SUMMARY

Automated vehicles (AVs) will crash less frequently than human-driven vehicles, but they will still crash. These crashes will sometimes create victims, and these victims will justifiably demand compensation. Our legal system is well-equipped to handle non-automated vehicle crashes, but AVs will challenge our existing doctrine. It is not yet clear how liability will be assigned when an AV crashes.

Each part of this four-part brief series considers one of four possible defendants—AV manufacturers, operators, fleet owners, and dispatchers—in a lawsuit following an AV crash. This brief (Part Three) explores the liability and insurance outlook for AV fleet owners. Particular attention is paid to the potential role that the federal law known as the “Graves Amendment” may play.

1 J.D. Candidate, 2019, UC Davis School of Law
2 Executive Director, UC Davis Policy Institute for Energy, Environment, and the Economy
3 Ph.D. Candidate, UC Davis Department of Civil and Environmental Engineering
1 Background

This four-part series explores questions around AV liability and insurance. Our purpose is to highlight areas where the emergence of AVs will pose a challenge to our existing legal doctrine. Uncertainty in liability is a major barrier to deployment of any new technology, especially one with such wide-ranging effects as AVs. A predictable, fair, and science-based approach to creating liability rules would assist in facilitating the rapid deployment of the safest AV business models.

Each part of this brief considers the liability burdens that a particular party to an AV crash could bear. This brief—Part Three of the series—explores the liability and insurance outlook for AV fleet owners.

An AV fleet owner, for the purpose of this brief, is either an individual or a company who owns more than one AV and who allows others to use one of their AVs on a temporary basis. The fleet owner will usually, but not always, charge a fee for use. Although any type of AV can be fleet owned, this brief will focus on AVs capable of self-driving in some or all circumstances (corresponding to vehicles at SAE Level Three and above; see next section). This brief will use the term “HAV” (highly automated vehicle) to refer to such vehicles.

This brief will address the following simplified scenario in which:

- At least some SAE Level Four and Five AVs will be fleet-owned.
- The fleet owner is not also the manufacturer of the AV.
- The AV fleet owner, if an individual, is not also the operator of the AV in a crash.
- AV insurance, like conventional auto insurance, is available to fleet owners in a competitive market with different insurance products available.
- Parties choose to purchase insurance when it is economically rational for them to do so.

This brief is structured as follows. Section 2 describes challenges to determining liability for and insuring AV fleet owners. Section 3 presents three possible liability and insurance frameworks for fleet owner insurance and notes the advantages and drawbacks of each. Section 4 outlines anticipated outcomes of each framework at different levels of vehicle automation. Section 5 concludes.

2 Challenges

2.1 Fleet owner liability

As described in Part One of this series, most conventional automobile accidents are caused by human driving error, including driver inattention, overconfidence, tiredness, and so on. Liability for such accidents is assigned to the human driver under a negligence framework. Accidents can also be caused by unintentional manufacturing errors, in which case liability is assigned to the manufacturer under a products liability framework.

AVs will complicate liability assessment and assignment. Automating driving tasks—that is, giving tasks over to the ability and judgment of a computer—blurs the line between human error and manufacturing defect. When a computer-controlled HAV crashes, there may not even be a human driver to commit an error. Of course, computers have no assets and cannot pay a liability judgment. This means that courts must impute the computer’s liability to another party. If a HAV that crashes is fleet-owned, the HAV fleet owner is a potentially liable party.

An important factor in determining liability will be the extent of automation in a given vehicle. The Society of
Automotive Engineers (SAE) has developed a widely used system for classifying vehicle automation (Table 1).

<table>
<thead>
<tr>
<th>SAE level</th>
<th>SAE name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No automation</td>
<td>All aspects of driving are fully human and manually controlled.</td>
</tr>
<tr>
<td>1</td>
<td>Driver assistance</td>
<td>Automation assists with only one aspect of driving (e.g., steering, speed, or braking control).</td>
</tr>
<tr>
<td>2</td>
<td>Partial automation</td>
<td>Automation assists with multiple aspects of driving, allowing for limited self-driving. Driver must monitor and be ready to take control of the vehicle at all times.</td>
</tr>
<tr>
<td>3</td>
<td>Conditional automation</td>
<td>Lowest-tiered system classified as automated driving. Automation controls routine driving, but manual override is required in challenging situations. Driver must monitor and be ready to take control of the vehicle at all times.</td>
</tr>
<tr>
<td>4</td>
<td>High automation</td>
<td>Automation controls all driving in most conditions. Manual override is possible but only required in very challenging situations.</td>
</tr>
<tr>
<td>5</td>
<td>Full automation</td>
<td>Automation controls all driving in all situations. Manual override is not necessary and may not even be possible.</td>
</tr>
</tbody>
</table>

This brief focuses on HAVs: those vehicles at SAE Levels Four and Five, and, in some cases, at SAE Level Three. We do not address vehicles at SAE Levels One and Two because these vehicles cannot self-drive in most situations. It is likely that an owner of a fleet AVs incapable of self-driving will be treated as a rental-car company. Liability rules for rental-car companies are well established and partial automation does not appear to pose any particular conceptual challenges to existing rental-car law. Indeed, most major rental-car companies already lease vehicles with low-level automated functions such as lane keeping and adaptive cruise control.

Fleets composed of HAVs, however, will challenge existing law—and soon. Large companies like Waymo and Uber are already testing HAV fleets, and Waymo has announced that it intends to launch a fleet of HAV taxis in the near future. In June 2018, California launched two pilot programs allowing transit companies to use HAVs to transport passengers as long they do not charge a fee. It is prudent to consider today how to determine liability for incidents involving HAV fleets tomorrow.

### 2.2 The Graves Amendment

The extent to which the owner of a HAV fleet is liable for incidents involving one or more of its fleet vehicles will depend largely on the fleet owner’s status under the federal “Graves Amendment.” In 2005, Congress passed the Federal Transportation Equity Act (49 U.S.C. § 30100). Section 30106 of this statute was sponsored by Congressman Sam Graves (R-MO) and so is known colloquially as the Graves Amendment. This section of the Act reads, in pertinent part:

An owner of a motor vehicle that rents or leases the vehicle to a person (or an affiliate of the owner) shall not be liable under the law of any State or political subdivision thereof, by reason of being the owner of the vehicle (or an affiliate of the owner), for harm to persons or property that results or arises out of the use, operation, or possession of the vehicle during the period of the rental or lease, if

1. the owner is engaged in the trade or business of renting or leasing motor vehicles; and
2. there is no negligence or criminal wrongdoing on the part of the owner (or an affiliate of the owner)

In other words, the Graves Amendment protects rental-car companies from “vicarious liability” lawsuits. Vicarious liability is a situation in which one party is held responsible for the acts or omissions of another party. The Graves Amendment provides a defense for rental-car companies in such situations.
Amendment hence prevents parties from suing a rental-car company for acts committed by its customers unless the company itself independently committed a negligent or criminal act. The Graves Amendment preempts state law, meaning that vicarious liability lawsuits cannot be filed against rental-car companies even in states that would otherwise permit such actions.

Lawmakers will have to determine whether a HAV fleet owner is more like a rental-car company or a taxi company. The Graves Amendment explicitly removes the threat of a vicarious liability lawsuit against rental-car companies. Courts have also extended the Graves Amendment to apply to on-demand carsharing services like Zipcar. This means that HAV fleet owners would likely also be protected by the Graves Amendment if courts decide that HAV fleet services are similar to carsharing services.

However, courts have held that taxi and delivery services operate outside the reach of the Graves Amendment. The reasoning behind this rule is rooted in the concept of agency. A person who rents and drives a rental car is not considered an “agent” of a rental-car company for two reasons. First, someone who rents and drives a car from a rental-car company is not driving on behalf of the company. Second, there is no employment relationship between a typical rental-car driver and company. Taxi and delivery drivers, by contrast, are typically considered agents of their companies and are typically employees or contractors of these companies. For these reasons, courts have determined that vicarious liability lawsuits against taxi or delivery companies are not barred by the Graves Amendment.

Lawmakers have not yet clarified whether a HAV fleet would be viewed akin to a rental-car company or to a taxi company. It is not yet legally clear whether or how an autonomous robot or software program can establish an agency relationship with a company, nor is it clear whether an autonomous robot or software program can be considered an employee. Furthermore, the human vehicle occupant’s potential ability to assume control of SAE Level Three and Four HAVs might render these vehicles more similar to traditional rental cars. A HAV fleet owner’s business model and the automation level of the vehicles in the fleet will be relevant to determining which legal arguments win out.

2.3 Fleet owner insurance

When a rental car crashes, multiple insurance policies may apply. Some personal vehicle insurance policies also cover drivers when operating rental cars. Some drivers purchase supplemental insurance policies directly from rental-car companies. Such supplemental policies are often reinsured by other, larger insurers. These reinsurers may bring their own claim-adjudication actions to protect their reinsurance investment. One or more of these parties may ultimately bear the cost of a HAV crash.

When a taxi crashes, on the other hand, the taxi company’s commercial insurance policy is typically the relevant insurance policy. Passengers do not purchase personal insurance policies when they ride in taxis, nor are they legally expected to. While a taxi occupant’s health insurance may compensate the occupant for damages sustained in a crash, the health insurer will usually “subrogate”: i.e., they will pay the victim’s bills and then seek reimbursement from the taxi company’s commercial insurer. Thus, the commercial insurer usually ends up bearing all costs of a taxi crash.

Clarification as to whether HAV fleets are viewed more like rental-car fleets or more like taxi fleets is needed to determine whether HAV fleet owners are likely to bear liability in the event of a crash. HAV fleet owners will not need to purchase liability insurance in the case of the former, but they will in the case of the latter. This is important from a consumer standpoint as well. HAV fleet owners will pass the cost of insurance on to customers, thereby affecting the cost per ride of using a HAV fleet service.
3 Possible liability and insurance frameworks

3.1 Vicarious liability

Under a vicarious liability framework, negligent acts committed by a fleet vehicle’s computer software would be imputed to the fleet owner. In other words, the fleet owner would be held liable (and required to pay) for any harm caused by the computer driver’s failure to adhere to the “reasonable person” standard.3

Since taxi companies can be vicariously liable for the negligent acts of their human drivers, it seems logical that HAV fleet companies could be vicariously liable for the negligent acts of their computer drivers as well. On the other hand, it may be a better policy decision to assign liability to the vehicle manufacturer rather than to the fleet owner. Manufacturers have direct control over the computer driver’s propensity to drive negligently; fleet owners do not. If manufacturers must bear the burden of liability, they should be incentivized to make their vehicles as safe as possible.

Lawmakers must also consider the fact that assigning liability to a particular class of actors (e.g., manufacturers or fleet owners) for incidents involving HAVs will disincentivize that type of actor from entering HAV markets. For example, if fleet owners must bear a heavy liability burden, the risk of liability may dissuade firms or individuals from becoming fleet owners. This could impede the widespread use and adoption of HAVs. It is necessary to consider the impact that liability assignment will have on the development and market potential of HAV technology.

If HAV fleet owners are susceptible to vicarious liability, they will need to purchase commercial fleet insurance. This insurance product already exists and is widely available, but new market entrants may create versions designed for HAV fleet owners. As discussed in Parts One and Two of this series, insurers with specialized knowledge of HAVs may be able to offer more competitive rates or better-tailored policies.

Importantly, the preemption power of the Graves Amendment means that a vicarious liability framework will only be possible if HAV fleet companies are treated like taxi companies rather than rental-car companies nationwide. Many states (including California, home to most major companies currently experimenting with HAVs) allow vicarious liability lawsuits against taxi drivers. For instance, a California appeals court affirmed a $335,000 jury verdict in a 2017 vicarious liability lawsuit brought against a taxi company when one of the company’s drivers made an illegal left turn and crashed into a motorcyclist.4 It is not yet clear if a similar lawsuit brought against a HAV fleet owner would succeed. More precisely, while it is clear that legal liability would exist in such an incident, it is not clear who would bear it: the HAV fleet owner, manufacturer, occupant, or some combination of the above. This legal confusion is problematic not only for the potentially liable parties, but also for the victims of accidents involving HAV fleets. If victims do not know who they should sue, they may sue all possibly liable parties. The result will be larger, more expensive, and time-consuming lawsuits from which only attorneys will benefit.

3.2 Negligent maintenance

Under a negligent maintenance framework, HAV fleet owners would be liable for an accident involving one of its vehicles if it could be shown that the accident arose from the owner’s failure to properly maintain and care for the vehicle. Notably, the Graves Amendment does not protect fleet owners from negligent maintenance lawsuits. 49 U.S.C. § 30106(a)(1) states that the Graves Amendment only applies “where there is no negligence...on the part of the owner.” A fleet owner’s failure to maintain its HAVs would likely be considered a negligent act.

A negligent maintenance theory would hold HAV fleet owners liable if they fail to properly maintain critical driving

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3 For a deeper treatment of computer driver negligence and the “reasonable person” standard, see Part One, Section 3 of this brief series.
components. This includes driving components included in automated and non-automated cars alike, such as the engine, tires, and brakes. It also includes driving components unique to HAVs, such as LiDAR and other sensors and computer software.

Negligent maintenance litigation often turns on the application of tort law's famous Learned Hand Formula for efficient precautions. The Learned Hand Formula is an algebraic formula expressed as “B = P*L”, where “B” stands for the burden of precaution, “P” stands for the probability of harm if precaution is not taken, and “L” stands for the expected magnitude of harm if precaution is not taken. When the cost of taking preventative precaution is less than the expected cost of paying damages (that is, when B < P*L), it is negligent not to pay precautionary costs. All parties are legally expected to incur precaution costs up to and equal to whatever harm is expected if precaution is not taken.

The Learned Hand Formula suggests that HAV fleet owners must only carry out precautionary vehicular maintenance to the point that the cost of the maintenance equals the expected cost of the accident that additional precaution would prevent. For example, LiDAR sensors are expensive, so the cost of replacing the sensors (“B”) may be high. However, a vehicle with faulty LiDAR sensors may be far more likely to crash (“P”), and the expected cost of such a crash may also be high (“L”). Thus, although the cost of replacing the sensors is high, the likelihood that failing to replace the sensors will result in an even more costly vehicle crash could mean that it is negligent for the fleet owner not to replace the sensors.

Similarly, HAV software updates will likely be free, so the cost burden of updating the fleet vehicle’s software will essentially be zero. If the software update even slightly decreases the probability or expected cost of a crash, it would likely be negligent for the HAV fleet owner not to update. HAV fleet owners will need to be diligent with their software-updating practices to avoid the risk of negligent maintenance.

Auto insurance does not cover typically negligent maintenance because most auto insurance policies only cover accidental damage. Unless HAV fleet owners expressly negotiate for an insurance policy that covers negligent maintenance liability, insurance will not alleviate the liability burden. Hence under a negligent maintenance liability framework, HAV fleet owners must diligently maintain vehicles or risk assuming substantial financial responsibility in the event of an incident.

3.3 Negligent entrustment

Under a negligent entrustment framework, one party can be held liable for providing a second party with a dangerous object that the second party is not adequately equipped to handle. Such a framework could be used to hold a HAV fleet owner liable for negligently entrusting one of their HAVs to a customer who is not legally equipped to handle it.

Negligent entrustment theory is not the same as vicarious liability. Vicarious liability is a strict liability theory: it would hold the HAV fleet owner liable for any negligent act committed by the computer driver, even if the HAV fleet owner did nothing wrong. By contrast, negligent entrustment would require a plaintiff to prove that entrusting a customer with a fleet owner’s HAV was itself a negligent act. Whereas a vicarious liability claim will analyze the computer driver for negligent driving, a negligent entrustment claim will analyze the fleet owner itself for its decision to allow a particular customer to use an HAV.

Many states, including California, recognize a civil cause of action for negligent entrustment of a motor vehicle. To establish this type of claim, the plaintiff must prove that the defendant (the loaner of the vehicle) knew or should

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5 This formula, also known as the “calculus of negligence”, is named for Judge Learned Hand, one of the most esteemed jurists of the 20th century. It was first described by Judge Hand’s majority opinion in United States v. Carroll Towing Co., 159 F.2d 169 (2nd Cir. 1947).

have known that the driver was incompetent or unfit to drive the vehicle. California courts have confirmed that rental-car companies can be defendants to negligent entrustment cases, the Graves Amendment notwithstanding.\(^7\) Negligent entrustment could thus potentially be applied to HAV fleet owners regardless of whether they are viewed more like rental-car companies or more like taxi companies.

It is not yet clear who would be deemed “incompetent or unfit” to operate a HAV. The SAE Level of the vehicle may play a significant role in this determination. A SAE Level Three or Four vehicle can self-drive in many situations but may require a human driver to take control in certain situations. It could therefore be negligent entrustment to allow a person without a driver's license to use such a vehicle. A SAE Level Five vehicle, however, is completely self-driving and may not allow human intervention under any circumstance. If there is no possibility of the human occupant taking control of the vehicle, there may be no grounds for a negligent entrustment lawsuit regardless of the human’s competency (or lack thereof).

Clarification as to whether or when a negligent entrustment lawsuit is viable could be important for mobility equity. Self-driving vehicles offer the potential to improve mobility access for many groups who cannot own or drive their own vehicles: the disabled, the impoverished, children, etc. HAVs could help these groups of people meet their travel needs more directly and safely than other forms of transit. But if HAV fleet owners face the prospect of negligent entrustment liability when they offer their fleet vehicles to these disadvantaged groups, they may refrain from doing so. Public policy must find the appropriate balance between protecting the legal recourse rights of victims of accidents involving HAVs and allowing HAV technology to be deployed in ways that can help the underprivileged.

If HAV fleet owners face the possibility of negligent entrustment liability, they will want to insure against it. Commercial auto insurance policies do not always cover negligent entrustment, but commercial policies for HAV fleet owners may need to. If this type of lawsuit proves to be legally viable, it is likely that fleet owners and insurers will negotiate to create an insurance product that would cover negligent entrustment.

4 Anticipated outcomes of framework application

4.1 Vicarious liability

A vicarious liability framework allows the victim of a HAV fleet vehicle to hold the fleet owner liable for the computer driver’s negligence regardless of whether or not the owner did anything wrong. The viability of this theory against HAV fleet owners depends on the status of HAV fleets under the Graves Amendment. If the Graves Amendment applies to HAV fleets, it prevents vicarious liability lawsuits. If it does not, vicarious liability lawsuits will be viable if state law allows them.

<table>
<thead>
<tr>
<th>Liability scenario</th>
<th>Fleet owner liability?</th>
<th>Should fleet owner insure?</th>
</tr>
</thead>
<tbody>
<tr>
<td>HAV fleets are treated like rental-car fleets.</td>
<td>Graves Amendment applies. Vicarious liability lawsuits against fleet owners are barred, regardless of state vicarious liability law.</td>
<td>No. Unnecessary because the Graves Amendment prohibits vicarious liability lawsuits.</td>
</tr>
<tr>
<td>HAV fleets are treated like taxi fleets.</td>
<td>Graves Amendment does not apply. Vicarious liability lawsuits against fleet owners are allowed if state has a vicarious liability law.</td>
<td>Yes, if the fleet owner is operating in a state that permits vicarious liability lawsuits.</td>
</tr>
</tbody>
</table>

4.2 Negligent maintenance

A negligent maintenance framework allows the victim of a HAV fleet vehicle to hold the fleet owner liable when the fleet owner's failure to maintain the HAV causes harm to the victim. This theory is likely viable regardless of whether the Graves Amendment extends to HAV fleet owners. Litigation will often turn on application of the Learned Hand Formula ($B = P*L$). Under this framework, a HAV fleet owner will be liable for any accident resulting from the owner's failure to adequately maintain essential driving components (e.g., tires or brakes), self-driving hardware (e.g., sensors), or self-driving software (e.g., by installing software updates in a timely manner), as long as the cost of maintenance does not exceed the cost of the accident (i.e., $B > P*L$). The fleet owner will likely insure if there are commercial insurance policies available to cover negligent maintenance lawsuits.

4.3 Negligent entrustment

A negligent entrustment framework allows the victim of an accident involving a HAV fleet vehicle to hold the fleet owner liable when the fleet owner lends a fleet vehicle to an “incompetent or unfit” operator, resulting in harm. This theory is likely viable regardless of whether the Graves Amendment extends to HAV fleet owners.

Table 3. Anticipated outcomes under a negligent entrustment framework

<table>
<thead>
<tr>
<th>Liability scenario</th>
<th>Fleet owner liability?</th>
<th>Should fleet owner insure?</th>
</tr>
</thead>
<tbody>
<tr>
<td>A HAV fleet owner entrusts an SAE Level Three or above HAV to a normal, qualified driver.</td>
<td>Unlikely. Without reason for the fleet owner to believe driver is a unique risk, entrustment with the HAV is probably not negligent.</td>
<td>Probably unnecessary.</td>
</tr>
<tr>
<td>A HAV fleet owner entrusts an SAE Level Three or Four HAV to an unqualified or otherwise risky driver.</td>
<td>Unclear, but plausible. Will likely require adjudication to determine who qualifies as “incompetent or unfit.”</td>
<td>Unclear. May not be necessary if fleet owner carefully vets customers for competence.</td>
</tr>
<tr>
<td>A HAV fleet owner entrusts an SAE Level Five vehicle to an unqualified or otherwise risky driver.</td>
<td>Unlikely. If there is no possibility for a human driver to assume control, it does not matter whether or not the driver would be competent or fit to do so.</td>
<td>Probably unnecessary.</td>
</tr>
</tbody>
</table>

5 Conclusion

The AV revolution will challenge the tort liability scheme, but some existing legal rules and doctrines may prove sufficiently flexible to address the unique features of AV manufacturing. Legal policymakers should consider both the benefits and shortcomings of AVs to strike the appropriate balance between innovation and victim compensation. Regardless of the scheme policymakers adopt, liability assignment must be clear. If all parties have a clear understanding of if, when, and how they may be liable, they will be better informed and will make better choices about using (and insuring their use of) AVs.

If policymakers choose to assign liability to AV manufacturers, the critical questions that must be resolved are:

- What will be the market impact of holding AV fleet owners liable? Will assigning liability in this way disincentivize market entry?
- Will the Graves Amendment apply to AV fleet owners and prevent vicarious liability lawsuits?
- What sort of vehicle maintenance must HAV fleet owners perform to avoid negligence? How will fleet owners know their expected maintenance level?
• What sort of vehicle occupant, if any, would be deemed “incompetent or unfit” for the purposes of a negligent entrustment claim against the fleet owner?

To answer these questions, policymakers should collaborate with legal experts who are doing important research in this field. This brief only touches on a few of many liability concepts that legal academia is currently debating. Legal experts can support good policy development by providing useful historical insight and practical analysis to help guide policymakers through the conceptual challenges of liability reform. This type of collaboration will ensure that manufacturers and consumers can realize the safety goals of AV technology.