might be bright enough for a healthy thirty-year old is not close to being adequate for an aged individual with impaired vision."*

**IES Lighting Handbook*, 8th Ed., Illuminating Engineering Society of North America (IESNA), 1993

GL Considerations for STF Risks
Risk Control and Risk Management



Prevent the incident

- Reduce the falls risks

Mitigate the loss (claim)

- Investigate the incident
- Defend the claim
- Risk transfer

Common (Effective) Defenses For Premise Liability Claims

Timely, comprehensive incident response and preservation of evidence

Status of Claimant

- Duty Owed to Licensee/Trespasser is different (less) than Business Invitee

Documentation of Inspection, Maintenance and Housekeeping

- Especially for transient conditions

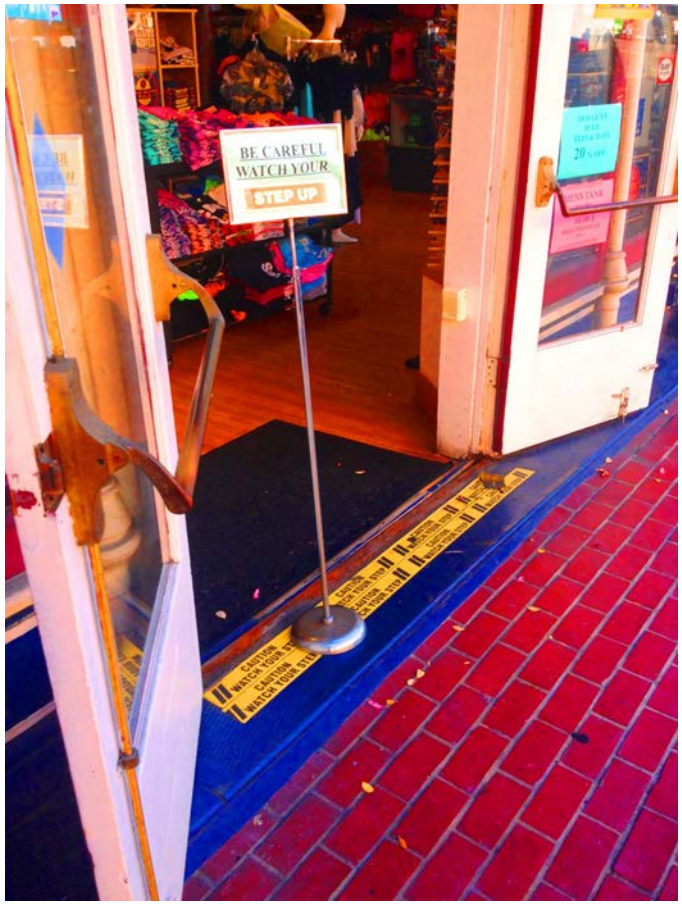
Effective Use of Warnings, Barricades, etc.

Open and Obvious Condition

Notice Defense Policyholder did not have knowledge of the hazard

Warning Signs

- Temporary warning of known condition
- Not a replacement for taking action to correct the hazard
- Barricades to keep people out are more effective than signs (that are frequently ignored)



Video Surveillance

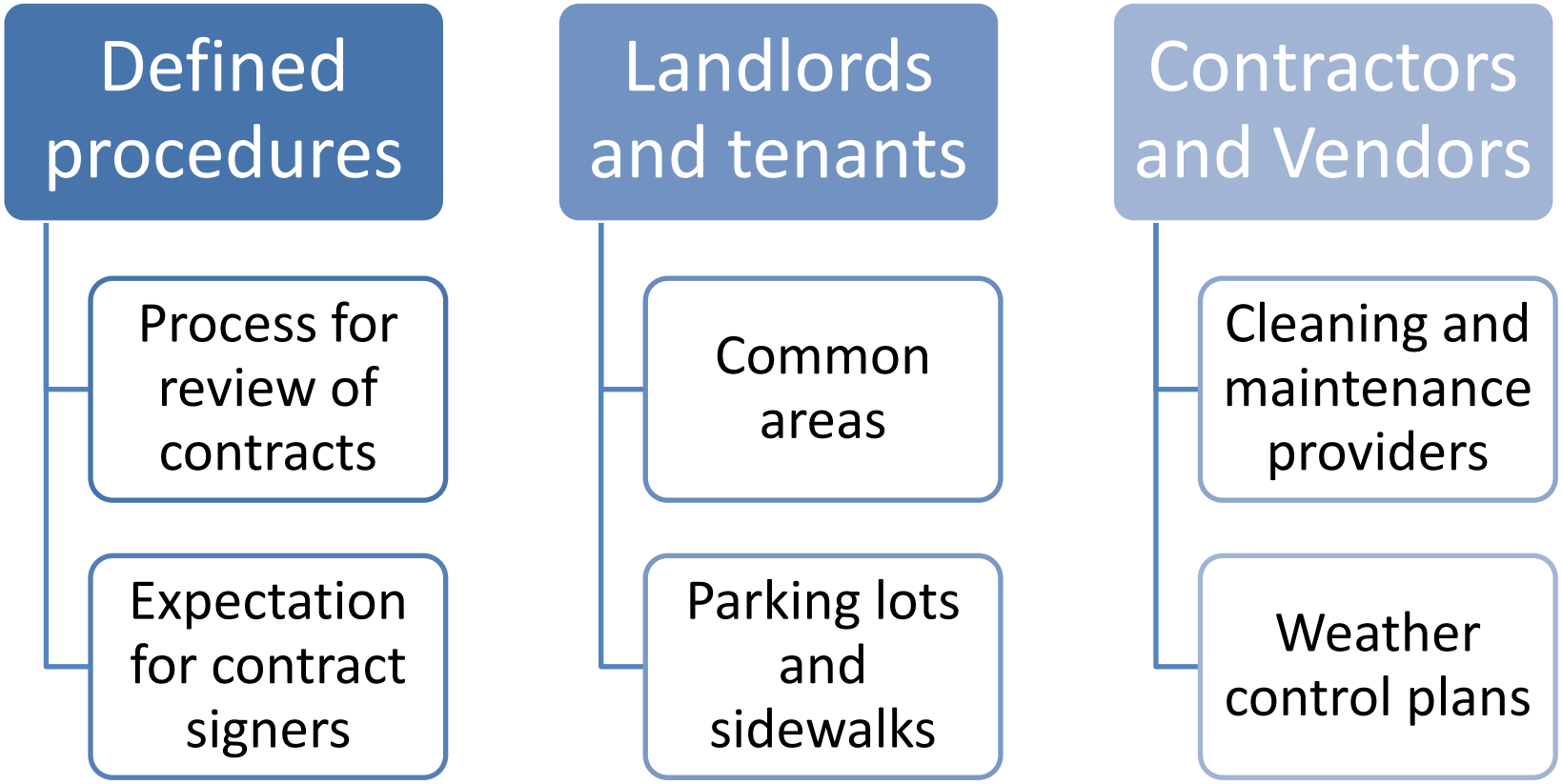
GL fraud deterrence and evidence

- Supplements a risk control program (not instead)
- Remember it documents real time conditions - video will also confirm hazards and gaps in inspections/programs

Considerations for use

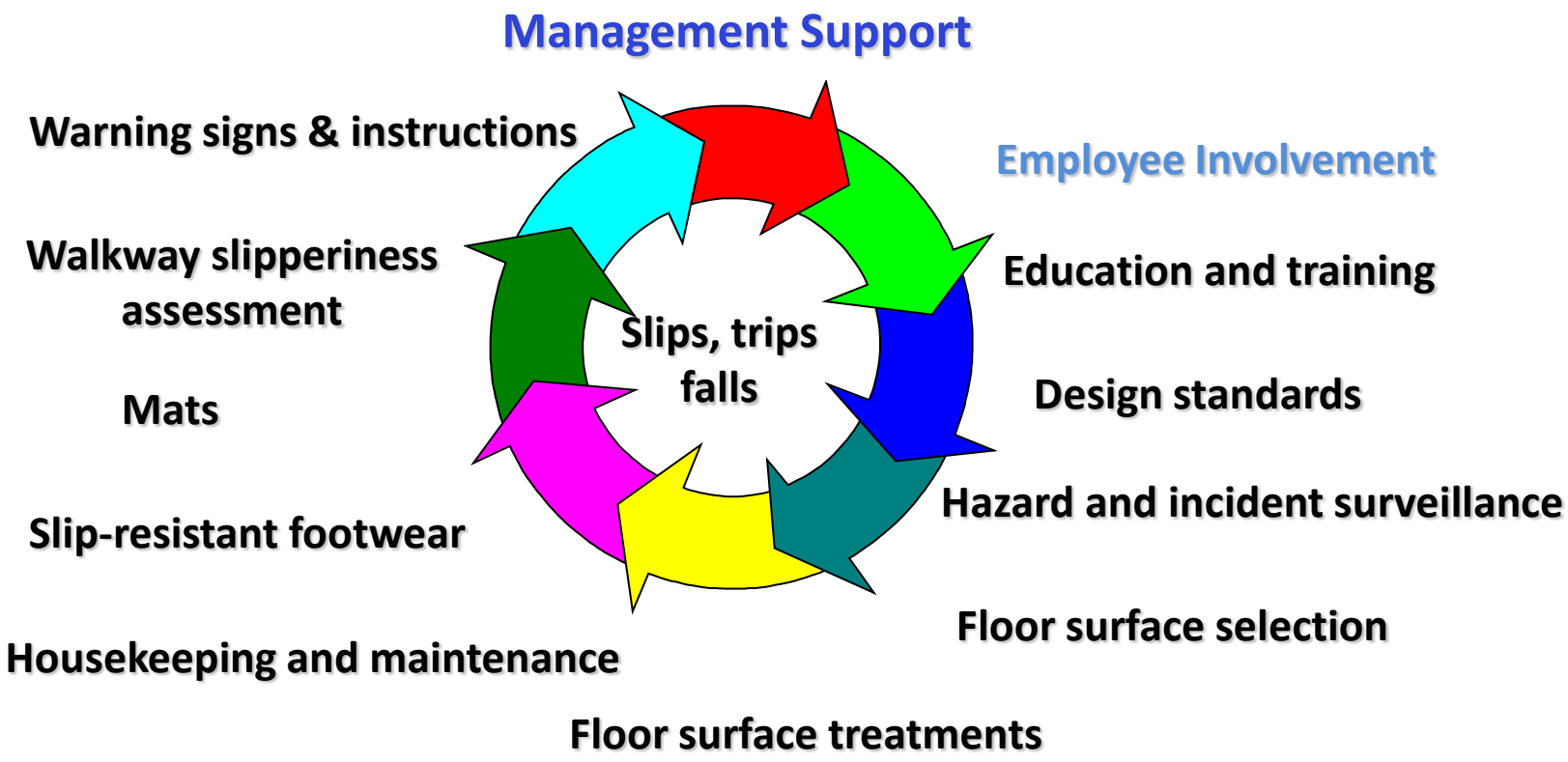
- Business purpose and need for surveillance
- Scope and duration of surveillance
- Retention and destruction of recordings policy
- Private space or public space monitored
- Will workers be informed or will this be hidden camera use?
- Local laws (e.g., California concealed camera laws)
- Consult with legal counsel

Risk Transfer Considerations



This is not legal advice. Always consult an attorney who is skilled, competent, and experienced in contract law and insurance coverage.

Fall Safety Management
Comprehensive and Systematic Process



Take Action!
Opportunities to Reduce Your STF Risk

Are there formal, written procedures for cleaning floors?

Do you have periodic inspection process to identify and correct STF hazards?

Has the lighting been evaluated at nighttime for all outdoor walkways, common areas and parking lots?

Is there a weather control plan for handling snow and ice removal?

Have contracts with liability/fall risk control implications been reviewed by legal counsel?

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