Spinal Cord Injuries and Recent Developments

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Claims involving spinal cord injuries are among the most profound and challenging ones to defend. They are unique in that they impact virtually every aspect of a patient's life from breathing, eating, to life expectancy. While there is no *cure* for spinal cord injuries, there is a degree of optimism as medical and scientific advancement in the area offer new treatment and promising care path options. Understanding the nature of spinal cord injuries, current state of treatment, as well as future treatment options, is critical in comprehensively defending a spinal cord injury claim.

Types of Spinal Cord Injuries

All spinal cord injuries are divided into two broad categories: incomplete and complete.

- Incomplete spinal cord injuries: With incomplete injuries, the cord is only partially severed, allowing the injured person to retain some function. In these cases, the degree of function depends on the location and extent of the injuries.
- Complete spinal cord injuries: By contrast, complete injuries occur when the spinal cord is fully severed, presumably eliminating all function. However, with treatment and physical therapy, it is possible to regain some function.

Incomplete spinal cord injuries are increasingly common, thanks in part to better diagnosis, treatment, and increased knowledge about how to properly respond—and how not to respond—to a suspected spinal cord injury. These injuries now account for more than 60% of spinal cord injuries.

Some of the most common types of incomplete or partial spinal cord injuries include:

- Anterior cord syndrome: This type of injury, to the front of the spinal cord, damages the motor and sensory pathways in the spinal cord. Patients may retain some sensation, but struggle with movement.
- Central cord syndrome: This is an injury to the center of the cord, and damages nerves that carry signals from the brain to the spinal cord. Loss of fine motor skills, paralysis of the arms, and partial impairment—usually less pronounced—in the legs are common. Some survivors also suffer a loss of bowel or bladder control, or lose sexual function.
- Brown-Sequard syndrome: This variety of injury is the product of damage to one side of the spinal cord. The injury may be more pronounced on one side of the body; for instance, movement may be impossible on the right side, but may be fully retained on the left. The degree to which Brown-Sequard patients are injured greatly varies from patient to patient.

Knowing the location of injury and whether or not the injury is complete is critical for prognosis and determining appropriate care. Doctors assign different labels to spinal cord injuries depending upon the nature of those injuries. The most common types of spinal cord injuries include:

- Tetraplegia: These injuries, which are the result of damage to the cervical spinal cord, are typically the most severe, producing varying degrees of paralysis. Sometimes known as quadriplegia, tetraplegia eliminates ability to move below the site of the injury and may produce difficulties with bladder and bowel control, respiration, and other routine functions. The higher up on the cervical spinal cord the injury is located, the more severe symptoms will likely be.
- Paraplegia: This occurs when sensation and movement are removed from the lower half of the body, including the legs. These injuries are the product of damage to the thoracic spinal cord. As with cervical spinal cord injuries, injuries are typically more severe when they are closer to the top vertebra.
- Triplegia: Triplegia causes loss of sensation and movement in one arm and both legs, and is typically the product of an incomplete spinal cord injury.

Injuries below the lumbar spinal cord do not typically produce symptoms of paralysis or loss of sensation. They can, however, produce nerve pain, reduce function in some areas of the body, and necessitate several surgeries to regain full function. Injuries to the sacral spinal cord, for instance, can interfere with bowel and bladder function, cause sexual dysfunction, and produce weakness in the hips or legs. In very rare cases, sacral spinal cord injury survivors suffer temporary or partial paralysis.

Data collected by spinal cord centers nationwide suggests the prognosis and care of spinal cord injuries is changing. The average age of injury is materially higher than in the past. That fact alone is impactful. The age of the patient has great relevance in the vocational realm, determining life expectancy, prognosis for regaining loss function and quality of life. Patients with a lower age of onset are statistically better able to emotionally cope with the challenges a spinal cord injury presents.

Spinal Cord Injuries 2010 -2015

According to the National Spinal Cord Injury Statistical Center at UAB, the causes of SCI have changed drastically since 2010.

- Vehicular 38%
- Falls 30%
- Violence (primarily gunshot wounds) 14%
- Sports/Recreation Activities 9%
- Medical/Surgical 5%
- Other 4%

Researchers have estimated that, as of 2015, 12,500 new SCI occur each year and between 240,000 and 337,000 people are currently living with some form of SCI in the United States.

The average age at injury has moved from 29 years in the 1970's to 42 years in 2015. With medical advancement, the length of hospital stays is declining with the stay in acute care averaging 11 days - down from 24 in the 1970's - and rehabilitations stays averaging 36 days - down from 98 days in the 1970's.

Treatment of spinal cord injuries, even the most basic treatment, is costly. Beyond the medical costs, there are economic impacts on the patient, his family, his employer, and the community. These include home accessibility, portable medical equipment, home care, and transportation costs. In the litigation arena, reviewing life care plans in the tens of millions of dollars to address a plaintiff with a significant spinal cord injury is not unusual.

What Do Spinal Cord Injuries Really Cost?

- Length of initial hospitalization following injury in acute care units: about 15 days
- Average stay in rehabilitation unit: 44 days
- Initial hospitalization costs following injury: $140,000
- Average first year expenses for a SCI injury (all groups): $198,000
- First year expenses for paraplegics: $152,000
- First year expenses for quadriplegics: $417,000
- Average lifetime costs for paraplegics, age of injury 25: $428,000
- Average lifetime costs for quadriplegics, age of injury 25: $1.35 million
- Percentage of SCI individuals who are covered by private health insurance at time of injury 52%
- Percentage of SCI individuals unemployed eight years after injury 63%.

Until recently, most care for spinal cord injury patients was palliative and rehabilitation based, intended to prevent further degradation of body systems. After the administration of steroids and/or lowering patients' body temperatures, there was little immediate post-accident treatment administered in order to maintain the patient's post-injury status (neuro-protection). However recent developments in medical science offer new and promising treatment options to patients suffering spinal cord injuries.

- In May 2016, an experimental trial at Mount Sinai Hospital in New York yielded positive results for a group of patients suffering severe spinal cord injuries. This particular approach involved the injection of stem cells into the damaged areas, with the goal of restoring function and movement. In particular, one patient -- a quadriplegic who was not expected to be able to walk again after a devastating car accident -- has begun regaining sensation and movement in his legs and hips. Thus far, four out of the six patients involved in the study have already demonstrated signs of improvement. Naturally, more research is needed, but the results are certainly encouraging.

- A research study at the Washington University School of Medicine in St. Louis in late 2015 has seen quadriplegics regain some hand and arm movement after spinal cord injuries impacted their lower necks. The procedure involves the rerouting of patients' nerves so that healthy nerves are connected to their damaged counterparts, resulting in improved neural communication throughout the body. Impressively, it can be performed just hours after the injury has taken place and allows for patients to be released after a single night of recovery from the four-hour surgery. Of course, extensive physical therapy is still required to train the brain to recognize the new nerve networks, but the psychological benefit that even a modicum of improvement has had on patients has already proven invaluable. Expect more on this one in the near future.

- At the German Center for Neurodegenerative Diseases, an FDA-approved anti-cancer drug called *epothilone B* represents a promising new treatment for spinal cord injuries, as reported in early 2015. Although the research is still in early stages, it has demonstrated cell regeneration in rodents with spinal cord injuries, leading to improvements in motor skills such as balance and coordination. Oftentimes, scar tissue and other factors restrict the body's ability to self-repair at the site of injury. As it stands, this particular therapy requires too many different treatments to justify a valid clinical approach. However, the team seeks to continue its research into how effective the drug may be in combatting different types of injury.

Recent animal based studies also provide a degree of promise in the proper treatment of spinal cord injuries. Delivering a single injection of scar-busting gene therapy to the spinal cord of rats following injury promoted the survival of nerve cells which improved hind limb function within weeks, according to a study in *The Journal of Neuroscience*. The findings suggest that, with more confirming research in animals and humans, gene therapy may hold the potential to improve the lives of individuals suffering from spinal cord injuries. In New Zealand, scientists inserted genes into damaged spinal cord tissue which allowed motor neurons to regrow and restore function.

In addition to restorative therapies, researchers are making progress in the arena of assistive devices intended to help patients move and walk. Post-injury, intensive attention must be paid to avoid muscle wasting and spinal curvature. The sooner a patient's muscles are utilized in a pre-injury manner, the better. There has been great technological advancement in restoring patients ability to walk (albeit in short spans and with significant training) with the use of wearable exoskeletons and robotic locomotive devices. There is promising research involving the use of brain-computer interface technology and EEG feedback to allow a paralyzed patient to walk. While none of these products are currently available outside the clinical or trial arena, there is reason to expect that assistive technology will be available in the future allowing a patient to "walk" or move independently.

Perhaps most intriguing, the Journal of Neuro Engineering has recently published a study where a spinal cord injury patient, using his own brain "power" was able to walk without any robotic

assistance using an EEG based system which takes signals from the patient's brain and delivers them to electrodes on the patient's knees which creates movement—bridging the feedback pathway damaged by the spinal cord injury itself. This study seems to bridge the gap between restorative therapies and assistive walking devices.

The potential that patients may regain function is clearly relevant in the litigation arena. Even limited mobility would ameliorate the ever present risk posed by pressure ulcers and reduce the risk of urinary tract infections, a common and often potentially fatal condition in spinal cord injury patients. Most importantly perhaps, mobility would have an enormous impact on quality of life issues.

There is a great deal of research addressing spinal cord injury patients and quality of life. Generally, the studies suggest a greater degree of satisfaction than most would expect, but there are unquestionably emotional and social stigma issues which are pervasive and erode a patient's sense of well-being. Independence of any kind and the ability to participate with less assistance in daily tasks would clearly impact the psychological and social impact of spinal cord injuries.

A patient's mobility also impacts life expectancy. Presently, spinal cord injury patients have a reduced life expectancy, in large part due to septicemia (associated with pressure ulcers as well as kidney issues) and pneumonia. While patients who are ventilator-dependent have a shorter lifespan than those who breathe independently, any increase in mobility directly correlates to improved health and presumably fewer complications and an increased life span.

Spinal cord injuries are complex and challenging to defend. However, the challenges they pose can be effectively managed if medical and technological developments and treatment options are made part of the case. Experts in the field should be utilized to explain what the state of medical research is, what can be reasonably expected, and how an individual patient may recover.

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Practical Defense Strategies for Clients, Claims, and Counsel to Combat the Impact of Reptile Tactics

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Reptile Theory tactics remain actively used with the plaintiff's bar across the U.S. and such tactics seem to be more than just a passing fad. In response, reptile theory has been a growing topic amongst the defense bar and various seminars throughout the U.S. Where there has been much discussion of the reptile theory, its origins, and the use of such theory by the plaintiff's bar, this paper will focus primarily on some practical applications during the course of investigation, discovery, and through the pretrial/trial phase of a litigated case in an effort to combat the potential negative impacts of such reptile theory tactics.

Many resources are available to gather knowledge about the basic concepts behind the reptile theory. The theory originated from a book authored by a Georgia plaintiff's lawyer, Don C. Keenan and a psychologist, David Law, entitled *Reptile: The 2009 Manual of the Plaintiff's Revolution*. The authors of the book advocate persuading jurors at trial by appealing to their "reptile brains," the "oldest" part of the brain and the part responsible for primitive survival instincts.

While the book itself lays out some strategy and theory for attacking the fear triggers in the minds of jurors, the theory has largely been extrapolated by the plaintiff's bar and put into motion through investigation, discovery, cross-examination, and trial arguments designed to produce greater income for plaintiff's counsel through magnification of jury awards largely based on fear and attempts to elicit jury outrage. Use of reptilian tactics in civil cases involving tractor trailer collisions typically comes with plaintiff lawyers framing pleadings, discovery, depositions, and trial around the action or inaction of the motor carrier and/or the driver rather than focusing on the actual accident or the plaintiff's injury. Generally, in such cases, reptile tactics are focused on (1) establishing the existence of a general or specific danger or safety rule, (2) luring a defense witness into agreeing that such a danger/rule exists, (3) demonstrating how the motor carrier or driver violated the rule or caused the danger, and (4) emphasizing that the motor carrier's and/or the driver's action or inaction "needlessly endangers the community." In theory, the emphasis on a motor carrier's or driver's violation of a safety rule appeals to the jurors' "reptile" brain, and encourages jurors to take action, usually by way of awarding large damages, to protect their community.

While it is not new that the plaintiff's bar attempts to invoke strategies to elicit jury fear and outrage in an effort to magnify damage awards, it is important to identify and anticipate reptile type tactics early in order to establish a procedural defense and prepare to invoke counter measures in an effort to minimize any negative impact of reptile arguments.

Although certainly not inclusive, five suggestions to consider by clients, claims personnel, and defense counsel include: 1) consideration of the potential for reptile tactics when investigating

claims pre-suit; 2) conducting discovery when suit is filed in order to flush out or box in potential reptile tactics and strategies used by plaintiff or plaintiff's bar; 3) preparing all witnesses for reptile questioning and tactics; 4) preparing motions in limine and other pretrial motions to exclude reptile theory tactics; and 5) prepare your oral arguments and trial objections to expose and clearly highlight improper reptilian tactics so as to bar use at trial or at least establish favorable grounds for appellate leverage if needed.

1. Pre-suit Investigation

Pre-suit investigation (if possible) is always key to support viable defenses and this is true in an effort to combat reptile tactics. The building blocks of a reptile strategy in a commercial vehicle case are consistent and focus on an argument of danger in that the defendant's violation of any safety rule, regardless of whether a particular or relevant rule was violated in the underlying case or a direct cause of an accident or harm alleged, is a problem for the jurors to resolve. It is essential a "community" safety campaign meant to trigger emotional self-interested reaction magnifying even small damage cases to favorable plaintiff's verdicts "on a scale that protects the public"

The first stage of investigation should ideally begin with the accident investigation including: obtaining the police report, fire department/first responder reports, ambulance trip reports, accident reports, witness statements, vehicle repair estimates, Carfax information, and photographs of the vehicles and the scene. A thorough investigation of the involved parties involved in the accident including criminal background checks through the Crime Information Bureau (CIB), ISO claim searches, driving history/Motor Vehicle Record (MVR) checks, obtaining and maintaining electronic logging devices ("ELDs") data from the vehicles, and obtaining cell phone/text message records from the day of the accident for both the claimant and the client/defendant driver. It is important to know the claim and accident history of both the claimant as well as the client driver to anticipate reptilian type criticism of the client driver's history and to "fight fire with fire" concerning the history of the claimant.

Statements should be taken from all parties involved in the accident, including any witnesses. Particular detail should be paid to not only the accident but also any conversation or comments that may have followed, which can be indicators of opportunism. Portions of social media sites (for both the claimant and the client driver) available or open to the public should also be inspected and monitored as well for contemporaneous accounts of the accident or continuation of activities after the accident which may support defenses and leverage any reptilian arguments.

It is also important during the investigative phase of the case to identify any applicable policies, procedures or standards used by client companies that employ or engage drivers including driver distraction policies, federal motor carrier safety standards, vehicle/equipment maintenance and inspection policies, state driving rules (i.e. "rules of the road") and especially motor vehicle checks and other background and criminal checks of drivers.

Once applicable policies and procedures are identified it is advisable to begin preparations of drivers, company representatives, and other personnel for discovery and litigation testimony so such defense witnesses are familiar with and prepared to testify concerning the application of policies, procedures, training and that such were carried out as it relates to the driver and equipment involved.

In all phases whether it be presuit discovery or pretrial, it is important to be a giver and not just a receiver when it comes to reptile tactics used. Pre-suit investigation and the discovery phase is also a perfect opportunity to go on the offensive and obtain evidence concerning the plaintiff's driving history as well as training, driver policies and procedures (or the lack thereof) as well as criminal employment and motor vehicle backgrounds for use in giving the claimants/plaintiffs a taste of their own reptilian medicine. Claimants/plaintiffs drive on the same roads and operate similar vehicles and equipment as defendants and therefore safety standards should be no different for plaintiffs as they should for defendants operating on such roads.

2. Discovery

In some instances, reptile tactics will be revealed during the pleadings phase, and in others it will be flushed out during the discovery phase. Typically, a plaintiff intending to employ reptile tactics will utilize the complaint as his or her de facto first discovery request. This is true because in most jurisdictions the scope of disclosures and discovery requests are dictated by the claims and defenses of the parties. Thus, if you see pleadings referencing "violations of safety rules" or "unnecessarily endangering the public or community," you should respond with denials and begin preparing your witnesses for likely reptilian-themed deposition questions. Below is an example of retile theory from an enumerated paragraph in a complaint under a count for vicarious liability against a trucking company employer:

Defendant X and/or defendant Y, through its agents and employees, knew, or should have known by exercising reasonable care, about the risks set forth in this Complaint and that by simply exercising reasonable care these risks would be reduced or eliminated. These risks include, but are not limited to:

a) The risks associated with unsafe and improperly trained drivers;
b) The risks associated with fatigued drivers;
c) The risks associated with violations of the hours of service regulations;
d) The risks associated with failing to train drivers to obey the FMCSR;
e) The risks associated with failing to have adequate risk management policies and procedures in place;
f) The risks associated with failing to have policies and procedures in place to identify undertrained and unqualified drivers;
g) The risks associated with failing to identify from prior wrecks, similar to the one in question, a root cause and implement policies, procedures, protocols, and practices to effectively reduce or eliminate the risk prior to the wreck in the question;
h) The risks associated with failing to appropriately implement and enforce risk management policies and procedures to identify the risks described above;

i) The risks associated with failing to appropriately implement and enforce risk management policies and procedures to reduce and eliminate the risks described above;

j) The risks associated with failure to appropriately implement and enforce risk management policies and procedures to monitor and assess DEFENDANT Z;

k) The risks associated with failing to implement and follow a written safety plan;

l) The risks associated with failing to protect the members of the public, such as the PLAINTIFF, from the risks described above; and

m) The risks associated with failing to use the composite knowledge reasonably available to defendant X and/or defendant Y to analyze the data available to it to identify the risk, take steps to reduce or eliminate the risk, and to protect members of the public from that risk.

Notice how the above "allegations" are bare legal conclusions without factual support. In federal court, pleadings are governed by *Bell v. Atlantic Corp. v. Twombly*, 550 U.S. 544, 127 S.Ct. 1955 (2007) and *Ashcroft v. Iqbal*, 556 U.S. 662, 129 S.Ct. 1937 (2009). In *Twombly*, the Court held that plaintiff must plead "only enough facts to state a claim to relief that is plausible on its face." *Twonbly*, 550 U.S. at 570. In *Iqbal*, the Court made clear that "plausibility" standard of Twombly applies to all cases. The majority opinion also clarified the methodology set forth in Twombly. First, the court ruling on a Rule 12(b)(6) motion ignores "legal conclusions" alleged in a complaint. Second, the court should look to the factual allegations to see if the claim is plausible. Defense practitioners would be advised to follow a similar procedure when answering reptilian complaints. (See *Drake v. Old Dominion Freight Line, Inc.*, 2016 WL 1328941 for an example of a federal court striking plaintiff's claim for negligent hiring, retention, qualification, supervision, and training due to a lack of factual support.)

If a plaintiff brings claims such as negligent hiring, retention, training, supervision, or entrustment, and these claims are permitted to stand, these claims oftentimes render evidence of prior incidents or accidents discoverable and sometimes admissible based upon knowledge or absence of mistake. (The reptile theory with these type claims focuses on triggering a fear/outrage reaction from the jury through evidence of safety rule violations or the perception that rules are systematically or habitually not followed or instead that companies have no rules or insufficient rules).

Therefore, the first step towards thwarting reptile tactics in the discovery phase is use discovery to isolate or limit evidence to only the accident or incident at issue. This can be accomplished through carefully crafted written discovery, requests for admissions, and thorough cross-examination of the plaintiff and other witnesses. Further, when responding to the plaintiff's reptilian discovery requests, respond with objections and facts and context to support defenses and bring to light plaintiff's improper reptile arguments as well as facts and arguments which may be unfavorable to the plaintiff's position.

The goal of aggressive discovery pursuits would be to support a motion to dismiss, motion for summary judgment, or motion to strike evidence of unrelated accident/incidents or policies/procedures which have nothing to do with the accident at issue. Oftentimes, early motions

of this nature are successful because many corporate negligence and punitive damages claims lack factual support and simply recast boilerplate elements and legal conclusions. The plaintiff's burden many times at the pleading stage in defending such a motion is establishing that the complaint contains sufficient facts "to state a claim to relief that is plausible on its face." Assuming your jurisdiction follows this pleading standard, motions to dismiss punitive damages and direct corporate negligence claims should always be filed in each and every instance where the complaint lacks adequate factual allegations. Moreover, once these claims have been dismissed, other incidents and accidents become far less likely to be relevant to the claims at hand, and, therefore, less likely to be admitted as evidence. Narrowed scope of pleadings and issues may take away some of the heat associated with reptile tactics and arguments.

3. Preparing witnesses for deposition testimony

In most instances, the reptile tactics take hold during the deposition of the defendant's corporate representative, the defendant driver, and other representatives of the defendant company. This is the point in time when the plaintiff's attorney begins establishing safety rules to later serve as the basis for plaintiff's counsel to argue at trial in an attempt to invoke a sense of fear into jurors. During the defendant corporate representative's deposition, common retile tactics can usually be found with hypothetical questions and questions in which the plaintiff's attorney asks the defense witness to "agree with plaintiff's counsel" about what may seem like common sense generalities about public safety. Below are some examples:

"You would agree with me that hiring someone with prior accident history is not as safe as hiring someone with a clean record?"

"You would agree that a truck driver and a company employing or engaging truck drivers should not needlessly endanger the public?"

"You would agree with me that failing to look both ways before pulling into an intersection needlessly endangers the public and community?"

[to the defendant driver] "Do you drive as carefully at other times as you did when you were driving and hit my client, the plaintiff?"

When being put to use, you will see reptile tactics asked in broad hypotheticals. However, because lay witness testimony must always be rationally based upon his or her perceptions, any hypothetical posed to a fact witness should be followed with an immediate objection.

Careful and lengthy preparation of all defense witnesses should be implemented throughout the litigation in anticipation of reptilian cross-examination tactics.

4. Preparing motions in limine and other pretrial motions

Several courts have begun to recognize these reptile themes and tactics as improper efforts to elicit juror passion and prejudice that seek punitive verdicts against defendants on the basis of fear. *See e.g. Brooks v. Caterpillar Global Mining Am.*, No. 4:14-cv-00022-JHM, 2017 U.S. Dist. Lexis

125095, at *24-25 (W.D. Ky. Aug. 8, 2017); *Big-low v. Eidenberg*, No. 112,701, 2016 Kan. App. Unpub. Lexis 285, at *39-40 (Kan. Ct. App. Apr. 15, 2016) (per curiam); *Hopper v. Ruta*, No. 12cv1767, 2013 Colo. Dist. Lexis 249, at *1 (Colo. Dist. Ct. Oct. 29, 2013); *see also Turner v. Salem*, No. 3:14-cv-00289-DCK, 2016 U.S. Dist. Lexis 1022389, at *7 (W.D.N.C. July 29, 2016) (discouraging "reptile theory" arguments but reserving ruling for specific objections at trial). However, most jurisdictions have a high standard for an order excluding evidence before trial, requiring that the evidence be "inadmissible on all potential grounds." E.g., *Efight ex rel. Wright v. Watkins & Shepard Trucking, Inc.*, 2:11-cv-001575-LRH-GWF, 2016 U.S. Dist. Lexis 6530, at *2 (D. Nev. Jan 19, 2016) (granting defense motion to exclude "golden rule" arguments). Pinpointing particular questions, evidence, or argument as inadmissible is the first step necessary to satisfy this standard.

Recent decisions denying defense motions in limine to exclude "reptile" evidence and arguments provide some basic guidance for researching and writing more effective challenges. One key takeaway is that failing to identify specific evidence, questions, or arguments for exclusion, or failing to articulate specific evidentiary grounds showing inadmissibility may be fatal to any effort to obtain a pretrial order precluding more generalized "reptile" theory or arguments at trial. It is important to note that "reptile" is not a category of evidence but a strategy by plaintiff's counsel for eliciting fear. The mere fact that a type of evidence or argument can be used as part of a reptile theme or theory supplies no evidentiary grounds for a court to exclude it. Therefore, it is more likely than not that a court would deny "stock" motions to generally or unambiguously exclude an umbrella style reptile category no matter how well defense counsel explains reptile strategy to the court. Accordingly, it is important to provide the court with specific examples of questions, testimony, opinions, or arguments made by plaintiff's counsel based on the discovery records or prior examples from trial transcripts or deposition transcripts of such reptile arguments or theory which should be precluded at trial.

<u>Identify Specific Evidence or Argument for Exclusion</u>

A federal district court in Tennessee recently recognized that reptile theory is used by the plaintiff's bar in some states as a way of showing the jury that the defendant's conduct represents a danger to the survival of jurors and their families. *Hensley v. Methodist Healthcare of Memphis Hosps.*, No. 2:13-cv-02436-STA-cgc, 2015 U. S. Dist. Lexis 113565, at *13-14 (W.D. Tenn. Aug. 27, 2015). The court further described it as an "appeal to the passion, prejudice, and sentiment of the jury." *Id.* But despite skepticism of reptile tactics, the court denied the defendants' motion in limine categorically requesting exclusion of techniques and "scare tactics" consistent with reptile theory because the defendants have again not identified the specific evidence that is sought to be excluded.

As a Georgia district court explained, "[t]o the extent that defendants seek to preclude plaintiffs from engaging in the reptile tactics, this request is unnecessary and overbroad. *Bunch v. Pac. Cycle, Inc.,* No. 4:13-cv-0036-HLM, 2015 U.S. Dist. Lexis 183890, at *6 (N.D. Ga. Apr. 27, 2015). Accordingly, it is important to identify the specific evidence sought to be excluded.

The following lines of authority are examples of exclusion or limiting particular evidence or arguments commonly offered as part of a reptile strategy. These are just examples of pretrial opportunities that defense counsel may wish to use to limit the foundation for a plaintiff's reptile theme. Of course jurisdiction specific research must be conducted to identify the best possible authority to bar or limit reptilian strategy.

Needless endangerment questions or hypothetical questions suggesting danger to non-plaintiffs.

Recent authority for precluding questions suggesting that certain conduct "needlessly endangers" the public include: *Pracht v. Saga Freight Logistics, LLC,* No. 3:13-cv-00529-RJC-DCK, 2015 U.S. Dist. Lexis 149775, at *4 (W.D.N.C. Oct. 30, 2015); *Big-low,* 2016 Kan. App. Unpub. Lexis 285, at *39; and *Hopper*, 2013 Colo. Dist. Lexis 249, at *1. In *Pracht*, the district court granted a motion by a motor carrier and its driver to bar the plaintiff's counsel from questioning defense witnesses in a way that suggested that jurors put themselves in the plaintiff's position or implied that the defendants were a danger to the public or a threat to the community. *Id.*; Defs' Omnibus Mot. In Limine 3-4, *Pracht v. Saga Freight Logistics, LLC,* No. 3:13-cv-00529-RJC-DCK, ECF No. 102 (W.D.N.C. Oct. 8, 2015). Questions specified in the motion and barred by the court's order granting the motion included the following:

Driving down the highway when you know you are fatigued and have not received proper rest needlessly endangers the lives of other people, doesn't it? Based on all your experience, familiarity with trucks and truck accidents, do you believe that a driver who knowingly violates the hours or service regulations is needlessly endangering other people on the highway?

The defendants argued effectively that such questions are irrelevant, violate prohibitions against "golden rule" arguments asking jurors to put themselves in the position of the injured party, are improper, under long standing bars against speculative proof of liability and damages, and improperly invite decisions based on decisions based on emotions and prejudice rather than on facts.

For the same legal reasons, a line of questioning designed to focus on harm that could have occurred to community members other than the public is equally improper. Defense counsel for a trucking company driver effectively illustrated this tactic in a recent motion in limine by quoting a series of questions by plaintiff's counsel:

Somebody could be hurt?
Somebody could be killed?
A child could be run over?
Mom could be run over?
A grandparent could be run over?
A wife could be run over?

Defs.' Mot. In Liminie No. 1 3-4 *Haley v. Westfreight Sys., Inc.*, No. 3:15-cv-1161-JPG-SCW, ECF. No. 79 (S.D. Ill. Feb. 15, 2017).

The above example questions "invoke the underpinnings of the golden rule arguments" that "seek to have jurors decide a case, not on the evidence presented at trial as instructed, but rather on the potential harms and losses that could have occurred within the community." *Id.* A federal district court agreed with a similar argument explained that "asking the jurors to put themselves in Plaintiffs' position and make a judgment based on that hypothetical reality amounts to improper 'golden rule' arguments." *Sialoi v. City of San Diego*, No. 3:11-cv-02280-JLS-KSC, 2016 U.S.Dist. Lexis 145013, at *4 (S.D. Cal. Oct. 18, 2016). Such arguments are "irrelevant to the actual damages alleged" and "have a substantial likelihood of unfairly prejudicing the jury" because they "may encourage the jury to render a verdict based on personal interest and bias rather than on the evidence." *Id.* (granting in part Defs.' Mot. In Limine No. 1 to Preclude "Golden Rule" Arguments Framed as References to or Arugments About "Public Safety or "Community Safety," *Sialoi v. City of San Diego*, No. 3:11-cv-02280-JLS-KSC, ECF No. 83 (Sept. 23, 2016)).

References to company policies/procedures as "Safety Rules"

Two decisions by the court of appeals in Kansas are especially on point and both provided persuasive rationale for excluding "safety rules" references that could be argued in a jurisdiction without such direct authority. In *Lanam v. Promise Reg'l Med. Ctr.-Hutchinson, Inc.* the district court issued a pretrial order barring a medical malpractice plaintiff from referring to the defendant's policies and procedures as "safety rules." No. 113,430, 2016 App. Unpub. Lexis 18, at *5-7, 19-24 (Kan. Ct. App. Jan. 8, 2016) (per curiam). While the plaintiff would be allowed to indicate that the purpose of the policies and procedures was patient safety, the district court required that the policies be referred to as what they were "policies and procedures." References to "safety rules" risked that "the jury would conflate the standard of care with an alleged safety rule," the trial court reasoned and the appellate court agreed. The plaintiff's counsel violated the order by referring to "the safety requirements that protect patients" during the opening statement. Finding this language synonymous and equally likely to prejudice the jury, the appellate court affirmed the district court's decision granting a mistrial. Similarly, in *Biglow v. Eidenberg*, the Court of Appeals of Kansas affirmed the trial court's pretrial ruling requiring plaintiff's counsel to instruct witnesses not to respond to questioning "with any derivative of the word 'safe' or the phrase 'needlessly endangering a patient'" with to refrain from using such language in closing argument. 2016 Kan. App. Unpub. Lexis 285, at *39-42, 45-47. The terms were inconsistent with a doctor's "legally defined duty of care," the trial and appellate courts found. Moreover, it would be easy for the jury to interpret such language from counsel in closing as a golden rule argument.

In some cases, however, the type of case of the jurisdiction's prior authority allowing "safety" language will make some reference to "safety rules" at trial inevitable. In a product liability case, a federal district court recently declined to enter a broad order requested that would have barred safety prevention references. "Certainly, it would be hard for plaintiffs to prove the product

is defective if they cannot say it was unsafe or dangerous," the court wrote. *Bunch*, 2015 U.S.Dist. Lexis 187687, at *6-7. The court barred a narrow category of safety related arguments, ordering that plaintiffs' could not "argue that this lawsuit was brought to ensure or promote community safety." *Id.* At *7.

"Rule" terminology necessarily implies a "duty." Language defining the defendant's actual duty of care is an essential starting point for any argument to exclude or to limit "safety rule" references. Most jurisdictions have negligence *per se* case law describing the only source of legal duty – generally, a statute, an ordinance, or a regulation would define negligence per se. A plaintiff's counsel may attempt to multiply the list of suggested "rules" by other means, such as answers to deposition questions, opinion or a retained expert, or a driver training manual or internal policy.

Jurisdictions may also vary in their treatment of the admissibility and legal consequence of a driver's manual, a training handbook, or an internal company policy. It is essential to compare the plaintiff's intended use of such source with decisions from that jurisdiction on admissibility and legal consequence of such materials. For example, in some states a manual or policy is inadmissible because it lacks the source of law, whereas in others it may be admissible as evidence of the standard of care or whether a defendant met the standard but should not operate to create a duty where the law imposes none.

Truck drivers subject to a higher, "Professional" standard of care

Arguably, no proposed heightened standard of care for commercial drivers should reach a jury in most jurisdictions. Many courts across the country have rejected plaintiff's suggestion that a commercial driver is a "professional driver held to a higher standard of care. *E.g., Fredericks v. Castora*, 360 A.2d 696, 697-98 (Pa. Super. Ct. 1976) (per curiam); *Dahlgren v. Muldrow*, No. 1:06-cv-00065-MP-AK, 2008 U.S. Lexis 4103, at *18-19 (N.D. Fla. Jan. 18, 2008); *Townsel v. Dadash, Inc.*, No. 05-10-01482-CV, 2012 Tex. App. Lexis 3185, at *9-10 (Tex. App. Apr. 24, 2012; *Calahan v. May Trucking Co.*, No. 1:11-cv-00214-NDF, 2012 U.S. Dist. Lexis 189853, at *13-15 (D. Wyo. Aug. 28, 2012); *Angulo v. Santillanes*, No. 1-12-2685, 2013 Ill. App. Unpub. Lexis 617, at *9 n.1 (Ill. App. Ct. Mar. 27, 2013); *Botey v. Green*, No. 3:12-cv-01520-RDM, at *6-8 (M.D. Pa. June 8, 2017). In Georgia a motorist has a duty to exercise ordinary care in the operation of a motor vehicle upon the highways. This standard applies to both non-commercial and commercial drivers. *Rios v. Norsworthy*, 266 Ga. App. 469, 597 S.E.2d 421 (2004). It is also noted that Louisiana is somewhat of a rare exception. *See Davis v. Witt*, 851 So.2d 1119, 1128-29 (La. 2003).

Likewise, the "size, type, and kind of truck being driver" does not impose on the driver "a duty to exercise more than ordinary care." *Assoc. Petroleum Carriers, Inc., v. Beall*, 217 F.2d 607, 608 (5th Cir. 1954). *Accord Lemons v. Maryland Chicken Processors*, 164, A.2d 703, 706 (Md. 1960) (no different test of negligence applies to the operation of "large, heavy and unwieldy vehicles").

One reptile tactic used by plaintiffs is to elicit testimony or introduce training materials stating that a commercial driver has a duty to be constantly aware or to maintain a constant vigil and

that a driver must anticipate and see any potential hazard. Arguably, this is prejudicial because it suggests that the mere occurrence of an accident is proof of a commercial driver's negligence and adjusts the standard of care closer to a strict liability standard. Because a relevant standard of care is the duty to exercise ordinary care under the circumstances, and a driver "cannot be found negligent merely because he could have prevented the collision if he had exercised a heightened degree of care," expert opinions and other evidence suggesting a constant awareness requirement should arguably be excluded. *Rios v. Norsworthy*, 597 S.E.2d 421, supra.

Suggestion of a "Safest Possible" standard of care

Decisions expressly rejecting the "safest" conduct as a measure of a negligence defendant's standard or care may provide some leverage in motions in limine. *E.g., Johnson v. Nat'l Sea Prods., Ltd.,* 35 F.3d 626, 632 (1st Cir. 1994) (defendant alleged to have loaded pallets into trailer negligently was not required to package and palletize its cartons "in the safest possible way"); *Biglow*, 2016 Kan. App. Unpub. Lexis 285, at *47 ("exercise of ordinary care and diligence does not necessarily require the safest option"). Not even a common carrier owes its passengers the "safest" conduct, nor does a manufacturer subject to strict liability have a duty to provide the "safest" product possible. Under the case law so holding, an under authorities simply setting forth a defendant's "reasonable" or "ordinary" standard of care, questions or argument by plaintiff's counsel or testimony by plaintiff's expert suggesting defendant's responsibility or failure to do what was "safest" should arguably be inadmissible.

Arguments as to community "Values" and arguments that jurors stand for the safety of the community

Arguments made by plaintiff counsel attempting to appeal to jurors to "bring justice" by applying "the values of the community" or acting as the community "conscience" have become common reptile tactics. While some jurisdictions may permit such arguments (at least without a direct link to the amount of money the jury should award), at least one federal district court reiterated that "'[s]end a message' or conscience of the community arguments are disfavored in the Sixth Circuit" because they "can have no appeal other than to prejudice" and amount to "improper distraction from the jury's sworn duty to reach a fair, honest and just verdict." *Brooks,* 2017 U.S. Dist. Lexis 125095, at *22-23 (quoting *Strickland v. Owens Corning,* 142 F.3d 353, 358-59 (6th Cir. 1998)). *Accord Westbrook v. Gen. Tire & Rubber Co.,* 754 F.2d 1233, 1238-39 (5th Cir. 1985). It is also noted that "voice/consciousness of the community" arguments and arguments telling a jury that they, along with the courthouse/courtrooms, exist to keep the community safe are also disfavored in several venues. *Smith v. Courter*, 531 S.W.2d 743, 747 (Mo. 1976) (Improper for plaintiff's counsel to ask jurors to speak out on social issues through their verdicts.); *Regalado v. Callaghan*, 207 Cal. Rptr. 3d 712, 725-26 (Cal. Ct. App. 2016) (Because it panders to jurors' prejudice, passion, or sympathy, such argument is forbidden, the California appellate court explained, calling closing argument appeals to jurors' self-interest "improper" and "misconduct.")(quoting *Cassim v. Allstate Ins. Co.,* 16 Cal. Rptr. 3d 374 (Cal. Ct. App. 2004)). *Accord Landrum v. Conseco Life Ins.,* No. 1:12-cv-00005-HSO-RHW,

2014 U.S. Dist. Lexis 188, at *17-18 (S.D. Miss. Jan. 2, 2014); *Norton v. Nguyen,* 853 N.Y.S.2d 671, 674 (N.Y. App. Div. 2008) ("it is inappropriate to refer to the jury as the `conscience of the community'").

Asking jurors to "Send a Message"

When only compensatory damages are available, statements asking the jury to "send a message" with the verdict are "intended to inflame and prejudice the jury," improperly invite punitive use of compensatory damages, and "should never be allowed." *Janssen Pharmaceutica, Inc. v. Bailey,* 878 So. 2d 31, 62 (Miss. 2004). *Accord Bunch,* 2015 U.S. Dist. Lexis 187867, at *6. The courts in Georgia have condemned send-a-message arguments as improper and highly prejudicial. *Central of Georgia R. Co. v. Swindle*, 260 Ga. 685, 398 S.E.2d 365, 367 (1990); *Gielow v. Strickland*, 185 Ga. App. 85, 363 S.E.2d 278, 279-80, cert. denied, 185 Ga. App. 910 (1987).

Some courts also treat "send a message" arguments together with "conscience of the community" references and exclude both for the same reason: that both "urge the jury to render its verdict based upon passion and prejudice and not the facts and evidence presented at trial." *Landrum,* 2014 U.S. Dist. Lexis 188, at *17-18. *See also Ervine v. Desert View Reg'l Med. Ctr. Holdings, LLC,* No. 2:10-cv-01494-JCM-GWF, 2017 U.S. Dist. Lexis 148520, at *9-11 (D. Nev. Sept. 13, 2017) (granting defendants' motion in limine and excluding "inappropriate argumentation," including arguments that the client's cause is just, that jurors should place themselves in the plaintiff's shoes, and that jurors should "send a message" with a high verdict). The authorities and rationale for exclusion apply equally to statements telling jurors to "speak" or "announce" with their verdict.

"Send a message" arguments should be challenged as improper when punitive damages are unavailable and may be challenged even when a punitive damage claim is supported by the evidence. In Florida, even when punitive damages are at issue, "a plaintiff may not utilize 'send a message' and conscience of the community arguments when discussing whether the plaintiff should be compensated, due to the potential for the jury to punish through the compensatory award." *R.J. Reynolds Tobacco Co. v. Gafney,* 188 So. 3d 53, 58 (Fla. Ct. App. 2016).

Other areas where plaintiff's counsel may present arguments which could be a basis for an exclusionary motion in limine may be found in opposition to summary judgment or other pretrial motions as well as expert disclosures or portions of expert reports, especially those reports or expert opinion disclosures related to safety, and in the specific context of trucking, other HR hiring practices and MVR background and training procedures. Careful pretrial review of the evidence is necessary to carefully craft motions in limine to give the best shot at exclusion of reptile tactics in advance of trial.

5. Trial arguments and objections

Of course it can be difficult in advance of trial to show plaintiff's counsel intent to offer a particular argument to the jury as discovery records will not normally include a preview of plaintiff's counsel opening or closing arguments or demonstrative exhibits plaintiffs may seem to use at trial.

This is why it is important to, if possible, obtain examples of plaintiff's counsel's opening and closing arguments from other cases based on trial transcripts which may be available and provide a basis for argument that reptile tactics during voir dire, opening, and closing should not be used.

If for some reason the plaintiff is allowed use of reptile arguments at trial, consideration of a counter-reptile attack. If a plaintiff is permitted to introduce reptilian arguments and evidence to attack the safety history or character of the defendants then submit rebuttal evidence. This can be done through use of the plaintiff's driving history, training, experience and former/current employment. There may also be consideration for use of past customers testifying about their positive experiences with the defendant/defendant driver, experts testifying about how the defendant company has reasonable practices and procedures in place to make the company as safe as possible, or through company employee and customer testimony that the defendant company is caring and diligent in its practices and procedures.

While reptile tactics are not necessarily a new creation, the use of such by plaintiff's counsel has increased in an effort to magnify damages and recovery in litigated cases. The tactics and defenses to the same are numerous. The reality is that there is may not be a "one size fits all" approach, as every case must be evaluated upon its merits, with all evidence being considered. However, the reptile tactics have proven to be effective and are likely here to stay. Accordingly, it is important to recognize such tactics and engage in efforts as early as possible in the investigation, discovery, and pre-trial phase of the litigation in an effort to gain leverage and fight back the impact of such tactics.

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…And the Drone Wins

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1. FACT SCENARIO

It is a clear, bright day. A utility truck bears left as it approaches a curve along a two-lane, undivided rural highway. A motorcycle approaches the same curve from the opposite direction, traveling slightly uphill. Neither vehicle has a clear view of what is around the bend due to lush vegetation lining the roadside. This combination of factors proves to be disastrous.

During trial, the motorcyclist (as Plaintiff) claimed the truck crossed the center line coming around the curve, causing him to take evasive action to avoid imminent collision. As a result, he lost control of the motorcycle and was thrown beneath the oncoming truck. The truck driver (as Defendant) denied the claim and asserted his vehicle stayed in its lane, presenting no hazard. There were no witnesses.

The Plaintiff's expert used laser scanner technology during the investigation. The scanner unit was set up according to the motorcycle's point of view at the curvature of the road. In his testimony, the expert claimed the only probable way the accident could have happened was a scenario where the truck veered across the central double line.

The Defendant's expert also used laser scanner technology but augmented the findings with data from an unmanned aerial vehicle (drone) to get a more comprehensive view of the terrain approaching the curve.

A battle of the experts ensued. Ultimately, they would have to make the determination: Was this a left-of-center or a line-of-sight issue?

We will present the direct examination of the Defense expert to resolve the conflict. The expert will explain the basis of the two investigations and explain the findings to reveal the most likely cause of the accident.

2. DIRECT EXAM PE INVESTIGATOR

a. Qualifications

b. Site Investigation

i. Total Station

ii. Laser Scanning

iii. **Unmanned Aircraft System**

c. **Plaintiff Used Laser Scanning**
   i. **Result**

d. **Defendant Used Unmanned Aircraft System**
   i. **Result**

e. **Advantages**
   i. **Time Spent**
   ii. **Expenses**
   iii. **Personnel**
   iv. **Safety**
   v. **Does Not Intrude on Law Enforcement Investigations**
   vi. **Short Time to Reconstruct Scene Into 3D Video**

f. **Animation**

3. **CONCLUSION**

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USE OF VIDEO SURVEILLANCE IN LITIGATION: STRATEGY AND TACTICS

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The use of video surveillance in personal injury litigation can be an effective tool in helping to resolve cases prior to trial. Jurors find video evidence easy to understand and at times entertaining when contrasted to a plaintiff's testimony. The use of video to attack the plaintiff's credibility if very effective if handled properly. The strategy of how and when to utilize surveillance is typically determined on a case by case basis by the claims professional and legal counsel based on their combined experience, the law and rules of procedure applicable in the particular jurisdiction. We have included as part of this paper a compendium of the law in all 50 states regarding the legality of surveillance in each jurisdiction as well disclosure requirements prior to trial.

METHODS OF VIDEO SURVEILLANCE

Improvements in technology have considerably improved the quality and effectiveness of video surveillance in recent years. Most plaintiff counsel warn clients to be aware of their surroundings and assume that the defendant will have an investigators surveil plaintiff at some point in the life of the case. Most surveillance video footage is obtained by private investigators. However, the availability of closed circuit cameras used for security, social media and other technology have increased the parameters of potential data available. License plate recognition cameras have allowed private companies (such as TransUnion) to compile databases allowing insurance investigators to spot vehicle patterns and most likely locations to search for subjects of an investigation. This information can reveal travel patterns, which may in turn lead to information about undisclosed activity or employment. Some investigators have deployed unmanned cameras in vehicles to reduce the suspicion level of the previously warned plaintiffs with the added benefit of reducing the expense of the investigation.

PLAINTIFF USE OF VIDEO SURVEILLANCE

Some plaintiff attorneys have been creative in turning the surveillance table on defendants by employing investigators in cases where the issue of adherence to regular equipment maintenance practice and procedures is disputed. For example, in a trucking incident caused by mechanical failure the parties disputed whether the failure could have been anticipated or was the result of improper maintenance. The plaintiff attorney hired an investigator to surveil the truck driver's daily activities in pre-trip maintenance and inspection to refute the driver's testimony. Defendants should take note of the possibility of counter-surveillance by the plaintiff and take appropriate precautions.

STRATEGY IN DEPLOYING SURVEILLANCE

A number of considerations are involved in the decision to obtain video surveillance

- Cost/benefit compared to overall value of the claim
- Coordination with the investigator with detailed instructions
- Budgeting investigation efforts
- Proper timing in the life of the case
- Compare and contrast before and after IME exams
- Timing to determine whether plaintiff is working or engaged in inconsistent activity
- Utilize other resources such as neighbors, co-workers, ex-spouses who have knowledge of plaintiff activity
- Long weekend and holiday potential for inconsistent activity by plaintiff

DISCLOSURE OF SURVEILLANCE EVIDENCE

The attached compendium summarizes the disclosure rules for each jurisdiction. Generally, video footage may be protected and privileged work product to the extent that it is not intended to be used by defendant at trial. Many jurisdictions require production of the video in response to proper discovery requests. Some differ as to whether the plaintiff is entitled to production of the video before their deposition or first given an opportunity to be truthful about their level of physical ability. Some courts frown on late production of video evidence if there is unfair surprise and/or failure to properly disclose in discovery. Late production of video as a defense strategy must be weighed against the expense of the surveillance of exercise and the risk that those efforts will to no avail if late production results in exclusion of the evidence.

AUTHENTICATION VIDEO EVIDENCE

The video evidence will need to be "proven up" in order to be admitted as evidence at trial. Ensure that you investigator is available to prove up the video at trial. This will include establishing the qualifications of the investigator who took the video, the activity filmed, the reliability of the equipment used, chain of custody of the video and accuracy of the video depicting the activity observed.

PHYSICIAN COMMENT ON SURVEILLANCE

Use of video surveillance can be useful when shown to medical experts and eliciting opinions as to nature and extent of any injury and causation. Most medical experts are reluctant to put their professional reputation at risk when confronted with video evidence that is inconsistent with a plaintiff's complaints and history of physical restrictions described to the medical expert.

PLAINTIFF ATTACKS ON SURVEILLANCE

Plaintiff attorneys tend to counter video surveillance with a number of strategies that defendants should be prepared to encounter and rebut.

- Characterization of the surveillance as an invasion of privacy
- Cross-examine the investigator as someone who "sneaks" around "spying"
- Attack the license and credentials of the investigator

- Video is heavily edited and does not include
- Plaintiff has good days and bad days and video is one of the good days
- Video not timely produced
- Require production of all video footage taken
- "impeachment" video is a short compilation over a lengthy period of time

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What's Next? The Autonomous Vehicle Revolution Expands to Trucks

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The transportation revolution is here! Fasten your seatbelts!
The race is on for the mass rollout of self-driving, autonomous vehicles (AVs). Google (now Waymo) and Nissan hope to get there by 2020. Ford and Volvo hope to have a fully autonomous vehicle on the road by 2021. You have probably begun to take more than a passing glimpse at the seemingly daily news articles about AV technology. The reality is that the technology is here (subject only to being fine-tuned), but the current federal and state regulatory schemes (or lack of them) are causing confusion and delays. In other words, our existing automobile laws are becoming more outdated day-by-day as AV technology continues to advance, and these outdated laws are creating barriers to the development, testing and deployment of AVs.

While the "non-traditional" auto manufacturers (Google/Waymo, Apple, Uber, Tesla) raced to take a quick lead in the public's eye on AV technology, the major auto manufacturers quickly ramped up their AV development to keep the pace. Now, GM, Ford, Toyota, Nissan, Volvo, BMW, Mercedes, and Audi are all in the race to see which one can bring AVs to the commercial market first. Traditional auto parts suppliers such as Continental, known for its tire division, are also pioneering innovations in the autonomous vehicle race. Continental opened a Silicon Valley business unit called "Continental Intelligent Transportation Systems" in 2014.

The race has resulted in a series of mergers, acquisitions, and partnerships among the auto manufacturers and a variety of start-ups, software companies, and product suppliers. For example, GM recently invested $500 million in ride-share company Lyft, and then it invested $1 billion to purchase Cruise Automation, a self-driving vehicle startup. Among technology and software companies, Intel recently acquired Mobileye, and Nvidia is providing self-driving software to Audi. In May 2016, Google announced the construction of a 53,000-square-foot facility in Michigan, to test its AV technology, and Google/Waymo is testing its self-driving cars in Phoenix through its "early rider" program. Toyota recently announced a $1 billion investment in its AV program. Uber is operating autonomous cars in Phoenix and Pittsburgh, and it acquired self-driving truck start-up Otto in August 2016 in a deal reportedly valued at about $680 million. As a group, several of the companies recently banded together to form the Self-Driving Coalition for Safer Streets, a lobbying group, to ensure that AVs hit the market sooner rather than later. The coalition is promoting one clear set of federal laws, which they intend to help develop, as the best way to evolve the technology.

Why All the Fuss?

Safety is the reason for all this attention. There were about 40,000 deaths in the United States in 2016, due to automobile accidents (an increase of 6 percent), including some 4,000 fatalities (11 per day) related to truck and bus crashes. In addition, there were 2.5 million injuries and over 6 million accidents. And more than 90 percent of those accidents were caused by human error. Estimates show that AV technology could reduce traffic deaths by about 80–90 percent. So the obvious problem is the human driver. Humans get tired, sleepy, and distracted, they text, they look at

Facebook . . . and they drink. In fact, one theory is that our children and grandchildren will look back one day with shock and disbelief as they consider the number of deaths and accidents during the first 100 years of the automobile when we actually drove them ourselves! On the other hand, the recent, highly publicized, Tesla accident in Florida, believed to be the first fatality involving a vehicle in autonomous mode, has been a wake-up call to the industry. But statistically, Tesla points out that its autopilot mode, when used in conjunction with driver oversight, reduces driver fatigue and is still safer than purely manual driving. Tesla also notes that its system was still in the beta-testing phase and that it provided warnings to the drivers that they remain engaged and ready to take the wheel.

Other benefits expected to come about as a result of AVs include reduced traffic congestion, off-site parking, fewer cars on the road, and less individual car ownership, as our society moves to a ride-hailing and ride-sharing mentality. Who wants the cost, maintenance, and insurance expenses and the other hassles of car ownership when your vehicle sits unused in the garage depreciating 90 percent of the time? Studies show that the members of our younger generation do not want to be bothered with driving anyway. They much prefer the freedom to text and use social media. And AVs will give new freedom to the elderly and people with disabilities.

How Will It Work?

The AVs are loaded with radar, lidar, cameras, sensors, software, maps, and computers with 360-degree awareness that can see around corners and over hills and otherwise anticipate things that humans cannot, and they can react faster. And the AVs will be connected to each other by vehicle-to-vehicle (V2V) technology, and to the world around them by vehicle-to-infrastructure (V2I) technology, via dedicated, short-range communication (DSRC) links to a wireless spectrum band similar to Wi-Fi. The merger of these technologies will allow the AV to become part of an integrated transportation ecosystem. In fact, the National Highway Traffic Safety Administration (NHTSA) proposed a rule mandating the deployment of connected V2V communications in December 2016.

One of the biggest debates among the manufacturers is how much autonomy the car needs to have and whether to pursue "semi-autonomy," (meaning that the human driver must take over in emergency, i.e., GM), or "full autonomy," (meaning no steering wheel, no brake pedals, i.e., Google). Google argues that semi-autonomy is actually more dangerous because the whole point is to remove the humans from behind the wheel, since humans cannot be relied upon to act quickly enough in emergency situations.

Federal Regulation and Guidance

With the backing of the federal government, the manufacturers and the states have the support to move the AV technology, testing, and development along at a brisk pace. President Obama carved out $4 billion in the 2017 budget for AV development, and NHTSA is bullishly advocating for AVs. To circumvent the patchwork of various state laws that are already developing, the U.S. Department of Transportation (DOT) and NHTSA have issued two recent operational guidelines for AV testing and regulation and a "model" policy for the states to help end the mish-mash of regulations that threaten to stymie the development of AVs.

Federal Automated Vehicle Policy

The first proposal by NHTSA was a 116-page policy, entitled, "Federal Automated Vehicle Policy—Accelerating the Next Revolution in Roadway Safety" (FAVP), which was released during the Obama administration on September 20, 2016, and was intended to serve as a guideline to establish a foundation and a framework upon which future DOT/NHTSA action would occur. This first policy, divided into four sections, identified which aspects of AV regulation would be uniform, and which would be left to the states' discretion. The guideline, which uses the term "HAVs" (highly automated vehicles), focused on safety, acknowledging that there were over 35,000 deaths on U.S. highways in 2015, 94 percent of which were caused by human error or bad decision making. This initial regulatory framework served as a "best practices" to guide manufacturers in the safe design, testing, and deployment of HAVs. In keeping with NHTSA's "ambitious approach to accelerate the HAV revolution," and its desire "to be more nimble and flexible," the policy was expected to be updated annually, if not sooner.

"A Vision for Safety"

Accordingly, a year later, the DOT in cooperation with NHTSA, under the Trump administration, issued a new federal AV policy on September 12, 2017, entitled, "Automated Driving Systems: A Vision for Safety 2.0" (A Vision for Safety), replacing the FAVP. The non-regulatory framework refers to automated driving systems (ADSs), whereas the original guideline referred to highly automated vehicles (HAVs). The new NHTSA guideline continues to adopt SAE International's six automation levels (levels 0–5), specifically focusing on vehicles falling within Levels 3 through 5, which are considered to be "conditional," "high," and "full automation," and include vehicles with no human driver. The new policy is "technology neutral" in that it does not favor traditional auto manufacturers over software companies; rather, it encourages one and all to enter the space to develop the AV technology sooner.

A Vision for Safety is a much leaner, 36-page document with only two sections. Section 1, "Voluntary Guidance," offers recommendations and suggestions by NHTSA for industry discussion among designers of ADSs to help analyze, identify, and resolve safety considerations with regard to design best practices before deployment. The new policy simplifies the process for manufacturing, testing, and deploying AVs, and it discourages the states from drafting conflicting legislation of their own. The policy attempts to strike a balance among competing groups by giving the manufacturers the flexibility that they need to allow the private sector to lead the charge on technology, while maintaining federal oversight over the process to appease the critics who are voicing safety concerns over the new technology. As for trucks, the "Voluntary Guidance" section notes that interstate motor carrier operations and commercial drivers continue to fall under the Federal Motor Carrier Safety Administration (FMCSA).

While NHTSA will be responsible for regulating the safety, design, and performance of the AVs, section 2, "Technical Assistance to States," provides clarity to the states on their role in the safe integration of Level 3–5 ADSs on public roads to ensure a consistent, unified, national framework, so as not to create barriers to ADS operation (such as any requirement that a driver keep one hand on the steering wheel at all times). The states will be responsible for regulating the human

driver and most aspects of vehicle operation, including driver licensing, vehicle registration and titling, and ensuring that traffic laws do not hamper AV technology. Section 2 encourages the states to create or designate a lead agency to monitor ADS applications and testing, along with asking them to consider how to allocate liability among owners, operators, and manufacturers, and determining who must carry motor vehicle insurance.

Similar to the FAVP, the new policy is intended to be flexible and updated when necessary, with the expectation that it will evolve as the needle continues to move on AV development.

SELF DRIVE Act and AV START Act

The new guideline comes on the heels of the passage of H.R. 3388, by the U.S. House of Representatives on September 6, 2017—first-of-its-kind legislation entitled, "Safely Ensuring Lives Future Deployment and Research in Vehicle Evolution" (SELF DRIVE) Act. A rare bipartisan bill, the House passed the SELF DRIVE Act for the stated purpose of increasing safety, increasing mobility for the handicapped and the elderly, and keeping America at the forefront of autonomous vehicle research. The Act preempts the states from implementing laws creating barriers to AV technology, and to the contrary, it allows manufacturers to deploy 25,000 vehicles in the first year that do not meet normal safety standards, with that number increasing to 100,000 vehicles in subsequent years.

The SELF DRIVE Act expedites the continued development of AV technology by clearing out the patchwork of conflicting state laws around the country. The Act recognizes the urgency to improve traffic safety, noting the recent uptick in traffic fatalities, while placing a specific emphasis on mobility for those in our society who are unable to drive themselves, given AVs' promise to provide our handicapped and disabled communities with the experience and freedom of mobility.

The House bill, however, does not include heavy trucks. The Senate conducted a hearing on September 13, entitled, "Transportation Innovation: Automated Trucks and Our Nation's Highways," to consider whether to include trucks in the Senate version of the bill. The testimony on behalf of the American Trucking Association emphasized the importance of including trucks in the discussion and a desire to be at the table while the roadmap for AVs is being drawn. After all, there are some 33.8 million commercial vehicles in the United States, which travel an estimated 450 billion miles annually. The Senate is expected to pass its own version of the SELF DRIVE Act—S. 1885 the "American Vision for Safer Transportation through Advancement of Revolutionary Technologies" (AV START) Act—so we will continue to monitor the daily evolution of the ongoing federal legislation on AVs.

State Regulations and the SAVE Act

Meanwhile, before the release of the new NHTSA policy and passage of the SELF DRIVE Act, some 22 states had already passed some form of AV legislation or issued an executive order concerning AVs. Among those states, several have passed what is known as "Save Act" legislation. The Save Act legislation (Safe Autonomous Vehicles Act) is seen by some as favoring traditional auto manufacturers over the non-traditional software companies, which merely add their equipment

to existing vehicles. The new federal guideline puts an end to any preferential treatment for one manufacturing or software entity over another, and it discourages any such distinctions between those invested in the emerging autonomous vehicle space.

Beyond the legislation, several states have been increasingly proactive with their investment in AV infrastructure and technology. In an effort to make Virginia a leader in AV-technology research and development, and to streamline the use of Virginia's roadways and state-of-the-art test facilities for AV testing and certification, the state announced on June 2, 2015, the creation of the "Virginia Automated Corridors Partnership." This initiative was created to help build a new economy, and to provide the opportunity for AV manufacturers and suppliers to experience ideal, real-world environments that they need to test complex driving scenarios. The program integrates numerous resources, such as 70 miles of interstate highway, dedicated high-occupancy toll lanes, high-definition mapping capabilities, enhanced pavement markings, and connected vehicle capability, via dedicated, short-range communications. Likewise, Ohio (home to some 70,000 truck drivers) committed $15 million to create a 35-mile stretch of highway outside Columbus for testing self-driving trucks.

Similarly, Arizona Governor Doug Ducey signed an executive order on August 25, 2015, to encourage AV development and testing. Michigan lawmakers recently passed new legislation to allow for the expanded manufacture and road testing of AVs, in an effort to protect Michigan's dominance in the automotive research and development arena, before other states (and countries) beat them to the task. California and Nevada, among others, have already passed legislation to promote and encourage AV development and to allow AV testing on public roads. Much of the past debate among state legislatures involved whether to require a human driver behind the wheel who can take over, or whether the definition of "driver" can actually include the AV's computer system, which acts to control the vehicle. The new NHTSA policy and the SELF DRIVE Act take care of those issues, however.

From Self-Driving Cars to Robo-Trucks

While driverless cars have been getting most of the media attention, self-driving trucks are quickly entering the discussion. The chatter reached a high pitch in May 2015, when Daimler showcased its Freightliner Inspiration Truck at the Hoover Dam in Nevada, promising to unlock autonomous vehicle advancements that reduce accidents, improve fuel efficiency, cut highway congestion, and safeguard the environment. It was the first licensed, autonomous-commercial truck to operate on an open public highway in the United States. The truck is equipped with "highway pilot" sensors and computers that link together cameras, radar systems, lane stability, collision avoidance, speed control, braking, steering, and other monitoring systems, which combined, create a Level-3 autonomous vehicle, allowing the driver to cede full control under certain conditions. The driver is in control when exiting the highway, traveling on local roads, and making deliveries. Daimler expects its semi-autonomous truck to hit the market by 2020.

The Daimler event was followed by the Otto self-driving truck (in partnership with Uber), transporting a load of beer from Fort Collins, Colorado, to Colorado Springs, on October 20, 2016.